

INFORMATION TECHNOLOGY SERVICES ITQ

REQUEST FOR QUOTATIONS FOR

MEDICAL MARIJUANA

ISSUING OFFICE

**OFFICE OF ADMINISTRATION
OFFICE FOR INFORMATION TECHNOLOGY
BUREAU OF IT PROCUREMENT
ON BEHALF OF DEPARTMENT OF HEALTH**

RFQ NUMBER

6100040415

DATE OF ISSUANCE

December 15, 2016

The Office of Administration, Office for Information Technology, Bureau of IT Procurement has posted solicitation RFQ 6100040415 for the Pennsylvania Department of Health, Medical Marijuana. Please go to the [eMarketplace Website](#) to view and download all documentation pertaining to this solicitation.

This is a restricted solicitation, only those contractors qualified in one (1) or more of the following service category(ies) under the Commonwealth's Master Information Technology (IT) Services Invitation to Qualify (ITQ) Contract, [4400004480](#), prior to the bid opening date may respond.

- Commercial Off-The-Shelf (COTS) Software Services
- Modifiable Off-The-Shelf (MOTS) Software Services
- Subscription Based Web Application Services or Software as a Service (SaaS) Procurements

Organizations interested in doing business with the Commonwealth through this contract must begin by registering with the Commonwealth as a Procurement Supplier. For more information about registration, please view the [Registration Guide](#).

Once an organization is registered with the Commonwealth, they must develop and submit a bid through the [PASupplierPortal Website](#) in order to qualify for one, all, or any combination of the service categories associated with this contract. The Commonwealth will evaluate the bid along with all supporting documentation to determine whether the organization meets the minimum eligibility requirements.

For more information about the Commonwealth's Invitation to Qualify contracts and their policies, please visit the [ITQ Website](#).

REQUEST FOR QUOTATIONS

FOR

MEDICAL MARIJUANA

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CALENDAR OF EVENTS

The Commonwealth will make every effort to adhere to the following schedule:

Activity	Responsibility	Date
Deadline to submit Questions via email to: RA-OITPurchases@pa.gov	Contractors	Thursday December 22, 2016, by 1:00 PM EST
Optional Pre-proposal Conference – Location Office for Information Technology Bureau of IT Procurement 613 North Street Finance Building, Conference Room 503 Harrisburg, PA 17120-0400	Issuing Office/ Contractors	Friday January 6, 2017, At 10:00 AM
Answers to Potential Contractor questions posted to the DGS website no later than this date.	Issuing Office	Thursday January 12, 2017, by 4:00 PM EST
Please monitor the DGS website for all communications regarding the RFQ.	Contractors	Ongoing
Sealed proposal must be received by the Issuing Office at Bureau of IT Procurement c/o Commonwealth Mail Processing Center 2 Technology Park (rear) Attn: IT Procurement, 506 Finance Harrisburg, PA 17110 Attn: Michael D. Gress Proposals must be time and date stamped by the facility receiving the proposals. Proposals may only be hand-delivered between 6:15 a.m. and 2:15 p.m., Monday through Friday, excluding Commonwealth holidays.	Contractors	Friday January 27, 2017, by 1:00 PM EST

PART I

GENERAL INFORMATION

I-1. Purpose

This Request for Quotes ("RFQ") provides to those interested in submitting proposals for the subject procurement ("Contractors") sufficient information to enable them to prepare and submit proposals for the **Office for Information Technology, Bureau of IT Procurement's** consideration on behalf of the Commonwealth of Pennsylvania ("Commonwealth") to satisfy a need for the **Department of Health, Pennsylvania's Medical Marijuana (MM)** ("Project").

I-2. Issuing Office

The **Office of Information Technology Bureau of IT Procurement** ("Issuing Office") has issued this RFQ on behalf of the Commonwealth. The sole point of contact in the Commonwealth for this RFQ is Michael Gress, Office for Information Technology, Bureau of IT Procurement, 613 North Street, Finance Building, Room 506, Harrisburg, PA 17120-0400, RA-OITPurchases@pa.gov), the Issuing Officer for this RFQ. Please refer all inquiries to the Issuing Officer.

I-3. Scope

This RFQ contains instructions governing the requested proposals, including the requirements for the information and material to be included; a description of the service to be provided; requirements which Contractors must meet to be eligible for consideration; general evaluation criteria; and other requirements specific to this RFQ.

I-4. Problem Statement

The Pennsylvania Department of Health must ensure that the cultivation, growing, processing, production, distribution, dispensing and sale of Medical Marijuana in the Commonwealth complies with the requirements of PA Act 16 of 2016 and supporting regulations. This project supports several related, time-sensitive system components required to implement Pennsylvania's Medical Marijuana program:

1. The implementation of a hosted, Software as a Service (SaaS) medical marijuana Seed to Sale tracking system, which will be used to monitor, control and report on activities of authorized growers/processors, dispensaries, laboratories, clinical registrants and academic clinical research centers.
2. To permit growers/processors to begin cultivating, growing and processing activities as soon as possible, a temporary 'bridge' tracking system needs to be in place and functional in advance of full-scale implementation of the Seed to Sale system.
3. The implementation of a hosted, SaaS registry for patients, caregivers, practitioners and medical providers, which will integrate with the Seed to Sale system as necessary to track patient dispensary activity.

Offerors, either directly or through their subcontractor(s), must be able to provide all products/services and meet the requirements requested in this solicitation, except the

production of Medical Marijuana Patient/Caregiver identification cards, which will be provided by the Pennsylvania Department of Transportation. The successful Offeror shall remain responsible for Contract performance regardless of subcontractor participation in the work

DOH will provide professional project oversight and management. The DOH project management team will be engaged in all project phases, from requirements validation through completion of end user training. Additional detail is provided in **Part IV** of this RFQ

I-5. Pre-proposal Conference

The Issuing Office will hold a pre-proposal conference as specified in the Calendar of Events. The purpose of this conference is to provide opportunity for clarification of the RFQ. Contractors should forward all questions to the Issuing Office in accordance with Part I-6 to ensure adequate time for analysis before the Issuing Office provides an answer. Contractors may also ask questions at the conference. In view of the limited facilities available for the conference, Contractors should limit their representation to **two (2)** individuals per Contractor. The pre-proposal conference is for information only. Any answers furnished during the conference will not be official until they have been verified, in writing, by the Issuing Office. All questions and written answers will be posted on the Department of General Services' ("DGS") website (www.emarketplace.state.pa.us) as an addendum to, and shall become part of, this RFQ. Attendance at the Pre-proposal Conference is optional.

I-6. Questions and Answers

If a Contractor has any questions regarding this RFQ, the Contractor must submit the questions by email (with the subject line "**IT ITQ RFQ 6100040415 Medical Marijuana Question**") to the Issuing Officer. Questions must be submitted via email no later than the date and time specified in the Calendar of Events. The Contractor shall not attempt to contact the Issuing Officer by any other means. The Issuing Officer will post the answers to the DGS website. A Contractor who submits a question *after* the deadline date for receipt of questions indicated on the Calendar of Events assumes the risk that its proposal will not be responsive or competitive because the Commonwealth is not able to respond before the proposal receipt date or in sufficient time for the Contractor to prepare a responsive or competitive proposal. When submitted after the deadline date for receipt of questions indicated on the Calendar of Events, the Issuing Officer *may* respond to questions of an administrative nature by directing the questioning Contractor to specific provisions in the RFQ. To the extent that the Issuing Office decides to respond to a non-administrative question *after* the deadline date for receipt of questions indicated on the Calendar of Events, the answer will be provided to all Contractors through an addendum. All questions must be submitted on **Appendix A, Questions Submittal Template** to the following email address:

RA-OITPurchases@pa.gov

All questions and responses as posted on the DGS website are considered as an addendum to, and part of, this RFQ. Each Contractor shall be responsible to monitor the

DGS website for new or revised RFQ information. The Issuing Office shall not be bound by any verbal information nor shall it be bound by any written information that is not either contained within the RFQ or formally issued as an addendum by the Issuing Office. The Issuing Office does not consider questions to be a protest of the specifications or of the solicitation.

I-7. Addenda to RFQ

If the Issuing Office deems it necessary to revise any part of this RFQ before the proposal response date, the Issuing Office will post an addendum to the DGS at website <http://www.emarketplace.state.pa.us>. Answers to the questions asked during the questions and answer period will also be posted to the DGS website as an addendum to the RFQ.

I-8. Electronic Version of RFQ

This RFQ is being made available by electronic means. The Contractor acknowledges and accepts full responsibility to insure that no changes are made to the RFQ. In the event of a conflict between a version of the RFQ in the Contractor's possession and the Issuing Office's version of the RFQ, the Issuing Office's version shall govern.

I-9. Response Date

To be considered, proposals must arrive at the Issuing Office on or before the time and date specified in the RFQ Calendar of Events. Contractors which mail proposals should allow sufficient mail delivery time to ensure timely receipt of their proposals. If, due to inclement weather, natural disaster, or any other cause, the Issuing Office location to which proposals are to be returned is closed on the proposal response date, the deadline for submission shall be automatically extended until the next Commonwealth business day on which the office is open, unless the Issuing Office otherwise notifies Contractors by posting an Addendum to the RFQ. The time for submission of proposals shall remain the same. Late proposals will not be considered.

I-10. Incurring Costs

The Issuing Office is not liable for any costs the Contractor incurs in preparation and submission of its proposal, in participating in the RFQ process or in anticipation of award of a purchase order.

I-11. Economy Of Preparation

Contractors should prepare proposals simply and economically, providing a straightforward, concise description of the Contractor's ability to meet the requirements of the RFQ.

I-12. Small Diverse Business Information

The Issuing Office encourages participation by Small Diverse Businesses and Small Businesses as prime contractors, and encourages all prime contractors to make significant commitment to use Small Diverse Businesses and Small Businesses as subcontractors and suppliers.

A Small Business must meet each of the following requirements:

- The business must be a for-profit, United States business;
- The business must be independently owned;
- The business may not be dominant in its field of operation;
- The business may not employ more than 100 full-time or full-time equivalent employees;
- The business, by type, may not exceed the following three-year average gross sales:
 - Procurement Goods and Services: \$20 million
 - Construction: \$20 million
 - Building Design Services: \$7 million
 - Information Technology Goods and Services: \$25 million

For credit in the RFQ scoring process, a Small Business must complete the DGS/BDISBO self-certification process. Additional information on this process can be found at:

<http://www.dgs.pa.gov/Businesses/Small%20Business%20Contracting%20Program/Pages/default.aspx>.

A Small Diverse Business is a DGS-verified minority-owned small business, woman-owned small business, veteran-owned small business, service-disabled veteran-owned small business, LGBT-owned small business, Disability-owned small business, or other small businesses as approved by DGS, that are owned and controlled by a majority of persons, not limited to members of minority groups, who have been deprived of the opportunity to develop and maintain a competitive position in the economy because of social disadvantages.

For credit in the RFQ scoring process, a Small Diverse Business must complete the DGS verification process. Additional information on this process can be found at: <http://www.dgs.pa.gov/Businesses/Minority,%20Women%20and%20Veteran%20Businesses/Pages/default.aspx>.

A Contractor that qualifies as a Small Diverse Business or a Small Business and submits a proposal as a prime contractor is not prohibited from being included as a subcontractor in separate proposals submitted by other Contractors.

A Small Diverse Business or Small Business may be included as a subcontractor with as many prime contractors as it chooses in separate proposals.

The Department's directory of self-certified Small Businesses and DGS/BDISBO-verified Small Diverse Businesses can be accessed from: <http://www.dgs.pa.gov/Businesses/Minority,%20Women%20and%20Veteran%20Businesses/Small-Diverse-Business-Verification/Pages/Finding-Small-Diverse-Businesses.aspx>.

Questions regarding the Small Diverse Business and Small Business Programs, including questions about the self-certification and verification processes can be directed to:

Department of General Services
Bureau of Diversity, Inclusion and Small Business Opportunities (BDISBO)
Room 601, North Office Building
Harrisburg, PA 17125
Phone: (717) 783-3119
Fax: (717) 787-7052
Email: RA-BDISBOVerification@pa.gov
Website: www.dgs.pa.gov

The Department's directory of BDISBO-verified minority, women, veteran and service disabled veteran-owned businesses can be accessed from: Searching for [Small Diverse Businesses](#).

I-13. Proposals

To be considered, Contractors should submit a complete response to this RFQ to the Issuing Office, using the format provided in Part II, providing **one (1)** paper copy of the Technical Submittal and **two (2) paper copies** of the Cost Submittal and **two (2) paper copies** of the **Small Diverse Business and Small Business (SDB/SB) Participation Submittal and related Letter(s) of Intent**. In addition to the paper copy of the proposal, Contractors shall submit **two (2)** complete and exact copies of the entire proposal (Technical, Cost and SDB submittals, along with all requested documents) on CD-ROM or Flash drive in Microsoft Office or Microsoft Office-compatible format. The electronic copy must be a mirror image of the paper copy and any spreadsheets must be in Microsoft Excel. The Contractors may not lock or protect any cells or tabs. Contractors should ensure that there is no costing information in the technical submittal. Contractors should not reiterate technical information in the cost submittal. The CD or Flash drive should clearly identify the Contractor and include the name and version number of the virus scanning software that was used to scan the CD or Flash drive before it was submitted. The Contractor shall make no other distribution of its proposal to any other Contractor or Commonwealth official or Commonwealth consultant. Each proposal page should be numbered for ease of reference. An official authorized to bind the Contractor to its provisions must sign the proposal. If the official signs the **Proposal Cover Sheet (Appendix B)** to this RFQ and the Proposal Cover Sheet is attached to the Contractor's proposal, the requirement will be met. For this RFQ, the proposal must remain valid until a purchase order is issued. If the Issuing Office selects the Contractor's proposal for award, the contents of the selected Contractor's proposal will become, except to the extent the contents are changed through Best and Final Offers or negotiations, contractual obligations.

Each Contractor submitting a proposal specifically waives any right to withdraw or modify it, except that the Contractor may withdraw its proposal by written notice received at the Issuing Office's address for proposal delivery prior to the exact hour and date specified for proposal receipt. A Contractor or its authorized representative may withdraw its proposal in person prior to the exact hour and date set for proposal receipt, provided the withdrawing person provides appropriate identification and signs a receipt for the proposal. A Contractor may modify its submitted proposal prior to the exact hour

and date set for proposal receipt only by submitting a new sealed proposal or sealed modification which complies with the RFQ requirements.

I-14. Alternate Proposals

The Issuing Office will not accept alternate proposals.

I-15. Proposal Contents

A. Confidential Information. The Commonwealth is not requesting, and does not require, confidential proprietary information or trade secrets to be included as part of Contractors' submissions in order to evaluate proposals submitted in response to this RFQ. Accordingly, except as provided herein, Contractors should not label proposal submissions as confidential or proprietary or trade secret protected. Any Contractor who determines that it must divulge such information as part of its proposal must submit the signed written statement described in subsection c. below and must additionally provide a redacted version of its proposal, which removes only the confidential proprietary information and trade secrets, for required public disclosure purposes.

B. Commonwealth Use. All material submitted with the proposal shall be considered the property of the Commonwealth of Pennsylvania and may be returned only at the Issuing Office's option. The Commonwealth has the right to use any or all ideas not protected by intellectual property rights that are presented in any proposal regardless of whether the proposal becomes part of a purchase order. Notwithstanding any Contractor copyright and/or trademark designations contained on proposals, the Commonwealth shall have the right to make copies and distribute proposals internally and to comply with public record or other disclosure requirements under the provisions of any Commonwealth or United States statute or regulation, or rule or order of any court of competent jurisdiction.

C. Public Disclosure. After the award of a contract pursuant to this RFQ, all proposal submissions are subject to disclosure in response to a request for public records made under the Pennsylvania Right-to-Know-Law, 65 P.S. § 67.101, et seq. If a proposal submission contains confidential proprietary information or trade secrets, a signed written statement to this effect must be provided with the submission in accordance with 65 P.S. § 67.707(b) for the information to be considered exempt under 65 P.S. § 67.708(b)(11) from public records requests (*See Appendix C, Trade Secret/Confidential Proprietary Information Notice*). Financial capability information submitted in response to **Part II, Section II-8** of this RFQ is exempt from public records disclosure under 65 P.S. § 67.708(b)(26).

I-16. Contractor's Representations and Authorizations

By submitting its proposal, each Contractor understands, represents, and acknowledges that:

A. All of the Contractor's information and representations in the proposal are true, correct, material and important, and the Issuing Office may rely upon the contents of

the proposal in making an award. The Commonwealth shall treat any misstatement, omission or misrepresentation as fraudulent concealment of the true facts relating to the proposal submission, punishable pursuant to 18 Pa. C.S. § 4904.

- B.** The Contractor has arrived at the price(s) and amounts in its proposal independently and without consultation, communication, or agreement with any other Contractor or potential Contractor.
- C.** The Contractor has not disclosed the price(s), the amount of the proposal, nor the approximate price(s) or amount(s) of its proposal to any other firm or person who is a Contractor or potential Contractor for this RFQ, and the Contractor shall not disclose any of these items on or before the proposal submission deadline specified in the Calendar of Events of this RFQ.
- D.** The Contractor has not attempted, nor will it attempt, to induce any firm or person to refrain from submitting a proposal on this purchase order, or to submit a proposal higher than this proposal, or to submit any intentionally high or noncompetitive proposal or other form of complementary proposal.
- E.** The Contractor makes its proposal in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive proposal.
- F.** To the best knowledge of the person signing the proposal for the Contractor, the Contractor, its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any Local, State, or Federal governmental agency and have not in the last **four (4)** years been convicted or found liable for any act prohibited by Local, State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding or proposing on any public contract, except as the Contractor has disclosed in its proposal.
- G.** To the best of the knowledge of the person signing the proposal for the Contractor and except as the Contractor has otherwise disclosed in its proposal, the Contractor has no outstanding, delinquent obligations to the Commonwealth including, but not limited to, any state tax liability not being contested on appeal or other obligation of the Contractor that is owed to the Commonwealth.
- H.** The Contractor is not currently under suspension or debarment by the Commonwealth, any other state or the federal government, and if the Contractor cannot so certify, then it shall submit along with its proposal a written explanation of why it cannot make such certification.
- I.** The Contractor has not made, under separate contract with the Issuing Office, any recommendations to the Issuing Office concerning the need for the services described in its proposal or the specifications for the services described in the proposal. (*See Pennsylvania State Adverse Interest Act*)

J. The Contractor, by submitting its proposal, authorizes Commonwealth agencies to release to the Commonwealth information concerning the Contractor's Pennsylvania taxes, unemployment compensation and workers' compensation liabilities.

K. The selected Contractor shall not begin to perform until it receives purchase order from the Commonwealth.

I-17. Restriction Of Contact

From the issue date of this RFQ until the Issuing Office selects a proposal for award, the Issuing Officer is the sole point of contact concerning this RFQ. Any violation of this condition may be cause for the Issuing Office to reject the offending Contractor's proposal. If the Issuing Office later discovers that the Contractor has engaged in any violations of this condition, the Issuing Office may reject the offending Contractor's proposal or rescind its purchase order award. Contractors must agree not to distribute any part of their proposals beyond the Issuing Office. A Contractor who shares information contained in its proposal with other Commonwealth personnel and/or competing Contractor personnel may be disqualified.

I-18. Prime Contractor Responsibilities

The selected Contractor will be responsible for all services offered in its proposal whether it produces them itself or by subcontract. The Issuing Office and Project Manager will consider the selected Contractor to be the sole point of contact with regard to contractual and purchase order matters.

I-19. Resources

Contractors shall provide all services, supplies, facilities, and other support necessary to complete the identified work, except as otherwise provided in this **Part I-19**.

I-20. Rejection Of Proposals

The Issuing Office reserves the right, in its sole and complete discretion, to reject any proposal received in response to this RFQ, or to negotiate separately with competing Contractors.

I-21. Discussions for Clarification

Contractors may be required to make an oral or written clarification of their proposals to the Issuing Office to ensure thorough mutual understanding and contractor responsiveness to the solicitation requirements. The Issuing Office will initiate requests for clarification. Clarifications may occur at any stage of the evaluation and selection process prior to issuance of a purchase order.

I-22. Best and Final Offer (BAFO)

A. While not required, the Issuing Office reserves the right to conduct discussions with Contractors for the purpose of obtaining "Best and Final Offers." To obtain Best and Final Offers from Contractors, the Issuing Office may do one or more of the following, in combination and in any order:

- 1.** Schedule oral presentations;

2. Request revised proposals;
 3. Conduct a reverse online auction; and
 4. Enter into pre-selection negotiations.
- B.** The following offerors will **not** be invited by the Issuing Office to submit a Best and Final Offer:
1. Those Contractors which the Issuing Office has determined to be not responsible or whose proposals the Issuing Office has determined to be not responsive.
 2. Those Contractors, which the Issuing Office has determined in accordance with **Part III, Section III-5**, from the submitted and gathered financial and other information, do not possess the financial capability, experience or qualifications to assure good faith performance of the purchase order.
 3. Those Contractors whose score for their technical submittal of the proposal is less than **seventy percent (70%)** of the total amount of technical points allotted to the technical criterion.

The Issuing Office may further limit participation in the Best and Final Offers process to those remaining responsible Contractors which the Issuing Office has, within its discretion, determined to be within the top competitive range of responsive proposals.

- C.** Evaluation Criteria found in **Part III, Section III-4**, shall also be used to evaluate the Best and Final Offers.
- D.** Price reductions offered through any reverse online auction shall have no effect upon the Offeror's Technical Submittal. Dollar commitments to Small Diverse Businesses can be reduced only in the same percentage as the percent reduction in the total price offered through any reverse online auction or negotiations.
- I-23. Notification of Selection**
- A.** Negotiations. The Issuing Office will notify all offerors in writing of the Contractor selected for negotiations after the Issuing Office has determined, taking into consideration all of the evaluation factors, the proposal that is the most advantageous to the Issuing Office.
- B.** Award. Offerors whose proposals are not selected will be notified when negotiations have been successfully completed and the final negotiated purchase order has been issued to the selected Contractor.

I-24. Purchase Order

The successful Contractor will be issued a purchase order with reference to **IT ITQ Contract #4400004480**. The term of the purchase order will commence on the Effective Date and will end in The term of the purchase order will commence on the Effective Date and will end in **five (5) years; with the option for three (3) one-year renewals at the Commonwealth's discretion**. The Commonwealth may exercise the renewal(s) in single or multiple year increments, at any time during the purchase order. No work may begin or be reimbursed prior to issuance of the purchase order. The selected Contractor will be paid after submitting invoices, provided it is in accordance with the work plan and approved by the Commonwealth Project Manager. Final payment will not be made until all Project work has been successfully completed.

I-25. Debriefing Conferences

Upon notification of award, Contractors whose proposals were not selected will be given the opportunity to be debriefed. The Issuing Office will schedule the debriefing at a mutually agreeable time. The debriefing will not compare the Contractor with other Contractors, other than the position of the Contractor's proposal in relation to all other Contractor proposals.

I-26. News Releases

Contractors shall not issue news releases, internet postings, advertisements or any other public communications pertaining to this Project without prior written approval of the Issuing Office, and then only in coordination with the Issuing Office.

I-27. Terms and Conditions

The requirements and terms and conditions of **IT ITQ Contract #4400004480** shall govern the purchase order issued as a result of this RFQ.

I-28. Information Technology Policies

This RFQ is subject to the Information Technology Policies (ITP's) {formerly known as Information Technology Bulletins} issued by the Office of Administration, Office for Information Technology (OA-OIT). ITP's may be found at <http://www.oa.pa.gov/Policies/Pages/itp.aspx>

All proposals must be submitted on the basis that all ITP's are applicable to this procurement. It is the responsibility of the Contractor to read and be familiar with the ITP's. Notwithstanding the foregoing, if the Contractor believes that any ITP is not applicable to this procurement, it must list all such ITP's in its technical response, and explain why it believes the ITP is not applicable. The Issuing Office may, in its sole discretion, accept or reject any request that an ITP not be considered to be applicable to the procurement. The Contractor's failure to list an ITP will result in its waiving its right to do so later, unless the Issuing Office, in its sole discretion, determines that it would be in the best interest of the Commonwealth to waive the pertinent ITPs.

PART II

PROPOSAL REQUIREMENTS

II-1. General Requirements

Contractors must submit their proposals in the format, including heading descriptions, outlined below. To be considered, the proposal must respond to all requirements in this part of the RFQ. Contractors should provide any other information thought to be relevant, but not applicable to the enumerated categories, as an appendix to the Proposal. All cost data relating to this proposal and all Small Diverse Business cost data should be kept separate from and not included in the Technical Submittal. Each Proposal shall consist of the following **three (3)** separately sealed submittals:

- A. Technical Submittal, which shall be a response to RFQ Part II, Sections II-1 through II-9 and ;**
- B. Small Diverse Business participation submittal, in response to RFQ Part II, Section II-10; and**
- C. Cost Submittal, in response to RFQ Part II, Section II-11.**

The Issuing Office reserves the right to request additional information which, in the Issuing Office's opinion, is necessary to assure that the Contractor's competence, number of qualified employees, business organization, and financial resources are adequate to perform according to the RFQ.

The Issuing Office may make investigations as deemed necessary to determine the ability of the Contractor to perform the Project, and the Contractor shall furnish to the Issuing Office all requested information and data. The Issuing Office reserves the right to reject any proposal if the evidence submitted by, or investigation of, such Contractor fails to satisfy the Issuing Office that such Contractor is properly qualified to carry out the obligations of the RFQ and to complete the Project as specified.

II-2. Statement of the Problem

State in succinct terms your understanding of the problem presented or the service required by this RFQ.

II-3. Management Summary

Include a narrative description of the proposed effort and a list of the items to be delivered or services to be provided.

II-4. Work Plan

Describe in narrative form your technical plan for accomplishing the work. Use the task descriptions in **Part IV** of this RFQ as your reference point. Modifications of the task descriptions are permitted; however, reasons for changes should be fully explained. Indicate the number of person hours allocated to each task. Include a Program Evaluation

and Review Technique (PERT) or similar type display, time related, showing each event. If more than one approach is apparent, comment on why you chose this approach.

II-5. Prior Experience

Include experience in medical marijuana Seed to Sale tracking for a state government agency. The Contractor should provide a minimum of **three (3)** client references applicable to projects that are similar in size and scope pertaining to these requirements contained within this RFQ. Experience shown should be work done by individuals who will be assigned to this project as well as that of your company. Studies or projects referred to must be identified and the name of the customer shown, including the name, address, and telephone number of the responsible official of the customer, company, or agency who may be contacted. (See **Appendix D, Project References**).

II-6. Personnel

Include the number of executive and professional personnel, analysts, auditors, researchers, programmers, consultants, etc., who will be engaged in the work. Show where these personnel will be physically located during the time they are engaged in the Project. For key personnel, include the employee's name and, through a resume or similar document, the Project personnel's education and experience in implementing large, complex medical marijuana Seed to Sale and/or Registry solutions supporting large and diverse user populations over a wide geographic area. Please complete **Appendix E, Personnel Experience by Key Position**. Reference section **IV.3.H. Staff Qualifications** for additional information pertaining to personnel meeting staff qualification requirements.

Resumes are not to include personal information that will, or will be likely to, require redaction prior to release of the proposal under the Right to Know Law. This includes home addresses and phone numbers, Social Security Numbers, Drivers' License numbers or numbers from state ID cards issued in lieu of a Drivers' License, financial account numbers, etc. If the Commonwealth requires any of this information for security verification or other purposes, the information will be requested separately and as necessary.

II-7. Training

If appropriate, indicate recommended training of agency personnel. Include the personnel to be trained, the number to be trained, duration of the program, place of training, curricula, training materials to be used, number and frequency of sessions, and number and level of instructors.

II-8. Financial Capability

Describe your company's financial stability and economic capability to perform the Project requirements. Provide your company's financial statements for the past **two (2)** fiscal years. If your company is a publicly traded company, please provide a link to your financial records on your company website; otherwise, provide **two (2) years** of your company's financial documents such as audited financial statements. Financial statements must include the company's Balance Sheet and Income Statement or Profit/Loss

Statements. Also include a Dun & Bradstreet comprehensive report if available. The Commonwealth reserves the right to request additional information it deems necessary to evaluate a Contractor's financial capability.

II-9. Emergency Preparedness

To support continuity of operations during an emergency, including a pandemic, the Commonwealth needs a strategy for maintaining operations for an extended period of time. One part of this strategy is to ensure that essential contracts that provide critical business services to the Commonwealth have planned for such an emergency and put contingencies in place to provide needed goods and services.

- A.** Describe how Contractor anticipates such a crisis will impact its operations.
- B.** Describe Contractor's emergency response continuity of operations plan. Attach a copy of the plan, or at a minimum, summarize how the plan addresses the following aspects of pandemic preparedness:
 - 1.** Employee training (describe Contractor's training plan, and how frequently it will be shared with employees)
 - 2.** Identified essential business functions and key employees (within Contractor's organization) necessary to carry them out
 - 3.** Contingency plans for:
 - a.** How Contractor will handle staffing issues when a portion of key employees are incapacitated due to illness.
 - b.** How Contractor employees will carry out the essential functions if contagion control measures prevent them from coming to the primary workplace.
 - 4.** How Contractor will communicate with staff and suppliers when primary communications systems are overloaded or otherwise fail, including key contacts, chain of communications (including suppliers), etc.
 - 5.** How and when Contractor's emergency plan will be tested, and if the plan will be tested by a third-party.

II-10. Small Diverse Business Participation Submittal

All Contractors are required to submit **two (2)** copies of the **Small Diverse Business and Small Business Participation Submittal Form** contained in (**Appendix F**) and related **Small Diverse and Small Business Letter(s) of Intent (Appendix G)**. The submittal must be sealed in its own envelope, separate from the remainder of the proposal, and

must be provided on the **Small Diverse Business and Small Business Participation Submittal form (Appendix F)**, with information as follows:

- A. Contractors must indicate their status as a Small Diverse Business and as a Small Business through selection of the appropriate checkboxes.
- B. Contractors must include a numerical percentage which represents the total percentage of the total cost in the Cost Submittal that the Contractor commits to paying to Small Diverse Businesses and Small Businesses as subcontractors.
- C. Contractors must include a listing of and required information for each of the Small Diverse Businesses and/or Small Businesses with whom they will subcontract to achieve the participation percentages outlined on the Small Diverse Business and Small Business Participation Submittal.
- D. Contractors must include a **Letter of Intent** (attached as **Appendix G** is a Letter of Intent template which may be used to satisfy these requirements) signed by both the Contractor and the Small Diverse Business or Small Business for each of the Small Diverse Businesses and Small Businesses identified in the **Small Diverse Business and Small Business Participation Submittal form (Appendix F)**. At minimum, the Letter of Intent must include the following:
 1. The fixed numerical percentage commitment and associated estimated dollar value of the commitment made to the Small Diverse Business or Small Business; and
 2. A description of the services or supplies the Small Diverse Business or Small Business will provide; and
 3. The timeframe during the initial contract term and any extensions, options and renewals when the Small Diverse Business or Small Business will perform or provide the services and/or supplies; and
 4. The name and telephone number of the Offeror's point of contact for Small Diverse Business and Small Business participation; and
 5. The name, address, and telephone number of the primary contact person for the Small Diverse Business or Small Business.
- E. Each Small Diverse Business and Small Business commitment which is credited by BDISBO along with the overall percentage of Small Diverse Business and Small Business commitments will become contractual obligations of the selected Contractor.

NOTE: Contractors will not receive credit for any commitments for which information as above is not included in the Small Diverse Business and Small

Business Participation Submittal. Contractors will not receive credit for stating that after the contract is awarded they will find a Small Diverse or Small Business.

NOTE: Equal employment opportunity and contract compliance statements referring to company equal employment opportunity policies or past contract compliance practices do not constitute proof of Small Diverse Business and/or Small Business Status or entitle a Contractor to receive credit for Small Diverse Business or Small Business participation.

II-11. Cost Submittal

The information requested in this **Part II-11** and **Appendix H (Cost Matrix)** shall constitute the Cost Submittal. The Cost Submittal shall be placed in a separate sealed envelope within the sealed proposal and kept separate from the technical submittal. The total proposed cost must be broken down into the components listed on **Appendix H (Cost Matrix)**.

Contractors should **not** include any assumptions in their cost submittals. If the Contractor includes assumptions in its cost submittal, the Issuing Office may reject the proposal. Contractors should direct in writing to the Issuing Office pursuant to **Part I, Section I-6** of this RFQ, any questions about whether a cost or other component is included or applies. All Contractors will then have the benefit of the Issuing Office's written answer so that all proposals are submitted on the same basis.

The Commonwealth will reimburse the selected Contractor for work satisfactorily performed after issuance of a purchase order and the start of the purchase order term, in accordance with Purchase order requirements.

II-12. Domestic Workforce Utilization

Contractors must complete and sign the **Domestic Workforce Utilization Certification** attached to this RFQ as **Appendix I**. Contractors who seek consideration for the Domestic Workforce Utilization Certification criterion must complete, sign, and submit the Domestic Workforce Utilization Certification Form in the same sealed envelope with the Technical Submittal.

PART III

CRITERIA FOR SELECTION

III-1. Mandatory Responsiveness Requirements

To be eligible for evaluation, a proposal must:

- A. Be timely received from a Contractor; and
- B. Properly signed; and
- C. Certify that the Contractor owns a medical marijuana Seed to Sale tracking software solution and has the ability to operate it as a hosted, Software as a Service (SaaS); **See Appendix J – Mandatory Requirements Certification.**

III-2. Technical Nonconforming Proposals

The Mandatory Responsiveness Requirements set forth in Part III-1 above (A-D) are the only RFQ requirements that the Commonwealth will consider to be *non-waivable*. The Issuing Office reserves the right, in its sole discretion, to (1) waive any other technical or immaterial nonconformities in a Contractor's proposal, (2) allow the Contractor to cure the nonconformity, or (3) consider the nonconformity in the scoring of the Contractor's proposal.

III-3. Evaluation

The Issuing Office has selected a committee of qualified personnel to review and evaluate timely submitted proposals. Independent of the committee, BDISBO will evaluate the Small Diverse Business participation submittal and provide the Issuing Office with a rating for this component of each proposal. The Issuing Office will notify in writing of its selection for negotiation the responsible Contractor whose proposal is determined to be the most advantageous to the Commonwealth as determined by the Issuing Office after taking into consideration all of the evaluation factors.

III-4. Evaluation Criteria

The following criteria will be used in evaluating each proposal:

A. Technical:

The Issuing Office has established the weight for the Technical criterion for this RFQ as **fifty percent (50 %)** of the total points. Evaluation will be based upon the following in order of importance:

- Understanding the Problem
- Contractor Qualifications
- Personnel Qualifications
- Soundness of Approach

The final Technical scores are determined by giving the maximum number of technical points available to the proposal with the highest raw technical score. The remaining proposals are rated by applying the Technical Scoring Formula set forth at the following webpage:

http://www.dgs.pa.gov/Businesses/Materials%20and%20Services%20Procurement/Procurement-Resources/Pages/RFP_SCORING_FORMULA.aspx

B. Cost:

The Issuing Office has established the weight for the Cost criterion for this RFQ as **thirty percent (30 %)** of the total points. The cost criterion is rated by giving the proposal with the lowest total cost the maximum number of Cost points available. The remaining proposals are rated by applying the Cost Formula set forth at the following webpage:

http://www.dgs.pa.gov/Businesses/Materials%20and%20Services%20Procurement/Procurement-Resources/Pages/RFP_SCORING_FORMULA.aspx

C. Small Diverse Business and Small Business (SDB/SB) Participation:

BDISBO has established the minimum evaluation weight for the Small Diverse Business and Small Business Participation criterion for this RFQ as **twenty percent (20%)** of the total points.

1. The Small Diverse and Small Business point allocation is based entirely on the percentage of the contract cost committed to Small Diverse Businesses and Small Businesses.
2. A total combined SDB/SB commitment less than **one percent (1%)** of the total contract cost is considered de minimis and will receive no Small Diverse Business or Small Business points.
3. **Two thirds (2/3)** of the total points are allocated to Small Diverse Business participation (SDB %).
4. **One third (1/3)** of the total points is allocated to Small Business participation (SB %).

5. Based on a maximum total of 200 available points for the Small Diverse Business and Small Business Participation Submittal, the scoring mechanism is as follows:

<p style="text-align: center;">Small Diverse Business and Small Business Raw Score =</p> <p style="text-align: center;">200 (SDB% + (1/3 * SB %))</p>

6. Each Contractor's raw score will be pro-rated against the Highest Contractor's raw score by applying the formula set forth on the following webpage: http://www.dgs.pa.gov/Businesses/Materials%20and%20Services%20Procurement/Procurement-Resources/Pages/RFP_SCORING_FORMULA.aspx.
7. The Contractor's prior performance in meeting its contractual obligations to Small Diverse Businesses and Small Businesses will be considered by BDISBO during the scoring process. To the extent the Contractor has failed to meet prior contractual commitments, BDISBO may recommend to the Issuing Office that the Contractor be determined non-responsible for the limited purpose of eligibility to receive Small Diverse Business and Small Business points.

D. Domestic Workforce Utilization:

Any points received for the Domestic Workforce Utilization criterion are bonus points in addition to the total points for this RFQ. The maximum amount of bonus points available for this criterion is **three percent (3%)** of the total points for this RFQ.

To the extent permitted by the laws and treaties of the United States, each proposal will be scored for its commitment to use domestic workforce in the fulfillment of the purchase order. Maximum consideration will be given to those Contractors who will perform the contracted direct labor exclusively within the geographical boundaries of the United States or within the geographical boundaries of a country that is a party to the World Trade Organization Government Procurement Agreement. Those who propose to perform a portion of the direct labor outside of the United States and not within the geographical boundaries of a party to the World Trade Organization Government Procurement Agreement will receive a correspondingly smaller score for this criterion. See the following webpage for the Domestic Workforce Utilization Formula:

http://www.dgs.pa.gov/Businesses/Materials%20and%20Services%20Procurement/Procurement-Resources/Pages/RFP_SCORING_FORMULA.aspx. Contractors who seek consideration for this criterion must submit in hardcopy the signed Domestic

Workforce Utilization Certification Form in the same sealed envelope with the Technical Submittal. The certification will be included as a contractual obligation when the purchase order is issued.

III-5. Contractor Responsibility

To be responsible, a Contractor must submit a responsive proposal and possess the capability to fully perform the purchase order requirements in all respects and the integrity and reliability to assure good faith performance of the purchase order.

In order for a Contractor to be considered responsible for this RFQ and therefore eligible for selection for best and final offers or selection for purchase order negotiations:

- A.** The total score for the technical submittal of the Contractor's proposal must be greater than or equal to **seventy percent (70%)** of the **available technical points**; and
- B.** The Contractor's financial information must demonstrate that the Contractor possesses the financial capability to assure good faith performance of the contract. The Issuing Office will review the Contractor's previous two audited annual financial statements, any additional information received from the Contractor, and any other publicly-available financial information concerning the Contractor, and assess each Contractor's financial capacity based on calculating and analyzing various financial ratios, and comparison with industry standards and trends.

A Contractor which fails to demonstrate sufficient financial capability to assure good faith performance of the purchase order as specified herein may be considered by the Issuing Office, in its sole discretion, for Best and Final Offers or purchase order negotiations contingent upon such Contractor providing purchase order performance security, in a form acceptable to the Issuing Office, for **twenty percent (20%)** of the proposed value of the base term of the purchase order. Based on the financial condition of the Contractor, the Issuing Office may require a certified or bank (cashier's) check, letter of credit, or a performance bond conditioned upon the faithful performance of the purchase order by the Contractor. The required performance security must be issued or executed by a bank or surety company authorized to do business in the Commonwealth. The cost of the required performance security will be the sole responsibility of the Contractor and cannot increase the Contractor's cost proposal or the purchase order cost to the Commonwealth.

Further, the Issuing Office will award a purchase order only to a Contractor determined to be responsible in accordance with the most current version of Commonwealth Management Directive 215.9, Contractor Responsibility Program.

III-6. Final Ranking and Award

- A.** After any best and final offer process conducted, the Issuing Office will combine the evaluation committee's final technical scores, BDISBO's final small diverse business participation scores, the final cost scores, and (when applicable) the domestic

workforce utilization scores, in accordance with the relative weights assigned to these areas as set forth in this Part.

- B.** The Issuing Office will rank responsible Contractors according to the total overall score assigned to each, in descending order.
- C.** The Issuing Office must select for purchase order negotiations the Contractor with the highest overall score;
- D.** The Issuing Office has the discretion to reject all proposals or cancel the request for quotations, at any time prior to the time a purchase order is issued, when it is in the best interests of the Commonwealth. The reasons for the rejection or cancellation shall be made part of the purchase order file.

PART IV

WORK STATEMENT

IV-1. Objectives

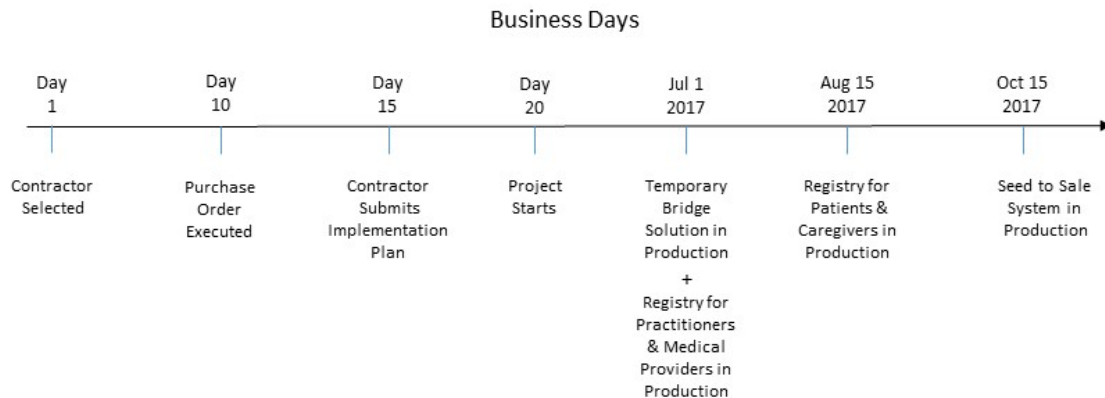
A. General. In April of 2016, Pennsylvania passed into law Act 16, which legalized the use of medical marijuana obtained for a certified medical use by a Pennsylvania resident with one of 17 serious medical conditions, such as cancer, post-traumatic stress disorder, epilepsy, and glaucoma. In Pennsylvania, medical marijuana can only be dispensed as pills, oil, topical forms (gel, creams or ointments), a form medically appropriate for administration by vaporization or nebulization (excluding dry leaf or plant), tincture, and liquid. Certified patients must be under the continuing care of a physician who is registered with DOH. Caregivers must continue to be approved by a patient. The Pennsylvania Department of Health must ensure that the production, growing, processing, distribution, sale and dispensing of medical marijuana in the Commonwealth complies with the requirements of PA Act 16 and supporting regulations.

B. Specific. To fulfill its responsibilities, DOH is seeking several time-sensitive, integrated system components. This solicitation includes a Seed to Sale inventory tracking system to facilitate the electronic monitoring of the state's medical marijuana industry; a temporary bridge solution to track industry cultivation, growing, processing and production activity prior to full-scale implementation of the Seed to Sale system; and supporting functionality to register, approve, provide system credentials and administer patients, caregivers, practitioners and medical providers. The solution(s) must be:

- 1. Comprehensive & Integrated** - Provide comprehensive, integrated data systems to support the business and system requirements of a robust and innovative medical marijuana monitoring and control program.
- 2. Web-Based Enterprise System** - Provide a web-based enterprise-wide system with the capability to support DOH and external users, such as: patients/caregivers, practitioners, medical providers, growers/processors, dispensaries, approved laboratories, clinical registrants, academic clinical research centers, local law enforcement agencies, approved DOH staff, and authorized representatives of other Commonwealth agencies.
- 3. Flexible** - Allow changes to functions and features. As much as possible, these should be out of the box or configurable within the software and not require customization.
- 4. Real Time** – System activities need to be recorded, processed, and displayed in as close to real time as possible. The vendor is expected to define the parameters of 'real time' in the system offering.
- 5. Accurate** - Provide accurate and auditable data for all activities related to the acquisition, planting, possession, growing, cultivation, harvest, processing, storage, testing, transfer, sale, dispensing, destruction/exchange/return, and recall of medical marijuana, as well as

activities related to approving, registering, credentialing and administering medical marijuana patients, caregivers, practitioners and medical providers.

6. **Secure** – Implement strong controls to ensure the privacy of information and the security of sensitive data, including Protected Health Information (PHI).
7. **Efficient** – Deliver flexible administrative functionality that provides visibility into all activities in the supply chain, permits the department to track supply to ensure demand is met, enforces quality assurance standards, and prevents diversion of medical marijuana.
8. **Scalable** - Include modules for building out the system as requirements and usage evolve.
9. **Reliable** - Meet availability and performance standards in accordance with pre-defined service levels.
10. **Auditable** – Use audit controls, electronic signatures, data encryption and other methods to track and assure the authenticity of transaction and other relevant data, including the ability to record unauthorized attempts to modify a system log.
11. **Timely** – Meet the following project schedule milestones:



IV-2. Nature and Scope of the Project

This solicitation is to define the DOH initiative to procure one or more hosted, Software-as-a-Service (SaaS) solutions to support Pennsylvania’s Medical Marijuana program. A user base of approximately 250,000 across systems is expected, with an estimated concurrent user volume of 10,000. DOH intends to issue permits for up to 33 growers/processors of medical marijuana, 198 dispensaries and 30 laboratories located throughout the Commonwealth. It is expected that the user base will grow over time. For planning purposes, Contractor(s) can expect a user base of 125,000 at program launch in mid-2017 (i.e. registry comes on line in June/July); the remaining 125,000 users are expected to become active when phase 2 begins in first quarter of 2018. Therefore, the full user base of 250,000 is expected to be in place and active starting in early 2018.

Equipment to assist in the registration, tracking, dispensing, sales, tax collection, and quality control processes shall also be provided with the solution.

A. Seed to Sale Solution

The primary system is Seed to Sale functionality that provides real time tracking to monitor, control and report on activities of authorized growers/processors, dispensaries, laboratories, clinical registrants, and academic clinical research centers. The automated system must ensure ongoing compliance with Commonwealth seed to sale tracking and monitoring requirements, laws and regulations. At a minimum, the Seed to Sale system must:

- 1) Track handling and processing tasks of all involved supply chain entities, including growers/processors, laboratories, dispensaries, and institutions conducting approved medical marijuana research activities.
- 2) Track the acquisition, planting, possession, cultivation, harvest, processing, storage, testing, transfer, selling, dispensing, destruction/exchange/return, and recall of medical marijuana.
- 3) Track medical marijuana by form, weight and/or volume, unique identifier, quantity, lot/batch, manufacture date, and expiration date.
- 4) Integrate with all supporting equipment, whether provided by the vendor or a Commonwealth of Pennsylvania agency, including scales, barcode scanners, scanning devices, identification card production and scanning equipment, and cash registers.
- 5) Track and retain an auditable database history, including modifications to information in the database(s).
- 6) Provide the ability to support multiple locations for a given registered organization.

DOH prefers a closed Seed to Sale system model, in which DOH and approved growers/processors, laboratories, clinical registrants, academic clinical research centers, and dispensaries use a single, centralized system that supports the operational/inventory/point of sale needs of approved organizations and fulfills the regulatory tracking requirements for DOH. The expectation is that this single system includes separable but integrated, commercially available modules, one or more for DOH regulatory Seed to Sale tracking, and one or more to meet the operational/inventory/point of sale requirements of growers/processors, laboratories, clinical registrants, academic clinical research centers, and dispensaries.

A decentralized Seed to Sale system model, where growers/processors, laboratories, clinical registrants, academic clinical research centers, and dispensaries use their own on-site operational/inventory/point of sale system(s) and meet DOH tracking requirements

by providing specific information to the state system via data exchange or programming interface, will be considered if certain minimum criteria are met:

- 1) Data exchange between systems must occur in real time
- 2) Data exchange between systems must be supported by a tightly controlled and formalized process, including written procedures, Contractor testing and pre-production certification
- 3) If the Contractor's existing solution does not include commercially available modules that are currently used by growers, manufacturers, dispensers and related entities to fulfill operational/inventory/point of sale functionality needs, the Contractor must include one or more commercially available software modules in the system proposal in order to fulfill this projected need; these solutions must have demonstrated interoperability with the Seed to Sale and Registry solutions included in the Contractor's system proposal

If it is within its capabilities, Contractors are permitted to include proposals for both closed and decentralized Seed to Sale models in response to this solicitation.

In addition to the Seed to Sale tracking solution, this solicitation includes two supporting systems. These solutions can be integral components of the Seed to Sale solution or can be separate but integrated components.

B. Bridge Functionality

DOH requires a temporary 'Bridge' tracking solution to permit authorized growers/processors to begin cultivation, growing and processing activities before full-scale implementation of the Seed to Sale production system. The bridge solution must provide basic but thorough automated tracking of cultivation, growing, processing and testing activities in accordance with regulatory requirements. This temporary system must offer a straightforward migration path, including data conversion, to the final Seed to Sale solution, and the migration activities must be accounted for in the Seed to Sale project plan.

C. Registry Solution

DOH also requires an integrated, hosted SaaS Registry to approve, register, credential, administer and fulfill system tasks by and related to patients, caregivers, practitioners, medical providers and dispensaries. This system must integrate with the Seed to Sale system as necessary to ensure ongoing compliance with DOH tracking and dispensing requirements.

IV-3. Requirements.

Contractor(s) shall describe how it will meet all of the requirements as described in this RFQ.

A. Licensing Requirements.

1. Any click-through terms presented to an individual upon use of any component of the system shall be pre-approved in writing by the Commonwealth Contracting Officer. Such terms may not be inconsistent with the terms in Appendix C, Software License Agreement of the IT ITQ Contract #4400004480. For purposes of clarity, the word “terms” in this Section IV-3(A)(1) does not refer to the license terms binding the Contractor and the Commonwealth.
2. In accordance with Section 37, Ownership Rights, of the IT ITQ Contract #4400004480, the license terms binding the Contractor and the Commonwealth will be approved via the issuance of the purchase order resulting from this RFQ, unless the license terms are negotiated (in accordance with Section IV-3(A)(4), below), in which case a separate licensing agreement will be prepared external to the purchase order. If the license terms binding the Contractor and the Commonwealth are memorialized in an agreement external to the purchase order resulting from this RFQ, this will be explicitly indicated in the purchase order resulting from this RFQ,
3. Absent negotiation of a license external to the purchase order, the license terms binding the Contractor and the Commonwealth shall be Appendix C, Software License Agreement of the IT ITQ Contract #4400004480, supplemented by the Contractor’s license agreement. The nature and extent of supplementation by the Contractor’s license agreement shall be in accordance with Appendix C, Section B, Software License Agreement of the IT ITQ Contract #4400004480.
4. Appendix C, Software License Agreement of the IT ITQ Contract #4400004480 supplemented by the Contractor’s license agreement shall govern only as to the licensing of the Contractor’s intellectual property. The Contractor understands and agrees to the following with respect to Appendix C, Software License Agreement of the IT ITQ Contract #4400004480 supplemented by the Contractor’s license agreement:
 - a. The Authorized Use for which the intellectual property is licensed is consistent and coextensive with the requirements of the Contract resulting from this RFQ.
 - b. The Commonwealth is not authorized to and cannot indemnify any entity.
 - c. Confidential Information includes but is not limited to all data supplied to or produced by the Contractor about private entities or individuals.
5. The Contractor must identify which, if any, of the terms and conditions (contained in Appendix C, Software License Agreement of the IT ITQ Contract #4400004480) it would like to negotiate in order to license its intellectual property. The Contractor’s failure to make a submission under

this paragraph will result in its waiving its right to do so later, but the Commonwealth may consider late objections and requests for additions if to do so, in the Commonwealth's sole discretion, would be in the best interest of the Commonwealth. The Commonwealth may, in its sole discretion, accept or reject any requested changes to Appendix C, Software License Agreement of the IT ITQ Contract #4400004480. The Contractor shall not request changes to the other provisions of IT ITQ Contract #4400004480, nor shall the Contractor request to completely substitute its own terms and conditions for any portion of IT ITQ Contract #4400004480. The Commonwealth will not accept references to the Contractor's, or any other, online guides or online terms and conditions contained in any proposal.

Regardless of any objections set out in its proposal, the Contractor must submit its license agreement on the basis of the terms and conditions set out in Appendix C, Software License Agreement of the IT ITQ Contract #4400004480. The Commonwealth may reject any proposal that is conditioned on the negotiation of Appendix C, Software License Agreement of the IT ITQ Contract #4400004480 or any other portion of IT ITQ Contract #4400004480.

B. Hosting Requirements

1. The Contractor(s) shall meet the hosting requirements as described in **Appendix K - Non-Commonwealth Hosted Application Services Requirements**.
2. The Contractor(s) shall describe the following:
 - a. Where the solution is physically hosted, including primary and back-up locations.
 - b. Whether the hosting environment is Contractor-owned and operated or sub-contracted.
 - c. Whether the hosting platform/cloud service provider is FedRAMP certified.
 - d. Whether the application boundary for the solution(s), including infrastructure and security controls, follows the guidelines and standards of FedRAMP.
 - e. Performance metrics for your solution(s) for the past two years, including system/application availability statistics, and the results of disaster recovery exercises (replication statistics for mirrored environments.) If solution(s) has not been in production for two years, provide performance metrics from inception through proposal submission date.
 - f. Any limitations of the solution(s) in supporting processing volumes as described in section **IV-2 Nature and Scope**.

C. Business and Technical Requirements. The SaaS solution shall meet the business and technical requirements as described in **Appendix L - MM Detailed Requirements**.

1. Contractor(s) shall describe any innovative capabilities, functions, and features that its solution offers.

D. Service Level Agreements (SLA). The selected Contractor(s) shall meet the service level agreements as described in **Appendix M – Service Level Agreements**.

E. Solution Support. Contractor(s) shall describe how it will provide support for the solution. The Contractor shall provide committed and qualified technology staff to support its solution.

1. **Type of Support.** Contractor(s) shall describe the types of support which shall be provided (ex. telephone, email, chat, web form, etc.). At a minimum, email and phone support. The selected Contractor must provide a toll-free phone number with the capability to route calls based on defined support tiers as listed below. Contractor(s) shall describe how it will handle tiered support. At its sole discretion, the Commonwealth or its agent may provide tier 1 support. Contractor(s) shall describe how it will provide support and work cooperatively with tier 1 to provide training and knowledge transfer of changes and updates to the solution.

- a. **Tier 1 Support.** Tier 1 support shall include help desk support for end-users of the solution. Tier 1 support shall be responsible for receiving all initial contacts for the SaaS solution(s) and Medical Marijuana program. Tier 1 support shall include basic customer issues, general inquiries, non-technical and program questions, account creation, password recovery, website navigation assistance, basic procedural “how-to” questions.

- b. **Tier 2 Support.** Tier 2 support shall include all problems, issues, requests or questions related to the IT application solution(s) that must be escalated to the selected Contractor and any program problems, issues, requests or questions that must be escalated to the agency.

Contractor(s) shall describe the staffing levels which will support the Solution Support and any projections (ex. Estimated call volumes, calls per agent, calls per user, average length of call, etc.) used to determine staffing levels. Contractor(s) shall describe the methodology it uses to monitor and adjust staffing levels as needed.

2. **Hours of Support.** Contractor(s) shall describe how it handles issue notification, classification, escalation and resolution.

- a. The selected Contractor shall provide overall help desk and technical support, including developing a help desk strategy,

metrics and protocols across the entire solution, subject to Commonwealth approval.

- a) **Core Business Hours.** The selected Contractor shall provide live support via phone or email during the core business hours of 7 AM and 9 PM, Eastern Time (ET), seven (7) days per week.
 - b) **Non-Core Business Hours.** The selected Contractor shall have a mechanism in place to handle system support during non-core business hours. At a minimum, callers to the support line must receive a message stating that call support is not available and offering the opportunity for the caller to leave a message for call back by the next business day.
3. **Problem tracking and resolution.** The selected Contractor shall provide and manage a process to track, monitor and resolve reported problems/issues. Contractor(s) shall describe its methodology to classify problems as to criticality and impact, including appropriate resolution procedures and escalation process for each classification of a problem. The selected Contractor shall provide DOH with an administrative account to view the statuses of reported issues and resolution progress.
 4. **Notifications.** Contractor(s) shall describe its notification policies and procedures. Contractor(s) shall include policies and procedures of notifications to service subscribers and users in the event of scheduled maintenance, unscheduled maintenance, emergency maintenance, downtime, system errors, or degraded performance. The SaaS solution shall provide system messages at login to notify users of emergency maintenance or other system events. The solution will display a notification of system scheduled maintenance seven (7) days prior to the scheduled maintenance period. A notification of scheduled maintenance shall be delivered to the Commonwealth fourteen (14) days prior to the scheduled maintenance.
 5. **Maintenance and Warranty.** The selected Contractor shall provide all necessary equipment to facilitate the registration, tracking and collection process for the entire solution, including but not limited to additional devices needed to conduct all aspects of the project. Contractor(s) shall describe how it will provide maintenance, support, and warranty of all related hardware and software needed to meet the requirements as stated in **Appendix L – MM Detailed Requirements** and throughout this RFQ.
 6. **Dedicated Personnel.** Contractor(s) must describe their standards for delivering consistent representation of Project Management, Account Management and Support Staff to clients and their commitment to quality

service

delivery.

F. Data Cleansing, Conversion and Upload. The selected Contractor shall ensure that all data that has been collected in the Temporary Bridge solution is cleansed, converted and uploaded into the production Seed to Sale system database. Contractor(s) must submit a draft data conversion plan with its proposal. The selected Contractor shall meet with DOH to review the draft data conversion plan and gather any additional details required to finalize the plan.

The data conversion plan shall include, but not be limited to the following;

1. An overview of the activities and services that the Contractor will provide, the assumption on which the plan is based, and the roles and responsibilities for individuals and organizations involved in the conversion effort.
2. A data conversion strategy for the conversion effort, which includes but is not limited to;
 - a. the needed roles and number of staff required,
 - b. the conversion method with descriptions of any automated method that requires minimal intervention from Commonwealth staff.
 - c. the method for converting hard copy records.
 - d. the mechanism for identifying and reporting conversion errors.
 - e. the method to reconcile converted data and differentiate between converted data and new system data.
 - f. A description of the capabilities to automatically reverse or undo a conversion by group or individuals.
3. Conversion preparation and procedures, which include but are not limited to;
 - a. Source specifications – identify the file and/or database name and description, data source, file structure, conversion rules, dependencies, access requirements, data format, and conversion acceptance criteria for each source.
 - b. Destination specifications – identify the name, data source, access requirements, and data format for each destination.
 - c. Intermediate processing requirements – identify the cleansing, validating, and initiating requirements.
 - d. Data element mapping – provide a mapping of the source to destination, considering intermediate processing requirements.
 - e. Data conversion tools and scripts – identify the necessary tools and scripts to perform data conversion, intermediate data processing, and loading cleansed data into the destination data repository. Includes both automated procedures (conversion programs) and manual procedures (data entry procedures) and define each script necessary.

- f. Testing – identify conversion verification procedures and activities required for system testing. Identify the testing tools and scripts, and the validation and verification of resulting test data, in preparation for data loading.
4. Provide a timeline and describe the schedule of activities to complete conversion at implementation.

G. System documentation. The selected Contractor shall provide an online user manual that provides comprehensive information/explanation on how to use the configured solution in a user-friendly manner. The selected Contractor shall update and maintain the content as system changes are made.

H. Qualification Requirements. Contractor(s) shall describe how it meets the following qualification requirements:

1. The selected contractor must own a medical marijuana Seed to Sale tracking software solution and have the ability to operate it as hosted, Software as a Service (SaaS);
2. The selected contractor must have experience successfully implementing, configuring, customizing, operating and supporting a medical marijuana Seed to Sale tracking system for a state government;
3. The selected contractor must have the ability to implement the Seed to Sale solution to meet the specific needs of DOH, as defined in **Appendix L – MM Detailed Requirements**, no later than October 15, 2017 or as modified in writing by the Commonwealth;
4. The selected contractor must own or have the ability to implement, configure, customize, operate and support a hosted, SaaS Registry system to approve, register, credential, and administer medical marijuana patients, caregivers, practitioners and medical providers as an integrated component of a Seed to Sale system;
5. The selected contractor must have the ability to implement the registry solution to approve, register, credential and administer practitioners and medical providers no later than July 1, 2017, and to approve, register, credential and administer patients and caregivers no later than August 15, 2017 or as modified in writing by the Commonwealth;
6. The selected contractor must have the capability to implement temporary ‘bridge’ functionality that will support regulatory tracking requirements if a decision is made to authorize growers/processor to begin the cultivation, growing and processing of medical marijuana before implementation of the production Seed to Sale system;

7. The selected contractor must have the ability to implement the temporary bridge functionality to provide basic tracking capabilities, as defined by DOH in **Appendix L – MM Detailed Requirements**, no later than July 1, 2017 or as modified in writing by the Commonwealth; the temporary bridge functionality must remain operational until data has been converted to the production Seed to Sale system;
8. Contractor(s) shall provide:
 - a. Details of any industry-recognized quality standard to which it is compliant, as well as any industry certifications or awards received.
 - b. How long has Contractor(s) provided the requested services?
 - c. How many clients have terminated a service contract in the past **three (3)** years for non-performance? Provide references for these terminated clients.
9. The selected Contractor's solutions must be capable of interoperability with Commonwealth systems for data exchange, services, or support of standard and proprietary protocols.
10. The selected Contractor shall provide a dedicated project manager to perform the project management services as described in section **IV-5. A. Project Management Services**.

I. Staff Qualifications. Contractor(s) shall describe how it meets the following staff qualification requirements for key personnel. Key personnel, to include but not be limited to, Project Manager, Business Analyst, Testing Lead, Trainer(s), Implementation Lead/Product Specialist, Account Manager, include the employee's name and, through a resume or similar document, the Project personnel's education and experience in enterprise-wide data management services, Software as a Service (SaaS) services, system implementation, project management, training, database administration, IT security, system and network architecture, and data migration. Indicate the responsibilities each individual will have in this project and how long each has been employed by the Contractor. Identify by name any subcontractors intended to be used and the services they are expected to perform. The minimum required experience for each of the expected key personnel is defined below. If an individual is removed the project, the role must be filled by another individual with the equivalent experience and knowledge. Key personnel changes are subject to approval by DOH.

1. **Project Manager.**
Six (6) years of experience including previous successful projects of similar size and complexity, delivered on time and within budget.
2. **Implementation Lead/Product Specialist**

Two (2) years of product/industry knowledge as well as experience including customer relationship management, previous experience in software implementation and rollout of solution of similar size and complexity.

3. Testing Lead

Four (4) years of experience developing comprehensive test plans and scenarios, conducting system and UAT testing, managing defect detection and resolution, and test result reporting.

4. Business Analyst

Four (4) years of experience including business process reengineering, software implementation and rollout, and documenting gap analyses.

5. Trainer

Four (4) years of experience including developing curriculum and providing formal classroom as well as one-on-one instruction.

J. Standards and Policies

1. DOH Policies, Procedures and Standards.

The selected Contractor's design/development team, prior to and during the execution of any design or development tasks involving the Department's existing system environments, shall comply with the policies, procedures, and standards provided by DOH Bureau of Informatics and Information Technology (BIIT). This includes but is not limited to participation in a requirements phase, design phase, development phase, testing phase, and implementation phase as documented in the prevailing organization's software and application development standards. DOH policies, procedures and standards are available at: <http://www.health.state.pa.us/pmm/>.

2. Services shall be provided in accordance with the policies, procedures and standards of the Commonwealth.

3. The selected Contractor must adhere to all Commonwealth data confidentiality requirements and statutory and regulatory confidentiality requirements.

K. Release Management. The Contractor(s) shall describe its methodology and processes for updating its SaaS solution for all types of releases, such as security updates, system maintenance, and system enhancements. Describe the SDLC used to implement releases. Describe how new functions and features are released to clients and a client's ability to control which new features are implemented.

L. Enhancements. Enhancements requiring customizations to the source code may be required due to program, policy, and legislative changes throughout the life of the contract. Enhancements will follow the change management process and the established blended rate referenced in **Appendix H, Cost Matrix** shall be used. All enhancements shall have DOH approval.

M. Disaster Recovery The selected Contractor shall provide a disaster recovery plan, which shall be tested on an annual basis to ensure success. The selected Contractor must employ reasonable disaster recovery procedures to assist in preventing interruption in the use of the solution. Contractor(s) shall describe its disaster recovery plans for maintaining operations during disasters. Contractor(s) shall provide detailed information regarding its disaster recovery systems, architecture/frameworks, capabilities, governance, procedures, Recovery Time Objective (RTO) and Recovery Point Objective (RPO).

IV-4. Tasks

The Contractor(s) shall explain how it will meet the tasks as described in this RFQ.

A. Implementation Planning. Contractor(s) must submit a draft implementation plan with its proposal. The selected Contractor shall meet with the DOH to review the draft implementation plan and gather any additional details required to finalize an implementation plan. Contractor shall schedule a meeting with DOH to present a finalized implementation plan within five (5) business days of receiving the notice to proceed. DOH will provide input and work with the Contractor to finalize the plan within five (5) business days after receipt. .

The implementation plan shall include all activities necessary to implement the solution. The implementation plan, at a minimum, shall include an implementation schedule, identification of roles and responsibilities, key milestones and deliverables. The selected Contractor shall execute the approved implementation plan.

Deliverable(s):

a. Finalized Implementation Plan approved by DOH.

B. Requirements Management. Contractor(s) shall describe its approach and methodology to requirements management. The selected Contractor shall be responsible for requirements management. The selected Contractor must track and manage all requirements, including the verification of those already identified by DOH as well as the discovery of additional requirements as needed to ensure completeness. The selected Contractor must propose a process to track, prioritize, and maintain status of requirements.

The selected Contractor shall develop a requirements traceability matrix which links requirements throughout the validation process. The purpose of the requirement traceability matrix is to ensure that all requirements defined for the

system are reflected in the design and tested. As the design specifications and test plans and scenarios are developed, the traceability matrix is updated.

The selected Contractor shall perform GAP analysis and include a GAP analysis as part of the Finalized Detailed Requirements Document. The GAP analysis shall be between the detailed requirements and the selected Contractor's SaaS solution. The purpose of the GAP analysis is to identify and resolve any gaps between the detailed requirements and the selected Contractor's SaaS solution to ensure that all requirements defined for the system are reflected in the solution.

The overall goal of this task is to perform all activities necessary to develop a set of finalized requirements and traceability matrix.

Deliverable(s):

- a. Finalized Detailed Requirements Document with GAP analysis
- b. Requirements Traceability Matrix

C. Data Cleansing, Conversion and Upload. The selected Contractor shall complete all tasks as described in section **IV.3.F. Data Cleansing, Conversion and Upload.**

Deliverable(s):

- a. Finalized Data Conversion Plan.
- b. Final report confirming the successful conversion and upload of bridge solution data.

D. Solution and Interface Design. The selected Contractor shall develop a detailed solution and interface design document, representing a refinement of the finalized requirements.

Deliverable(s):

- a. Detailed solution and interface design document.

E. Solution and Interface Configuration. The selected Contractor shall configure the solution and interfaces to meet the requirements as documented in **Appendix L – MM Detailed Requirements.**

Deliverable(s):

- a. Configured SaaS solution and interfaces.

F. Testing. The selected Contractor shall manage the testing process to include, but not be limited to, perform testing to ensure that all agreed upon requirements in the detailed requirements document have been met. System testing shall also include load testing. The Contractor shall also participate in the Commonwealth's user acceptance testing (UAT) to assist the DOH testers in becoming familiar with the solution, provision of test environment (including access for DOH testers), execution of test scenarios, and defect resolution (including the process for same).

This task shall include, but not be limited to, the following:

1. **Development of a Comprehensive Test Plan.** The selected Contractor shall create a test plan that includes, at a minimum, the approach to all types of testing to be performed (including system, UAT and stress/load) and roles and responsibilities. Test Plans shall include but not be limited to the following:
 - a. Resources required.
 - b. Test schedule.
 - c. Test mapping of requirements and associated components to testing with the criteria for pass/fail.
 - d. Roles and responsibilities in a RACI matrix or similar document.
 - e. Establishing authority sign-off and final approvals. The selected Contractor's test plan shall include reference to Quality Assurance and Defect Management processes to ensure resolution of defects.
2. **Use of Test Scenarios.** The selected Contractor shall be provided a Use Case document developed by DOH, which reflects requirements in the detailed requirements document. DOH at its sole discretion may develop additional test scenarios. These test scenarios shall be used by both the selected Contractor and the DOH for testing.
3. **System Testing.** The selected Contractor shall ensure that system tests are performed and the results are made available to the DOH for review and feedback.
4. **UAT Testing.** The selected Contractor shall support the DOH during UAT testing.
5. **Stress/Load Testing.** The selected Contractor shall perform testing using automated tools and make adjustments as necessary to ensure the system is capable of supporting the projected number of users and concurrent users.
6. **Defect Resolution.** The selected Contractor shall be responsible for the defect resolution and re-testing of any errors, defects, or unsuccessfully tested functions.
7. **Test Results.** Test results documentation shall include results of the testing, including defect management reporting, confirmation of errors being retested and resolved. Test result documentation shall include an updated requirements traceability matrix that maps all requirements in the detailed requirements document to the test scenarios. This matrix shall demonstrate that all requirements have been addressed and successfully tested.

Deliverable(s):

- a. Test Plan.
- b. Final Test Results Report.

F. Implementation. Upon completion of successful User Acceptance and stress/load testing and DOH approval, the selected Contractor shall implement the new solution into production. The Contractor shall provide access to the solution in the production application for designated users. The selected Contractor shall provide a final implementation report which demonstrates the successful completion of all tasks as described in the Implementation plan and a certification of operational readiness.

Deliverable(s):

- a. Final Implementation Report.

G. Training. Contractor(s) shall describe its training methodology that will be used to train both Commonwealth staff and other users. The selected Contractor shall provide training schedule notification in advance for all training session(s). All training materials and schedules must be approved by DOH. DOH, at its sole discretion, may elect to have the selected Contractor provide on-site classroom training in Harrisburg, Pennsylvania. Classroom training shall not exceed 25 attendees per session. The Contractor must propose an approach to train all authorized user groups, including approach for each group and the type of training (on-site, web-based, self-training, etc.) that will be used. The training effort must be included as a separate task grouping in the project plan.

Deliverable(s)

- a. Training plan.
- b. Training materials, which include a guide for future training of prescribers/dispensers.
- c. Classroom training session(s).

H. Solution Operation and Support. The selected Contractor shall submit monthly SLA and Status reports as described in section **IV-5. C. SLA Reporting.**

1. The selected Contractor shall provide solution support services as described in section **IV-3.E. Solution Support.**
2. The selected Contractor shall perform all system maintenance needed to ensure the SaaS solution remains operational and meets the requirements of this RFQ.
3. The selected Contractor shall perform all system monitoring and problem resolution as needed to meet the service levels as described in **Appendix M – Service Level Agreements.**

4. The selected Contractor shall provide any upgrade(s) to the SaaS solution at no additional charge.
 - a. No system upgrade shall be performed without Commonwealth approval.
5. The selected Contractor shall maintain system documentation as described in section **IV-3.G. System documentation** and make it available online.
6. The selected Contractor shall provide project management services as described in section **IV-5. A. Project Management Services**.
7. The selected Contractor shall perform release management services for its solution according to its release management methodology as described in section **IV-3.K. Release Management**.
8. The selected Contractor shall provide training for DOH staff and users for all future releases which involve new functions, features, or changes to implemented user processes. Contractors shall describe its methodology for ongoing user training for the term of the Contract.
9. The selected Contractor shall host the SaaS solution as described in section **IV-3. B. Hosting Requirements**.
10. The selected Contractor shall provide maintenance, support and warranty services as described in section **IV-3.E.5. Maintenance and Warranty**.
11. The selected Contractor shall provide disaster recovery services as described in section **IV-3.M. Disaster Recovery**.

Deliverable(s):

- a. Solution subscription

- I. **Turnover.** The selected Contractor shall also be responsible for developing a turnover plan to be used to transfer the service and data to a new incoming contractor and/or Commonwealth staff at the conclusion of the contract awarded as a result of this solicitation. The selected Contractor shall work cooperatively with DOH, any additional Commonwealth representatives, and incoming contractor.

The turnover plan shall be prepared and submitted as a project plan that identifies the work elements/tasks, the resources assigned to the tasks, the time allotted to each element and the deliverable items to be produced. Where appropriate, a PERT or Gantt chart shall be used to show project, task, and time relationships. The selected contractor must provide the incoming vendor with a copy of all materials necessary to facilitate data migration and general system transfer activities.

The turnover plan shall be requested by the DOH Project Manager in writing one (1) month prior to the required delivery date. The turnover plan can be requested as early as thirteen (13) months prior to contract end, but not less than six (6) months prior to contract end. The turnover plan shall be submitted to the DOH Project Manager in writing within one (1) month of request to allow for the review and approval by the DOH Project Manager. DOH requires a ten (10) business days to review the proposed plan and comment. A final plan, revised based on DOH feedback, shall be delivered to DOH within five (5) business days of receiving DOH feedback.

At contract closeout and final turnover, all data collected and stored in the system(s) will be transferred to DOH without cost within 30 calendar days in a format agreed upon by the Commonwealth. The transfer must include detailed data dictionary(s) with coding definitions, and instructions detailing where the data will be housed and how it will be formatted and secured during the transfer; this information must be provided to DOH within 60 calendar days before contract termination.

Deliverable(s):

- a. Turnover plan.
- b. Turnover final report – showing successful completion of all turnover activities.

IV-5. Reports and Project Control

- A. Project Management Services.** The selected Contractor shall provide project management services throughout the project (initial and future releases). Contractor(s) shall describe its project management approach which will govern the implementation and ongoing services as required by this RFQ.

At a minimum, the selected Contractor shall deliver and maintain project management plans as described below. The Contractor shall create, maintain and execute the following plans and supporting documentation and logs in a format agreed to by the Commonwealth.

- 1. Work Plan.** The selected Contractor shall provide a work plan detailing all work to be performed to complete the project. The selected Contractor shall submit an initial or baseline work plan to be reviewed and approved by the Commonwealth, then maintained by the selected Contractor through the life of the project. The work plan shall include a work breakdown structure (WBS) and schedule. It shall contain all the work (tasks and deliverables), duration of each task (in days), planned schedule dates for the work to occur (consider business days, excluding Commonwealth holidays), dependencies and resources (Commonwealth and the selected Contractor) assigned to accomplish the project.
- 2. Communications Plan.** The selected Contractor shall submit a communications management plan for review and approval. It shall describe the communication management process to be followed for the duration of the project. The communications management plan shall

address the timeframe and frequency for project meetings and reports, what is communicated (status reports, agendas, meeting minutes, issues log), who shall communicate and who shall receive the information, and the methods to convey the information (electronic / hard copy).

3. **Task Plan.** A work plan for each task that identifies the work elements of each task, the resources assigned to the task, and the time allotted to each element and the deliverable items to be produced. Where appropriate, a PERT or GANTT chart display should be used to show project, task, and time relationship.
4. **Change Management Plan.** The selected Contractor shall submit a change management plan for review and approval. It shall describe the change process to track change requests from submittal to final disposition. The change management plan shall include the process to track submission, coordination, review, evaluation, categorization, and approval for release of any and all changes. It shall address who receives requests and any forms and change logs to be used. The change management plan should identify the level of authority included within a change review team to review and make change decisions during the project. The review team approves, defers, or rejects any changes that occur during the project. The Contractor shall capture, track, and maintain change status in a change log.
5. **Quality Management Plan.** The quality management plan must describe the approach used to address Quality Assurance (QA) and Quality Control (QC) throughout the life of the project. The quality management plan should identify the quality processes and practices including the periodic reviews, audits and the testing strategy for key deliverables. The plan should also include the criteria by which quality is measured, the tolerances required of product and project deliverables, how compliance is measured, and the process for addressing those instances whenever quality measures are out of tolerance or compliance.
6. **Risk Management Plan** – The selected Contractor shall submit a risk management plan for review and approval. It shall identify risks and what actions shall be taken to manage risks throughout the life of a project. A risk is any factor that may potentially interfere with successful completion of the project. The risk management plan must cover who is responsible for managing the risks, how they shall be tracked throughout the project, how contingency plans shall be implemented, and how project reserves shall be allocated to handle risk. As risks are identified, they are entered into the risk management log, which shall serve as the central repository for all risks identified by the project.

7. **Service Management Plan.** Contractor(s) shall describe its service management methodology used to deliver service to its customers. Identify any industry best practices or standards its service management methodology is based. IT Service management shall include strategic approach directed by policies and incorporated in processes and supporting procedures that are performed to plan, deliver, operate, control, and improve IT services offered to customers. Contractor(s) shall describe tools used for service management to include any integration of automated tools. Contractor(s) shall include as part of its proposal any service management plan(s) which will be utilized to deliver, operate, control, and improve the services as described in this RFQ.
 8. **Status Report.** A periodic monthly progress report covering activities, problems and recommendations. This report should be keyed to the work plan the Contractor developed in its proposal, as amended or approved by the Commonwealth.
 9. **Final Report.** Upon completion of each release, the selected Contractor shall close out the project by providing a final report as evidence of completeness and indicating any approved outstanding issues. Any unapproved outstanding issues shall be remedied prior to project closeout. A final report shall be submitted by the selected Contractor within 7 days after the project completion.
- B. **Problem Identification Report.** An “as required” report, identifying problem areas. The report should describe the problem and its impact on the overall project and on each affected task. It should list possible courses of action with advantages and disadvantages of each, and include the selected Contractor’s recommendations with supporting rationale.
 - C. **SLA Reporting.** A monthly report to provide statistical information to assess compliance with the required SLAs. This report must be delivered within **three (3)** business days of month’s end.
 - D. **Ad Hoc Reporting.** The selected Contractor may be required to provide ad hoc reports or assist DOH in the creation of ad hoc reports.
 - E. **Strategic Roadmap and Tactical Plan.** Contractor(s) shall describe how it will effectively manage and sustain its services, systems, and resources to support the current and future needs of the Pennsylvania Medical Marijuana Program. The selected Contractor shall provide annual strategic roadmaps and plans for all services and supporting system along to ensure alignment with program changes, service current and future demands, and comply with applicable policies and supporting regulations. The strategic roadmap and tactical plan shall be delivered within **thirty (30)** calendar days of the last month of the current contract year.

IV-6. Purchase order Requirements — Small Diverse Business and Small Business (SDB/SB) Participation.

All purchase orders containing Small Diverse Business and Small Business Participation must contain the following provisions to be maintained through the initial contract term and any subsequent options or renewals:

- A.** Each Small Diverse Business and Small Business commitment which was credited by BDISBO and the total percentage of such Small Diverse Business and Small Business commitments made at the time of proposal submittal, BAFO or negotiations, as applicable, become obligations of the selected Offeror upon execution of its purchase order with the Commonwealth.
- B.** All Small Diverse Business and Small Business subcontractors credited by BDISBO must perform at least **fifty percent (50%)** of the work subcontracted to them.
- C.** The individual percentage commitments made to Small Diverse Businesses and Small Businesses cannot be altered without written approval from BDISBO.
- D.** Small Diverse Business and Small Business commitments must be maintained in the event the purchase order is assigned to another prime contractor.
- E.** The selected Contractor and each Small Diverse Business and Small Business for which a commitment was credited by BDISBO must submit a final, definitive subcontract agreement signed by the selected Contractor and the Small Diverse Business and/or Small Business to BDISBO within **thirty (30)** days of the final execution date of the Commonwealth purchase order. A Model Subcontract Agreement which may be used to satisfy this requirement is provided in **Appendix N, Model Form of Small Diverse and Small Business Subcontract Agreement**. The subcontract must contain:
 - 1. The specific work, supplies or services the Small Diverse Business and/or Small Business will perform; location for work performed; how the work, supplies or services relate to the project; and the specific timeframe during the initial term and any extensions, options and renewals of the prime contract when the work, supplies or services will be provided or performed.
 - 2. The fixed percentage commitment and associated estimated dollar value that each Small Diverse Business and/or Small Business will receive based on the final negotiated cost for the initial term of the prime contract.
 - 3. Payment terms indicating that the Small Diverse Business and/or Small Business will be paid for work satisfactorily completed within **fourteen (14)** days of the selected Contractor's receipt of payment from the Commonwealth for such work.

4. Commercially reasonable terms for the applicable business/industry that are no less favorable than the terms of the selected Contractor's contract with the Commonwealth and that do not place disproportionate risk on the Small Diverse Business and/or Small Business relative to the nature and level of the Small Diverse Business' and/or Small Business' participation in the project.
- F.** If the selected Contractor and a Small Diverse Business or Small Business credited by BDISBO cannot agree upon a definitive subcontract within thirty (30) days of the final execution date of the Commonwealth purchase order, the selected Contractor must notify BDISBO.
- G.** The Selected Contractor shall complete the Prime Contractor's Quarterly Utilization Report and submit it to the contracting officer of the Issuing Office and BDISBO within **ten (10)** business days at the end of each quarter of the purchase order term. This information will be used to track and confirm the actual dollar amount paid to Small Diverse Business and Small Business subcontractors and suppliers and will serve as a record of fulfillment of the commitment. If there was no activity during the quarter, the form must be completed by stating "No activity in this quarter." A late fee of \$100.00 per day may be assessed against the Selected Contractor if the Utilization Report is not submitted in accordance with the schedule above.
- H.** The Selected Contractor shall notify the Contracting Officer of the Issuing Office and BDISBO when circumstances arise that may negatively impact the selected Contractor's ability to comply with Small Diverse Business and/or Small Business commitments and to provide a corrective action plan. Disputes will be decided by the Issuing Office and DGS.
- I.** If the Selected Contractor fails to satisfy its Small Diverse Business and/or Small Business commitment(s), it may be subject to a range of sanctions BDISBO deems appropriate. Such sanctions include, but are not limited to, one or more of the following: a determination that the selected Contractor is not responsible under the Contractor Responsibility Program; withholding of payments; suspension or termination of the contract together with consequential damages; revocation of the selected Contractor's Small Diverse Business status and/or Small Business status; and/or suspension or debarment from future contracting opportunities with the Commonwealth.

Appendix A Questions Submittal Template

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RFQ Name	Medical Marijuana
RFQ Number	6100040415

Contractor Information:	
Contractor Name	
Contractor Mailing Address	
Contractor Contact Person	
Contact Person's Phone Number	
Contact Person's E-Mail Address	

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41				
42				
43				
44				

RFQ Information:	
RFQ Name	Medical Marijuana
RFQ Number	6100040415

Contractor Information:	
Contractor Name	
Contractor Mailing Address	
Contractor Contact Person	
Contact Person's Phone Number	
Contact Person's E-Mail Address	

Question #	Document	Page #	Section Reference	Question
45				
46				
47				
48				
49				
50				

**APPENDIX B
PROPOSAL COVER SHEET
COMMONWEALTH OF PENNSYLVANIA
OFFICE FOR INFORMATION TECHNOLOGY
MEDICAL MARIJUANA RFQ 6100040415**

Enclosed in three separately sealed submittals is the proposal of the Contractor identified below for the above-referenced RFQ:

Contractor Information:	
Contractor Name	
Contractor Mailing Address	
Contractor Website	
Contractor Contact Person	
Contact Person's Phone Number	
Contact Person's Facsimile Number	
Contact Person's E-Mail Address	
Contractor Federal ID Number	
Contractor SAP/SRM Vendor Number	

Submittals Enclosed and Separately Sealed:	
<input type="checkbox"/>	Technical Submittal
<input type="checkbox"/>	Small Diverse Business Participation Submittal
<input type="checkbox"/>	Cost Submittal

<i>Signature</i>	
Signature of an official authorized to bind the Contractor to the provisions contained in the Contractor's proposal:	
Printed Name	
Title	

FAILURE TO COMPLETE, SIGN AND RETURN THIS FORM WITH THE CONTRACTOR'S PROPOSAL MAY RESULT IN THE REJECTION OF THE CONTRACTOR'S PROPOSAL

**Master Information Technology (IT) Services Invitation to Qualify (ITQ) Contract
APPENDIX C, Trade Secret/Confidential Proprietary Information Notice**

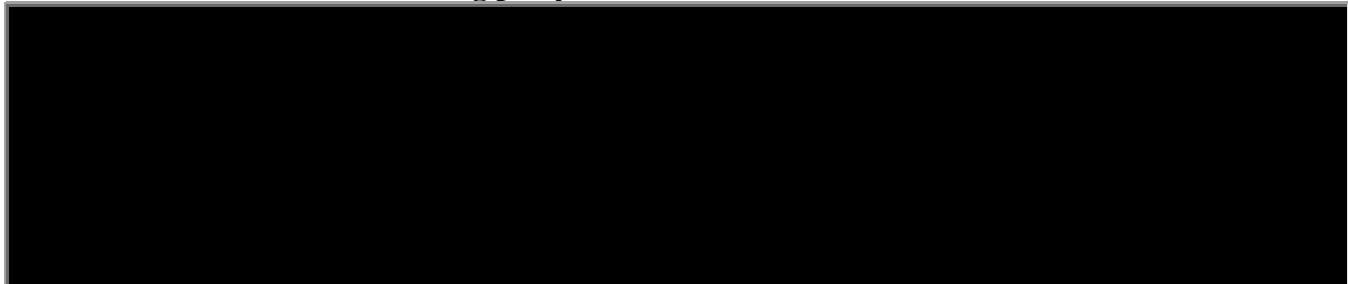
Instructions:

The Commonwealth may not assert on behalf of a third party an exception to the public release of materials that contain trade secrets or confidential proprietary information unless the materials are accompanied, at the time they are submitted, by this form or a document containing similar information.

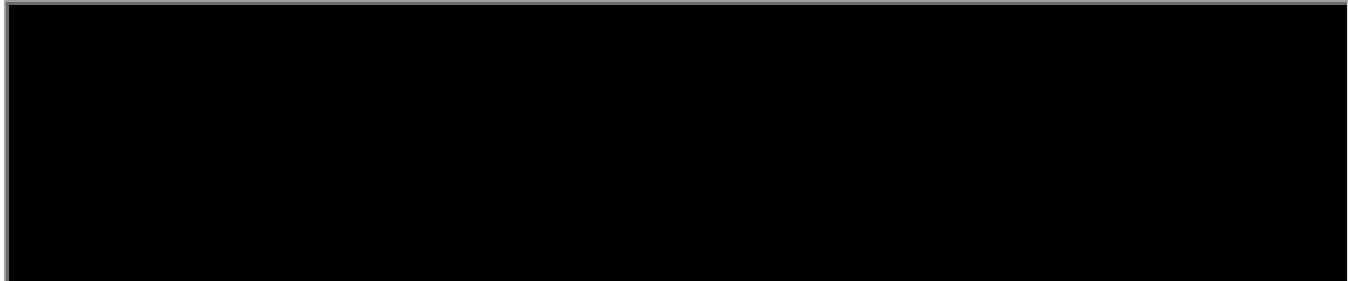
It is the responsibility of the party submitting this form to ensure that all statements and assertions made below are legally defensible and accurate. The Commonwealth will not provide a submitting party any advice with regard to trade secret law.

Name of submitting party:

Contact information for submitting party:

A large black rectangular redaction box covering the contact information for the submitting party.

Please provide a brief overview of the materials that you are submitting (e.g. bid, grant application, technical schematics):

A large black rectangular redaction box covering the overview of the materials being submitted.

Please provide a brief explanation of why the materials are being submitted to the Commonwealth (e.g. response to bid #12345, application for grant XYZ being offered by the Department of Health, documents required to be submitted under law ABC)

A large black rectangular redaction box covering the explanation of why the materials are being submitted.

Master Information Technology (IT) Services Invitation to Qualify (ITQ) Contract
APPENDIX C, Trade Secret/Confidential Proprietary Information Notice

Please provide a list detailing which portions of the material being submitted you believe constitute a trade secret or confidential proprietary information, and please provide an explanation of why you think those materials constitute a trade secret or confidential proprietary information. Also, please mark the submitted material in such a way to allow a reviewer to easily distinguish between the parts referenced below. (You may attach additional pages if needed)

Note: The following information will not be considered a trade secret or confidential proprietary information:

- Any information submitted as part of a vendor's cost bid
- Information submitted as part of a vendor's technical response that does not pertain to specific business practices or product specification
- Information submitted as part of a vendor's technical or small diverse business response that is otherwise publicly available or otherwise easily obtained
- Information detailing the name, quantity, and price paid for any product or service being purchased by the Commonwealth

Page Number	Description	Explanation

Master Information Technology (IT) Services Invitation to Qualify (ITQ) Contract
APPENDIX C, Trade Secret/Confidential Proprietary Information Notice

Acknowledgment

The undersigned party hereby agrees that it has read and completed this form, and has marked the material being submitted in accordance with the instructions above. The undersigned party acknowledges that the Commonwealth is not liable for the use or disclosure of trade secret data or confidential proprietary information that has not been clearly marked as such, and which was not accompanied by a specific explanation included with this form.

The undersigned agrees to defend any action seeking release of the materials it believes to be trade secret or confidential, and indemnify and hold harmless the Commonwealth, its agents and employees, from any judgments awarded against the Commonwealth in favor of the party requesting the materials, and any and all costs connected with that defense. This indemnification survives so long as the Commonwealth has possession of the submitted material, and will apply to all costs unless and until the undersigned provides a written statement or similar notice to the Commonwealth stating that it no longer wishes to exempt the submitted material from public disclosure.

The undersigned acknowledges that the Commonwealth is required to keep all records for at least as long as specified in its published records retention schedule.

The undersigned acknowledges that the Commonwealth reserves the right to reject the undersigned's claim of trade secret/confidential proprietary information if the Commonwealth determines that the undersigned has not met the burden of establishing that the information constitutes a trade secret or is confidential. The undersigned also acknowledges that if only a certain part of the submitted material is found to constitute a trade secret or is confidential, the remainder of the submitted material will become public; only the protected information will be removed and remain nonpublic.

If being submitted electronically, the undersigned agrees that the mark below is a valid electronic signature.

Signature

Title

Date

APPENDIX D

PROJECT REFERENCES

Name of Client & Project Title	Client – Project Title	
Contract Value	[VALUE]	
Nature and Scope of Project:	Describe the project in sufficient detail to explain it is similar to the Commonwealth's project. How does this project compare in size, scope, complexity and/or duration? What is it specifically about this project that makes it a good representative project of the vendor's work? <i>(Reference Section II-4 Prior Experience)</i>	
Project Duration:	Start Date Year: [YEAR]	End Date Year: [YEAR or on-going]
Nature of the Client:	Description of client and organizational unit that project was managed by.	
Nature of Client Audience:	Description of project users and/or client/customer audience.	
Number of Users:	[Number]	
# & Composition of Vendor Employees & Consultants Assigned:	Vendor Project Manager/Key Consultant on Project Team: Describe start-up, peak and ongoing level of vendor efforts	
Client Contact Information:	<p>Provide the name, title, address and telephone number of at least two references or contact persons that the Commonwealth can contact to inquire about the vendor's performance, and indicate the role these individuals had in relation to the assignment or project. The references/contact persons should be individuals who were key stakeholders or project leaders and who can validate the vendor's role and responsibilities and who can comment on the quality of the vendor's performance. 2 contacts required.</p> <p>Reference Contacts:</p> <p>Name: _____ Title: _____</p> <p>Department: _____</p> <p>Full Address: _____</p> <p>Telephone: _____ E-mail: _____</p> <p>Relation/Role to Project: _____</p> <p>Name: _____ Title: _____</p> <p>Department: _____</p> <p>Full Address: _____</p> <p>Telephone: _____ E-mail: _____</p> <p>Relation/Role to Project: _____</p>	

**APPENDIX E
PERSONNEL EXPERIENCE BY KEY POSITION**

POSITION (Include at least one row for all positions identified as Key Positions by DOH in II-6 of the RFQ, as well as any additional positions you've identified as integral to the work delineated in your proposal.)	PERSONNEL NAME (Identify by first/last name the person who will fulfill this position.)	COMMITMENT (Provide the percentage of this person's time to be committed to the proposed project.)	CURRICULA VITAE			
			# YEARS PRIOR EXPERIENCE IN POSITION (List the number of years this person has acted in the same role on prior projects similar in nature to the proposed project.)	OTHER RELEVANT EXPERIENCE (Provide a brief narrative of other experience this person has had that may be relevant to his/her role in the proposed project.)	EDUCATION (List all postsecondary degrees completed for this person.)	OTHER PROFESSIONAL QUALIFICATIONS (List any certifications and/or professional memberships for this person that may be <u>relevant</u> to this position.)

**APPENDIX E
PERSONNEL EXPERIENCE BY KEY POSITION**

**APPENDIX F
SMALL DIVERSE BUSINESS (SDB) AND SMALL BUSINESS (SB)
PARTICIPATION SUBMITTAL**

Project: Medical Marijuana - In order to implement Act 16 of 2016, the Pennsylvania Department of Health is seeking to procure a hosted, Software as a Service(SaaS) Medical Marijuana seed to sale tracking system, which will be used to monitor, control and report on activities of authorized growers, processors, dispensaries, Laboratories and research institutions. This procurement also supports the implementation of a hosted, SaaS registry for providers, patients and caregivers.

Contractor Firm: _____

Contractor Contact Name: _____ **Email:** _____

CONTRACTOR INFORMATION:

Is your firm a DGS-Verified Small Diverse Business? Yes No (**MUST** check one)

Is your firm a DGS-Self-Certified Small Business? Yes No (**MUST** check one)

SUBCONTRACTING INFORMATION:

Percentage Commitment for SDB and SB Subcontracting Participation

After examination of the contract documents, which are made a part hereof as if fully set forth herein, the Contractor commits to the following percentages of the total contract cost for Small Diverse Business and Small Business subcontracting participation.

Small Diverse Business Subcontracting percentage commitment:

_____ % _____ Percent
(Figure) (Written)

Small Business Subcontracting percentage commitment:

_____ % _____ Percent
(Figure) (Written)

Listing SDB and SB Subcontractors

The Contractor must list in the chart below the SDBs and SBs that will be used to meet the percentage commitments provided above. Include the SDB/SB firm name, SDB or SB designation, SDB/SB Primary Contact Information, a description of the service or supplies the SDB/SB will provide, fixed percent of total contract cost committed, estimated dollar value of each commitment, and an indication as to the Contractor's intent to utilize the SDB/SB subcontractor for contract options or renewals. Include as many pages as necessary. **Contractors must also include a Letter of Intent as indicated in RFQ Part II, Section II-10 for each SDB/SB listed.**

SDB/SB Name	SDB or SB	Primary Contact Name & Email	Description of Services or Supplies to be provided	% of total Contract Cost Committed	Estimated \$ value of Commitment	Will SDB/SB be used for options/renewals? (yes/no)

**APPENDIX G
SMALL DIVERSE AND SMALL BUSINESS
LETTER OF INTENT**

[DATE]

[SDB/SB Contact Name]

Title

[SDB/SB Company Name]

Address

City, State, Zip]

Dear [SDB/SB Contact Name]:

This letter serves as confirmation of the intent of [Contractor] to utilize [Small Diverse Business (SDB) or Small Business (SB)] on RFQ [RFQ number and Title] issued by the [Commonwealth agency name].

If [Contractor] is the successful vendor, [SDB or SB] shall provide [identify the specific work, goods or services the SDB/SB will perform] during the initial term of the prime contract and during any extensions, options or renewal periods of the prime contract exercised by the Commonwealth, as more specifically set forth below: [identify the specific time periods during the initial contract term and any extensions, options and renewals when the component work, goods or services will be provided or performed.]

These services represent [identify fixed numerical percentage commitment] of the total cost in the [Contractor's] cost submittal for the initial term of the contract. Dependent on final negotiated contract pricing and actual contract usage or volume, it is expected that [SDB or SB] will receive an estimated [identify associated estimated dollar value that the fixed percentage commitment represents] during the initial contract term.

[SDB/SB] represents that it meets the small or small diverse business requirements set forth in the RFQ and all required documentation has been provided to [Contractor] for its SDB/SB submission.

We look forward to the opportunity to serve the [Commonwealth agency name] on this project. If you have any questions concerning our small business or small diverse business commitment, please feel free to contact me at the number below.

Sincerely,

Acknowledged,

Contractor Name

Title

Company

Phone number

SDB or SB Name

Title

Company

Phone number

Instructions

- 1.) All sheets must be filled out completely. Fill out all yellow highlighted cells on each worksheet.
- 2.) Formulas are imbedded in the Worksheets. Contractor's is responsible and must verify that all calculations, subtotal costs and grand total costs are accurate.
- 3.) Vendor Information. Complete the required cells. The information will carry forward through the rest of the worksheet.
- 3.) SaaS Subscription. The annual total for the subscription should be entered. Subscription costs should include all costs to implement, maintain and support the solution. The subscription costs should be based on calculations including and excluding Tier 1 help desk support as stated in the RFQ.
- 4.) Blended Rate: Contractors should enter the blended hourly rate for performing customizations needed to meet the requirements. The rates entered into the highlighted fields will remain in effect for the duration of the contract and be used when future customizations are needed.
- 5.) Requirement Customizations: Follow the instructions. References should be made using the MM Detailed Requirements Appendix K submitted with the Offeror's proposal.
- 6.) Summary. All amounts will be transferred and calculated automatically.
- 7.) Monetary cells without a dollar amount will be translated to mean zero (0) dollars.
- 8.) Please contact the Issuing Officer with any questions or concerns.

Vendor Information

Offeror Name	Contact Person	
Offeror Address	Email Address	
	Phone Number	Fax Number
Vendor Number	Federal ID or SSN (TIN)	

APPENDIX H, COST MATRIX

Vendor Name	0
Vendor ID Number	0
Vendor TIN	0

SaaS Subscription

Task	Base Years					Renewal Years		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
IV-4.H. Solution Operation & Support (including Tier 1 help desk support)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IV-4.H. Solution Operation & Support (excluding Tier 1 help desk support)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Total Base Years with Tier 1	\$ -
Total Base Years without Tier 1	\$ -
Total Renewal Years with Tier 1	\$ -
Total Renewal Years without Tier 1	\$ -
Total Base & Renewal Years with Tier 1	\$ -
Total Base & Renewal Years without Tier 1	\$ -

*The annual SaaS subscription shall be paid in equally quarterly payments.

Vendor Name	0
Vendor ID Number	0
Vendor TIN	0

Blended Rate

Blended Rate (Base Years)*	\$ -
Blended Rate (Renewal Years)	\$ -

NOTE: The information provided is for evaluation purposes only and does not guarantee payment or work to be performed.

NOTE: The rates entered will remain for the life of the contract during each respective phase.

* The rates entered in the Blended Rate (Base Years) will be used in the table below to calculate cost totals for each customization needed to meet the requirements for the solution upon implementation.

NOTE: Additional enhancements and required customizations may be requested during the life of the contract. The enhancements will follow the change management process and the rates established above shall be used.

Requirements Customization

System	Subcategory	*Technical Requirement tab line reference	Function Description	Requirement Statement	Hours Required	Amount	
Registry	Audit	line 6	Data & Reporting/Tracking	The registry solution must track and retain an auditable database history, including modifications to any information in the database(s).	10	\$ 1,500.00	EXAMPLE - based on \$150/hour
					0	\$ -	
					0	\$ -	
					0	\$ -	
					0	\$ -	
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					0	\$ -	
					0	\$ -	
					0	\$ -	
					0	\$ -	
					0	\$ -	
Total Customization Costs						\$ -	

NOTE: Additional rows may be added if needed.

*Technical Requirement line reference - Contractors should use the line reference from Appendix "X" - MM Detailed Requirements (see example above)

APPENDIX H, COST MATRIX

Vendor Name	0
Vendor ID Number	0
Vendor TIN	0

Summary

Costs including Tier 1 Help Desk Support	
SaaS Subscription Base Years	\$ -
Requirement Customizations	\$ -
Total Costs Base Years	\$ -

SaaS Subscription Renewal Years	\$ -
Total Costs Renewal Years	\$ -

Total Costs Base & Renewal Years	\$ -
----------------------------------	------

Costs excluding Tier 1 Help Desk Support	
SaaS Subscription Base Years	\$ -
Requirement Customizations	\$ -
Total Costs Base Years	\$ -

SaaS Subscription Renewal Years	\$ -
Total Costs Renewal Years	\$ -

Total Costs Base & Renewal Years	\$ -
----------------------------------	------

Master Information Technology (IT) Services Invitation to Qualify (ITQ) Contract

APPENDIX I, Domestic Workforce Utilization Certification

To the extent permitted by the laws and treaties of the United States, each proposal will be scored for its commitment to use the domestic workforce in the fulfillment of the contract. Maximum consideration will be given to those offerors who will perform the contracted direct labor exclusively within the geographical boundaries of the United States or within the geographical boundaries of a country that is a party to the World Trade Organization Government Procurement Agreement. Those who propose to perform a portion of the direct labor outside of the United States and not within the geographical boundaries of a party to the World Trade Organization Government Procurement Agreement will receive a correspondingly smaller score for this criterion. In order to be eligible for any consideration for this criterion, offerors must complete and sign the following certification. This certification will be included as a contractual obligation when the contract is executed. Failure to complete and sign this certification will result in no consideration being given to the offeror for this criterion.

I, [title] of [name of Contractor] a [place of incorporation] corporation or other legal entity, ("Contractor") located at [address], having a Social Security or Federal Identification Number of [number], do hereby certify and represent to the Commonwealth of Pennsylvania ("Commonwealth") (Check one of the boxes below):

All of the direct labor performed within the scope of services under the contract will be performed exclusively within the geographical boundaries of the United States or one of the following countries that is a party to the World Trade Organization Government Procurement Agreement: Aruba, Austria, Belgium, Bulgaria, Canada, Chinese Taipei, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Liechtenstein, Lithuania, Luxemburg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom

OR

[] percent [Contractor must specify the percentage] of the direct labor performed within the scope of services under the contract will be performed within the geographical boundaries of the United States or within the geographical boundaries of one of the countries listed above that is a party to the World Trade Organization Government Procurement Agreement. Please identify the direct labor performed under the contract that will be performed outside the United States and not within the geographical boundaries of a party to the World Trade Organization Government Procurement Agreement and identify the country where the direct labor will be performed: [Use additional sheets if necessary]

The Department of General Services [or other purchasing agency] shall treat any misstatement as fraudulent concealment of the true facts punishable under Section 4904 of the *Pennsylvania Crimes Code*, Title 18, of Pa. Consolidated Statutes.

Attest or Witness:

Corporate or Legal Entity's Name

Signature/Date

Signature/Date

Printed Name/Title

Printed Name/Title



**APENDIX J
CONTRACTOR CERTIFICATION
AND
ACCEPTANCE OF RFQ MANDATORY REQUIREMENTS
SOLICITATION # 6100040415**

CONTRACTOR NAME: _____

CONTRACTOR ADDRESS: _____

CONTRACTOR FEDERAL ID NUMBER: _____

CONTRACTOR SAP/SRM VENDOR NUMBER: _____

CERTIFICATION: I, the undersigned official of the above-named Contractor, do hereby certify that the Contractor owns a medical marijuana Seed to Sale tracking software solution and has the ability to operate it as a hosted, Software as a Service (SaaS). I further certify that I am authorized to provide this certification on behalf of the above-named Contractor.

I understand that false statements made herein are subject to the penalties of 18 Pa. C.S.A. Section 4904 relating to unsworn falsification to authorities and I am making this statement under penalty of perjury.

<i>Signature</i>
Signature of an official authorized to bind the Contractor to the provisions contained in the Contractor's proposal:
Printed Name
Title

FAILURE TO COMPLETE, SIGN AND RETURN THIS FORM WITH THE CONTRACTOR'S PROPOSAL WILL RESULT IN THE REJECTION OF THE CONTRACTOR'S PROPOSAL

APPENDIX K
NON-COMMONWEALTH HOSTED APPLICATION SERVICES REQUIREMENTS

The purpose of this appendix is to define requirements for technology solutions procured by the Commonwealth that are not hosted within Commonwealth infrastructure.

A. Hosting Requirements

1. The selected Contractor shall supply all hosting infrastructure required for performance of the Contract.
2. The selected Contractor shall provide secure access to all levels of users via the internet.
3. The selected Contractor is responsible for purchase, setup and maintenance of all required software and hardware needed to support the implementation of the system and all follow-up on maintenance and support.
4. The selected Contractor shall use commercially reasonable resources and efforts to maintain adequate internet connection bandwidth and server capacity to maintain compliance with the Service Level Agreements as described in **Appendix M - Service Level Agreements**.
5. The selected Contractor shall maintain all hosting equipment (hardware and software) and replace as necessary to maintain compliance with the Service Level Agreements as described in **Appendix M - Service Level Agreements**.
6. The selected Contractor shall monitor, prevent and deter unauthorized system access. Any and all known attempts must be reported to the Commonwealth within the timeframe set out by the RFQ. In the event of any impermissible disclosure, loss or destruction of Confidential Information, the receiving Party must immediately notify the disclosing Party and take all reasonable steps to mitigate any potential harm or further disclosure, loss or destruction of such Confidential Information. In addition, pertaining to the unauthorized access, use, release, or disclosure of data, the selected Contractor shall comply with state and federal data breach notifications regulations and is to report security incidents to the Commonwealth within one (1) hour of when the selected Contractor knew of such unauthorized access, use, release, or disclosure of data.
7. The selected Contractor shall allow the Commonwealth or its delegate, at times chosen by the Commonwealth, to review the hosted system's location and security architecture.
8. The selected Contractor staff, directly responsible for day-to-day monitoring and maintenance, shall have industry standard certifications applicable to the environment and system architecture used.
9. The selected Contractor shall locate servers in a climate-controlled environment. Contractor shall house all servers and equipment in an operational environment that meets industry standards including climate control, fire and security hazard detection, electrical needs, and physical security.
10. The selected Contractor shall examine system and error logs daily to minimize and predict system problems and initiate appropriate action.
11. The selected Contractor shall completely test and apply patches for all third-party software products before release.

12. The selected Contractor shall provide evidence that its hosting platform/cloud service provider is FedRAMP certified.

B. System Availability

1. The selected Contractor shall make available the system and any custom software on a 24 x 7 basis as established by the RFQ, with the exception of pre-planned maintenance.
2. The selected Contractor shall perform routine maintenance during planned downtime windows, with the approval of DOH. Routine maintenance shall include, but is not limited to, server upgrades/patching, software upgrades/patching and hardware maintenance.
3. The selected Contractor shall perform non-routine maintenance at a mutually agreeable time with two (2) weeks advance notice to the Commonwealth.
4. From time to time, emergency maintenance may be required to bring down the system. In such situations, if possible, the selected Contractor shall give advance notice, before the system goes down for maintenance, to the Commonwealth. The selected Contractor will limit the emergency maintenance to those situations which require immediate action of bringing down the system that cannot wait for the next scheduled maintenance period.

C. Security Requirements

1. The selected contractor shall provide evidence that the application boundary for their solution(s), including infrastructure and security controls, follows the guidelines and standards of FedRAMP. The selected Contractor shall permit the Commonwealth, at its sole discretion, to audit the solution's compliance to FedRAMP standards.
2. The selected Contractor shall conduct a third party independent security/vulnerability assessment at its own expense on an annual basis and submit the results of such assessment to the Commonwealth.
3. The selected Contractor shall comply with Commonwealth directions/resolutions to remediate the results of the security/vulnerability assessment to align with the standards of the Commonwealth.
4. The selected Contractor shall use industry best practices to protect access to the system with a firewall and firewall rules to prevent access by non-authorized users and block all improper and unauthorized access attempts.
5. The selected Contractor shall use industry best practices to provide system intrusion detection and prevention in order to detect intrusions in a timely manner.
6. The selected Contractor shall use industry best practices to provide virus protection on all servers and network components.
7. The selected Contractor shall limit access to the system and servers and provide access only to those staff that must have access to provide services proposed.

8. The Selected Contractor will provide all Services, using security technologies and techniques in accordance with industry best practices and the Commonwealth's security policies, procedures, and requirements, including those relating to the prevention and detection of fraud and any other inappropriate use or access of systems and networks.
9. All data in transit and at rest must be encrypted. All data in transit and rest must remain in the continental United States.

D. Data Storage

1. The selected Contractor shall use industry best practices to update all systems and third party software security patches to reduce security risk. The Selected Contractor shall protect their systems with anti-virus, host intrusion protection, incident response monitoring and reporting, network firewalls, application firewalls, and employ system and application patch management to protect its network and customer data from unauthorized disclosure.
2. The selected Contractor shall be solely responsible for all data storage required.
3. The selected Contractor shall take all necessary measures to protect the data including, but not limited to, the backup of the servers to meet the Recovery Point Objective and Recovery Time Objective established in the Service Level Agreements. in accordance with industry best practices and encryption techniques.
4. The selected Contractor agrees to have appropriate controls in place to protect critical or sensitive data and shall employ stringent policies, procedures, and best practices to protect that data particularly in instances where sensitive data may be stored on a selected Contractor controlled or owned electronic device.
5. The selected Contractor shall utilize a secured backup solution to prevent loss of data, back up all data every day and store backup media. Storage of backup media offsite is required. Data retention period has been established as the term of this contract. Stored media must be kept in an all-hazards protective storage safe at the worksite and when taken offsite. All back up data and media shall be encrypted.

E. Disaster Recovery

1. The selected Contractor shall employ reasonable disaster recovery procedures to assist in preventing interruption in the use of the system.
2. The selected contractor will perform an annual disaster recovery exercise to test their procedures and establish a Recovery Point Objective (RPO) and Recovery Time Objective (RTO).
3. The selected Contractor support and problem resolution solution shall provide a means to classify problems as to criticality and impact and with appropriate resolution procedures and escalation process for each classification of problem.

F. Data Exchange/Interface Requirements

1. PCI Compliance

The Selected Contractor is obliged to adhere to the Payment Card Industry Data Security Standard (PCI DSS) if it processes payment card data. Moreover, The Selected Contractor certifies that their Information Technology practices conform to and meet current PCI DSS standards as defined by The PCI Security Standards Council at https://www.pcisecuritystandards.org/security_standards/index.php.

The Selected Contractor will monitor these PCI DSS standards and its Information Technology practices and the Selected Contractor will notify the Commonwealth within one (1) week, if its practices should not conform to such standards. The SELECTED CONTRACTOR will provide a letter of certification to attest to meeting this requirement and agrees to the Commonwealth's right-to-audit either by Commonwealth or external 3rd party auditors.

Selected Contractor agrees that it may (1) create, (2) receive from or on behalf of Commonwealth, or (3) have access to, payment card records or record systems containing cardholder data including credit card numbers (collectively, the "Cardholder Data"). Selected Contractor shall comply with the Payment Card Industry Data Security Standard ("PCI-DSS") requirements for Cardholder Data that are prescribed by the payment brands (as appropriate including Visa, MasterCard, American Express, Discover), as they may be amended from time to time (collectively, the "PCIDSS Requirements"). Selected Contractor acknowledges and agrees that Cardholder Data may only be used for assisting in completing a card transaction, for fraud control services, for loyalty programs, or as specifically agreed to by the payment brands, for purposes of this Agreement or as required by applicable law.

G. Adherence to Policy

1. The selected Contractor support and problem resolution solution shall provide a means to classify problems as to criticality and impact and with appropriate resolution procedures and escalation process for each classification of problem.
2. The selected Contractor shall abide by all the Commonwealth's policies (Information Technology Policies (ITPs)).
3. The Selected Contractor shall comply with all pertinent federal and state privacy regulations.

H. Closeout

1. All data shall remain the property of the Commonwealth and will be delivered in a Commonwealth approved format.

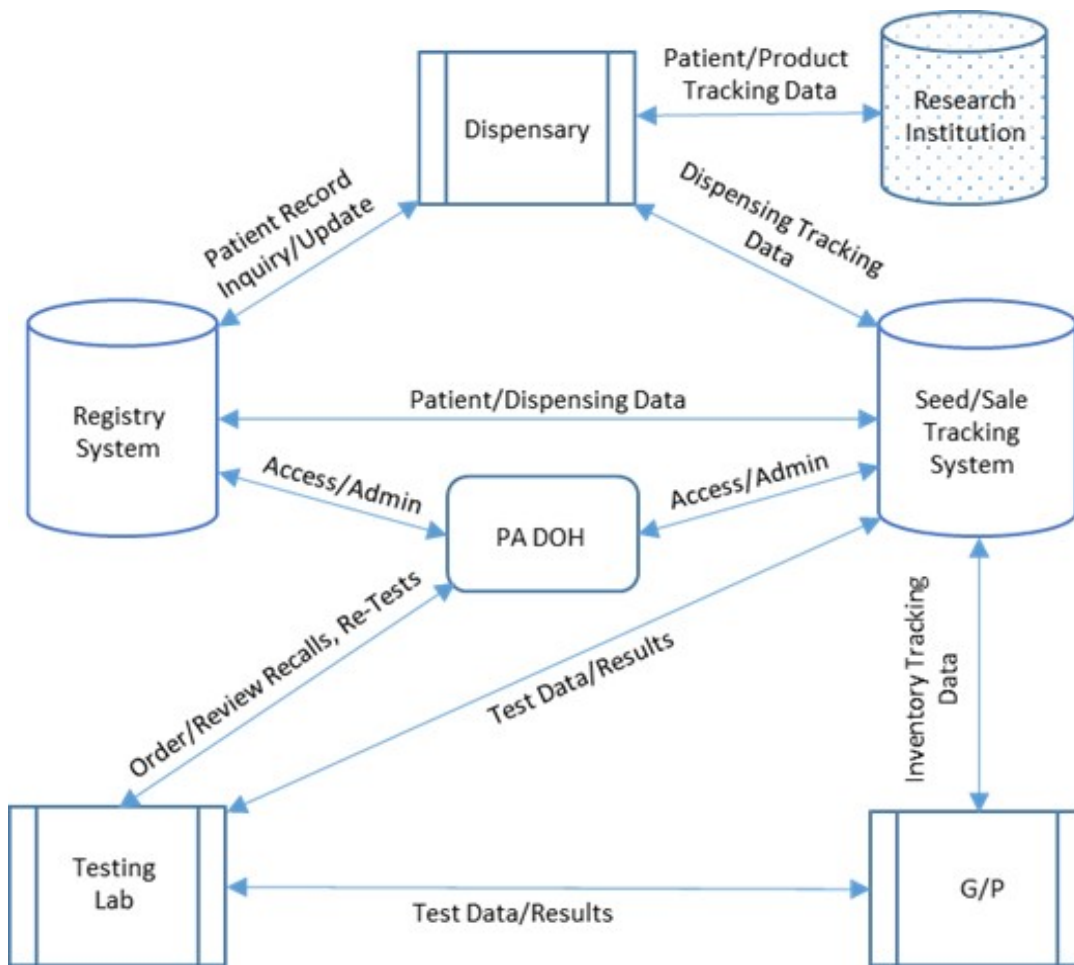
2. The selected Contractor shall delete all data from its servers upon approval from DOH that the data has been delivered in a Commonwealth approved format.
3. The selected Contractor shall verifying that all of the data has been delivered to the Commonwealth and removed from the Contractor's servers per Commonwealth ITPs.
4. Additional closeout details are provided in the system requirements.

The foundation for a successful project is built upon the quality and thoroughness of requirements gathering. This document is intended to facilitate understanding of the business and system requirements for the design and development of a technical solution that will support Pennsylvania's Medical Marijuana program.

The project team used the DOH Project Management Office (PMO) Requirements template to document business requirements, technical requirements and a traceability matrix. This workbook has a worksheet covering each of these topics.

The 'Business' sheet provides a high-level description of the program's business needs and source(s), primarily Act 16, supporting regulations, and program guidance. The 'Technical' sheet outlines the functional and non-functional system requirements in detail. The 'Business' and 'Technical' sheets are linked by the 'BR ID' column, which traces each system requirement to the applicable business requirement.

At a high level, the requirements are intended to support the following business flows:



Notes:

To meet aggressive program dates, DOH will be refining program roles, functions and processes before and during system implementation. Virtually all program functions and processes have a system component, and considerable effort has been spent ensuring that the detailed requirements specified in the 'Technical' worksheet are accurate and thorough. It is possible, however, that as program build out continues, modifications to system requirements may be needed.

The Pennsylvania Department of Health has primary responsibility for the administration of the Medical Marijuana program, but several other Commonwealth of Pennsylvania agencies will assist in administration, including the Departments of State, Revenue, Transportation, and Labor and Industry, among others. Program coordination and administration will rely on the sharing of data via file exchange, programming interface, direct system access, and report generation. Although all data flows have not been established at this time, the detailed system requirements specified in the 'Technical' worksheet provide adequate information for the bidder to understand the general requirements of Pennsylvania's administration model.

Please note the following:

- Requirements applicable to the temporary Bridge solution are identified in a separate column. The intention is to focus this effort on meeting immediate core requirements for this interim solution.
- The 'Timing' column is intended to provide information regarding phasing. 'Day 1' requirements are needed at time of system production; a '+' indicates the maximum number of days after system implementation that the specified requirement can be delayed.
- Each bidder is required to complete the table highlighted in blue on the right side of the 'Technical' worksheet and provide explanatory information, as applicable.

During the project implementation lifecycle, particularly the project planning and testing phases, the detailed system requirements outlined in this document, along with supporting use cases, will be mapped to the contractor's proposed solution(s) to ensure that complete program coverage is provided.

This workbook should be referenced during proposal preparation to ensure that your proposed solution addresses the functional and non-functional system requirements.

MEDICAL MARIJUANA DETAILED REQUIREMENTS
Glossary and Acronyms

Term/Acronym	Definition
API	Application Programming Interface
Approved organizations	Growers/Processors, laboratories, dispensaries and research institutions approved by DOH to participate in Pennsylvania's medical marijuana supply chain.
BIIT	DOH Bureau of Informatics and Information Technology
CBD	Cannabinol
COTS	Commercial off the self
DEA	Drug Enforcement Agency
DOH	Pennsylvania Department of Health
DOS	Department of State
EHR	Electronic Health Record
Form	The characteristics of MM recommended or limited for a particular patient, including the method of consumption and any particular dosage, strain, variety and quantity or percentage of MM or particular active ingredient
FTP	File Transfer Protocol
Functional Requirement	Describes system features or things the system must do, not how it must be done. Specifies the behavior of a solution in terms of capabilities, effects, interactions, or standards.
G/P	A person, including a natural person, corporation, partnership, association, trust or other entity, or any combination thereof, that holds a valid permit from the Department under the Act to grow and process medical marijuana.
Harvest batch	A specifically identified quantity of medical marijuana plant that is uniform in strain, cultivated utilizing the same growing practices, harvested at the same time, at the same location and cured under uniform conditions.
Harvest lot	A specifically identified quantity of medical marijuana plant taken from a harvest batch.
HIPAA	Health Insurance Portability and Accountability Act
ID	Identification Card that authorizes a patient and/or caregiver's access to and use of MM
MM	Medical Marijuana
MMO	Medical Marijuana Organization
Non-Functional Requirement	Describes properties the system must have (e.g. performance, availability, accessibility) and Quality of Service characteristics such as audit/purge requirements, performance requirements, disaster recovery requirements, and security requirements.
Process lot	Any amount of a medical marijuana product of the same type and processed using the same medical marijuana extract or ingredients, standard operating procedures and the same, or combination of, different harvest lots.
SaaS	Software as a Service
THC	Tetrahydrocannabinol

ID	Business Requirement Statement	Source	Section(s)
BR001	The system shall provide functionality to track and record in real time the inventory transaction information of cultivator, product manufacturer, retail/ dispensary, transport company and testing facility via a user interface or automated, real time certified API interface.	Act 16 of 2016	301(a)(4)(iv)
BR002	The system shall enable the dispensaries in network access the patient/caregiver information on disbursement of medical marijuana in real time.	Act 16 of 2016	301(a)(4)(v)
BR003	The system shall provide the ability to perform ad hoc queries and reporting function for DOH and other Commonwealth agencies; system shall allow review and approval of information requests and responses when required for certain user roles.	Act 16 of 2016	301(a)(11)
BR004	The functionality for DOH to determine and modify minimum number and types of medical marijuana produced and dispensed by grower/processor or dispensary.	Act 16 of 2016	301(a)(12)
BR005	The system shall authenticate user access requests through a streamlined online registration process, including associating uploaded documents, forms, and copies of identification; the employees and operators of a grower/process and dispensary after being approved by DOH shall be tracked by the STS system based on their employee ID.	Act 16 of 2016	602(a)(1)
BR006	The number of dispensaries, grower/processors, permit status, etc. need to be tracked in the system. System shall provide the ability to support multiple locations for a DOH approved MMO.	Act 16 of 2016	616(2)
BR007	Provides a central data management system capable of storing inventory, point of sale, and data for all growers/processors, laboratories, and dispensaries in Pennsylvania.	Act 16 of 2016	701(a)
BR008	Assign a unique identification number for every plant and inventory item recorded in the system. The system shall capture the weight of medical marijuana at each stage of the process: beginning Inventory, ending Inventory, acquisition, possession, growth, manufacture, sale, delivery, disposal, return/recall, transportation, and distribution or dispensing to patients/caregivers. The system shall integrate in real time with equipment capturing the weight of MM at each stages.	Act 16 of 2016	701(a)
BR009	The system shall generate a daily log/report and make it available to designated grower/processor and dispensary at time of system login. The system shall contain each day's beginning inventory, acquisitions, amounts purchased and sold, disbursements, disposals and ending inventory. For dispensary, the system shall include prices paid and amounts collected from patients/ caregivers.	Act 16 of 2016	701(a)(3)
BR010	Provide functionality for DOH to determine compliance with Pennsylvania DOH statutes and rules. This information, to be accessed through screens, queries and reports, shall include but not limited to growing, manufacture, laboratory testing, dispensing history, dispensary, disposal, medical marijuana product availability, and production statistics for any time period determined by DOH with a secure and system assigned unique identification number.	Act 16 of 2016	701(b)(2)
BR011	Allow DOH to query the system, compile, generate and store reports and edit as needed and post it on the department's publicly accessible Internet website.	Act 16 of 2016	701(d)
BR012	DOH system shall integrate seamlessly with, and operate fully and accurately on all compatible user hardware/software equipment of external seed to sale system.	Act 16 of 2016	703(8)
BR013	The system shall provide grower/processor the ability to select laboratory that are approved by DOH. The system shall enable DOH and the Department of Revenue to monitor the price of medical marijuana sold by dispensaries, including a per-dose price; shall implement a cap on the price and sale of medical marijuana based on the price regulations provided by DOH.	Act 16 of 2016	704
BR014	The system shall enable the dispensaries to scan the Identification card and validate Identification card for all patient/ caregivers and get access to the patient's registry record, including the certification and dispensing history.	Act 16 of 2016	801(a)
BR015	The functionality shall allow the product to be tracked back to the patient/ caregiver. The data input may include but is not limited to : name, address and identification number of the dispensary; name, and address of the patient/caregiver; date when dispensed; form and quantity dispensed; limitation or restriction on the form noted on the certification; amounts dispensed and prices collected from patients/ caregivers.	Act 16 of 2016	801(a)
BR016	The system shall provide the functionality to track the disposal of any electronically recorded certification information.	Act 16 of 2016	801(c)
BR017	The system shall enable the dispensaries to print and file the receipt information with the department.	Act 16 of 2016	801(c)

ID	Business Requirement Statement	Source	Section(s)
BR 018	The system shall allow the dispensary to verify information for the patient/caregiver on requirement set by the practitioner as to the form and quantity of MM from their certification. Shall notify the dispensary specifying the problem with the data if a data file submitted by a dispensary does not meet validations for pre-disbursement conditions.	Act 16 of 2016	801(e)
BR019	The system shall print, track and record the 'safety insert' version provided in each package.	Act 16 of 2016	801(h)
BR020	The system shall assign a unique serial number on the label that shall match the product with a producer batch and lot number in case of any warnings or recalls. To facilitate the tracking of product dispensed from the dispensary, the label of each product shall include packaging date, expiration date, individual doses, species and percentage of THC, warning on the product usage; name, address and identification number of the dispensary; name, and address of the patient/caregiver; date when dispensed; form and quantity dispensed; limitation or restriction on the form noted on the certification.	Act 16 of 2016	801(h)(i)
BR021	The system shall provide the ability to perform ad hoc queries and reporting function for local, state, or federal law enforcement agencies.	Act 16 of 2016	1103
BR022	The system shall maintain an audit history for activity that includes use and storage of any solvent, gas or other chemical used in growing or processing.	Regulations - G/P	1151.23 (a)(7)
BR023	Grower/processor shall send request for product testing to laboratory in the system; laboratory shall send a courier with a transport manifest to pick it up. The product for testing shall be assigned a unique ID for tracking through the testing phase. For product re-tests, grower/processor shall use designated transportation vendors to send to laboratory with an unique ID for tracking. The system shall provide functionality to record transfer of medical marijuana to a DOH approved laboratory. Input may include fields including but not limited to : date of transfer, transferred by, order number, source license number, testing facility name, testing facility license number, and list of transferred products including product ID, product name , lot and / Batch number and quantity. The system shall provide the ability to set thresholds of accepted values for laboratory testing and store detailed testing results. Test results for any lot or Batch must be accessible by DOH or any Licensee. The system shall allow DOH and Licensees to search, upload, and download test results.	Regulations - G/P	1151.23(a)(8)
BR024	The g/p shall tag, date and time all marijuana seeds entering the premises for start-up inventory.	Regulations - G/P	1151.25(a)
BR025	The system shall allow input, tracking, reporting, and storage of start-up inventory of marijuana or marijuana products received at G/P facilities. Data input may include, but is not limited to, the following fields: receipt date, receipt time, received by, source Licensee name, source Licensee number, order number, items shipped and/ or received; including product ID, Product name, Lot number, Batch number, weight, and quantity.	Regulations - G/P	1151.25(a)
BR026	The system shall allow input of product types including but not limited to plants, clones, or grafted plants. Inputs may include fields including but not limited to : product name, product type, product ID, and units of measure. Product inputs may be traced back to their origin. Allows input of inventory locations within an organization, including but not limited to: germination and clone room, and vegetative/growth room. Allows tracking of seeds, clones, or grafted plants by count/ variety.	Regulations - G/P	1151.25(d)
BR027	The system shall maintain an audit history for security & surveillance system and user activity including a date/time stamp and user ID. The activity shall include but not limited to maintain a log of actions taken to enter and exit from storage rooms and safes, changes, additions, deletions in alarm system, alarm system failure notification, power outage, security & fire drills, and any inappropriate access, change or request in the lock, or alarm system.	Regulations - G/P	1151.27(a)
BR028	The system shall track the daily application of fertilizer, pesticides, fungicides or herbicides, any other compounds and or/products applied to each individual plant; including type and amounts used to support healthy growth of plants. Tracks the addition of active ingredients or materials of approved pharmaceutical grade to alter the color, appearance, smell, taste, effect, and weight of medical marijuana.	Regulations - G/P	1151.28(b)
BR029	The system shall provide reporting functionality for DOH to determine the condition of the marijuana plant.	Regulations - G/P	1151.28(e)
BR030	Shall track the transfer of plant inventory between growth stages and locations. Data input may include, but is not limited to : transfer date, transfer to location, order number, list of plants transferred.	Regulations - G/P	1151.28(g)

ID	Business Requirement Statement	Source	Section(s)
BR031	The System shall capture all plant component weights desired by the DOH for both the harvest and cure processes. Data fields may include, but not limited to: curing stage, product name, product ID, Lot number, Unique Plant Identifier, quantity yielded, and units of measure.	Regulations - G/P	1151.28(h)(1)
BR032	To facilitate the tracking of products produced and dispensed by grower & processor, the inventory of each package shall be tracked by count/variety with product ID and a Lot number. Data may include field including, but not limited to: form, cannabinoid profile, product name, package ID, Unique Plant Identifier for each plant included in the lot, weight and other units of measures.	Regulations - G/P	1151.29(a)(1)
BR033	The system shall allow users to search for real-time inventory items by entering a set of search criteria parameters, including but limited to seeds, plants, plant- clones or grafts, and finished products. The functionality shall allow the tracking of medical marijuana plant through the growth phases. Inputs may include fields including but not limited to seeds, plants, clones, or grafted plants; including product ID, units of measure of product yield, number of units yielded. The product inputs shall be tracked back to their origin.	Regulations - G/P	1151.31(a)(1)
BR034	Allows input of real-time inventory adjustments, such as damaged, defective, expired, or contaminated. Data input may include but is not limited to: date of adjustment, adjustment type, plant or other product ID, LOT number, Batch number, weight/ quantity, name and address of disposal company and explanation. This should trigger flag for DOH.	Regulations - G/P	1151.31(a)(5)
BR035	The system shall provide pre-defined reporting functionality for DOH to determine compliance with PADOH statutes and rules. Able to collect and summarize in report format, data for various read/entry points in the processing of medical marijuana. Capable of reporting of tracking Batch information through the entire supply chain, cross reference and analyze data between growers and processors such as grow cycles and the number of plants.	Regulations - G/P	1151.31(b)(1)
BR036	Allows the addition of seed and plant inventory items in the system. Inputs may include, but are not limited to, the following fields: strain, plant ID, status in production cycle, date, and added by. In addition, an attribute will be provided to allow indication of weather the plant is seedling, clone, or mother plant.	Regulations - G/P	1151.31(d)
BR037	Each lot of medical marijuana shall be recorded in the system with an unique identifier.	Regulations - G/P	1151.35(c)
BR038	The System must notify the when the labels are approved or denied including a reason for denial and assign a unique identifier number. When a data file submitted by a grower/processor does not meet validations for accuracy and completeness, the system must notify the grower/processor, specifying the problem with the data, and ensuring that the data is corrected and resubmitted by the grower/processor.	Regulations - G/P	1151.35(d)
BR039	Tracks package of harvested Cannabis. Data may include, but is not limited to the following fields: strain, product name, product type, product ID, Batch number, Lot number, Unique Plant Identifier, net package weight and units of measure. To facilitate the tracking of product inputs back to their origin, the data file from the grower/ processor on each product label shall also include the following information: Name, address and permit number of g/p; Form of medical marijuana; THC and CBD content in milligrams; Date packaged; Name and signature of employee preparing the signature; Name and signature of employee shipping the package; Name and address of the Dispensary receiving the package; Date of expiration of MM.	Regulations - G/P	1151.35(d)(1)
BR040	The system shall provide functionality for grower and processor, Dispensary and laboratory to create transport manifest documents. Transport manifest shall be stored and tracked by the system. Input data may include, but is not limited to the following fields: name, address, permit number of the grower/processor sending the delivery; name and contact information for a representative of the grower/processor sending the delivery; delivery schedule including description of routes and delivery time and date; date of arrival, approximate time of arrival along with the transport vehicle's make, model, and license plate number with name, signature, and Driver's license number of each member of the delivery team accompanying the transport, name, address, and permit number of the dispensary receiving the delivery; name and contact information for a representative of the dispensary receiving the delivery, and quantity (by weight or unit) of each medical marijuana batch/ lot, along with the lot number of every batch.	Regulations - G/P	1151.36(a)

ID	Business Requirement Statement	Source	Section(s)
BR041	Transport manifests shall be used as shipping documents of transfers between locations; system shall use GPS for tracking and monitoring the shipping containers and vehicle movements; provide functionality for DOH to retain records of delivery and receipts of medical marijuana products.	Regulations - G/P	1151.38(b)
BR042	The system shall provide the functionality to track and record the number of drivers or other security required to ensure against storage or in-transit loses; system shall be able to generate reports on tracking of transport manifest; allow DOH to receive alerts in case of theft, diversion, or discrepancy during transport.	Regulations - G/P	1151.39(a)
BR043	The system shall allow inventory adjustments, such as disposal, wastage, theft, failure to grow or seizure by law enforcement. Shall provide reporting functionality for DOH to determine compliance with DOH statutes and rules.	Regulations - G/P	1151.41
BR044	The system shall allow DOH to receive alerts for product recall. Provide functionality to notify and report DOH on inventory items that has been recalled. The system shall be able to flag any medical marijuana product that failed the testing and flag the component failed. Capable of reporting of Batch information through the entire supply chain. Allows input of daily inventory adjustments for affected and disposal of medical marijuana. Inputs may include, but are not limited to, the following fields: product type, amount, form, batches and lot, name of the recall coordinator, transportation details, name and address of testing laboratories, date and result of testing. For each disposal, the system shall include name of the person overseeing disposal, the name of the disposal company, if applicable, the method of disposal, the date of disposal including amount and types, forms, batches and lots, if applicable.	Regulations - G/P	1151.43(a)(1)
BR045	The system shall provide functionality for the physician to submit their application to DOH for authorization to certify patients; allow the physicians to upload their documentation of credentials and experience online; allow the physicians to complete online training.	Act 16	401(a)(1)
BR046	The functionality for the physician to receive approval for issuing certification to patients.	Act 16	401(a)(2)
BR047	Functionality to annually review, approve and revoke physician's license and credentials.	Act 16	401(b)(2)
BR048	The functionality for physician to review and update patient's registry record and notify DOH if the patient no longer has the serious medical condition, if medical marijuana would no longer be therapeutic or palliative, or the patient has died.	Act 16	401(c)(1)
BR049	Allow the approved physician to register the patient/caregiver and issue certification via registry portal for medical marijuana; certification shall be issued if the patient has serious medical condition, if the practitioner determines the patient is likely to receive therapeutic or palliative benefit from the use of medical marijuana;	Act 16	403(a)(1)
BR050	The functionality to fill out the certification form online and submit an electronic copy to the registry; allow the patient/ caregiver to get a copy of the certification; the data input in the certification may include but is not limited to : patient's name, date of birth and address, specific serious medical condition of the patient, a statement by the practitioner that the patient has a serious medical condition and the patient is under the practitioner's continuing care for the serious medical condition, date of issuance, name, address, telephone number and signature of the practitioner, requirement or limitation concerning the appropriate form and supply of medical marijuana, any limitation on the duration of use, if applicable, including whether the patient is terminally ill, and a statement that a false statement made by a practitioner is punishable under the applicable provisions of 18 Pa.C.S. Ch. 49 (relating to falsification and intimidation).	Act 16	403(b)(1)
BR051	Enable practitioner to view previously issued certifications; system shall edit against supply and dosage threshold established by DOH.	Act 16	405
BR052	System shall provide functionality for DOH to verify the certification and application provided by the patient/ caregiver and issue or integrate identification card to patient/ designated caregiver to obtain medical marijuana. The ID card may include but not limited to: name of the caregiver or the patient, as appropriate, state whether the individual is designated as a patient or as a caregiver, date of issuance and expiration date of the ID card, identification number for the patient or caregiver, as appropriate, and requirement or limitation set by the practitioner as to the form of medical marijuana. Functionality to notify patient/ caregiver for an invalid ID card.	Act 16	501(a)

ID	Business Requirement Statement	Source	Section(s)
BR053	System shall allow the dispensaries to scan MM ID cards to capture and process barcode data; ID card shall be activated at the dispensary; enable the patient/ caregiver to acknowledge notices and receive medical marijuana along with receipt and insert.	Act 16	501(a)
BR054	System shall generate email with unique ID/ PIN; allow caregiver to complete account setup and submit separate application for issuance and renewal.	Act 16	501(c)
BR055	System shall allow the patient/ caregiver to complete application for issuance or renewal and upload supporting documents; provide functionality to sign, date and submit the application with processing fee. Functionality to complete account setup with electronic submission. The data input in the application may include but is not limited to : name, address and date of birth of the patient, name, address and date of birth of a caregiver, federal and Commonwealth criminal history record information of the caregiver, name, address and telephone number of the practitioner, and conditions for issuance. If the patient designates a caregiver, the application shall include an identification card for the caregiver or another patient, the expiration date of the identification card.	Act 16	501(c)(1)
BR056	Allow the patient/ caregiver to download and /or complete and submit application and renewal forms.	Act 16	501(d)
BR057	System shall send renewal notices to patient/ caregiver based on parameters set by DOH.	Act 16	501(e)
BR058	System shall provide functionality to add, edit or modify personal information in the application form and allow to report an event of lost, stolen, destroyed or illegible ID card within a stipulated time. Shall track the application and issuance of replacement ID cards.	Act 16	501(h)
BR059	System shall provide functionality to review, update, and establish parameters in defined certification fields, such as expiration date.	Act 16	504(1)
BR060	The system shall allow a caregiver to submit application if the patient is under 18 years of age; shall verify the relationship of the caregiver to the patient; allow caregiver to receive medical marijuana on patient's behalf.	Act 16	506(1)
BR061	5% tax is imposed on gross receipts from sales by growers/processors to dispensaries, approved by the DOH; Administered and consistent with Article XI of Tax Reform Code of 1971; Quarterly returns and payments are due by 1/20, 4/20/, 7/20, and 10/20 each year; all fees, interest, and taxes payable are deposited in the Medical Marijuana Program Fund.	Act 16	901(a)

<p>Explanatory Notes:</p> <p>1) The temporary Bridge data management solution must be capable of storing and providing interim regulatory tracking of inventory, point of sale, and data for all approved grower/processors, testing laboratories, dispensaries and research institutions in Pennsylvania. Requirements applicable to the temporary Bridge solution are identified in a separate column. The intention is to focus this effort on meeting immediate core requirements.</p> <p>2) The 'Timing' column is intended to provide information regarding phasing. 'Day 1' requirements are needed at time of solution production implementation; '+' indicates the number of days after the initial solution production implementation that the functionality needs to be in place.</p> <p>3) Bidders must complete the table highlighted in blue. Select the correct answer from the drop down box in each column. As necessary, include additional information in the 'Explanation' column. Requirements that involve customization and/or subcontracting must include an explanation, including estimated effect on both solution price and implementation schedule. Failure to complete this table as requested may result in a lower technical score.</p>														
Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation	
<p>Table Example</p> <p>The registry solution must be able to communicate information of interest to registered users through broadcast postings on the registry's home page.</p>														
<p>The Registry solution must provide functionality to register, authorize, credential and administer patients, caregivers, practitioners and medical providers according to requirements</p>														
Registry	Functional	Audit	SOW-001	Data & Reporting/ Tracking	The registry solution must track and retain an auditable database history, including modifications to any information in the database(s).		High	Registry Day 1	Applies to all data requirements					
Registry	Functional	Audit	SOW-002	Data & Reporting/ Tracking	For the purpose of monitoring registry usage, the registry solution must include an audit history that shows all user activity, such as logons, failed logons, changes, additions, deletions, searches, and data requests by any system or users including a date/time stamp and user ID.		High	Registry Day 1	Applies to all data requirements					
Registry	Functional	Audit	SOW-003	Data & Reporting/ Credentials	The registry solution must include full administrative capabilities to define, control, periodically review and update system access and privileges for internal and external (outside of pa.gov domain) users, including creating user security groups, granting general or granular access to users and groups, revoking or modifying access, and granting read-only or change capability to users and groups.		High	Registry Day 1	Applies to all data requirements					
Registry	Functional	External	SOW-004	Integration	The registry solution must provide all supporting equipment, including barcode scanners, scanning devices, identification card production and scanning equipment, and cash registers. As noted in SOW-017, DOH reserves the right to produce identification cards using an external source.		High	Registry Day 1	BR012					
Registry	Functional	External	SOW-005	Data & Reporting	The registry solution must include full administrative capabilities to define, produce and electronically store both ad hoc and preconfigured queries and reports in a specified format. Functionality must permit queries and reports against all database fields, and provide authorized users the ability to build queries and reports and select file type (CSV, .PDF) using dropdown lists or other automated tools; data field access needs to be limited by user or group roles.		High	Registry Day 1	BR003 BR004					
Registry	Functional	External	SOW-006	Integration	The registry solution must be capable of secure SSL data exchanges (both import and export) that comply with Commonwealth of PA Information Technology Policies and use file formats and transmission protocols conforming to national standards, including SFTP, XML, ASCII, and CSV; APIs/web services must be based on open standards.		High	Registry Day 1	Applies to Program directive					
Registry	Functional	External	SOW-007	Data & Reporting	For reporting and queries, the registry solution must provide a data repository copy of the production database(s) that is refreshed according to DOH requirements.		High	Registry Day 1	Applies to all data requirements					
Registry	Functional	External	SOW-008	Data & Reporting	The registry's repositories must include a detailed data dictionary with coding definitions that is made available to authorized staff.		High	Registry Day 1	Applies to all data requirements					
Registry	Functional	Internal	SOW-009	Credentials	The registry solution must uniquely identify each patient, caregiver, practitioner, medical provider, and user while accommodating multiple roles for a single entity.		High	Registry Day 1	BR046 BR054					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Registry	Functional	Internal	SOW-010	Registration	The registry solution must track patient, caregiver, practitioner, and medical provider information during the registration and eligibility processes, including saving partial records for later completion.		High	Registry Day 1	BR047 BR055 BR056					
Registry	Functional	Internal	SOW-011	Registration	The registry solution must allow patients, caregivers, practitioners and medical providers to generate and change user credentials; submit, update, and approve application forms based on DOH requirements, which may require processing of data feeds from external parties; acknowledge DOH notices using a checkbox; upload and store supporting documents; follow review/approval workflows defined by DOH; allow users to input data using online screens or fillable pdf forms.		High	Registry Day 1	BR045 BR049 BR054 BR056					
Registry	Functional	Internal	SOW-012	Registration	The registry solution must link associated patient, caregiver, practitioner, medical provider and dispensary accounts to support processing workflows, as defined by DOH requirements.		High	Registry Day 1	BR002 BR053					
Registry	Functional	Internal	SOW-013	Registration	The registry solution must support the definition of multiple categories of patients, caregivers, practitioners and medical providers, each with separate combinations of processing workflows.		High	Registry Day 1	BR060					
Registry	Functional	Internal	SOW-014	Registration	The registry solution must link patient and caregiver accounts to identification cards.		High	Registry Day 1	BR052 BR053					
Registry	Functional	Internal	SOW-015	Integration	The registry solution must integrate and share data with seed-to-sale as necessary to ensure ongoing compliance with DOH tracking requirements, including reconciliation of data updates made in either system.		High	STS +30 Days	BR006 BR010					
Registry	Functional	Internal	SOW-016	Integration	Medical marijuana product information and dispensing information tracked in the seed-to-sale solution must be linked to each patient's registry record to track recalls.		High	Registry +30 days	BR016 BR020 BR044					
Registry	Functional	Internal	SOW-017	Registration	The solution must be able to produce patient and caregiver identification cards. DOH reserves the right, at its sole discretion, to have the identification cards printed through another source. In the event that DOH uses another source to print the cards, the solution must provide the patient/caregiver unique identification number and account/application information to the external source via data file for inclusion on the identification card.		High	Registry Day 1	BR052					
Registry	Functional	Output	SOW-018	Registration	The registry solution must generate workflow-based emails, with links to associated portal pages, for patients, caregivers, practitioners, medical providers, and approved dispensaries to support DOH administrative tasks, including account setup.		High	Registry Day 1	BR045 BR046 BR053 BR054					
Registry	Functional	Output	SOW-019	Data & Reporting	The registry solution must include tools that will electronically analyze activity data to assist in the identification of at-risk and unprofessional		High	Registry +60 days	Applies to all data requirements					
Registry	Functional	Output	SOW-020	Data & Reporting	The registry solution must include full administrative capabilities to configure automated, unsolicited system and email/text alerts to notify DOH staff and other users of incidents, events and required actions.		High	Registry +60 days	Applies to all data requirements					
Registry	Functional	Output	SOW-021	Data & Reporting	The registry solution must be able to set and change threshold levels for defined fields and generate unsolicited alerts to DOH and registered entities who exceed specific threshold levels.		High	Registry +60 days	Applies to all data requirements					
Registry	Functional	Security & Privacy	SOW-022	Credentials	The registry solution must include a mechanism for DOH and/or designee(s) to grant or revoke user security privileges.		High	Registry Day 1	BR042 BR043 BR044 BR047 BR052					
Registry	Functional	Security & Privacy	SOW-023	Credentials	The registry solution must allow a registered user to establish or deactivate a delegate subaccount(s) for their designee(s), and further, include a mechanism for the user to monitor system activity of their designee(s) online and through a reporting mechanism.		High	Registry Day 1	BR035 BR058 BR059					
Registry	Functional	Security & Privacy	SOW-024	Registration	The registry solution must authenticate user access requests through a streamlined online registration process that links individuals to a system-generated, unique identification/personal identification number, including associating uploaded documents, forms, and copies of identification.		High	Registry Day 1	BR054 BR055					
Registry	Functional	Security & Privacy	SOW-025	Registration/ Credentials	The registry solution must notify users via email when their registration is denied including a reason for denial.		High	Registry Day 1	BR038 BR047 BR060					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Registry	Functional	Security & Privacy	SOW-026	Registration/ Credentials	The registry solution must notify users in advance via email when their passwords are about to expire; timing of the password expiration and the expiration notice to be based on parameters set by DOH.		High	Registry Day 1	Applies to Security & Privacy requirements					
Registry	Functional	Security & Privacy	SOW-027	Data & Reporting	The registry solution must include full administrative, privilege-based capabilities to extract/import/export data to/from dispensaries and other organizations in an ad hoc or preconfigured manner; the data extraction process must permit DOH to define frequency and must make a detailed data dictionary with coding definitions available to administrative staff.		High	Registry Day 1	BR007 BR011 BR055					
Registry	Functional	Security & Privacy	SOW-028	Data & Reporting	For the registry solution, the contractor must provide data access, data management, cleansing capabilities and normalization integrated with data mining for ease of data analysis.		High	Registry Day 1	Applies to all data requirements					
Registry	Functional	Security & Privacy	SOW-029	Data & Reporting	Based on user security access and roles, the registry solution must allow authorized users to search/query the system to request and receive information without intervention.		High	Registry Day 1	Applies to all data requirements					
Registry	Functional	Security & Privacy	SOW-030	Credentials	The registry solution must include a secure and automated method for obtaining system login credentials for users at approved entities based on the system-assigned, unique identification/personal identification number.		High	Registry Day 1	BR010					
Registry	Functional	Security & Privacy	SOW-031	Data & Reporting	The registry solution must allow review and approval of information requests and responses when required for certain user roles.		High	Registry Day 1	BR003					
Registry	Functional	Security & Privacy	SOW-032	Data & Reporting	The registry solution must include full administrative capabilities to extract, import, and export data to internal and external parties in an ad hoc or preconfigured manner, based on access privileges. The data extraction process must permit DOH to define frequency and file type (CSV, .PDF) and provide a detailed data dictionary with coding definitions to authorized staff.		High	Registry Day 1	Applies to all data requirements					
Registry	Functional	User Interface	SOW-033	Portal	The registry solution must provide a single portal to serve DOH, patients, caregivers, practitioners, medical providers, dispensaries and all approved entities.		High	Registry Day 1	BR045 BR048 BR049 BR051 BR055 BR056 BR058 BR060					
Registry	Functional	User Interface	SOW-034	Portal	The registry portal must include secure, web-based interface for data entry, display, document upload, administration, reporting for DOH and authorized users, and interfacing with other entities as needed.		High	Registry Day 1	BR050 BR055					
Registry	Functional	User Interface	SOW-035	Portal	The registry solution must be able to communicate information of interest to registered users through broadcast postings on the registry's home page.		High	Registry Day 1	BR011 BR024 BR073					
Registry	Functional	User Interface	SOW-036	Registration	The seed-to-sale solution must notify users via email when their attempted registration is still incomplete after a configurable amount of time has		High	Registry Day 1	BR055					
Registry	Functional	Internal	SOW-037	Integration	The registry solution must allow authorized dispensary staff to access the registry to view patient, caregiver, practitioner, and medical provider records and to input changes to patient and/or caregiver certification and dispensing information.		High	Registry +30 days	BR002 BR014 BR018					
Registry	Functional	Output	SOW-038	Data & Reporting	The registry solution must be able to generate patient, caregiver, practitioner, medical provider, and dispensary history reports compatible with printing and electronic distribution.		High	Registry Day 1	BR050 BR055					
Registry	Non-Functional	Performance	SOW-039	Portal	The registry solution shall provide system messages at login to notify users of emergency maintenance or other system events.		High	Registry Day 1	Applies to Program directive					
Registry	Non-Functional	Performance	SOW-040	Portal	The registry solution shall display a continual notification of system scheduled maintenance, starting seven (7) days prior to the scheduled maintenance period and ending after the scheduled maintenance is		High	Registry Day 1	Applies to Performance requirements					
Registry	Non-Functional	Performance	SOW-041	Portal	A notification of scheduled maintenance to the registry system shall be delivered to the Commonwealth fourteen (14) days prior to the scheduled maintenance.		High	Registry Day 1	Applies to Performance requirements					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
The Seed-to-Sale solution must provide a central data management solution capable of providing and storing regulatory tracking of inventory, point of sale, and data for all approved														
Seed-to-Sale	Functional	Audit	SOW-042	Data & Reporting/ Tracking	The seed-to-sale solution must track and retain an auditable database history, including modifications to any information in the database(s).	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	Audit	SOW-043	Data & Reporting/ Tracking	For the purpose of monitoring seed-to-sale usage, the seed-to-sale solution must include an audit history that shows all user activity, including failed logons and original data when changes are made, with date/time stamp and	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	Audit	SOW-044	Data & Reporting/ Credentials	The seed-to-sale solution must include full administrative capabilities to define, control, periodically review and update system access and privileges for internal and external (outside of pa.gov domain) users, including creating user security groups, granting general or granular access to users and groups, revoking or modifying access, and granting read-only or change capability to users and groups.		High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	Audit	SOW-045	Tax	The seed-to-sale solution must include the ability to respond to GAAP Audit inquiries regarding the total number of tax postings, payments received, and dollar value of payments received with details down to the individual transaction level.		High	STS +90 Days	DOR Directive					
Seed-to-Sale	Functional	External	SOW-046	Integration	The seed-to-sale solution must provide all supporting equipment, including mobile devices, scales, 2D barcode scanners, scanning devices, identification card scanning equipment, and cash registers.	Yes	High	STS Day 1	BR012					
Seed-to-Sale	Functional	External	SOW-047	Data & Reporting	The seed-to-sale solution must send and receive data transmissions via secure FTP, secure email, Virtual Private Network (VPN) , SSL website telephone modem, physical media, and other agreed upon media.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	External	SOW-048	Data & Reporting	The seed-to-sale solution must allow registered organizations under common ownership to submit their data in a single joint transmission.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	External	SOW-049	Data & Reporting	The seed-to-sale solution must process and upload into the database accurate, complete and real time data from all reporting entities and document receipt of each data transmission from all reporting entities. For the temporary bridge solution, real time data is not required.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	External	SOW-050	Data & Reporting	When a data file submitted to the seed-to-sale system by a reporting entity does not meet validations for accuracy and completeness, the solution must include notifying the entity, specifying the problem with the data, and ensuring that the data is corrected and resubmitted by the entity; rejected files must be securely stored and/or purged.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	External	SOW-051	Data & Reporting	The seed-to-sale solution must receive electronic tracking information transmitted directly from approved entities seven days per week 24 hours per day.	Yes	High	STS Day 1	Applies to all technical requirements and					
Seed-to-Sale	Functional	External	SOW-052	Data & Reporting	The seed-to-sale solution must include full administrative capabilities to define, produce and electronically store both ad hoc and preconfigured queries and reports in a specified format. Functionality must permit queries and reports against all database fields, and provide authorized users the ability to build queries and reports and select file type (CSV, .PDF) using dropdown lists or other automated tools; data field access needs to be limited by user or group roles.	Yes	High	STS Day 1	BR003 BR004					
Seed-to-Sale	Functional	External	SOW-053	Integration	The seed-to-sale solution must be capable of secure SSL data exchanges (both import and export) that comply with Commonwealth of PA Information Technology Policies and use file formats and transmission protocols conforming to national standards, including SFTP, XML, ASCII, and CSV; APIs/web services must be based on open standards.		High	STS Day 1	Applies to Program directive					
Seed-to-Sale	Functional	External	SOW-054	Data & Reporting	For reporting and queries, the seed-to-sale solution must provide a data repository copy of the production database(s) that is refreshed according to DOH requirements	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	External	SOW-055	Data & Reporting	The seed-to-sale's repositories must include a detailed data dictionary with coding definitions that is made available to authorized staff.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	Internal	SOW-056	Credentials	The seed-to-sale solution must uniquely identify each patient, caregiver, practitioner, medical provider, and user while accommodating multiple roles for a single entity.		High	STS Day 1	BR046 BR054					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Seed-to-Sale	Functional	Internal	SOW-057	Integration	The seed-to-sale solution must integrate and share data with the registry as necessary to ensure ongoing compliance with DOH tracking requirements, including reconciliation of data updates made in either system.	Yes	High	STS +30 Days	BR006 BR010					
Seed-to-Sale	Functional	Internal	SOW-058	Tracking	The seed-to-sale solution must allow DOH to input, store and change information about approved entities, including an indicator for status (approved, suspended, others); upon initial approval, the system will register the approved entity and generate an approval letter to the approved entity.	Yes	High	STS Day 1	BR006 BR015					
Seed-to-Sale	Functional	Internal	SOW-059	Tracking	The seed-to-sale solution must support multiple locations for a given registered organization.	Yes	High	STS Day 1	BR006					
Seed-to-Sale	Functional	Internal	SOW-060	Tracking	The seed-to-sale solution must track the movement of medical marijuana through all activities related to the acquisition, planting, growing, possession, cultivation (including the application of fertilizers, pesticides and any other compounds and/or products applied to each individual plant), harvest, processing, production, storage, testing, transport, dispensing, sale, destruction/exchange and recall of medical marijuana.	Yes	High	STS Day 1	BR008 BR010 BR025 BR028 BR030 BR031 BR044					
Seed-to-Sale	Functional	Internal	SOW-061	Tracking	The seed-to-sale solution must allow approved grower/processors, testing labs, dispensaries and research institutions to input and update inventory transaction data directly via a user interface or automated, real time certified API interface. For the temporary bridge solution, an automated data load is acceptable in place of the real time API interface.	Yes	High	STS Day 1	BR001					
Seed-to-Sale	Functional	Internal	SOW-062	Tracking	The seed-to-sale solution must uniquely identify every seed, clone, graft, plant and inventory item recorded in the system(s), including RFID tracking, barcode.	Yes	High	STS Day 1	BR008 BR024 BR033 BR036					
Seed-to-Sale	Functional	Internal	SOW-063	Tracking	The seed-to-sale solution must: receive inventory, view/search inventory, add/edit location, add/edit product type, create work order, create batch, create lot, transfer to a location inside the organization, transfer to an external organization, adjust inventory, send/receive/report for quality assurance testing activities, creating/updating transport manifest, dispensary sales and inventory transaction data.	Yes	High	STS Day 1	BR022 BR025 BR026 BR029 BR030					
Seed-to-Sale	Functional	Internal	SOW-064	Tracking	The seed-to-sale solution must track in U.S. customary and metric units; allow for input using either measurement, and provide automatic conversion between both measurements.	Yes	High	STS Day 1	BR026 BR031					
Seed-to-Sale	Functional	Internal	SOW-065	Tracking	The seed-to-sale solution must track medical marijuana by: tag or label system-generated unique ID, form, strain, description (seedling, clone, mother plant), number/quantity/weight/volume, lot or batch, status in processing cycle, manufacture date, expiration date, added by (employee #), physical location, time/date stamp, number of immature plants, number of medical marijuana products ready for sale, number of damaged, defective, expired or contaminated plants/grfts/seeds.	Yes	High	STS Day 1	BR024 BR034 BR037 BR038					
Seed-to-Sale	Functional	Internal	SOW-066	Tracking	The seed-to-sale solution must allow approved growers/processors to produce a label for medical marijuana which lists: form, quantity and weight; single dose THC and CBD content in milligrams; an identifier that is unique to a particular batch, including a number assigned to each lot in the batch; packaging date; employee # of preparer, packager and shipper; name and address of receiving dispensary; expiration date; and instructions and/or notices to be determined by DOH.	Yes	High	STS Day 1	BR032 BR039					
Seed-to-Sale	Functional	Internal	SOW-067	Tax	The seed-to-sale solution must electronically produce ad hoc reports for dynamically specified time frames reflecting sales transactions between approved growers/processors and dispensaries.		High	STS +90 Days	BR013					
Seed-to-Sale	Functional	Internal	SOW-068	Tax	The seed-to-sale solution must electronically produce reports to display the calculation of the amount of excise tax due based on the sales amounts for a specified period; excise tax values to be set by administratively configurable parameters.		High	STS +90 Days	BR061					
Seed-to-Sale	Functional	Internal	SOW-069	Tax	The seed-to-sale solution must allow approved grower/processors to electronically remit excise tax payments.		High	STS +90 Days	DOR Directive					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Seed-to-Sale	Functional	Internal	SOW-070	Tax	The seed-to-sale solution must permit the manual posting of tax payment(s) received outside of the system.		High	STS +90 Days	DOR Directive					
Seed-to-Sale	Functional	Internal	SOW-071	Tax	The seed-to-sale solution must provide the ability to clear the tax payment against the gross receipts tax liability for the specified time period.		High	STS +90 Days	DOR Directive					
Seed-to-Sale	Functional	Internal	SOW-072	Tax	The seed-to-sale solution must deposit gross receipts tax payments directly into an established Medical Marijuana fund.		High	STS +90 Days	DOR Directive					
Seed-to-Sale	Functional	Internal	SOW-073	Transport	The grower/processor must be able to input, store and change descriptive and status information with effective date about approved transportation vendors to the seed-to-sale system; vendors must be displayed on a drop down list specific to each grower/processor.	Yes	High	STS Day 1	BR041 BR042					
Seed-to-Sale	Functional	Internal	SOW-074	Transport	The seed-to-sale solution must allow approved entities to generate a printed and electronic transport manifest that accompanies every transport vehicle and contains: name, address, permit number, and designated representative of the grower processor; name, address, permit number and designated representative of the organization receiving the delivery; quantity by weight or unit and identification number of each batch or lot contained in the transport; date and time of departure; date and estimated time of arrival; transport vehicle information; and identifying information for each delivery team member.	Yes	High	STS Day 1	BR040 BR041					
Seed-to-Sale	Functional	Internal	SOW-075	Testing	Upon offline approval of a testing laboratory, the seed-to-sale solution must allow DOH to input, store and change descriptive and status information about approved testing labs and assign labs to specific grower/processors; approved labs need to be displayed on a drop down list specific to each grower/processor.	Yes	High	STS Day 1	BR013					
Seed-to-Sale	Functional	Internal	SOW-076	Testing	The seed-to-sale solution must support two (2) or more separate workflows for testing laboratories (test and re-test).	Yes	High	STS Day 1	BR023					
Seed-to-Sale	Functional	Internal	SOW-077	Testing	The seed-to-sale solution must record and track the transfer, receipt and all processing steps of product sent to an approved testing facility for quality assurance testing.	Yes	High	STS Day 1	BR040 BR041					
Seed-to-Sale	Functional	Internal	SOW-078	Data & Reporting	The seed-to-sale solution must standardize data to improve quality and consistency.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	Output	SOW-079	Data & Reporting	The seed-to-sale solution must include tools that will electronically analyze activity data to assist in the identification of at-risk and unprofessional activities.		High	STS +60 Days	Applies to all data requirements					
Seed-to-Sale	Functional	Output	SOW-080	Data & Reporting	The seed-to-sale solution must include full administrative capabilities to configure automated, unsolicited system and email/text alerts to notify DOH staff and other users of incidents, events and required actions.		High	STS +60 Days	Applies to all data requirements					
Seed-to-Sale	Functional	Output	SOW-081	Data & Reporting	The seed-to-sale solution must be able to set and change threshold levels for defined fields and generate unsolicited alerts to DOH and registered entities who exceed specific threshold levels.		High	STS +60 Days	Applies to all data requirements					
Seed-to-Sale	Functional	Output	SOW-082	Transport	The seed-to-sale solution must permit each recipient of transported medical marijuana to provide the grower/processor with a printed and electronic receipt for the medical marijuana received.	Yes	High	STS Day 1	BR041					
Seed-to-Sale	Functional	Security & Privacy	SOW-083	Credentials	The seed-to-sale solution must include a mechanism for DOH and/or designee(s) to grant or revoke user security privileges.	Yes	High	STS Day 1	BR042 BR043 BR044 BR047 BR052					
Seed-to-Sale	Functional	Security & Privacy	SOW-084	Credentials	The seed-to-sale solution must allow a registered user to establish or deactivate a delegate subaccount(s) for their designee(s), and further, include a mechanism for the user to monitor the system activity of their designee(s) online and through a reporting mechanism.		High	STS Day 1	BR035 BR058 BR059					
Seed-to-Sale	Functional	Security & Privacy	SOW-085	Registration/ Credentials	The seed-to-sale solution must notify users via email when their registration is denied including a reason for denial.		High	STS Day 1	BR038 BR047 BR060					
Seed-to-Sale	Functional	Security & Privacy	SOW-086	Registration/ Credentials	The seed-to-sale solution must notify users in advance via email when their passwords are about to expire; timing of the password expiration and the expiration notice to be based on parameters set by DOH.		High	STS Day 1	Applies to Security & Privacy requirements					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Seed-to-Sale	Functional	Security & Privacy	SOW-087	Data & Reporting	As part of the seed-to-sale solution, the contractor must provide data access, data management, cleansing capabilities and normalization integrated with data mining for ease of data analysis.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	Security & Privacy	SOW-088	Data & Reporting	Based on user security access and roles, the seed-to-sale solution must allow authorized users to search/query the system to request and receive information without intervention.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	Security & Privacy	SOW-089	Credentials	The seed-to-sale solution must allow DOH and/or designee(s) to assign roles for internal and external users based upon each user's functional use of the system(s).	Yes	High	STS Day 1	BR009					
Seed-to-Sale	Functional	Security & Privacy	SOW-090	Credentials	The seed-to-sale solution must include a secure and automated method for obtaining system login credentials for users at approved entities based on the system-assigned, unique identification/personal identification number.	Yes	High	STS Day 1	BR010					
Seed-to-Sale	Functional	Security & Privacy	SOW-091	Credentials	The seed-to-sale solution must allow users to generate and change their own password.		High	STS Day 1	BR007					
Seed-to-Sale	Functional	Security & Privacy	SOW-092	Credentials	The seed-to-sale solution must authenticate user access requests through a streamlined online registration process, including associating uploaded documents, forms, and copies of identification.	Yes	High	STS Day 1	BR005 BR026					
Seed-to-Sale	Functional	Security & Privacy	SOW-093	Tracking	The seed-to-sale solution must allow organizations to input, store and change employee identification information, including status (approved, suspended, others).	Yes	High	STS Day 1	BR005					
Seed-to-Sale	Functional	Security & Privacy	SOW-094	Data & Reporting	The seed-to-sale solution must allow review and approval of information requests and responses when required for certain user roles.	Yes	High	STS Day 1	BR003					
Seed-to-Sale	Functional	Security & Privacy	SOW-095	Data & Reporting	The seed-to-sale solution must include full administrative capabilities to extract, import, and export data to internal and external parties in an ad hoc or preconfigured manner, based on access privileges. The data extraction process must permit DOH to define frequency and file type (CSV, .PDF) and provide a detailed data dictionary with coding definitions to authorized staff.	Yes	High	STS Day 1	Applies to all data requirements					
Seed-to-Sale	Functional	User Interface	SOW-096	Portal	The seed-to-sale solution must provide a single portal to serve DOH, patients, caregivers, practitioners, medical providers, dispensaries and all approved entities. Limitations may apply to the temporary bridge solution.	Yes	High	STS Day 1	BR045 BR048 BR049 BR051 BR055 BR056 BR058 BR060					
Seed-to-Sale	Functional	User Interface	SOW-097	Portal	The seed-to-sale solution must be able to communicate information of interest to registered users through broadcast postings on the seed-to-sale's home page.		High	STS Day 1	BR011 BR024 BR073					
Seed-to-Sale	Functional	User Interface	SOW-098	Portal	The seed-to-sale solution must include a secure web-based user interface for data entry, display, and reporting by approved entities.	Yes	High	STS Day 1	Applies to all UIs					
Seed-to-Sale	Functional	User Interface	SOW-099	Portal	The seed-to-sale solution must include a secure user interface for Commonwealth staff for user administration, system administration, display of inventory and tax/revenue information, reporting and data analysis. For the temporary bridge solution, users could be limited to DOH staff and tax/revenue information may not be required.	Yes	High	STS Day 1	Applies to all UIs					
Seed-to-Sale	Functional	User Interface	SOW-100	Credentials	The seed-to-sale solution must notify users via email when their attempted registration is still incomplete after a configurable amount of time has		High	STS Day 1	BR005					
Seed-to-Sale	Non-Functional	Performance	SOW-101	Portal	The seed-to-sale solution shall provide system messages at login to notify users of emergency maintenance or other system events.	Yes	High	STS Day 1	Applies to Program directive					
Seed-to-Sale	Non-Functional	Performance	SOW-102	Portal	The seed-to-sale solution shall display a continual notification of system scheduled maintenance, starting seven (7) days prior to the scheduled maintenance period and ending after the scheduled maintenance is completed.	Yes	High	STS Day 1	Applies to Performance requirements					
Seed-to-Sale	Non-Functional	Performance	SOW-103	Portal	A notification of scheduled maintenance to the seed-to-sale system shall be delivered to the Commonwealth fourteen (14) days prior to the scheduled maintenance.	Yes	High	STS Day 1	Applies to Performance requirements					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
All solutions must provide global functionality.														
Global	Functional	Purge	SOW-104		The solution must provide the ability to override purge process for specific record types for a given time period. Purge override data will be captured for audit purposes.	Yes	High	All Solutions Day 1	Applies to all data requirements					
Global	Functional	Purge	SOW-105		The solution must be able to purge information based on DOH directive.	Yes	High	All Solutions Day 1	Applies to all data requirements					
Global	Non-Functional	Environment	SOW-107		The solution must be flexible, evolving platforms to meet future needs.	Yes	High	All Solutions Day 1	Applies to all technical requirements and					
Global	Non-Functional	Environment	SOW-108		The solution must support standard database disaster recovery and back-up procedures which comply with the Commonwealth of Pennsylvania Database Management System guidelines. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx Locate the Information Domain section (ITP INF001). See supporting document OPD INF001B	Yes	High	All Solutions Day 1	Applies to all data requirements					
Global	Non-Functional	Environment	SOW-109		All data must reside within and not traverse outside of the boundaries of the continental United States.	Yes	High	All Solutions Day 1	Applies to all data requirements					
Global	Non-Functional	Environment	SOW-110		The contractor must provide to DOH full physical data models and data dictionaries of the delivered systems, including data warehouses or repositories.	Yes	High	All Solutions Day 1	Applies to all data requirements					
Global	Non-Functional	Environment	SOW-111		The solution must adhere to the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for information processing. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Information Domain section.	Yes	High	All Solutions Day 1	Applies to Performance requirements					
Global	Non-Functional	Environment	SOW-112		The solution must adhere to the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for information data storage. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Security Domain section.	Yes	High	All Solutions Day 1	Applies to Performance requirements					
Global	Non-Functional	Environment	SOW-113		The solution must adhere to the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for information secure communications. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Security Domain section.	Yes	High	All Solutions Day 1	Applies to all technical requirements and solutions					
Global	Non-Functional	Environment	SOW-114		The solution must enforce Secure Socket Layer (SSL) encryption for all system transactions and interactions.	Yes	High	All Solutions Day 1	Applies to all data requirements					
Global	Non-Functional	Environment	SOW-115		The solution must encrypt all data in the database as well as encrypt all back-ups and any interim storage.	Yes	High	All Solutions Day 1	Applies to all data requirements					
Global	Non-Functional	Environment	SOW-116		The solution must protect the privacy and security of data in a way that complies with HIPAA policies and standards, including encrypting the transmission of data to the database. See links for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Privacy and Security Domain sections Also see - http://www.hhs.gov/ocr/privacy/index.html	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements					
Global	Non-Functional	Environment	SOW-117		The solution must protect all data in accordance with the Commonwealth of Pennsylvania Electronic Information Privacy Policy. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Privacy Domain section	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements					
Global	Non-Functional	Environment	SOW-118		The solution must adhere to the accessibility standards as set forth in the Commonwealth of Pennsylvania IT Accessibility Policy in accordance with the Americans with Disability Act 508. See links for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Access Domain section See also http://www.ada.gov/	Yes	High	All Solutions Day 1	Applies to all UIs					
Global	Non-Functional	Performance	SOW-119		The application infrastructure(s) must be highly scalable to support several hundred thousand users accessing the systems at the same time, achieving high end user satisfaction from a performance perspective.	Yes	High	All Solutions Day 1	Applies to all UIs					
Global	Non-Functional	Performance	SOW-120		The solution must provide for 24/7 remote web access, with the exception of downtime for pre-planned maintenance during non-peak usage hours.	Yes	High	All Solutions Day 1	Applies to Performance requirements					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Global	Non-Functional	Performance	SOW-121		The contractor must provide comprehensive, intuitive Web Portals that are branded according to DOH requirements. The web site design and branding must comply with the Governor's Office Management Directive 205.40 - Commonwealth Branding, and to DOH standards for electronic and printed materials. The web design is subject to written approval by the DOH.	Yes	High	All Solutions Day 1	BR008 BR009 BR010 BR011 BR012 BR014 BR015 BR016 BR017 BR018 BR025 BR026 BR040 BR041 BR042 BR044 BR045 BR049 BR050					
Global	Non-Functional	Performance	SOW-122		The software Web Portal interface development must follow the approach of Responsive Web Design, to provide the optimal viewing and interaction experience across devices. The Web Portals must support web browsers and browser versions currently in use by over 95% of web users (e.g., Edge, Internet Explorer, Firefox, Safari, Chrome, and Opera). The platform must adhere to World Wide Web Consortium (W3C) recommendations and other standards of interoperability.	Yes	High	All Solutions Day 1	Applies to all UIs					
Global	Non-Functional	Performance	SOW-123		In the event of an unplanned outage that affects the system(s) availability, contractor must provide email and text notifications to a DOH contact list within 30 minutes of the outage; the notice must include a summary of the event and its cause, and the expected resolution time.	Yes	High	All Solutions Day 1	Applies to Performance requirements					
Global	Non-Functional	Security & Privacy	SOW-124		The contractor must provide data breach notifications to all impacted parties in accordance with HIPAA regulations and DOH requirements.	Yes	High	All Solutions Day 1	Applies to all data requirements					
Global	Non-Functional	Security & Privacy	SOW-125		The solution must adhere to the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for assigning user IDs. See link for details: //www.oa.pa.gov/Policies/Pages/itp.aspx See Security Domain section - ITP SEC007	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements					
Global	Non-Functional	Security & Privacy	SOW-126		The solution must ensure that each internal and external user log-on be password-protected and follow the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for password creation and expiration. //www.oa.pa.gov/Policies/Pages/itp.aspx See Security Domain section - ITP SEC007	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements					
Global	Non-Functional	Security & Privacy	SOW-127		The solution shall implement prudent and effective practices for the protection and security of information resources, including routine and recurring security assessment and testing in compliance with Commonwealth of Pennsylvania Information Technology Standards, Bulletins and guidelines for Security Assessment and Testing. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx#business	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements					
Global	Non-Functional	System Support	SOW-128		The contractor must prepare and provide to approved entities any instructions needed to comply with the reporting requirements, including technical assistance. PA DOH reserves the right to review and approve any communication prior to it being distributed.	Yes	High	All Solutions Day 1	BR003 BR021 BR025 BR029 BR035 BR043 BR044					
Global	Non-Functional	System Support	SOW-130		The solution must provide online user reference materials to enable users to research and resolve issues.	Yes	High	All Solutions Day 1	Applies to all technical requirements and					

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Global	Non-Functional	System Testing	SOW-131		The solution must provide the capability and adequate time for DOH to perform user testing, including testing of data converted from the temporary bridge solution and API interfaces, prior to implementing the new system.	Yes	High	All Solutions Day 1	Applies to all technical requirements and					
Global	Non-Functional	System Testing	SOW-132		The solution must provide for the contractor (and the Commonwealth, at its discretion) to completely test all application software modifications and patches, including API interfaces, in the contractor's testing environment(s) before being applied in the production environment.	Yes	High	All Solutions Day 1	Applies to all technical requirements and solutions					
Global	Non-Functional	System Training	SOW-133		The contractor must propose an approach to train all authorized user groups; proposal must include type of training (on-site, web-based, self-training, etc.) and be included as a component in the project plan.	Yes	High	All Solutions Day 1	R025 R159 R165 R188 R210 R249 R250					

APPENDIX M

SERVICE LEVEL AGREEMENTS

Performance Metric	Performance Target	Definition	Calculation	Frequency of Review	Service Credit
System availability during core business hours	99.9%	This service level measures the percentage of time the system and all functionality is available during core business hours, with the exception of approved downtime for maintenance, per quarter. This Service Level measurement is by the availability of the Service during the core business hours of 7:00 AM and 9:00 PM Eastern Time (ET), seven (7) days per week. This includes all the hardware, software, infrastructure or other items required by the selected Offeror to deliver the Service as described in the RFQ.	$A=(T-M-D)/(T-M) \times 100\%$ A=Availability T=Total Quarterly Minutes during core business hours M=Approved Quarterly Maintenance Downtime during core business hours D=Downtime minutes during core business hours	quarterly	<99.89% - 99.85% - credit will be 2.5% of quarterly SaaS subscription <99.85% - 99.80% - credit will be 5% of quarterly SaaS subscription <99.80% or < - credit will 10% of quarterly SaaS subscription
System availability during non-core business hours	95.0%	This service level measures the percentage of time the system and all functionality is available during non-core business hours. Non-core business hours are defined as any time outside of 7:00 AM and 9:00 PM ET, seven (7) days per week. This Service Level measurement is by the availability of the Service during non-core business hours. This includes all the hardware, software, infrastructure or other items required by the selected Offeror to deliver the Service as described in the RFQ.	$A= (T-M-D)/(T-M) \times 100\%$ A=Availability T=Total Quarterly Minutes during non-core business hours M=Approved Quarterly Maintenance minutes during non-core business hours D=Downtime minutes during non-core business hours	quarterly	<95.0% - credit will be 1.0% of quarterly SaaS subscription

<p>Non-degradation of service availability during core business hours.</p>	<p>98.0%</p>	<p>This Service Level is the percentage of time the application is non-degraded during core business hours. This measurement is by application, not by server instance. Degradation shall mean a Service that tests as fully operational but is degraded below the baselines established during acceptance testing. This includes, but is not limited to slow performance and/or intermittent system errors. This Service Level measurement is by the degradation of the Service during core business hours. This includes all the hardware, software, infrastructure or other items required by the selected Offeror to deliver the Service as described in the RFQ. The Service Level measurement does not include any degradation of the Service experienced outside of the selected Offeror's application gateway.</p>	<p>$N = (T - M - D) / (T - M) \times 100\%$ N= Non-Degradation T=Total Quarterly Minutes during core business hours M=Approved quarterly maintenance minutes during core business hours D=Time Service is Degraded (Total number of minutes during core business hours the system is degraded per quarter)</p>	<p>quarterly</p>	<p>2.5% of the quarterly SaaS subscription</p>
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Non-degradation of service availability during non-core business hours.	95.0%	This Service Level is the percentage of time the application is non-degraded during non-core business hours. This measurement is by application, not by server instance. Degradation shall mean a Service that tests as fully operational but is degraded below the baselines established during acceptance testing. This includes, but is not limited to slow performance and/or intermittent system errors. This Service Level is measurement is by the degradation of the Service during non-core business hours. This includes all the hardware, software, infrastructure or other items required by the selected Offeror to deliver the Service as described in the RFQ. The Service Level measurement does not include any degradation of the Service experienced outside of the selected Offeror's application gateway.	$N = \frac{(T - M - D)}{(T - M)} \times 100\%$ <p>N= Non-Degradation T=Total Quarterly Minutes during non-core business hours M=Approved quarterly maintenance minutes during non-core business hours D=Time Service is Degraded (Total number of minutes during non-core business hours the system is degraded per quarter)</p>	quarterly	1% of quarterly SaaS Subscription
Problem circumvention or resolution time	*** 1-Urgent Priority within 2 hours 2-High Priority within 4 hours 3-Standard Priority within 3 business days 4-Low Priority within week	The time required for circumvention or solution after a problem/incident is reported to vendor based on priority level.	Time from problem/incident is reported until the problem/incident is resolved or circumvented.	continual	2.5% of quarterly SaaS subscription per incident

System unavailability notification	within thirty (30) minutes	Notification to contact list provided by DOH, of any non-scheduled system unavailability within thirty (30) minutes of discovery or notice during core business hours. Notification will include a brief explanation of the issue, criticality level, and projected resolution time.	Time from discovery or receiving notice of system unavailability until notification is sent to DOH.	continual	2.5% of the quarterly SaaS subscription per incident
Disaster Recovery	Recovery Point Objective (RPO) of less than 1 hour; Recovery Time Objective (RTO) of less than 24 hours	RPO is the maximum targeted period in which data might be lost from an IT service or business process due to a disruptive incident. RTO is the duration of time within which a business process must be restored after a disruptive incident in order to avoid unacceptable consequences associated with a break in business continuity	RTO and RPO calculated during annual disaster recovery exercise.	annual	2.5% of annual subscription per failure
Scheduled maintenance notification	100%	Notification of scheduled maintenance to contact list provided by DOH no less than 14 days prior to scheduled maintenance window.	Notification of days within the 14 days scheduled maintenance that notification is not sent to DOH until notification is sent	quarterly	.5% of quarterly SaaS subscription
Response to other methods of contact	80%	Goal is 30 minutes or less. Measures average length of time from receipt of email, voicemail, or other method of contact (excluding phone call) to the time a responding email is sent or return call is placed	Total number of minutes from receipt until response to other contact methods / Total number of contacts (excluding phone call)	daily, weekly, monthly, quarterly, annually	5% of the total monthly cost (derived from the total annual cost divided by 12).
First Call Resolution	65% or higher	Measures percentage of calls resolved first time per agent	Total number of phone calls per agent resolved in one phone call / Total phone calls between live help desk agent and caller "One call" includes: 1) The 1st call from an individual that is answered by a live help desk agent and,	daily, weekly, monthly, quarterly, annually	10% of the total monthly cost (derived from the total annual cost divided by 12)

			<p>2) 1st call returned by a live help desk agent responding to voicemail that is answered by the original caller</p> <p>Excludes calls that cannot be resolved by the help desk agent and must be, by procedures, escalated to another group for resolution</p>		
Help Desk availability	99.9% or higher	Help desk must be available as per predefined days and times.	Total time Help Desk unavailable during operating hours / Total operating hours commitment	daily, weekly, monthly, quarterly, annually	10% of the total monthly cost (derived from the total annual cost divided by 12)
Calls that receive a busy signal	99% of all calls do not receive a busy signal	<p>Measures the average number of calls placed that receive a busy signal.</p> <p>Goal is 0 calls receiving a busy signal</p>	Total number of phone calls placed that receive a busy signal / Total number of phone calls placed quarterly	quarterly	<p>>1% - credit will be 3% of the quarterly SaaS subscription</p> <p>>3% - credit will 5% of the quarterly SaaS subscription</p>
Dropped call by user rate*	3% or less of all calls > 60 seconds	Measures percentage of unanswered phone calls (hang ups before call is answered by a live help desk agent)	Total number of abandoned calls after 60 seconds / Total number of calls placed quarterly	quarterly	>3% - credit will be 5% of the quarterly SaaS subscription
After Hours Message Center	Never more than a full day of outage	<p>After hours message center must always be available for playing recorded messages of:</p> <ul style="list-style-type: none"> • Help Desk operating hours • emergency numbers and the information needed from a caller <p>Goal is 100% availability</p>	24 Hour clock starts from time of reported outage	daily check from start of reported outage	1% of the quarterly SaaS subscription for each 24 hour period
On Hold Wait Time	95% or higher	Measures average on hold wait time of users from the time a caller is placed on hold by a live agent until the time a live agent is back on the phone with the caller.	Total number of minutes on hold/Total number of calls placed on hold	quarterly	1% of the quarterly SaaS subscription

		Goal is 1 minute or less			
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If any of the SLA metrics defined in this document are not met, DOH, at its sole discretion may require the Contractor to develop a corrective action plan.

Definitions:

Service Level Credit: a credit available to the Commonwealth should the service provider fail to meet target service levels.

Maximum at Risk Amount: a defined percentage of quarterly service fees or a total dollar value which is not exceeded when assessing service credits. Maximum at risk amount is 20% of the annual invoice amount).

Notes:

*For calculation purposes, phone calls abandoned within 60 seconds (ASA standard) are not counted as a call placed.

*****Priorities:**

- 1- Urgent Priority = Hosted system or major functionality of system is not available or operational for all users
- 2-High Priority = Hosted system or major functionality of system is not available or operational for multiple users
- 3-Standard Priority = Minor function of hosted system is not operational for multiple users, but all other functionality is available and operational for users
- 4-Low Priority = Minor function of hosted system is not operational for single user, but all other functionality is available and operational for users

Quarters are defined as:

- January through March
- April through June
- July through September
- October through December

The Contractor will be notified by email and letter of the results of the review of the quarterly report within 10 days of receipt of the quarterly report and any SLA credits due as a result of SLA's not being met.

Contractor Fees withheld as set forth above shall not constitute liquidated damages for the corresponding failure to perform, and the Department shall be free to pursue any and all remedies available under the Contract with respect thereto, provided that any such credits actually paid by the Contractor to the Commonwealth shall be offset against any damages awarded to the Department for claims arising from the corresponding failure to perform.

APPENDIX N

MODEL FORM OF SMALL DIVERSE AND SMALL BUSINESS SUBCONTRACTOR AGREEMENT

This Subcontractor Agreement ("Subcontract") is made effective as of _____, 20____, by and between _____, ("Contractor") and _____, a Small Diverse Business or Small Business ("Subcontractor") (collectively referred to as the "Parties").

RECITALS

Contractor has entered into a contract dated _____ (the "Prime Contract") with the Department of _____ of the Commonwealth of Pennsylvania ("Commonwealth"). Under the Prime Contract, Contractor has agreed to provide certain supplies, services or construction ("Services") to the Commonwealth.

In connection with the Procurement leading to the Prime Contract, Contractor and Subcontractor entered into a letter agreement dated _____ ("Letter of Intent") whereby the Contractor committed a certain percentage of work ("Small Diverse Business or Small Business Commitment") under the Prime Contract to the Subcontractor.

As contemplated by the Letter of Intent and in accordance with the provisions of the Procurement and Prime Contract, the Parties have agreed to enter into this Subcontract to fulfill the Small Diverse Business or Small Business Commitment expressed in the Letter of Intent and as required by the Prime Contract.

DEFINITIONS

The following words and terms when used in this Subcontract shall have the following meanings:

Bureau – The Department's Bureau of Diversity, Inclusion and Small Business Opportunities.

Contracting Officer – The person authorized to administer and make written determinations for the Commonwealth with respect to the Prime Contract.

Department – The Department of General Services of the Commonwealth of Pennsylvania.

Issuing Office – The department, board, commission or other agency of the Commonwealth of Pennsylvania that issued the Procurement.

Procurement – The Invitation for Bids, Request for Quotes, Request for Proposals or other solicitation and all associated final procurement documentation issued by the Commonwealth to obtain proposals from firms for award of the Prime Contract.

Small Business – A business in the United States which is independently owned, not dominant in its field of operation, employs no more than 100 full-time or full-time equivalent employees, and earns less than \$7 million in gross annual revenues for building design, \$20 million in gross annual revenues for sales and services and \$25 million in gross annual revenues for those businesses in the information technology sales or service business.

Small Diverse Business – A Department-verified minority-owned small business, woman-owned small business, veteran-owned small business, service-disabled veteran-owned small business, LGBT-owned small business, or disability-owned small business.

AGREEMENT

Now, therefore, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound, the Parties hereby agree as follows:

1. Subcontractor Representations. Subcontractor represents and warrants to Contractor as follows:

(a) Subcontractor is self-certified as a Small Business in accordance with the requirements and procedures established by the Bureau of Diversity, Inclusion and Small Business Opportunities; [Subcontractor is also verified as a Small Diverse Business by the Bureau of Diversity, Inclusion and Small Business Opportunities in accordance with the requirements and procedures established by the Bureau;]

(b) Subcontractor possesses the necessary knowledge, experience, expertise, capital, resources and personnel required to perform the Services it will provide under this Subcontract;

(c) Subcontractor (i) is duly organized, validly existing and in good standing under the laws of its state of incorporation or organization, (ii) has the power and authority to own its properties and to carry on business as now being conducted, and (iii) has the power to execute and deliver this Subcontract;

(d) The execution and performance by Subcontractor of the terms and provisions of this Subcontract have been duly authorized by all requisite action, and neither the execution nor the performance of this Subcontract by Subcontractor will violate any provision of law, any order of any court or other agency of government, the organizational documents of Subcontractor or any indenture, agreement or other instrument to which Subcontractor is a party, or by which Subcontractor is bound, or be in conflict with, result in a breach of, or constitute (with due notice or lapse of time or both) a default under, or except as may be provided by this Subcontract, result in the creation or imposition of any lien, charge or encumbrance of any nature whatsoever upon any of the property or assets of Subcontractor pursuant to, any such indenture agreement or instrument;

(e) Subcontractor has obtained all licenses, permits and approvals required to perform the Services it will provide under this Subcontract; and

(f) Subcontractor is not under suspension or debarment by the Commonwealth or any other governmental entity, instrumentality or authority.

2. Contractor Representations. Contractor represents and warrants to Subcontractor as follows:

(a) Contractor (i) is duly organized, validly existing and in good standing under the laws of its state of incorporation or organization, (ii) has the power and authority to own its properties and to carry on business as now being conducted, and (iii) has the power to execute and deliver this Subcontract;

(b) The execution and performance by Contractor of the terms and provisions of this Subcontract by Contractor have been duly authorized by all requisite action, and neither the execution nor the performance of this Subcontract will violate any provision of law, any order of any court or other agency of government, the organizational documents of Contractor or any indenture, agreement or other instrument to which Contractor is a party, or by which Contractor is bound, or be in conflict with, result in a breach of, or constitute (with due notice or lapse of time or both) a default under, or except as may be provided by this Subcontract, result in the creation or imposition of any lien, charge or encumbrance of any nature whatsoever upon any of the property or assets of Contractor pursuant to, any such indenture agreement or instrument;

(c) Contractor has obtained all licenses, permits and approvals required to perform the Services to be provided by Contractor under the Prime Contract; and

(d) Contractor is not under suspension or debarment by the Commonwealth or any other governmental entity, instrumentality or authority.

3. Relationship of the Parties. The provisions of this Subcontract are not intended to create, nor shall be deemed or construed to create, any joint venture, partnership or other relationship between Contractor and Subcontractor, other than that of independent entities contracting with each other solely for the purpose of carrying out the provisions of this Subcontract. Neither of the Parties to this Subcontract, nor any of their respective employees, agents, or other representatives, shall be construed to be the agent, employee or representative of the other party. Neither party shall have the authority to bind the other party, nor shall a party be responsible for the acts or omissions of the other party, unless otherwise stated in this Subcontract. Similarly, the Parties expressly acknowledge that neither the Contractor nor the Subcontractor is an agent, employee or representative of the Commonwealth and each party covenants not to represent itself accordingly.

4. Prime Contract Flow-Down.

(a) General. This agreement is a subcontract under the Prime Contract and all provisions of the Prime Contract and any amendments thereto applicable to the Services being performed by the Subcontractor shall extend to and be binding upon the Parties as part of this Subcontract.

(b) Specific. The Parties agree to comply with the following provisions of the Prime Contract, which are incorporated herein by reference:

- (1) The Americans with Disabilities Act Provisions.
- (2) Nondiscrimination/Sexual Harassment Clause.
- (3) Contractor Integrity Provisions.
- (4) Contractor Responsibility Provisions.

(c) Termination. Should the Prime Contract be terminated pursuant to the terms and conditions provided in the Procurement, such termination shall have the same effect on this Subcontract. Payment for Services provided as of the date of termination must be made in accordance with the Section 13 of this Subcontract.

(d) Audit Provisions. The Commonwealth shall have the right, at reasonable times and at a site designated by the Commonwealth, to audit the books, documents, and records of the Parties to the extent that the books, documents, and records relate to the Parties' compliance with the provisions set forth in subsection (b) above or to the Small Diverse Business or Small Business Commitment effectuated through this Subcontract. The Parties shall preserve such books, documents, and records for a period of three years from the date of final payment hereunder. The Parties shall give full and free access to all such records to the Commonwealth and/or its authorized representatives.

5. Order of Precedence. The Letter of Intent, Procurement and Prime Contract are incorporated herein by reference into this Subcontract. In the event of any conflict or inconsistency among the individual components of this Subcontract, such conflict or inconsistency shall be resolved by observing the following order of precedence:

- (a) This Subcontract;
- (b) The Letter of Intent;
- (c) The Prime Contract; and
- (d) The Procurement.

6. Further Action. The Parties shall take such actions and complete, execute and deliver any and all documents or instruments necessary to carry out the terms and provisions of this Subcontract, to effectuate the purpose of this Subcontract, and to fulfill the obligations of each party hereunder.

7. Description of Services. Subcontractor will perform the following Services for the Contractor which Contractor is obligated to provide to the Commonwealth under the Prime Contract:

[DESCRIBE IN DETAIL THE SPECIFIC SUPPLIES, SERVICES OR CONSTRUCTION THE SUBCONTRACTOR WILL PROVIDE OR PERFORM]

8. Small Diverse Business or Small Business Commitment. The above-referenced Services represent ___ % of the final negotiated total cost for the initial term of the Prime Contract. Any proposed change to the Small Diverse Business or Small Business Commitment must be submitted in writing to the Bureau which will make a recommendation to the Commonwealth Contracting Officer regarding a course of action.

9. Performance of Services. Subcontractor may not subcontract more than 50% of the work subcontracted to it hereunder without written permission from the Bureau. Subcontractor will perform the Services strictly in accordance with any applicable plans and specifications as contained in the Prime Contract and the reasonable deadlines set by Contractor in view of the requirements of the Prime Contract, and in a good workmanlike manner consistent with industry standards, meeting all applicable local, state and federal laws, regulations and policies.

10. Location of Services. Subcontractor will provide the Services at the following address(es):

11. Timeframe for Performance of Services. The Services will be provided by Subcontractor during the initial term of the Prime Contract, and during any extensions, options or renewal periods of the Prime Contract exercised by the Commonwealth, as more specifically set forth below:

[IDENTIFY THE SPECIFIC TIME PERIODS DURING THE INITIAL CONTRACT TERM AND EXTENSIONS, OPTIONS AND RENEWALS WHEN THE SUBCONTRACTOR WILL PERFORM COMPONENT SERVICES]

12. Pricing of Services. Subcontractor shall provide or perform the Services at the pricing specified in Exhibit ___ to this Subcontract. [ATTACH A BILL OF MATERIALS, RATE CARD OR OTHER APPROPRIATE COST SHEET COVERING THE SERVICES TO BE PROVIDED.]

13. Payment for Services. Contractor shall exert reasonable and diligent efforts to collect prompt payment from the Commonwealth. Contractor shall pay Subcontractor in proportion to amounts received from the Commonwealth which are attributable to the Services performed by Subcontractor. Contractor shall pay Subcontractor within fourteen (14) days after the Contractor receives such payment from the Commonwealth, unless the parties expressly agree upon a different payment schedule or structure as set forth below:

14. Utilization Reports. Both the Contractor and Subcontractor shall complete Quarterly Utilization Reports (or similar type documents containing the same information) and submit them to the Contracting Officer and to the Bureau within ten (10) business days at the end of each quarter. This information will be used to determine the actual dollar amount paid to Subcontractor and will also serve as a record of fulfillment of Contractor's Small Diverse Business and Small Business Commitments. If there was no activity during the quarter, then the form must be completed by stating "No activity in this quarter." A late fee of \$100.00 per day may be assessed against the Contractor if its Utilization Report is not submitted in accordance with the schedule above.

15. Change Orders. If the Commonwealth issues any change order or other formal contract instrument either expanding or limiting the work to be performed under the Prime Contract, the Parties shall accept such Change Orders. Contractor agrees to provide Subcontractor with written notice of any such change orders that affect the Services to be provided by the Subcontractor hereunder as soon as practical after Contractor receives such notice. Any resulting increase or decrease in the Services, Small Diverse Business or Small Business Commitment provided for in Paragraphs 7 or 8 above must be in writing, mutually agreed to, and signed by both Parties and communicated to the Bureau. If the Parties are unable to reach an agreement regarding any adjustment to the Services, Small Diverse Business or Small Business Commitment necessitated by a Commonwealth Change Order, the Parties must submit the matter in writing to the Bureau which will make a recommendation to the Contracting Officer regarding a course of action.

16. Force Majeure. Neither party will incur any liability to the other if its performance of any obligation under this Subcontract is prevented or delayed by causes beyond its control and without the fault or negligence of either party. Causes beyond a party's control may include, but are not limited to, acts of God or war, changes in controlling law, regulations, orders or the requirements of any governmental entity, severe weather conditions, civil disorders, natural disasters, fire, epidemic and quarantines, general strikes throughout the trade, and freight embargoes. The existence of such causes beyond a party's control shall extend the period for performance to such extent as may be necessary to enable complete performance in the exercise of reasonable diligence after the causes have been removed.

17. Dispute Resolution.

(a) The Parties will attempt to resolve any dispute arising out of or relating to this Subcontract through friendly negotiations.

(1) The Parties expressly acknowledge and confer upon the Bureau and Contracting Officer the authority to adjudicate disputes that the Parties cannot resolve amicably concerning the Parties' compliance with their Small Diverse Business and Small Business Commitments as provided in the Prime Contract and this Subcontract.

(2) The Bureau may recommend to the Contracting Officer a range of sanctions it deems appropriate if the Bureau determines a party has failed to satisfy or perform its Small Diverse Business or Small Business commitment. Such sanctions include, but are not limited to, one or more of the following: a determination that the party is not responsible under the Contractor Responsibility Program; withholding of Prime Contract and/or Subcontract payments; suspension or termination of the Prime Contract and/or Subcontract together with consequential damages; revocation of the party's Small Business self-certification status and/or Small Diverse Business verification status; and/or suspension or debarment of one or both parties from future contracting opportunities with the Commonwealth.

(3) The Parties' acknowledge that their prior performance in meeting their Small Diverse Businesses and Small Businesses contractual obligations will be considered by the Bureau during future procurement scoring processes. To the extent a party has failed to meet prior contractual commitments, the Bureau may recommend to the Issuing Office that the party be determined non-responsible for the limited purpose of eligibility to receive SDB/SB points or consideration as a qualified Small Diverse Business or Small Business.

(b) Nothing herein shall be construed to prevent either party from seeking such relief as provided by law in a court or tribunal of competent jurisdiction.

18. Notices. Any written notice to any party under this Subcontract shall be deemed sufficient if delivered personally, or by facsimile, telecopy, electronic or digital transmission (provided such delivery is confirmed), or by a recognized overnight courier service (e.g., DHL, Federal Express, etc.) with confirmed receipt, or by certified or registered United States mail, postage prepaid, return receipt requested, and sent to the following:

If to Contractor:

If to Subcontractor:

19. Waiver. No waiver by either party of any breach of this Subcontract shall be deemed to waive any other breach. No acceptance of payment or performance after any breach shall be deemed a waiver of any breach. No failure or delay to exercise any right by a party upon another's default shall prevent that party from later exercising that right, nor shall such failure or delay operate as a waiver of any default.

20. Severability. If any provision of this Subcontract shall be held to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any provision of this Subcontract is invalid or unenforceable, but that by limiting such provision it would become valid and enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.

21. Assignment. Neither party may assign or transfer this Subcontract without the prior written consent of the Commonwealth. If Contractor's Prime Contract with the Commonwealth is assigned to another contractor, the new contractor must maintain the Small Diverse Business and Small Business Commitment set forth in the Prime Contract as implemented through this Subcontract.

22. Applicable Law. This Subcontract shall be governed by the laws of the Commonwealth of Pennsylvania.

23. Entire Agreement. This Subcontract constitutes the entire agreement of the Parties regarding the subject of this Subcontract as of the date of execution. No other agreement or understandings, verbal or written, expressed or implied, are a part of this Subcontract unless specified herein.

24. Amendment. This Subcontract may be modified or amended only if made in writing and signed by both Parties. Any proposed change to the Contractor's Small Diverse Business or Small Business Commitment to Subcontractor must be submitted in writing to the Bureau which will make a recommendation to the Contracting Officer regarding a course of action.

25. Binding Effect. This Subcontract shall be binding upon, and inure to the benefit of, the Parties and their respective heirs, representatives, successors and assigns.

26. Counterparts. This Subcontract may be executed by the Parties in counterparts, each of which together shall be deemed an original but all of which together shall constitute one and the same instrument. A party's delivery of a duly executed signature page of this Subcontract in electronic format shall have the same force and effect as delivery of an original signature page.

ADDITIONAL TERMS AND CONDITIONS

[THE PARTIES MAY INCLUDE ADDITIONAL TERMS AND CONDITIONS APPROPRIATE FOR THE SERVICES TO BE PROVIDED SO LONG AS THEY ARE COMMERCIALY REASONABLE TERMS FOR THE APPLICABLE BUSINESS OR INDUSTRY, ARE NO LESS FAVORABLE THAN THE TERMS OF THE PRIME CONTRACT, AND DO NOT PLACE DISPROPORTIONATE RISK ON THE SMALL DIVERSE BUSINESS OR SMALL BUSINESS RELATIVE TO THE NATURE AND LEVEL OF THE SMALL DIVERSE BUSINESS' OR SMALL BUSINESS' PARTICIPATION IN THE PROJECT. SUCH TERMS MAY INCLUDE:

Background Checks
Confidentiality/Disclosure of Information
Data Security

Insurance
Invoicing Requirements
Environmental Protection
Intellectual Property Rights
Record Retention/Audits
Service Level Agreements (SLAs) (consistent with Prime Contract SLAs)
Public Works Construction Requirements (including Bonding, E-Verify, Prevailing Wage, and Prompt Payment provisions)

IN WITNESS WHEREOF, the Parties hereto have caused this Subcontract to be executed by their duly authorized officers as set forth below.

Contractor

Subcontractor

Insert Company Name

Insert Company Name

By: _____
Signature

By: _____
Signature

Printed Name

Printed Name

Title

Title

Date

Date

Date: Wednesday December 21, 2016

Subject: Medical Marijuana RFQ

Solicitation Number: 6100040415

Solicitation Due Date: Friday January 27, 2017 by 1:00 PM EST

Addendum Number: 1

To All Offerors/Bidders:

The Commonwealth of Pennsylvania defines a solicitation “Addendum” as an addition to or amendment of the original terms, conditions, specification, or instruction of a procurement solicitation (e.g. Invitation for Bids, Request for Quotes and Request for Proposals).

The following changes has been made to the solicitation:

RFQ –Part III-1 Mandatory Responsiveness Requirements -- Page 16, Appendix J, and Calendar of Events – Page v has been revised.

1. Part III-1 Mandatory Responsiveness Requirements. **Requirement D.** stating that the Seed to Sale SaaS solution must be in production for 6 months, **has been removed.**
2. **Appendix J** has been revised to reflect the removal of **Requirement D.**
3. Calendar of events on page v, the following modification has been made in bold. (Year 2016 has been changed to **2017**).

<p>*Optional* Pre-proposal Conference – Location Office for Information Technology Bureau of IT Procurement 613 North Street Finance Building, Conference Room 503 Harrisburg, PA 17120-0400</p>	<p>Issuing Office/ Contractors</p>	<p>Friday January 6, 2017, At 10:00 AM</p>
<p>Answers to Potential Contractor questions posted to the DGS website no later than this date.</p>	<p>Issuing Office</p>	<p>Thursday January 12, 2017, by 4:00 PM EST</p>

<p>Sealed proposal must be received by the Issuing Office at Bureau of IT Procurement c/o Commonwealth Mail Processing Center 2 Technology Park (rear) Attn: IT Procurement, 506 Finance Harrisburg, PA 17110 Attn: Michael D. Gress</p> <p>Proposals must be time and date stamped by the facility receiving the proposals. Proposals may only be hand-delivered between 6:15 a.m. and 2:15 p.m., Monday through Friday, excluding Commonwealth holidays.</p>	<p>Contractors</p>	<p>Friday January 27, 2017, by 1:00 PM EST</p>
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This document has been posted to the e-Marketplace website at: <http://www.emarketplace.state.pa.us>

For Solicitation where a "hard copy" (vs. electronic) response is requested:

- If you already submitted a response to the original solicitation, you may either submit a new response, or return this Addendum with a statement that your original response remains firm, by the due date to the following address:

Michael Gress, Bureau of IT Procurement
c/o Commonwealth Mail Processing Center
2 Technology Park (rear)
Attn: IT Procurement, 506 Finance
Harrisburg, PA 17110

Except as amended by this Addendum, the terms, conditions, specification, and instruction of the solicitation and any previous solicitation addenda, remain as originally written.

Very truly yours,

Michael D. Gress 12/21/16

Name: Michael Gress

Title: Issuing Officer

Phone: 717 346-2670

Email: RA-OITPurchases@pa.gov

Date: January 9, 2017

Subject: Medical Marijuana

Solicitation Number: 6100040415

Solicitation Due Date: January 27, 2017 by 1:00 PM EST

Addendum Number: 2

To All Offerors/Bidders:

The Commonwealth of Pennsylvania defines a solicitation “Addendum” as an addition to or amendment of the original terms, conditions, specification, or instruction of a procurement solicitation (e.g. Invitation for Bids, Request for Quotes and Request for Proposals).

This addendum is intended to inform Contractors that the Pre-Proposal Conference documents outlined below have been posted to eMarketplace in <http://www.emarketplace.state.pa.us>

- Pre-Proposal Conference Sign In Sheet with Business Cards
- Pre-Proposal Conference Presentation
- Pre-Proposal Conference Drafted Questions Handout – This handout is for informational purposes only to let the Contractor community see what questions the Commonwealth has received. The official Questions and Answers will be posted in a future Addendum no later than **January 12, 2017 by 4:00 PM EST**.

For Solicitation where a “hard copy” (vs. electronic) response is requested:

- If you already submitted a response to the original solicitation, you may either submit a new response, or return this Addendum with a statement that your original response remains firm, by the due date to the following address:

Michael Gress, Bureau of IT Procurement
c/o Commonwealth Mail Processing Center
2 Technology Park (rear)
Attn: IT Procurement 506 Finance
Harrisburg, PA 17110

Except as amended by this Addendum, the terms, conditions, specification, and instruction of the solicitation and any previous solicitation addenda, remain as originally written.

Very truly yours,

Name: Michael Gress

Title: Issuing Officer

Phone: 717-346-2670

Email: RA-OITPurchases@pa.gov

Date: January 12, 2017

Subject: Medical Marijuana

Solicitation Number: 6100040415

Solicitation Due Date: January 27, 2017 by 1:00 PM EST

Addendum Number: 3

To All Offerors/Bidders:

The Commonwealth of Pennsylvania defines a solicitation "Addendum" as an addition to or amendment of the original terms, conditions, specification, or instruction of a procurement solicitation (e.g. Invitation for Bids, Request for Quotes and Request for Proposals).

This addendum is intended to inform Contractors that the Pre-Proposal Conference documents outlined below have been posted to eMarketplace in <http://www.emarketplace.state.pa.us>

- **In the RFQ, Part III-6.C FINAL RANKING AND AWARD the following language has been deleted:**

C. PROVIDED, HOWEVER, THAT AN AWARD WILL NOT BE MADE TO A CONTRACTOR WHOSE PROPOSAL RECEIVED THE LOWEST TECHNICAL SCORE AND HAD THE LOWEST COST SCORE OF THE RESPONSIVE PROPOSALS RECEIVED FROM RESPONSIBLE CONTRACTORS. IN THE EVENT, SUCH A PROPOSAL ACHIEVES THE HIGHEST OVERALL SCORE, IT SHALL BE ELIMINATED FROM CONSIDERATION AND AWARD SHALL BE MADE TO THE CONTRACTOR WITH THE NEXT HIGHEST OVERALL SCORE.

- **Posting of Final Questions and Answers.**

This document has been posted to the e-Marketplace website at:
<http://www.emarketplace.state.pa.us>

- The flow chart in the Instructions tab of **Appendix L, MM Detailed Requirements** has changed.
- In the RFQ – Part IV-2. **Nature and Scope of the Project** updated to include additional user base information.
- In the RFQ – Part IV-3. **Requirements E. Solution Support 1. Type of Support** updated to define Tiers and request staffing level information.

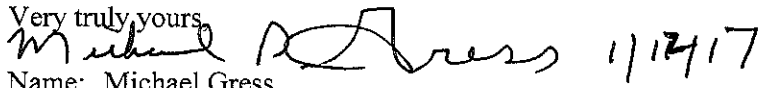
For Solicitation where a "hard copy" (vs. electronic) response if requested:

- If you already submitted a response to the original solicitation, you may either submit a new response, or return this Addendum with a statement that your original response remains firm, by the due date to the following address:

Michael Gress, Bureau of IT Procurement
c/o Commonwealth Mail Processing Center
2 Technology Park (rear)
Attn: IT Procurement 506 Finance
Harrisburg, PA 17110

Except as amended by this Addendum, the terms, conditions, specification, and instruction of the solicitation and any previous solicitation addenda, remain as originally written.

Very truly yours,

 1/12/17

Name: Michael Gress

Title: Issuing Officer

Phone: 717-346-2670

Email: RA-OITPurchases@pa.gov

ADMINISTRATIVE CLARIFICATION

January 31, 2017

Amy Poinsett
MJ Freeway, LLC.
1601 Arapahoe Street
Suite 800
Denver, CO 80202
amy@mjfreeway.com

RE: Office of Administration RFQ # 6100040415

Dear Ms. Poinsett,

The Office of Administration is performing its preliminary evaluation of proposals received in response to the Medical Marijuana RFQ 6100040415 issued on December 15, 2017. So that the Office may complete the preliminary evaluation, we have determined a need for administrative clarification of your proposal.

1. Please acknowledge that all **three (3)** addenda posted to e-Marketplace have been reviewed and that your response is offered subject to the changes/supplementations implemented therein.
2. Please substantiate that Amy Poinsett is an official authorized to bind the L.L.C. to the proposal. Appropriate substantiation would include, but is not limited to, an indication in by-laws that you or a person in your position is authorized to bind the organization in contract, or a letter from your General Counsel.
3. Please resubmit **Appendix H, Cost Matrix** without deleting extra rows. The amount for Requirements Customization did not carry through to the Summary page, resulting in an inaccurate total. No numbers on the Cost Matrix may be altered.
4. Please affirmatively indicate your understanding that any assumptions listed in your proposal documents (e.g.; p. 20 and Section IV-4) do not alter the requirements of the RFQ, and will be accepted only insofar as they are explicitly agreed upon by the Commonwealth.

Please provide a complete response to this issue no later than **February 3, 2017 10:00am** via electronic e-mail, followed by USPO mail, to mgress@pa.gov. Thank you for your assistance.

USPO mail address:

Attn: Michael Gress

Bureau of IT Procurement

c/o Commonwealth Mail Processing Center

2 Technology Park (rear)

Attn: IT Procurement, 506 Finance

Harrisburg, Pennsylvania 17110

Sincerely,



1/31/17

Michael Gress

Issuing Officer

ROBERTS
& OLIVIA_{LLC}

February 2, 2017

Bureau of IT Procurement
c/o Commonwealth Mail Processing Center
2 Technology Park (rear)
Harrisburg, Pennsylvania 17110
Attn: Michael Gress, IT Procurement, 506 Finance

Re: MJ Freeway, LLC, a Colorado limited liability company (the "Company")


Ladies and Gentlemen:

This firm is outside corporate counsel to the Company and represented the Company in connection with the preparation of the Company's Second Amended and Restated Operating Agreement (the "Operating Agreement"), which is the currently effective governing document for the Company. Pursuant to the Operating Agreement Amy Poinsett is appointed as a Manager of the Company and has also been appointed as Chief Executive Officer of the Company. In those capacities Ms. Poinsett has the authority to execute documents that are binding obligations of the Company.

Please do not hesitate to contact me if you need any further information or documentation related to Ms. Poinsett's authority.

Very truly yours,

ROBERTS & OLIVIA, LLC

By: 
William R. Roberts, Manager

Cc: Amy Poinsett
Karen Kaussner

Vendor Name	MJ Freeway LLC
Vendor ID Number	519825
Vendor TIN	27-2354485

Blended Rate

Blended Rate (Base Years)*	\$ 150.00
Blended Rate (Renewal Years)	\$ 150.00

NOTE: The information provided is for evaluation purposes only and does not guarantee payment or work to be performed.

NOTE: The rates entered will remain for the life of the contract during each respective phase.

* The rates entered in the Blended Rate (Base Years) will be used in the table below to calculate cost totals for each customization needed to meet the requirements for the solution upon implementation.

NOTE: Additional enhancements and required customizations may be requested during the life of the contract. The enhancements will follow the change management process and the rates established above shall be used.

Requirements Customization

System	Subcategory	*Technical Requirement tab line reference	Function Description	Requirement Statement	Hours Required	Amount	
Registry	Audit	line 6	Data & Reporting/Tracking	The registry solution must track and retain an auditable database history, including modifications to any information in the database(s).	10	\$ 1,500.00	EXAMPLE - based on \$150/hour
Registry	Security & Privacy	line 28	Credentials	The registry solution must allow a registered user to establish or deactivate a delegate subaccount(s) for their designee(s), and further, include a mechanism for the user to monitor system activity of their designee(s) online and through a reporting mechanism.	100	\$ 15,000.00	
Seed to Sale	Security & Privacy	line 90	Credentials	The seed-to-sale solution must allow a registered user to establish or deactivate a delegate subaccount(s) for their designee(s), and further, include a mechanism for the user to monitor the system activity of their designee(s) online and through a reporting mechanism.	100	\$ 15,000.00	
Seed to Sale	Internal	line 75	Tax	The seed-to-sale solution must allow approved grower/processors to electronically remit excise tax payments.	25	\$ 3,750.00	
Seed to Sale	Internal	line 76	Tax	The seed-to-sale solution must permit the manual posting of tax payment(s) received outside of the system.	25	\$ 3,750.00	

APPENDIX H, COST MATRIX

Seed to Sale	Internal	line 77	Tax	The seed-to-sale solution must provide the ability to clear the tax payment against the gross receipts tax liability for the specified time period.	25	\$ 3,750.00
Seed to Sale	Internal	line 78	Tax	The seed-to-sale solution must deposit gross receipts tax payments directly into an established Medical Marijuana fund.	25	\$ 3,750.00
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Total Customization Costs						\$ 45,000.00

NOTE: Additional rows may be added if needed.

*Technical Requirement line reference - Contractors should use the line reference from Appendix "X" - MM Detailed Requirements (see example above)

Instructions

- 1.) All sheets must be filled out completely. Fill out all yellow highlighted cells on each worksheet.
- 2.) Formulas are imbedded in the Worksheets. Contractor's is responsible and must verify that all calculations are accurate.
- 3.) Vendor Information. Complete the required cells. The information will carry forward through the remainder of the proposal.
- 3.) SaaS Subscription. The annual total for the subscription should be entered. Subscription costs should be based on the solution. The subscription costs should be based on calculations including and excluding Tier 1 help desk support.
- 4.) Blended Rate: Contractors should enter the blended hourly rate for performing customizations needed for the solution. The highlighted fields will remain in effect for the duration of the contract and be used when future customizations are needed.
- 5.) Requirement Customizations: Follow the instructions. References should be made using the MM Description of Work.
- 6.) Summary. All amounts will be transferred and calculated automatically.
- 7.) Monetary cells without a dollar amount will be translated to mean zero (0) dollars.
- 8.) Please contact the Issuing Officer with any questions or concerns.

APPENDIX H, COST MATRIX

Calculations, subtotal costs and grand total costs are

and include all costs to implement, maintain and support
desk support as stated in the RFQ.
needed to meet the requirements. The rates entered into
customizations are needed.
Detailed Requirements Appendix K submitted with the

Vendor Information

Offeror Name	Contact Person	
MJ Freeway LLC	Amy Poinsett	
Offeror Address	Email Address	
1601 Arapahoe St	amy@mjfreeway.com	
8th Floor	Phone Number	Fax Number
Denver, CO 80201	970-708-0213	888-932-6537
Vendor Number	Federal ID or SSN (TIN)	
519825	27-2354485	

APPENDIX H, COST MATRIX

Vendor Name	MJ Freeway LLC
Vendor ID Number	519825
Vendor TIN	27-2354485

SaaS Subscription

Task	Base Years					Renewal Years		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
IV-4.H. Solution Operation & Support (including Tier 1 help desk support)	\$ 2,564,330.15	\$ 1,609,458.10	\$ 2,663,203.56	\$ 1,719,376.95	\$ 1,778,091.90	\$ 1,850,467.47	\$ 1,926,628.43	\$ 2,007,705.55
IV-4.H. Solution Operation & Support (excluding Tier 1 help desk support)	\$ 2,144,692.00	\$ 1,177,230.80	\$ 1,218,009.44	\$ 1,260,827.01	\$ 1,305,785.46	\$ 1,363,991.84	\$ 1,425,558.53	\$ 1,491,603.55

Total Base Years with Tier 1	\$ 10,334,460.66
Total Base Years without Tier 1	\$ 7,106,544.71
Total Renewal Years with Tier 1	\$ 5,784,801.45
Total Renewal Years without Tier 1	\$ 4,281,153.92
Total Base & Renewal Years with Tier 1	\$ 16,119,262.11
Total Base & Renewal Years without Tier 1	\$ 11,387,698.63

*The annual SaaS subscription shall be paid in equally quarterly payments.

APPENDIX H, COST MATRIX

Vendor Name	MJ Freeway LLC
Vendor ID Number	519825
Vendor TIN	27-2354485

Summary

Costs including Tier 1 Help Desk Support	
SaaS Subscription Base Years	\$ 10,334,460.66
Requirement Customizations	\$ 45,000.00
Total Costs Base Years	\$ 10,379,460.66

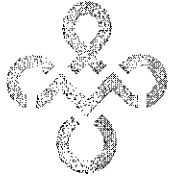
SaaS Subscription Renewal Years	\$ 5,784,801.45
Total Costs Renewal Years	\$ 5,784,801.45

Total Costs Base & Renewal Years	\$ 16,164,262.11
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Costs excluding Tier 1 Help Desk Support	
SaaS Subscription Base Years	\$ 7,106,544.71
Requirement Customizations	\$ -
Total Costs Base Years	\$ 7,106,544.71

SaaS Subscription Renewal Years	\$ 4,281,153.92
Total Costs Renewal Years	\$ 4,281,153.92

Total Costs Base & Renewal Years	\$ 11,387,698.63
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MJ FREEWAY

February 22, 2017

Michael Gress

Bureau of IT Procurement

C/O Commonwealth Mail Processing Center

2 Technology Park (rear)

Attn: IT Procurement, Finance Building, Room 506

Harrisburg, PA 17110

RE: Office of Administration Medical Marijuana RFQ # 6100040415

Dear Mr. Gress,

Attached is our response to your request for technical clarifications on our proposal for the reference RFQ. We appreciate the opportunity to provide these clarifications of the solicitation requirements.

Sincerely,



Amy Poinsett

Co-Founder & CEO

Written Technical Clarification Items – MJ Freeway LLC

- 1. Does the proposed solution include supporting equipment (e.g. scanning devices, scales, 2d barcode scanners, etc.) required to support and integrate with the systems?**

The proposed solution includes acquisition and distribution of supporting equipment. The MJ Freeway team will work with the Commonwealth to determine the type and number of supporting equipment necessary to support the Registry component of the Solution.

MJ Freeway/Leaf Data Systems integrates with commonly used USB point-of-sale hardware, such as scanning devices, scales, 2d barcode scanners, etc.

Our plan calls for TreCom Systems Group, one of our PA based subcontractors, to manage the acquisition and distribution of the required hardware. The TreCom team will also be handling Tier One support so they are ideally positioned to manage the supporting equipment process.

- 2. Provide additional information to explain the monitoring tools and activities that will be used by the contractor to meet FedRAMP controls.**

In addition to monitoring solutions used by Amazon Web Services and Oracle to maintain compliance with FedRAMP certification requirements, MJ Freeway utilizes a continuous monitoring strategy around software, systems, and security.

- AlertLogic provides Network based Intrusion Detection System (IDS) and centralized logging with offsite analysis through a Security Operations Center (SOC).
 - These systems help us validate our access controls and governance models.
- Atlassian products are used for configuration and release management (BitBucket, Bamboo, Jira, Confluence)
 - These tools help us to monitor, audit, and control what changes get released to the environments and when.
- MJ Freeway utilizes a combination of tools for live metrics gathering and monitoring of the live environments including Sensu, CloudWatch, along with in-house developed tools.
 - These tools allow us to see how the application(s) and systems are performing in real time.
- All the above tools include alerting functionality that pushes alerts to the appropriate staff.

- 3. Can the proposed Seed to Sale system accommodate multiple lab re-tests?**

MJ Freeway's Leaf Data Systems accommodates multiple lab re-tests attached to specific lots/batches of product. During the design phase of the project, the team will work with PA DOH to identify any rules or constraints related to re-tests, such as under what circumstances re-tests are permitted and who is required to authorize re-tests.

4. Will there be planned staff turnover/re-assignment after the solution has been placed into production?

After the Solution has been placed into production, MJ Freeway will transition into post production support that includes Tier 1 Help Desk as well as additional escalation support levels for issue resolution. To facilitate a seamless transition and sustain continuity, MJ Freeway plans to utilize much of the same leadership and staff involved in the implementation to provide solution support. Technical, functional, regulatory, and organizational knowledge and collaboration obtained during the implementation will provide our support team the ability to quickly and proactively track and resolve system problems identified in production.

Summary of Resolutions to Technical Clarifications
 Updated 4/4/16

	PA Question	Status	Agreed Upon Resolution
1	What specific equipment/devices will be provided to medical marijuana organizations in order to interface with the Seed/Sale, Bridge and Registry systems?	Closed	<p>MJ Freeway confirmed that the numbers outlined in their answer include equipment for 33 growers/processors, 198 dispensaries, 30 laboratories, as outlined in the RFQ. The proposal also includes additional equipment for breakage and replacement.</p> <p>The equipment/devices listed in MJ Freeway's response are covered by a manufacturer's warranty, but questions related to the operation or malfunction of equipment/devices will be handled by technical support provided under this contract.</p>
2	As noted during your oral presentation, your proposal includes the production of MM ID cards. How will ID cards be distributed, and does your proposal include card distribution costs (e.g. postage), if any?	Closed	Not included in project scope.
3	Can an official PA driver license photo be used if MJ Freeway produces MM ID cards? This will require a web service or file exchange.	Closed	Technically feasible but no longer needed.
4	What is the cost reduction if DOH uses another Commonwealth agency for MM ID card production?	Closed	MM ID Cards are not included; therefore, there will not be a cost reduction for using another agency.

Summary of Resolutions to Technical Clarifications
 Updated 4/4/16

5	When is the project baseline scope established—before or after Discovery/Fit Gap Analysis?	Closed	<p>Establishing the project baseline scope is an iterative and collaborative process between MJ Freeway and the Commonwealth throughout the project lifecycle. In our RFQ response, MJ Freeway provided the Commonwealth an implementation and pricing approach that reflect our knowledge of the Commonwealth’s requirements, past project experiences, and domain expertise in the Cannabis industry. This understanding represents the initial project baseline scope. As the project evolves, our proposed governance structure and methodology framework are flexible to allow for changes based on what is discovered in requirement elaboration workshops with the Commonwealth during the Inception phase. Should any of the changes materially impact scope, pricing and schedule assumptions, MJ Freeway will collaborate with the Commonwealth to assess their impacts to the overall project and execute the change control process if necessary.</p> <p>Upon the conclusion of the requirement elaboration workshops in which every requirement will be agreed upon, traced, designed, configured, tested, etc., MJ Freeway will establish a new project baseline scope upon this milestone. Please bear in mind that scope management is an iterative process in nature as changes, for example, regulatory and policy updates, might further be introduced and impacted at any phase of the project lifecycle.</p>
6	MJ Freeway proposed separate resolution times for incidents and problems.	Closed	<p>Parties agreed that DOH will establish initial incident criticality level when reporting a technical issue; after evaluation by technical support, any subsequent change to criticality level will be mutually agreed to by DOH and MJ Freeway.</p> <p>MJ Freeway agreed to develop an incident/problem escalation procedure, including a personnel contact list, for DOH review and approval. The incident/problem escalation plan will be developed and reviewed/approved during the initial project planning phase. DOH’s acceptance and approval of this plan will be a requirement of the project planning acceptance. The plan is expected to include:</p> <ul style="list-style-type: none"> • Process for reporting incidents/problems • Definitions of criticality levels (as mutually agreed to by DOH and MJ Freeway) • Process for escalating if DOH deems necessary • Personnel contact list • Actions expected as part of escalation <p>The incident response timeframes (time to respond and target resolution time) outlined on page 44 of the RFQ technical submittal will establish the minimum acceptable response timeframes in the forthcoming incident/problem escalation plan.</p>

<p>7</p>	<p>The technical requirements outlined in Appendix L include creation/support of web services and file/data exchanges with external entities for both the Seed to Sale and Registry systems.</p> <p>a. Are web services identified during the project planning/discovery period and included in the baseline project scope?</p> <p>b. Do web services include creation of new services as well as integration with existing Commonwealth agency web services?</p> <p>c. Is there a limit to the number of web services or file/data exchanges required by DOH for external integration?</p> <p>d. Are there any other limitations or costs related to the creation/support of web services and file/data exchanges?</p>	<p>Closed</p>	<p>System interfaces (i.e. web services or file exchanges) not identified in the diagram below (slide 19 of the pre-proposal conference slide deck) will require a change order, with resulting work completed in accordance with the vendor rate card.</p> <pre> graph TD Registry((Registry System)) -- "Patient Record Inquiry/Update" --> Dispensary[Dispensary] Dispensary -- "Patient/Product Tracking Data" --> RI((Research Institution)) RI -- "Dispensing Tracking Data" --> Dispensary Registry -- "Patient/Dispensing Data" --> SSTS((Seed/Sale Tracking System)) SSTS -- "Access/Admin" --> PA[PA DOH] PA -- "Access/Admin" --> SSTS PA -- "Order/Review Recalls, Re-Tests" --> TL[Testing Lab] TL -- "Test Data/Results" --> PA TL -- "Test Data/Results" --> GP[G/P] GP -- "Inventory Tracking Data" --> SSTS SSTS -- "Inventory Tracking Data" --> GP </pre>
<p>8</p>	<p>Your proposal notes that Oracle's cloud is FedRAMP moderate. What FedRAMP security baseline will be used for the Amazon platform?</p>	<p>Closed</p>	<p>Amazon Web Services GovCloud is FedRAMP high and Amazon Web Services US East-West Cloud is FedRAMP moderate. MJ Freeway recommends using the AWS GovCloud environment for the PA Seed to Sale Solution.</p>

Summary of Resolutions to Technical Clarifications
 Updated 4/4/16

9	If you provide tier 1 help desk support as outlined in your proposal, will a separate toll-free number be provided for DOH?	Closed	PA DOH will be assigned a single toll-free number with call routing.
10	<p>As noted in the solicitation, DOH retains the right to use an external source to provide tier 1 help desk support.</p> <p>a. Does your proposal include software licenses and other costs that may be necessary to integrate an external call center into your support structure?</p> <p>b. Will you make your knowledgebase, procedures and other related support documentation available for use by the external call center?</p>	Open	<p>MJ Freeway provided call metrics to address this item:¹</p> <ul style="list-style-type: none"> • Estimated call volumes – approx. 3800 per month ² • Number of calls per agent – approx. 55 per day • Number of calls per user – average 1-2 • Average length of call – 8-9 min <p>¹ Projections were based on the MJ Freeway team’s experience in other installations, informed by the program size projections for PA. ² Call volume expected for the PA solution implementation is 38,000 per month. Projected calls to be received/resolved by Tier 1 (UniqueSource) is 10%, or 3,800 per month. This number represents live agent calls, not IVR call handling.</p> <p>MJ Freeway will provide the following to integrate an external provider of Tier 1 support:</p> <ul style="list-style-type: none"> • Ability to create a ticket using email or web form; this information will feed into Salesforce ticketing system • Mechanism (e.g. email or web form) to escalate tickets to Tier 2 team • User manual for software applications • Procedures for handling calls (e.g. how to respond, when to escalate, etc.) • Reference materials related to troubleshooting activities • Design specifications and test scenarios/acceptance criteria to assist the Tier 1 vendor with obtaining knowledge of the system design and intended functionality • Three (3) two (2) hour sessions on the configured applications to facilitate knowledge transfer • Access to a knowledgebase that has reference materials related to troubleshooting activities for Tier 1 <p>MJ Freeway requested information to explain how the Service Level Agreements (SLAs) established in Appendix M of the MM RFQ will apply if UniqueSource provides Tier 1 support. Per OA, if Unique Source takes the contract for Tier 1, MJ Freeway’s SLAs would take effect from the time they receive notification from Unique Source. These two contracts are separate and will be maintained as such by DOH. If MJ Freeway receives the full contract, then the existing SLAs for MJ Freeway will still apply.</p>

Summary of Resolutions to Technical Clarifications
 Updated 4/4/16

11	Certain testing assumptions require clarification.	Closed	<p>Baseline requirements and conceptual flow diagrams, and technical design specifications produced in the Elaboration phase can provide the basis upon which testing strategy, scenarios, and scripts will be developed and executed.</p> <p>As part of the solution, PA DOH will have a dedicated testing environment for the Commonwealth to validate the configured applications. Logistics such as office space, recommended participants, timing, deliverables, etc., will be defined in collaboration with the Commonwealth and baselined in the Project Implementation Plan. DOH will be responsible to arrange meeting space on an ad hoc basis to support on-site project activities.</p> <p>Provision of test data will be a coordinated task for both parties.</p>
12	Would the use of any particular tagging option outlined in your proposal-- RFID, barcode, other— result in cost savings?	Closed	<p>Barcode scanners are included and are a significantly less expensive reader option than RFID enabled readers. If RFID scanners are required, they would increase the scanner device cost by approximately 300%. ar codes are system-generated but can be printed using the same equipment listed in the response to question 1. Costs for printing materials needed to produce bar code tags is not included in the proposal.</p>
13	Please confirm that three items referenced in your proposal are available for DOH use: a. Spanish module; is this module available in both the Seed to Sale and Registry systems? b. Registry functionality to manage applications from medical marijuana organizations c. Payment gateway interface	Closed	<p>The Seed to Sale solution is localized into Spanish and available for DOH use. Although the Registry solution also supports multiple languages including Spanish, that was not factored into the scope of the Registry implementation. We look forward to discuss further with the Commonwealth regarding this requirement.</p> <p>The technology platform to implement the MMO applications is included in the SaaS subscription (no source code changes), based on the user metrics provided in the RFQ. MJ Freeway has not included in scope the effort and cost required to analyze, configure, test, and deploy the functionality of the MMO applications.</p> <p>MJ Freeway confirmed that all integration work to implement the payment gateway interface is included in the proposal price. Gateway transaction costs are not included.</p>

Summary of Resolutions to Technical Clarifications
 Updated 4/4/16

14	The Commonwealth has estimated its initial and full user base; it is our expectation, however, that you will be able to handle either a smaller or a larger user base. How will you do this? Please explain your system's, and your company's, ability to scale as usage grows? What does your experience tell you about the possible growth of the user base and how to be prepared for it?	Closed	<p>The application infrastructure(s) are highly scalable to support several hundred thousand users accessing the system(s) at the same time, and DOH will not incur additional infrastructure-related costs if additional capacity is required to support the user base.</p> <p>MJ Freeway is required to provide technical infrastructure and licensing to support a user base of 250,000, with an estimated concurrent volume of 10,000. DOH will pay a SaaS subscription fee, with no restrictions limiting user sessions specifically, or user system interactions in general. MJ Freeway confirmed this statement, and DOH subsequently acknowledged MJ Freeway's confirmation that the solution is not subject to any licensing caps.</p>
15	Will the training plan be included as part of the implementation plan developed during the project planning stage?	Closed	<p>The training strategy will be part of the implementation plan and the details on training execution will be finalized later in project lifecycle. MJ Freeway confirmed that the training plan will be executed by MJ Freeway and is included in the proposal price.</p>
16	Please provide any license terms that you expect will be applicable to the Commonwealth or any of its users (either via click-through or any other method of agreement or acknowledgement).	Open	<p>A source code escrow agreement is not required for this engagement.</p> <p>Proposed license terms are too restrictive for Commonwealth MMOs, who should not, for example, be required to be bound to MJ Freeway in order to be permitted users of this system. We think it more appropriate for a permitted user to promise to follow certain rules, but not to be bound as though they are the licensee. We also want to know what terms are applicable to the Commonwealth itself, as the licensee.</p> <p>Commonwealth attorneys will provide mark-up for review by MJ Freeway.</p>

Summary of Resolutions to Technical Clarifications
 Updated 4/4/16

17	<p>As outlined below, your proposed Tier 1 support costs contain a substantial increase in the third year. Please explain the increase. \$419638.15 \$432227.3 \$1445194.1 \$458549.94 \$472306.44</p>	Closed	<p>MJ Freeway ran several costing scenarios, particularly around the acquisition, distribution and support of hardware for PA licensees. Once we determined the scenario of choice, we inadvertently forgot to parse this number into the correct years as part of our final response. The identified costs Tier 1 support should reflect the following:</p> <p>\$569,638.15 \$582,227.30 \$595,194.12 \$608,549.94 \$616,056.44</p> <p>The topline totals with and without Tier 1 are:</p> <table border="1"> <thead> <tr> <th rowspan="2">Task</th> <th colspan="5">Base Years</th> <th colspan="3">Renewal Years</th> </tr> <tr> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> <th>Year 4</th> <th>Year 5</th> <th>Year 6</th> <th>Year 7</th> <th>Year 8</th> </tr> </thead> <tbody> <tr> <td>Totals with Tier 1</td> <td>\$ 2,749,808.15</td> <td>\$ 1,790,997.10</td> <td>\$ 1,844,742.56</td> <td>\$ 1,900,915.95</td> <td>\$ 1,953,380.90</td> <td>\$ 1,882,006.47</td> <td>\$ 1,958,167.43</td> <td>\$ 2,039,244.55</td> </tr> <tr> <td>Totals without Tier 1</td> <td>\$ 2,180,170.00</td> <td>\$ 1,208,769.80</td> <td>\$ 1,249,548.44</td> <td>\$ 1,292,366.01</td> <td>\$ 1,337,324.46</td> <td>\$ 1,395,530.84</td> <td>\$ 1,457,097.53</td> <td>\$ 1,523,142.55</td> </tr> </tbody> </table>	Task	Base Years					Renewal Years			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Totals with Tier 1	\$ 2,749,808.15	\$ 1,790,997.10	\$ 1,844,742.56	\$ 1,900,915.95	\$ 1,953,380.90	\$ 1,882,006.47	\$ 1,958,167.43	\$ 2,039,244.55	Totals without Tier 1	\$ 2,180,170.00	\$ 1,208,769.80	\$ 1,249,548.44	\$ 1,292,366.01	\$ 1,337,324.46	\$ 1,395,530.84	\$ 1,457,097.53	\$ 1,523,142.55
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18	<p>Cost Reduction – Discuss a five percent (5%) overall cost reduction</p>	Closed	<p>Final cost terms for SaaS subscription acknowledged and accepted by both parties.</p> <p>Total 5-year cost with extended Tier 1 support, less 3% discount = \$9,644,397.72.</p> <p>Calculation:</p> <p>\$10,239,844.66 (total contract cost with Tier 1)</p> <p>- \$297,166.60 (for Commonwealth/UniqueSource Tier 1 services)</p> <p>-----</p> <p>= \$9,942,678.06</p> <p>Less 3% = \$9,644,397.72</p> <p>If UniqueSource opts not to provide Tier 1 services, the contract amount will be increased by \$297,166.60, raising the total 5-year cost to \$9,941,564.32.</p> <p>DOH will pay the subscription fee at the beginning of each quarter.</p>																																			

Summary of Resolutions to Technical Clarifications
 Updated 4/4/16

19	Project Management	Closed	<p>TreCom will be providing project management services. Karen Kaussner will serve as the primary project manager and the TreCom project manager will provide on-site support under her direction.</p> <p>MJ Freeway provided the resume of the proposed on-site TreCom project manager for DOH approval.</p>
20	3 rd Party Assessment, Insurance	Open	<p>During the term of the contract, MJ Freeway will provide DOH with a detailed summary of all third-party security/risk assessments, including audits, vulnerability scans, penetration tests and compliance reviews, within 15 calendar days of receipt. The detailed summary must include information necessary for DOH to objectively assess each finding or recommendation, including a description, criticality level, remediation plan, and remediation timeframe.</p> <p>Copy of insurance certification was provided.</p> <p>Commonwealth attorneys will follow up with Insurance certificate requirements.</p>
21	Active Directory Integration	Closed	<p>MJ Freeway has the capability to integrate with the Commonwealth's ActiveDirectory for logon and credential services so Commonwealth employees can use single sign-on. MJ Freeway supports SSO integration based on SAML 2.0 for increased compatibility and easier adoption. This integration is not currently in scope and would require a change order.</p>
22	Protection of Confidential Information	Closed	<p>DOH will identify confidential information during project planning and execution that requires appropriate protections and controls to restrict user and query/report access and privileges for data classified by DOH as confidential. Both the Registry and the Seed to Sale solutions use role based access controls to restrict access to information. DOH will be able to define the profile that grants and restricts access to certain data and information. Additional restrictions can also be added through configuration to ensure restricted information is safely secured.</p>

APPENDIX H, COST MATRIX

Vendor Name	MJ Freeway LLC
Vendor ID Number	519825
Vendor TIN	27-2354485

Summary

Costs including Tier 1 Help Desk Support	
SaaS Subscription Base Years	\$ 9,941,564.32
Requirement Customizations	\$ 45,000.00
Total Costs Base Years	\$ 9,986,564.32

SaaS Subscription Renewal Years	\$ 5,879,418.45
Total Costs Renewal Years	\$ 5,879,418.45

Total Costs Base & Renewal Years	\$ 15,865,982.77
----------------------------------	------------------

Costs excluding Tier 1 Help Desk Support	
SaaS Subscription Base Years	\$ 9,644,397.72
Requirement Customizations	\$ -
Total Costs Base Years	\$ 9,644,397.72

SaaS Subscription Renewal Years	\$ 5,729,053.69
Total Costs Renewal Years	\$ 5,729,053.69

Total Costs Base & Renewal Years	\$ 15,373,451.41
----------------------------------	------------------

Instructions

- 1.) All sheets must be filled out completely. Fill out all yellow highlighted cells on each worksheet.
- 2.) Formulas are imbedded in the Worksheets. Contractor's is responsible and must verify that all calculations, subtotal costs and grand total costs are accurate.
- 3.) Vendor Information. Complete the required cells. The information will carry forward through the rest of the worksheet.

- 3.) SaaS Subscription. The annual total for the subscription should be entered. Subscription costs should include all costs to implement, maintain and support the solution. The subscription costs should be based on calculations including and excluding Tier 1 help desk support as stated in the RFQ.
- 4.) Blended Rate: Contractors should enter the blended hourly rate for performing customizations needed to meet the requirements. The rates entered into the highlighted fields will remain in effect for the duration of the contract and be used when future customizations are needed.
- 5.) Requirement Customizations: Follow the instructions. References should be made using the MM Detailed Requirements Appendix K submitted with the Offeror's proposal.
- 6.) Summary. All amounts will be transferred and calculated automatically.
- 7.) Monetary cells without a dollar amount will be translated to mean zero (0) dollars.
- 8.) Please contact the Issuing Officer with any questions or concerns.

Vendor Information

Offeror Name	Contact Person	
MJ Freeway LLC	Amy Poinsett	
Offeror Address	Email Address	
1601 Arapahoe St	amy@mjfreeway.com	
8th Floor	Phone Number	Fax Number
Denver, CO 80201	970-708-0213	888-932-6537
Vendor Number	Federal ID or SSN (TIN)	
519825	27-2354485	

APPENDIX H, COST MATRIX

Vendor Name	MJ Freeway LLC
Vendor ID Number	519825
Vendor TIN	27-2354485

SaaS Subscription

Task	Base Years					Renewal Years		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
IV-4.H. Solution Operation & Support (including Tier 1 help desk support)	\$ 2,669,096.91	\$ 1,739,050.19	\$ 1,791,183.28	\$ 1,845,671.47	\$ 1,896,562.47	\$ 1,882,006.47	\$ 1,958,167.43	\$ 2,039,244.55
IV-4.H. Solution Operation & Support (excluding Tier 1 help desk support)	\$ 2,612,059.00	\$ 1,680,791.14	\$ 1,731,666.45	\$ 1,784,859.13	\$ 1,835,022.00	\$ 1,833,358.90	\$ 1,908,060.44	\$ 1,987,634.35

Total Base Years with Tier 1	\$ 9,941,564.32
Total Base Years without Tier 1	\$ 9,644,397.72
Total Renewal Years with Tier 1	\$ 5,879,418.45
Total Renewal Years without Tier 1	\$ 5,729,053.69
Total Base & Renewal Years with Tier 1	\$ 15,820,982.77
Total Base & Renewal Years without Tier 1	\$ 15,373,451.41

*The annual SaaS subscription shall be paid in equally quarterly payments.

Vendor Name	MJ Freeway LLC
Vendor ID Number	519825
Vendor TIN	27-2354485

Blended Rate

Blended Rate (Base Years)*	\$ 150.00
Blended Rate (Renewal Years)	\$ 150.00

NOTE: The information provided is for evaluation purposes only and does not guarantee payment or work to be performed.

NOTE: The rates entered will remain for the life of the contract during each respective phase.

* The rates entered in the Blended Rate (Base Years) will be used in the table below to calculate cost totals for each customization needed to meet the requirements for the solution upon implementation.

NOTE: Additional enhancements and required customizations may be requested during the life of the contract. The enhancements will follow the change management process and the rates established above shall be used.

Requirements Customization

System	Subcategory	*Technical Requirement tab line reference	Function Description	Requirement Statement	Hours Required	Amount	
Registry	Audit	line 6	Data & Reporting/Tracking	The registry solution must track and retain an auditable database history, including modifications to any information in the database(s).	10	\$ 1,500.00	EXAMPLE - based on \$150/hour
Registry	Security & Privacy	line 28	Credentials	The registry solution must allow a registered user to establish or deactivate a delegate subaccount(s) for their designee(s), and further, include a mechanism for the user to monitor system activity of their designee(s) online and through a reporting mechanism.	100	\$ 15,000.00	
Seed to Sale	Security & Privacy	line 90	Credentials	The seed-to-sale solution must allow a registered user to establish or deactivate a delegate subaccount(s) for their designee(s), and further, include a mechanism for the user to monitor the system activity of their designee(s) online and through a reporting mechanism.	100	\$ 15,000.00	
Seed to Sale	Internal	line 75	Tax	The seed-to-sale solution must allow approved grower/processors to electronically remit excise tax payments.	25	\$ 3,750.00	
Seed to Sale	Internal	line 76	Tax	The seed-to-sale solution must permit the manual posting of tax payment(s) received outside of the system.	25	\$ 3,750.00	
Seed to Sale	Internal	line 77	Tax	The seed-to-sale solution must provide the ability to clear the tax payment against the gross receipts tax liability for the specified time period.	25	\$ 3,750.00	
Seed to Sale	Internal	line 78	Tax	The seed-to-sale solution must deposit gross receipts tax payments directly into an established Medical Marijuana fund.	25	\$ 3,750.00	
					0	\$ -	
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					0	\$ -	
					0	\$ -	
					0	\$ -	
					0	\$ -	
Total Customization Costs						\$	45,000.00

NOTE: Additional rows may be added if needed.

*Technical Requirement line reference - Contractors should use the line reference from Appendix "X" - MM Detailed Requirements (see example above)

**PPENDIX G
SMALL DIVERSE AND SMALL BUSINESS
LETTER OF INTENT**

April 6, 2017

**Joel D. Warshaw, MD
Chief Executive Officer
Premier Personal Healthcare, LLC
2000 Oxford Drive Suite 440
Bethel Park, PA 15102**

Dear Dr. Warshaw:

This letter serves as confirmation of the intent of MJ Freeway, LLC to utilize Premier Personal Healthcare, LLC on RFQ # 6100040415 Medical Marijuana, issued by the Department of Health.

If MJ Freeway, LLC is the successful vendor, Premier Personal Healthcare, LLC shall provide Training, Testing and card production services during the initial term of the prime contract and during any extensions, options or renewal periods of the prime contract exercised by the Commonwealth, as more specifically set forth below: contract beginning in 2017 and continuing five base years with option for three renewal years.

These services represent 3.12% of the total cost in the MJ Freeway, LLC cost submittal for the initial term of the contract. Dependent on final negotiated contract pricing and actual contract usage or volume, it is expected that Premier Personal Healthcare, LLC will receive an estimated \$306,985.60 during the initial contract term.

Premier Personal Healthcare, LLC represents that it meets the small or small diverse business requirements set forth in the RFQ and all required documentation has been provided to MJ Freeway, LLC for its SDB/SB submission.

We look forward to the opportunity to serve the Department of Health on this project. If you have any questions concerning our small business or small diverse business commitment, please feel free to contact me at the number below.

Sincerely,

Acknowledged,

Amy Poinsett
CEO
MJ Freeway, LLC
970-708-0213

Joel D. Warshaw, MD
Chief Executive Officer
Premier Personal Healthcare, LLC.
412-833-2233

APPENDIX F
SMALL DIVERSE BUSINESS (SDB) AND SMALL BUSINESS (SB)
PARTICIPATION SUBMITTAL

Project: Medical Marijuana - In order to implement Act 16 of 2016, the Pennsylvania Department of Health is seeking to procure a hosted, Software as a Service(SaaS) Medical Marijuana seed to sale tracking system, which will be used to monitor, control and report on activities of authorized growers, processors, dispensaries, Laboratories and research institutions. This procurement also supports the implementation of a hosted, SaaS registry for providers, patients and caregivers.

Contractor Firm: MJ Freeway

Contractor Contact Name: Amy Poinsett **Email:** amy@mjfreeway.com

CONTRACTOR INFORMATION:

Is your firm a DGS-Verified Small Diverse Business? Yes No (MUST check one)

Is your firm a DGS-Self-Certified Small Business? Yes No (MUST check one)

SUBCONTRACTING INFORMATION:

Percentage Commitment for SDB and SB Subcontracting Participation

After examination of the contract documents, which are made a part hereof as if fully set forth herein, the Contractor commits to the following percentages of the total contract cost for Small Diverse Business and Small Business subcontracting participation.

Small Diverse Business Subcontracting percentage commitment:

36.9 % Thirty-six point nine Percent
(Figure) (Written)

Small Business Subcontracting percentage commitment:

3.12 % Three point one two Percent
(Figure) (Written)

Listing SDB and SB Subcontractors

The Contractor must list in the chart below the SDBs and SBs that will be used to meet the percentage commitments provided above. Include the SDB/SB firm name, SDB or SB designation, SDB/SB Primary Contact Information, a description of the service or supplies the SDB/SB will provide, fixed percent of total contract cost committed, estimated dollar value of each commitment, and an indication as to the Contractor's intent to utilize the SDB/SB subcontractor for contract options or renewals. Include as many pages as necessary. **Contractors must also include a Letter of Intent as indicated in RFQ Part II, Section II-10 for each SDB/SB listed.**

SDB/SB Name	SDB or SB	Primary Contact Name & Email	Description of Services or Supplies to be provided	% of total Contract Cost Committed	Estimated \$ value of Commitment	Will SDB/SB be used for options/renewals? (yes/no)
TreCom Systems Group, LLC	SDB	Phillip Gring pgring@trecomsystems.com	Tier 1 Support, Project Manager, Business Analyst, Equipment provisioning	36.9%	\$3,667,965.71	Yes
Premier Personal Healthcare, LLC	SB	Joel Warshaw joel@warshawmd.com	Testing, Training	3.12%	\$306,985.60	Yes

**APPENDIX G
SMALL DIVERSE AND SMALL BUSINESS
LETTER OF INTENT**

April 6, 2017

**Joel D. Warshaw, MD
Chief Executive Officer
Premier Personal Healthcare, LLC
2000 Oxford Drive Suite 440
Bethel Park, PA 15102**

Dear Dr. Warshaw:

This letter serves as confirmation of the intent of MJ Freeway, LLC to utilize Premier Personal Healthcare, LLC on RFQ # 6100040415 Medical Marijuana, issued by the Department of Health.

If MJ Freeway, LLC is the successful vendor, Premier Personal Healthcare, LLC shall provide Training, Testing and card production services during the initial term of the prime contract and during any extensions, options or renewal periods of the prime contract exercised by the Commonwealth, as more specifically set forth below: contract beginning in 2017 and continuing five base years with option for three renewal years.

These services represent 3.21 of the total cost in the MJ Freeway, LLC cost submittal for the initial term of the contract. Dependent on final negotiated contract pricing and actual contract usage or volume, it is expected that Premier Personal Healthcare, LLC will receive an estimated \$306,985.60 during the initial contract term.

Premier Personal Healthcare, LLC represents that it meets the small or small diverse business requirements set forth in the RFQ and all required documentation has been provided to MJ Freeway, LLC for its SDB/SB submission.

We look forward to the opportunity to serve the Department of Health on this project. If you have any questions concerning our small business or small diverse business commitment, please feel free to contact me at the number below.

Sincerely,

Acknowledged,

Amy Poinsett
CEO
MJ Freeway, LLC
970-708-0213

Joel D. Warshaw, MD
Chief Executive Officer
Premier Personal Healthcare, LLC.
412-833-2233

**APPENDIX F
SMALL DIVERSE BUSINESS (SDB) AND SMALL BUSINESS (SB)
PARTICIPATION SUBMITTAL**

Project: Medical Marijuana - In order to implement Act 16 of 2016, the Pennsylvania Department of Health is seeking to procure a hosted, Software as a Service(SaaS) Medical Marijuana seed to sale tracking system, which will be used to monitor, control and report on activities of authorized growers, processors, dispensaries, Laboratories and research institutions. This procurement also supports the implementation of a hosted, SaaS registry for providers, patients and caregivers.

Contractor Firm: MJ Freeway

Contractor Contact Name: Amy Poinsett **Email:** amy@mjfreeway.com

CONTRACTOR INFORMATION:

Is your firm a DGS-Verified Small Diverse Business? Yes No (MUST check one)

Is your firm a DGS-Self-Certified Small Business? Yes No (MUST check one)

SUBCONTRACTING INFORMATION:

Percentage Commitment for SDB and SB Subcontracting Participation

After examination of the contract documents, which are made a part hereof as if fully set forth herein, the Contractor commits to the following percentages of the total contract cost for Small Diverse Business and Small Business subcontracting participation.

Small Diverse Business Subcontracting percentage commitment:

35.09 % Thirty-five point zero nine Percent
(Figure) (Written)

Small Business Subcontracting percentage commitment:

3.21 % Three point two one Percent
(Figure) (Written)

Listing SDB and SB Subcontractors

The Contractor must list in the chart below the SDBs and SBs that will be used to meet the percentage commitments provided above. Include the SDB/SB firm name, SDB or SB designation, SDB/SB Primary Contact Information, a description of the service or supplies the SDB/SB will provide, fixed percent of total contract cost committed, estimated dollar value of each commitment, and an indication as to the Contractor's intent to utilize the SDB/SB subcontractor for contract options or renewals. Include as many pages as necessary. **Contractors must also include a Letter of Intent as indicated in RFQ Part II, Section II-10 for each SDB/SB listed.**

SDB/SB Name	SDB or SB	Primary Contact Name & Email	Description of Services or Supplies to be provided	% of total Contract Cost Committed	Estimated \$ value of Commitment	Will SDB/SB be used for options/renewals? (yes/no)
TreCom Systems Group, LLC	SDB	Phillip Gring pgring@trecomsystems.com	Tier 1 Support, Project Manager, Business Analyst, Equipment provisioning	35.09%	\$3,384,564.11	Yes
Premier Personal Healthcare, LLC	SB	Joel Warshaw joel@warshawmd.com	Testing, Training	3.21%	\$306,985.60	Yes

TECHNICAL SUBMITTAL

II-2. Statement of the Problem

In order to comply with the requirements in PA Act 16 of 2016, the Pennsylvania Department of Health seeks a comprehensive software solution that includes:

- A Seed-to-Sale tracking system to monitor, control and report on activities of authorized licensees. System should be a hosted, Software as a Service (SaaS) environment.
- A temporary “bridge” tracking system in advance of full-scale implementation of Seed-to-Sale system. This temporary solution must be in place by July 1, 2017.
- A Registry system for patients, caregivers, practitioners and medical providers. System should be a hosted, Software as a Service (SaaS) environment and will integrate with the Seed-to-Sale system.

II-3. Management Summary

Since 2010, MJ Freeway has designed, developed, deployed, and supported its highly versatile COTS platform as a central data management platform for inventory, point of sale, and other data. MJ Freeway invented seed to sale tracking for Cannabis and is patent pending on both the concept and the software methodology. The MJ Freeway development team has consistently demonstrated a high degree of experience and knowledge in efficiently modifying the platform to meet demanding and ever-changing compliance requirements worldwide. MJ Freeway employs an information architecture that enables its developers to quickly and easily create customizations and configuration options. This has proven invaluable, particularly in the face of rapidly changing legislation and different requirements from state to state, and country to country. MJ Freeway's software tools for cannabis business licensees are in use in over 1000 regulated cannabis businesses across the country. MJ Freeway's product for regulatory authorities, Leaf Data Systems, is in use in multiple state and local government environments.

Leaf Data Systems is designed to track every action performed on each plant from its creation (i.e. from seed, clone, or tissue) through any changes of form, transactions, and transportation, all the way to the sale to a patient of finished Cannabis product. This all-encompassing process is commonly referred to as “seed to sale” tracking, and MJ Freeway is patent pending on that important reference. The purpose of the seed to sale inventory tracking methodology is to track each plant and each gram of Cannabis throughout the entire cultivation and distribution cycle: propagation, cultivation, harvest, post-harvest processing, testing, manufacturing, distribution, processing, inventory, and finally the point of sale. Destruction and disposal are also captured. This patent-pending, proprietary tracking methodology provides numerous unique data points, including manufacture date and expiration date, throughout the entire product history, ensuring accurate data for managerial and compliance reporting, as well as enabling efficient and accurate product recalls. Throughout the seed to sale process, DOH will have the ability to see all Cannabis, in all locations, and in all forms. Each object in Leaf Data Systems’ database, including each plant, product, and inventory item, is assigned a globally unique, non-repeating identification number upon creation within the database table. Licensee barcodes/RFID tags bear the tag or label ID and are attached to every item, including plants, packages, and infused or edible products. For each inventory transaction, this unique identifier is recorded, along the time and date of the transaction and the user ID of the individual performing the transaction. This data, as with all data in Leaf Data Systems, can be recorded by the Licensee through manual entry, CSV file upload, or API integration. Leaf Data System’s deployment is highly scalable and uses a cloud configuration that is unique to the cannabis industry. Leaf Data Systems is hosted at redundant Tier 3 data center locations on virtualized servers. The data centers themselves are geographically dispersed. This professionally managed infrastructure framework is commensurate with

high system availability rates, extremely responsive Mean Time to repair times, system redundancy, system resiliency, disaster recovery, and business continuity.

For this project, we recommend utilizing a government cloud environment at the cloud provider data center that is concurrently maintainable, with an Infrastructure as a Service (IaaS) provider. The cloud provider facility provides a highly available blended ISP transit solution for bandwidth, ensuring 99.99%+ uptime and access to the system for the Pennsylvania Department of Health as well as all authorized licensees in Pennsylvania.

DOH has indicated a preference for a closed Seed-to-Sale model, in which DOH and approved growers/processors, laboratories, clinical registrants, academic clinical research centers, and dispensaries use a single, centralized system that supports the operational/inventory/point of sale needs of approved organizations and fulfills the regulatory tracking requirements for DOH. MJ Freeway is well positioned to meet this requirement with the powerful combination of the MJ Freeway business solution platform and Leaf Data Systems. The MJ Freeway business solution platform includes functionality to meet the operational/inventory/point of sale requirements of growers/processors, laboratories, clinical registrants, academic clinical research centers, and dispensaries and is integrated with Leaf Data Systems. The combination of these two systems into one offers DOH a powerful tool for seed-to-sale tracking and regulatory management.

Should DOH determine that a decentralized model will better meet the Commonwealth's requirements, MJ Freeway can readily accommodate that approach as well. Leaf Data Systems offers an industry standard open API interface which can be used by any operational/inventory/point of sale system to integrate with Leaf Data Systems. This allows the data exchange to occur in real time, and can be controlled through formalized process. MJ Freeway's business solution platform is included in this response as a commercially available module, currently in use by over 1000 licensed growers, manufacturers and dispensers to fulfill operational/inventory/point of sale functionality needs. The MJ Freeway business solution platform has demonstrated operability with Leaf Data Systems.

MJ Freeway understands the Commonwealth's Department of Health is endeavoring to implement a hosted Software-as-a-Service (SaaS) that facilitates a secured, electronic, and online database ("Registry") to approve, register, credential, and administer ordering practitioners, physicians and qualified patients, as well as caregivers. This Registry will further enable integration with the Seed to Sale system as necessary to track patient dispensary activity. In addition to the aforementioned stakeholders, the registry can be made accessible to law enforcement, dispensing organization staff, and DOH staff.

MJ Freeway partners with Oracle to deliver the Registry solution. This cloud-hosted solution, successfully implemented in several States, provides a complete, open, modular, and integrated platform for all Registry requirements. Our approach takes advantage of MJ Freeway's domain expertise and Oracle's extensive research, development, project, and technical expertise in providing Health and Human Services solutions that will continue to grow with the Commonwealth for many years to come. Based upon our understanding of DOH's requirements, deliverables, methodology, and shared vision of the implementation principles, phasing, and timeline, we can present a strong business case for providing the implementation of the Registry solution.

MJ Freeway and Oracle recommend DOH to utilize elements of the Oracle Unified Method (OUM), Oracle's standards-based method that enables the entire enterprise IT lifecycle, to implement the Registry solution. By combining recommended practices, activities and tasks in different ways, OUM is scalable and extensible to adapt to MJ Freeway's delivery framework and Commonwealth's implementation approach as described in the RFQ. This methodology has been used to implement successful projects in many health projects across Federal as well as State & Local agencies. OUM provides an implementation approach that is agile, incremental, iterative, rapid, and broadly adaptive that incorporates the Commonwealth's standards and practices, and business-focused. OUM includes a comprehensive project management framework and materials to support Oracle's growing focus on enterprise-level IT strategy, architecture, and governance.

II-4. Work Plan

Our approach assumes that we will use the standard functionality provided by the applications versus customizing the applications. Customization of the applications leads to higher risk and a higher cost of ownership. Using the recommended leading practices built into our applications, we will configure the applications to address the requirements which will require the Commonwealth to align its business processes with the applications. Our approach has five major phases: Inception, Elaboration, Construction, Transition, and Production.

- **Inception** - The overriding goal of the Inception phase is concurrence among all stakeholders on the lifecycle objectives for the project. It is the time to begin assembling and integrating the project team, to scope the entire engagement, develop the initial project plan, and identify any significant project risks. The Inception phase is used to kick off the project and confirm, document, prioritize the high-level business requirements for the project, and begin the fit/gap analysis. The fit/gap analysis determines how well the standard functionality of the application addresses Commonwealth's business processes and requirements. Processes that can be handled in the same or similar fashion without customization will be considered a fit. Gaps are those processes that would require a change in policies and/or procedures.
- **Elaboration** – In the Elaboration phase, we will start to further define other elements while refining the approach for the key architecture elements. These findings would also include our approach to get the elements into the system. During this phase the first of three Conference Room Pilots will be conducted where MJ Freeway will demonstrate various aspects of the system to be implemented. We will demonstrate examples of configuration in our pre-configured Medical Marijuana environments called the Gold Instance. The power of bringing this tool into the project at this time will help the Commonwealth see a typical system in action and configured with values you might find more familiar than those supplied by the Install Demo environment. This instance can be used to validate decisions and approaches delivered in the system including processes and their associated controls. As a change management tool, it has been our experience that project teams will show more enthusiasm for and adoption of a system that is configured to have a look and feel similar to their business.
- **Construction** – The goal of the Construction phase is to take the solution from detailed requirements models, through configuration of the applications and development and testing of reports, interfaces and conversion programs, to a system that is ready to go into production. In short, the team completes the development of the system, determines that all components fit together, and prepares the system for the acceptance test and deployment. During construction testing falls into the following major categories:
 - **Unit Testing.** The unit test is driven by the smallest pieces of business functionality provided by the system. Unit testing validates data, business rules, and business process requirements. In addition, unit testing validates that business processes work as designed and the database is ready for full functionality testing.
 - **System Testing.** The system test is driven by the connections between components of the Seed to Sale, Registry, and DOH legacy systems. The test focuses on point-to-point business processing (among and between modules). All issues will be logged, and Priority 1 and 2 issues will be resolved prior to the systems integration test.
 - **System Integration Testing.** System Integration Testing (SIT) is a testing phase that includes end-to-end business process testing and security testing designed to verify that all applications, custom code including interfaces and custom reports are functioning as expected.

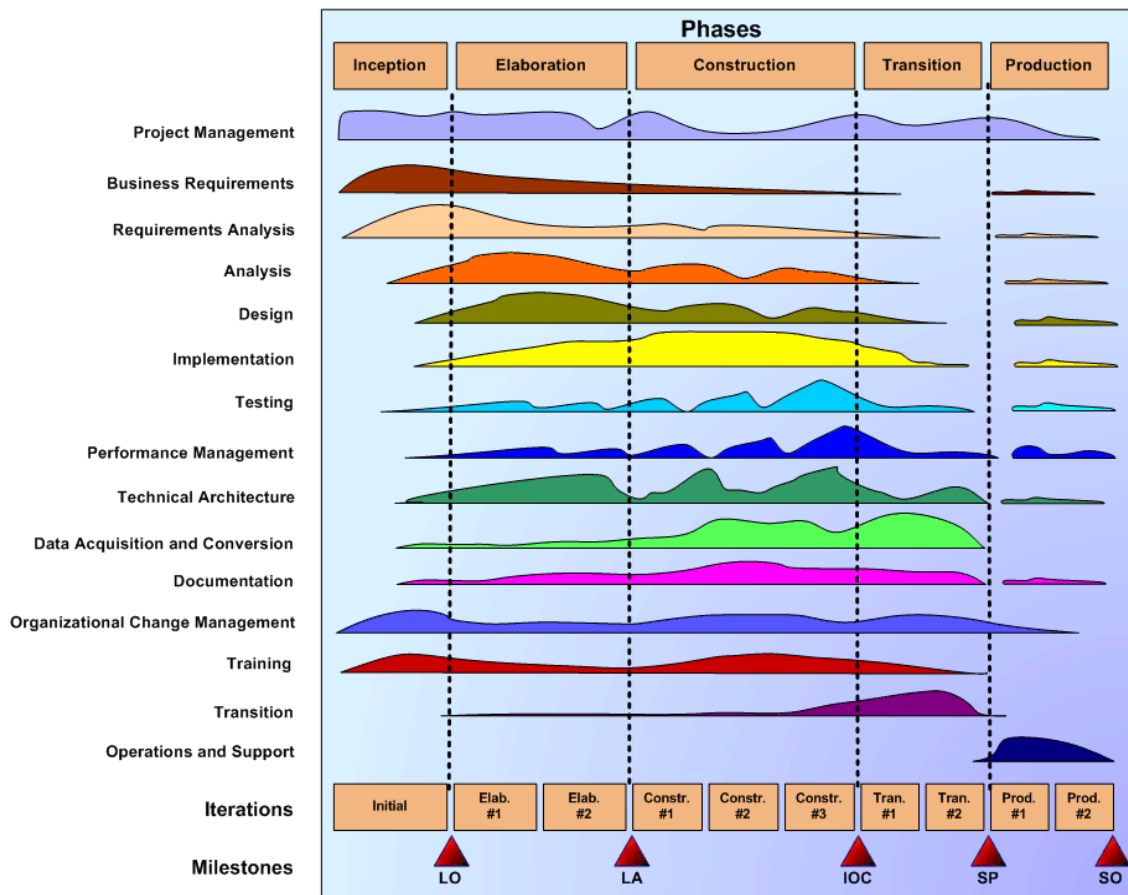
The tested system is the major end work product of the Construction phase. Also during this phase, training materials are developed in preparation for training the end users in the use of the system.

- **Transition** – During this phase, the new system is accepted by the organization, the organization is made ready for the new system, and the system is put into production. During this phase, the MJ Freeway Project

Manager will work with DOH’s Project Manager to develop a production cutover plan, which includes the go-live schedule and a checklist of tasks required to transition to production. All project leads will be involved in the development and review of the document to validate that all cutover tasks/events are included and in the right sequence. Risks and mitigation strategies will be identified and documented and a cutover contingency plan will be developed that can be executed in the event that issues arise that may impact the go-live schedule.

- **Production** – The goal of the Production phase is to operate the new system, assess the success of the system, and support the users.

All tasks are organized into processes that group related tasks together. Project team members are assigned to these groupings according to their specialization and background. The figure below illustrates how the processes are executed across the five phases of the project lifecycle.



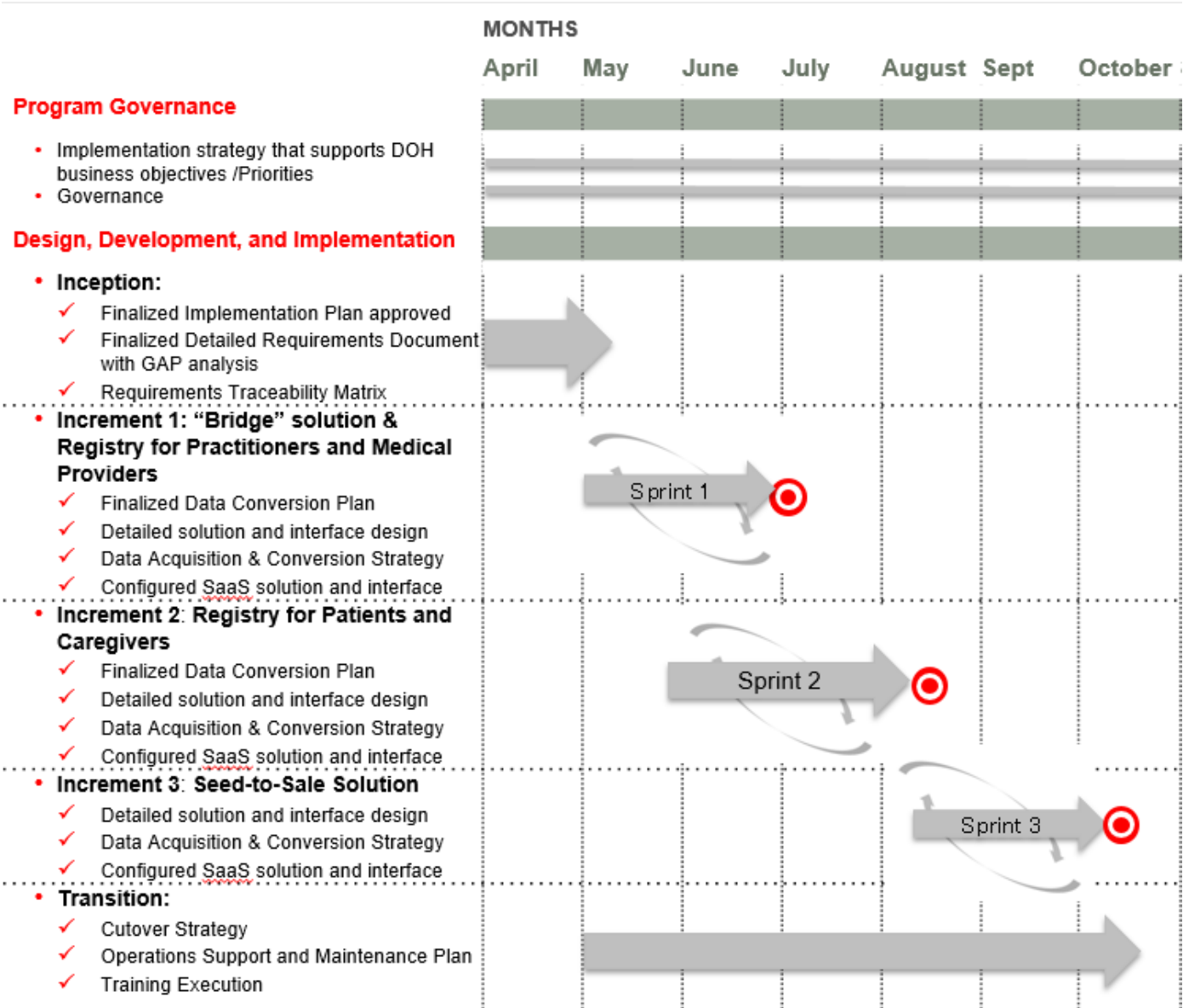
Implementation Planning

MJ Freeway/Oracle aims to collaborate with DOH to further understand organizational structure and governance processes and will structure our team and processes to naturally align. The MJ Freeway project governance approach will integrate with DOH for planning, decision making, issue resolution, tracking, and reporting. Further, we recommend DOH and MJ Freeway/Oracle team members have role-pairing, where “shoulder to shoulder” interactions occur naturally to facilitate knowledge transfer and the function of the project.

MJ Freeway/Oracle will work collaboratively with DOH to further refine and baseline the workplan during project initiation to support reporting of status, metrics, and key performance indicators (KPIs). In accordance with our methodology, MJ Freeway/Oracle recommends updating the schedule on a regular basis to:

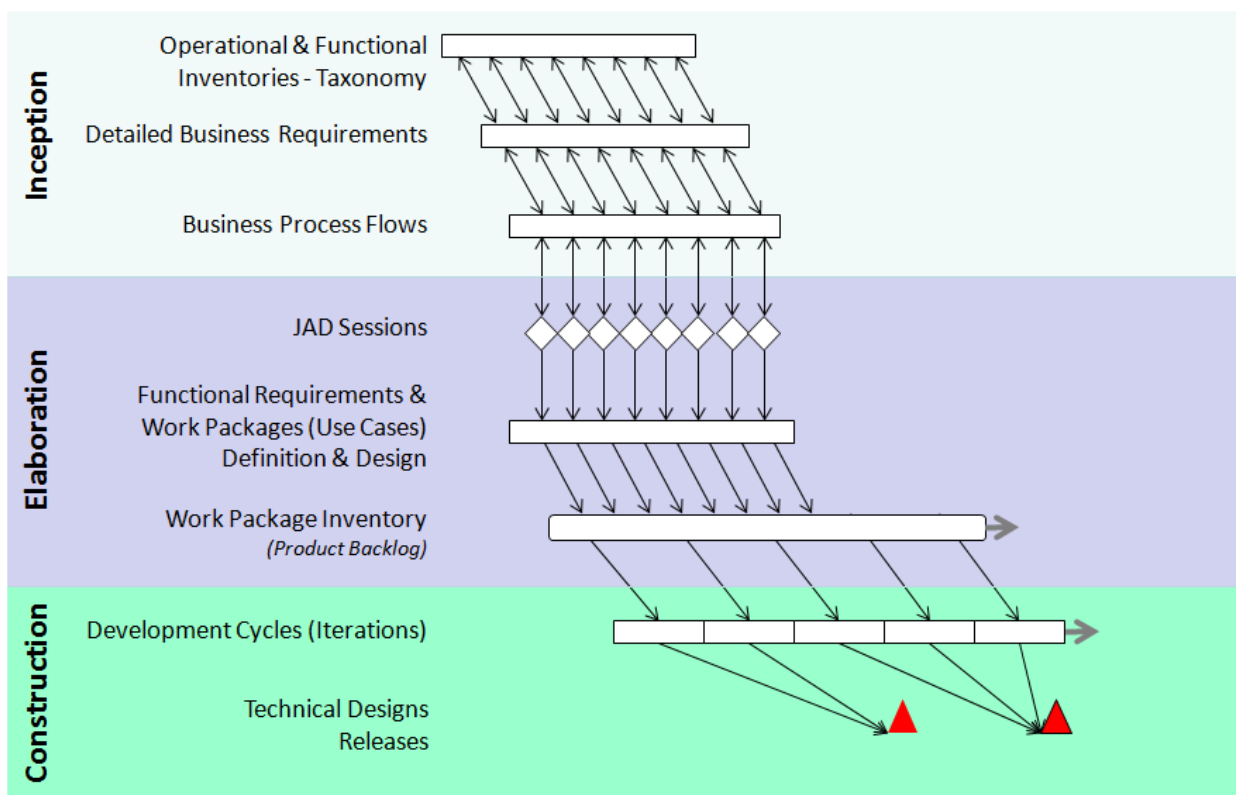
- Reflect progress,
- Support reporting of status, metrics, and KPIs,
- Identify risks and issues and support management’s resolution efforts to resolve them, and
- Provide greater detail and insight into upcoming project activities.

The figure below provides an overview of the time frames for the major Design, Development, and Implementation (DDI) activities of the project. The DDI is a customized OUM approach that MJ Freeway believes will help DOH meet the July 2017 implementation date. It also supports the DOH desire, shared by our core principle, of implementing a COTS solution with no/limited customization.



MJ Freeway’s project execution approach employs the following principles:

- Iterative and Incremental** – OUM recognizes the advantages of an iterative and incremental approach to development and deployment of information systems. Any of the tasks within OUM may be iterated. Whether or not to iterate, as well as the number of iterations, varies. Tasks may be iterated to increase quality of the work products to a desired level, to add sufficient level of detail, or to refine and expand the work products on the basis of user feedback. MJ Freeway’s approach to implement the Seed to Sale and Registry replacement project is focusing on the iterative Construction approach in which functional and solution components are logically encapsulated into work packages. Each of the work packages will be designed, configured, and tested through Conference Room Pilot (CRP) sessions to refine solution design and specifications, obtain early user acceptance, and demonstrate technology interoperability and impacts to DOH legacy and operational environments. The organization of the work packages can be tailored to align to the process and departmental priorities, e.g., Provider Certification, Patient Registration, Caregiver Registration, Seed to Sale, Payment Processing, etc., or a combination thereof. This approach is illustrated below:



- Business Process and Use Case-Driven** – Business processes and use cases, expressed in the context of the functions currently performed in Seed to Sale and Registry, are used as the primary artifacts for establishing the desired behavior of the system and for communicating this behavior among the stakeholders.
- Architecture-Centric** – In the context of the software lifecycle, architecture-centric means that the system’s architecture is used as a primary artifact for conceptualizing, constructing, managing and evolving the system that is being implemented. Architecture refers to the set of significant decisions about the organization of a software system, the selection of the structural elements and their interfaces by which the system is composed, together with their behavior as specified in the collaboration among those elements, the composition of these structural and behavioral elements into progressively larger subsystems, and the architectural style that guides this organization.

- **Risk-Focused** – A key focus of each iteration in MJ Freeway’s methodology is to attack and reduce the most significant project risks. This helps address that the project team addresses the most critical risks as early as possible in the project lifecycle.
- **Flexible and Scalable** – OUM subscribes to an iterative approach that incorporates testing and validation throughout the lifecycle, rather than testing for quality only at the end of the project. In addition, MJ Freeway recommends using prototypes and Conference Room Pilots to demonstrate the use cases and the to-be processes to facilitate visual design, promotes user adoption, and mitigate testing and acceptance risks.

Milestones

- The table below lists some of the project’s major milestones. The finalized WBS and project schedule will include all the major and smaller milestones of this project. If there are any scheduling delays which may impact a milestone or delivery date, the Project Manager must be notified immediately so proactive measures may be taken to keep the project on schedule. Approved changes to these milestones or dates are communicated to the project team by the project manager.

Milestone	Description
Pennsylvania Contract Signature	Contract approved and finalized
Project Kickoff	Overview of project scope and timeline
Complete Project Planning	All requirements for Pennsylvania MJ Freeway/Leaf Data Systems and MJ Freeway/Oracle finalized
Complete Project Design	Design for initial deployment
Complete Project Development	Development for each of three planned deployments
Complete Environment Builds	Test, Training, and Production Environments
Complete Testing	System, functional, and acceptance testing
Complete Training	PA DOH Training, Licensee Training, Registrant Training
System Go Live	PA DOH Solutions in production – three planned cycles
Licensee Deployment	Deploy operational/POS solution to licensees
Acceptance of Final Deliverables	Project implementation complete, commence ongoing support

Deliverables for this project include:

- *Finalized Implementation Plan approved by DOH.*
- *Finalized Detailed Requirements Document with GAP analysis*
- *Requirements Traceability Matrix*
- *Finalized Data Conversion Plan.*
- *Final report confirming the successful conversion and upload of bridge solution data.*
- *Detailed solution and interface design document.*
- *Configured SaaS solution and interfaces.*
- *Test Plan.*

- *Final Test Results Report.*
- *Final Implementation Report.*
- *Training plan.*
- *Training materials, which include a guide for future training of prescribers/dispensers.*
- *Classroom training session(s).*
- *Solution subscription – SLA Reporting*
- *Turnover plan*
- *Turnover final report – showing successful completion of all turn over activities*

Typical roles and responsibilities chart

R - Responsible - person assigned to do the work A - Accountable - person who makes the final decision and has the ultimate ownership C - Consulted - the person who must be consulted before a decision or action is taken I - Informed - the person who must be informed that a decision or action has been taken	<div style="display: flex; justify-content: space-between; padding: 5px;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Project Sponsor</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">PA DOH Project Manager</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Leaf Data Systems Project Manager</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Technical Lead</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Developer</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Training</div> </div>						
	Function						
	Initiate Project	R, A	I	I	I	I	I
	Establish Project Plan	A	C	R	C	C	C
	Gather Requirements	A	C	R	C	C	I
Technical Requirements	I	C	R	R, A	C	I	
Development	I	I	C	A	R	I	
Technical Testing	I	C	C	R, A	C	I	
Acceptance Testing	A	R	R	C	C	I	
Training	C	C	A	C	C	R	
Implementation	A	C	R	R	C	I	

Requirements Management

The MJ Freeway/Oracle proposal and project approach is based on a COTS solution hence we believe our requirements gathering and analysis for all components aligns to this underlying strategy. We believe that the project team and the project approach will need to focus on following an SDLC methodology that supports these key requirements. A standard SDLC methodology that focuses on a “ground up” solution development will not meet the Commonwealth’s requirements.

MJ Freeway/Oracle also understands that industry standard processes and disciplines that are included in a proven SDLC are needed to successfully implement the Seed to Sale solution. The SDLC approach that we propose for this

project is based on the Rational Unified Process (RUP). This methodology utilizes industry standard methods and processes. We are proposing to utilize an adaptation of RUP that is specifically targeted for COTS-based implementations.

The following sub-section provides an overview of the standard RUP methodology. In subsequent sub-sections we articulate how we will adapt this methodology to meet the Commonwealth's overall requirements to:

- Utilize a COTS solution
- Adapt processes to the COTS, where feasible

MJ Freeway's approach to requirements validation will begin with an analysis of the Commonwealth's Conceptual Design and existing requirements. We recognize the Commonwealth's efforts to-date to define business processes, re-engineer where prudent, and build initial requirements in anticipation of the Marijuana ballot passage. The project team will work with the Commonwealth in a collaborative effort to not re-write the requirements, nor accept the requirements as-is, but to validate, clarify, and expand the Seed to Sale system requirements to address the Commonwealth's needs and leverage the pre-built components as well as our COTS functionality. These activities include:

- Our business analysts will work with the Champion (Core User) team members to identify the appropriate business process models and build a library of potential standard functionality in our existing solution to address the Commonwealth's requirements. This effort will be used to develop a map of the overall system functionality and which component(s) will provide the functionality. Using terms from the Rational Unified Process methodology, this analysis will yield the "Vision" requirements.
- Based on our past efforts with implementing COTS products with our methodology, we recommend that the steps required to create a modified customer business process should precede the development of Use Cases. The modified customer business processes will describe a complete process including all Actors and system interactions necessary to complete the process. The business processes will provide the context necessary to define the Primary Use Cases, their actors, and the information needs.
- During Requirements Validation workshops and JAD sessions, we will work with the Core Users and extended teams to identify gaps and requirements for each step in these business processes, with a goal to minimizing the configuration effort. By starting with embedded business process models from previous Marijuana implementations, we will help direct the Commonwealth user teams' focus to functionality that is available and standard rather than unnecessarily customize to Commonwealth-specific requirements. To the degree that we can resolve the business requirement with standard functionality, we can provide the Commonwealth with a higher return on its significant investment. Our approach reduces the time and expense of the implementation and future upgrades because it minimizes configuration and customization to implement, yet maintains the flexibility necessary to quickly react to legislative and other changes.
- Our workshop approach entails:
 - Within these fit-gap workshops, we will cover the functionality from MJ Freeway and Oracle that span the Seed to Sale business processes
 - For each of these workshops, we will review requirements, do gap analysis and review/modify use cases from existing functionality or use cases that we have been created in working with other States. As each workshop progresses, we will go into finer levels of detail in each area to address alignment with Seed to Sale requirements.
 - We have several leverageable items from other Cannabis implementations for these workshops. Leverageable items include requirements, entity models, process models, use cases, functional designs, technical designs and the latest iteration from other projects. Our team will leverage these items in the requirements verification, design and builds.
 - When the workshops are concluded, we will document the detailed requirements and the findings of the gap analysis in the Finalized Detailed Requirements Document with GAP analysis deliverable.

- We will also create the Requirements Traceability Matrix and proceed to develop the functional and technical designs, followed by a build/configure iteration.

Data Cleansing, Conversion and Upload

MJ Freeway's Leaf Data Systems existing COTS configuration meets more than 90% of the technical requirements listed in Appendix L MM Requirements. Given that close alignment, it is our expectation that a temporary bridge will not be required in order to meet all 1 July 2017 requirements. That being said, we are including a cleansing, conversion and upload plan to ensure we are ready for any eventuality.

The Data Migration approach will be built upon the MJ Freeway conversion methodology. This involves various activities and tasks to support a complete and accurate data conversion to the Seed to Sale solution. The data conversion methodology includes planning and management that meet and exceed Industry Standards and Best Practices and Commonwealth requirements as well as validation and verifications through work sessions, JADs and multiple levels and types of testing. For the Seed to Sale system, MJ Freeway will design and develop of the data conversion utilizing the COTS data migration services, Connect Web Services (CWSS). The development phase will involve setup and configuration of the COTS products and creation of the various scripts needed for data transformation, extraction and loading. Development for conversion will occur simultaneously with the Seed to Sale system configuration and each would utilize their own development environment (with regular sync from MMPTS to conversion environment) to enable rapid development and configuration:

- Design the extraction, transformation/conversion and loading of the data to the Seed to Sale system.
- Based on the information from Data Mapping document, create a detailed Data Model diagram.
- Data extraction from the source system using ETL tools. Design ETL processing based on source system to extract the relevant Medicaid data and define massaging schema to perform extraction from source by applying the relevant criteria.
- Loading the data to a replicated legacy Database. Based on the information from Data Mapping document, create a detailed Data Model diagram.
- Define the Approaches for converting and loading the Master Person Index and the separate approach for loading the Seed to Sale solution during the State-wide Roll-Out. Formulate Enterprise matching rule to find duplicate data to derive data for the Seed to Sale solution.
- Data cleansing including de-duplication and corrections. Formulate Enterprise matching rule to find duplicate data to derive data for the Seed to Sale solution. The data de-duplication step involves analysis of source data to come up with an enterprise matching rule, giving weight to source data attributes that contribute to matching scores, finalizing de-duplication keys in the source data and finalizing manual and auto match thresholds etc. All these parameters need to be fine-tuned in an iterative fashion. Matching rules and weightages need to be configured considering data like accentuation and noisy data. Configuring a survivorship rule for the surviving data. An example of common survivorship rules are "Recent" wins, "History" wins or "System Confidence" (for example, Payroll system always wins for DOB, CRM always wins for address change).

- Data elements such as Postal Code or Phone numbers etc. will be subjected for standardization. Unique system keys like customer numbers, account numbers etc. are also common. Unique indicators like SSN, DEA#. Etc., hold high importance. These will be evaluated and finalized during the analysis phase of the project.
- Design the Data Preparation process including automated data analysis (profiling) to improve data quality and reduce ETL timelines.
- Define the Data governance by defining set of rules that data has to follow and the data stewardship makes sure that the data follows those rules. The role of a data steward is to ensure that the master data is clean, consistent, and accurate. There may be cases for which data quality could not be determined with automated rules and workflows, so manual intervention is required (the people identified for doing this manual intervention are the data stewards). The technical aspects of data stewardship involve a set of tools provided by us that help a steward find, analyze, and resolve data-quality issues.
- Data cleansing reports and artifacts.
- Based on the data model diagram, create the Data Staging Area where the data is loaded.
- Data loading including limited Seed to Sale processing to support the loading.
- Design and Develop the Cross Reference Database and Files to support the external systems using our COTS ETL tools.



MJ Freeway Data Conversion Approach

Data Conversion Planning and Management includes:

- Data Conversion Planning – Creating and executing the Seed to Sale Data Conversion Plan, with constant review and adjustment as the project proceeds.

- Defined approach to monitoring and applying to the data conversion changes that occur to the Seed to Sale system data elements and usage.
- Contingency Planning – Creating the Data Conversion Contingency Plan for handling the risks and issue that arise throughout the Data Conversion project. Adjustments are made as new risks and issues emerge or are removed.
- Risk Management to track and mitigate risks to the data conversion. Follows and uses the Risk Management processes and tools of the Seed to Sale project, but tracked and managed by the Data Conversion team.
- Issue Management to track and manage the issues that arise for the data conversion Project Planning Support. Follows and uses the Issue Management processes and tools of the Seed to Sale project, but tracked and managed by the Data Conversion team.
- Department wide Roll-Out Implementation Planning Support with the Data Conversion and Migration Planning.
- Continual monitoring and updates Implementation Planning based on Conversion Engine performance during testing to be applied to the Implementation Planning
- MJ Freeway will perform data mapping of patients, physicians, caregivers, payments, compassion centers, etc., entities to Seed to Sale. This includes creating scripts to support data analysis of the following components:
- Understand the source system data structure to identify and extract the relevant data from the Department's systems (e.g. Historical Medicaid data that ended in the last 2 years). It includes understanding database constraints and triggers that include uniqueness, referential integrity, standards such as postal code, and mandatory fields as it applies to the data being converted and loaded with an emphasis on data quality.
- Iterative work sessions with the Department team where the source data is massaged and transformed to as close as possible to the target Seed to Sale system data model. Relationships between data elements in source and target systems are key drivers for the transformation process.
- Data is also profiled at this stage to eliminate redundancies (e.g. country being recorded as USA and United States will be consolidated into one). Data profiling involves finding anomalies, variations and patterns in the source database (CaseNet and MCIS), which will help to identify data issues upfront rather than discovering it during system integration testing. It also helps to facilitate better design of the solution. As data conversion target is a COTS Seed to Sale solution, it helps to identify the areas that need maximum massaging and transformation.
- Create the fit-gap analysis document that describes the procedures on how data can be mapped in the Seed to Sale system.
- Create the legacy data mapping documents for the Seed to Sale solution that explain the various data mapping scenarios, and the data structure, conversion/translations for the data elements and data cleansing that might be required.
- Create data mapping on an entity to entity mapping level.
- Determine Non-Functional and Non-Operational data elements that are requested to be converted to the Seed to Sale system and those that will not be converted.
- Validation and Verification of the data mapping in review JADs with the Commonwealth.

To maintain data quality, MJ Freeway will work with the Commonwealth to develop a Data Cleansing/Standardization Approach. While the system will perform data profiling, cleansing, and data de-duplication based on defined rules, the system will not perform any data correction other than any predefined mass data corrections analyzed and approved by the business. Largely, data correction will be a manual process where an end user (data steward) will have to analyze data that is reported by the system and perform corrections in the source systems during the conversion process or perform updates to the Seed to Sale system after conversion. This will include:

- There will be two data cleansing rounds which will provide reporting that allows the user to perform the necessary data correction within the source systems before the data is finally converted.
- The Pre-Conversion Data Correction that will be required to do in the legacy systems
- The During Conversion Data Cleansing processing will be required
- The Post-Conversion Data Correction which will be completed in the Seed to Sale system
- The Conversion Reports and artifacts required to support data cleansing and correction.
- Developing a Data Verification Approach including:
 - The Pre-Conversion Counts and Verification Checklist
 - The During Conversion Counts and Verifications
 - The Post-Conversion Counts and Verification Checklist and Acceptance Criteria
 - The Conversion Verification and Validation Reports and artifacts required.
- Continuous monitoring and re-action to Seed to Sale design and development, tracking and reacting to the changes in data elements, usage, collection and output

Solution and Interface Design

The gaps that require code customization will proceed to the Systems design. The systems design team will evaluate the Use Case created by the requirements team and will document a technical solution to meet the gap. When mapping the functional customizations to the technical solution, the system designer will review the several system components within the Use Case specification.

The User Interface (UI) screens will be reviewed by System Designers familiar with the UI design constructs. Prototypes will be created in order to provide an understanding of the cosmetic changes to the screen. Once completed, the prototype screen will be added, for later review, to the collection of artifacts used for the System Design sub-phase specific to the Use Case.

The Data Tier is another solution layer that will be reviewed by system designers. The Data Model will be modified, if required, with the necessary edits required. The configuration data, typically viewed in a drop-down list, will be reviewed and updated with the specific values required for this implementation. Once completed, the Data Model and Configuration Data updates will be added, for later review, to the collection of artifacts used for the System Design Sub-phase specific to the User Case.

The Application Layer will be reviewed by a system designer familiar with business workflows, business rules, and business entities. Changes to the business logic are modeled in the necessary diagrams, sequence flows, etc. If interfaces are involved, the integration system designers will be included in the design process to understand any impacts on the interface designs. Once completed, the updated Application Layer models will be added, for later review, to the collection of artifacts for the System Design Sub-phase specific to the Use Case.

After all system designs areas have been completed for the Use Case customizations, the MJ Freeway leads in each discipline (Architect, QA, Conversion, Training, etc.) will be notified to review the upcoming changes. Review feedback will cycle back to the system designers for proper refinement and updates. The outcome from the system design tasks will be the Detail Design specification. It will include several artifacts, depending on the required customization.

Elaboration of System Design Summary

Phase	Design
Process/Tasks	User Interface Prototype
	Application Layer Customizations
	Data Model Changes
	Reference Data Edits
	Design Configuration/Business Rules Modifications
Tools Used	MS Office, MS Excel, MS Visio
Output/Work Items	<i>Detailed solution and interface design document:</i>
	<ul style="list-style-type: none"> • Detailed Design Specification • Network/Infrastructure Diagrams • Business Rules Configuration Document • Updated Data Model

The Interface portion of the MJ Freeway/Oracle solution may have the most extensive involvement of external systems and stakeholders with the primary stakeholder in the project. Each interface has systems and processing that will be impacted by the implementation of the new system. While some impacts will be minor, certain existing systems will see major impacts and changes required to support the new Seed to Sale and Patient Registry systems. At a minimum, stakeholders, to whom we will refer as the Interface Partners, will need to support testing the transactions that will be created by MJ Freeway using current formats and current connectivity processing.

MJ Freeway/Oracle will develop an initial Interface Plan to support all individual interfaces and Interface Partners. The plan will include the appropriate tasks and activities for each Interface, ranging from simply moving the connectivity from Seed to Sale to Patient Registry up to complete development of a new interface. From past experience, MJ Freeway/Oracle has found that a separate and distinct interface plan is required to properly communicate and manage each interface project. This meets the needs of the large number of external stakeholders and their individual views of their own interfaces. Each Interface Plan will track both Medical Marijuana project activities and the activities that the individual Interface Partners will need to perform on their systems or as coordinated activities with MJ Freeway/Oracle.

Separate Interface Plans allow for focused communication with the Interface Partners, avoiding confusion with other parts of the MJ Freeway/Oracle configuration and development or other unrelated activities. Once the MJ Freeway/Oracle Interface Team and the Commonwealth Project Interface Team members begin the Interface activities, the draft plan will be revised and managed following the overall project methodology.

As part of the project methodologies, the issues and risks for the interfaces, individually and collectively, will be recorded with all other project development, implementation, and migration risks and issues. Because control of the interface activities and interactions is jointly managed by MJ Freeway/Oracle and the Interface Partner, interface issues and risks may require coordination that impacts the Medical Marijuana project as a whole or limits what can be

accomplished individually. MJ Freeway/Oracle puts additional emphasis on the interface issues and risks, making sure they are not ignored simply because they do not reside in the core Seed to Sale and Patient Registry systems.

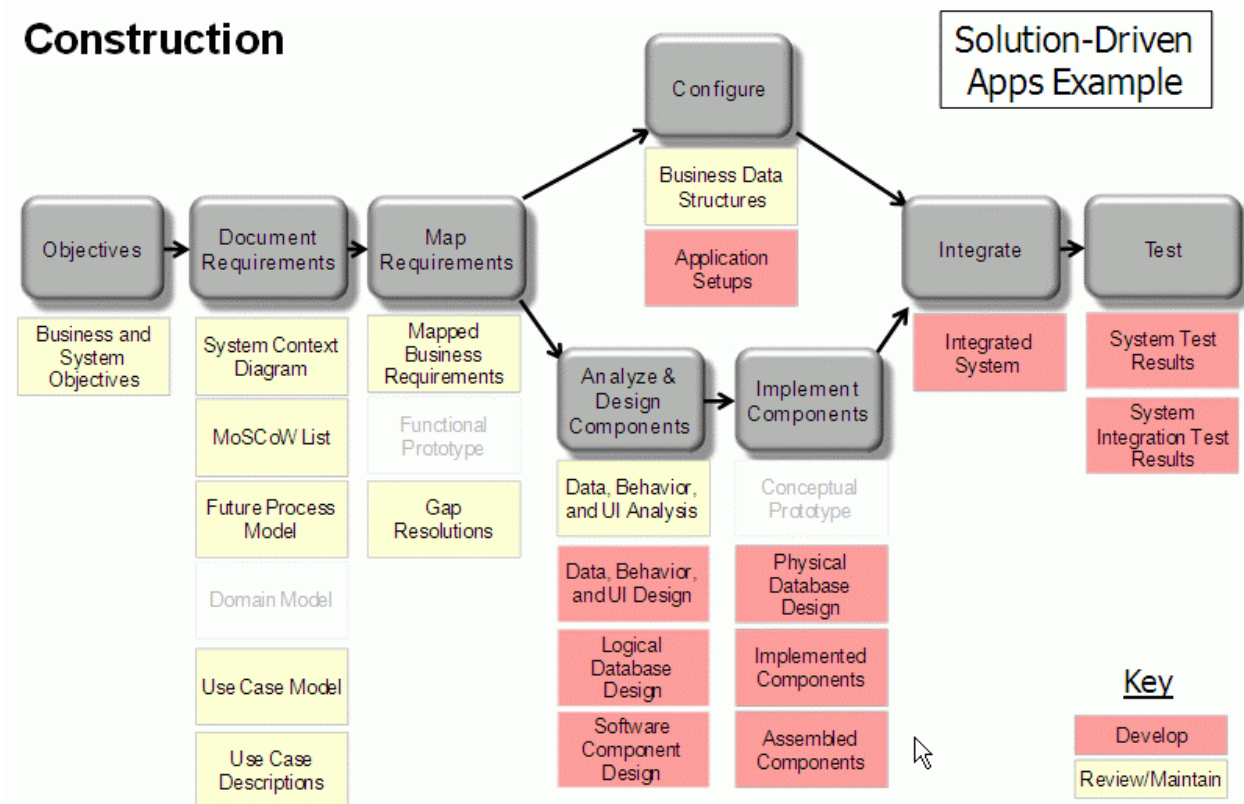
Solution and Interface Configuration

The goal of the Construction phase is to take the solution from detailed requirements models, through configuration of standard packaged software functionality and re-usable artifacts and best practices from similar projects, development and testing of custom components, and integration to a system that is ready for a first release that goes into production. This first release is often called a beta release. In short, we complete the development of the application system, ensure that all components fit together, and prepare the system for the acceptance test and deployment. The application system is completed within a pre-defined number of iterations. Updates are made to each of the models (Use Case Model, Design Model, Architectural Implementation, etc.), as the requirements are progressively refined. When all of the planned iterations have been completed for each partition, the complete application system is tested. The tested system is the end work product of the phase.

By developing an overall architecture and design based on the stated business requirements at the beginning of the project, software development and system implementation can be divided into meaningful and achievable functionality, incrementally implemented, and released for testing in smaller internal releases. When the number of implemented functions is sufficient to provide usable functionality to the using community (customers, providers, and workers), the changes/functionality can be aggregated into a software system release, readied for testing and training, communicated to stakeholders, and implemented statewide. The overall flow of system and software development will follow the ordinary uses of the system. For example, the customer portal login functionality will be developed before the functionality that would be needed for enrollment or retrieval of available information. This approach to incremental implementation allows early functionality to be implemented and provides early beneficial use of the systems.

At the beginning of the development and implementation phases of the project, we will acquire and install any computer hardware needed as part of the system development and implementation. For software implementation, wherever possible, we will use configuration capabilities of off-the-shelf software to implement the approved design. When necessary, we will use Java or other languages to meet the needs of the application under development to implement custom software applications or interfaces. MJ Freeway/Oracle will use a software repository to control change and access to any software that is under development or that has been released for general usage or test. We will follow the tool's specific checkout, merge, and check-in procedures to ensure that the configuration baseline is maintained throughout the increments of software development. The configuration control and software repository will allow for the merging of multiple streams of software development to be using the same baseline software. Our Construction workflow is depicted in the diagram below:

Construction



Development Workflow

During software development, database tables that are required for testing will be created based on extracts from the operational system or developed in conjunction with Commonwealth personnel. For example, the new access and security information required for the Medical Marijuana system will need to be developed with extensive Commonwealth input. Software documentation to support use, operations, and maintenance of the system will be produced during software system development.

We have developed a very large number of software systems – some from scratch, some integrating off-the-shelf products, and most some combination thereof. As part of our experience in developing software systems, we have worked in a wide variety of languages and circumstances. We plan to adopt software development standards based on our experience and industry-accepted software development standards. Our software development standards include specifications for naming, in-line documentation, and wide variety of specifications for ensuring the readability and maintainability of software. Our software development processes are based on CMMI standards for design, design reviews, documentation, testing, and implementation. MJ Freeway/Oracle will tailor a specific set of software development standards from our extensive library of processes and procedures and from previous projects for the DOH project.

While it is important to evaluate the progress of system implementation based on the comparison of hours expended versus hours budgeted, there are other metrics that will provide insight into the overall system developed process. Such things as the number of functions implemented versus the number of functions budgeted may be a truer measure than hours expended. We will work with the Commonwealth to establish a meaningful set of metrics and how to report those metrics, to provide insight into our progress.

MJ Freeway will use the Rational Unified Process (RUP®) as the design, development, and implementation methodology for our solution. RUP describes how to use widely proven approaches to system development with the goals of reducing risk, eliminating rework, and improving project efficiency. These approaches are called “best practices” because they are observed to be commonly used by successful organizations and can be tailored to meet the needs of projects of any size and complexity. RUP provides each team member with the guidelines, templates, and tools necessary for the entire team to take full advantage of the original six best practices on which RUP was founded:

1. **Develop Software Iteratively** – Given the size and complexity of the Solution, it is not possible to sequentially define the entire problem, design the entire solution, build the software, and then test the product at the end. An iterative approach is required that allows an increasing understanding of the problem through successive refinements and to incrementally grow an effective solution over multiple iterations. We will work with the Commonwealth to identify risks associated with the project and plan iterations early on in the lifecycle, addressing the highest probability / largest impact risks first. Risks may be associated with the ability to integrate a COTS tool into the Commonwealth’ technical environment, the complexities of statewide rollout, the use of new technology, or the ability to meet a specific requirement. Each iteration produces an executable increment (interim software delivery) that is added to the architecture. Using an iterative approach will allow our Team to address risk early, adjust as necessary, and quickly demonstrate results, promoting buy-in and resulting in a high quality product.
2. **Manage Requirements** – Comprehensive requirements management processes and tools are essential to ensure that system requirements are well-defined, clearly understood, and can be traced from elicitation through delivery. RUP describes how to elicit, organize, and document required functionality and constraints. Use cases and scenarios are effective mechanisms for ensuring that business processes are appropriately reflected in functional requirements. The Rational tool suite provides comprehensive traceability for requirements to ensure that they are mapped to design components and test cases. RUP includes processes for tracking and evaluating change requests, and stores an audit trail of all requirements decisions (e.g., approved, allocated, or deferred).
3. **Use Component-Based Architectures** – RUP focuses on early development and baselining of a robust executable architecture prior to committing resources for full-scale development. RUP incorporates industry best practices to offer scalability and flexibility, which will enable the Commonwealth to adapt to changing business and regulatory environments, enable improvements in delivery of customer service, and promote software reuse. Our proposed solution is based on a modular architecture coupled with a heavy emphasis on using COTS products. We place significant focus on defining subsystems and on packaging functionality within subsystems. This system design technique promotes reuse, improves productivity, and also lays the foundation for easier, lower cost system maintenance. It also enables us to leverage our deep SOA expertise to identify subsystems and packages that can be converted into reusable services.
4. **Visually Model Software** – By visually modeling software to capture the structure and behavior of architectures and components, project teams can focus on the big picture and hide the details. These visual abstractions enable teams to communicate different aspects of the solution, see how the elements of the system fit together, make sure that the building blocks are consistent with code, maintain consistency between a design and its implementation, and promote unambiguous communication. This consistency will allow the Commonwealth, for example, to use senior technical staff to review artifacts throughout a project and enhance the Commonwealth’ ability to leverage staff across projects, while promoting consistency and reuse across the Commonwealth’s computing and data center environment.
5. **Verify Software Quality** – RUP provides processes and standards to assist project teams in the planning, design, implementation, execution, and evaluation of tests across a wide range of dimensions: functionality, reliability, performance. Quality assurance is built into the process, in all activities, involving all participants, using objective measurements and criteria, and not treated as an afterthought or a separate activity performed by a separate group.
6. **Control Changes To Software** – The ability to manage change – making certain that each change is acceptable, and being able to track changes – is essential in an environment in which change is inevitable. RUP describes how to control, track, and monitor changes to enable successful iterative development. It also guides establishing secure workspaces for each developer by providing isolation from changes made in other workspaces and by controlling changes of all software artifacts (e.g., models, code, documents). And it brings a team together to work as a single unit by describing how to automate integration and build management.

The design of the individual interfaces will follow a flow process to allow for multiple interface and Interface Partners to be engaged at the same time, but must not overwhelm the Interface Project by trying doing all individual interfaces concurrently. Most of the interfaces will not change transactions or connectivity but will be focused on determining and

mapping the Seed to Sale and Registry data to create the interface our components. Much data determination to create individual interface transactions or messages will be determined by using the Data Mapping information created by the Data Conversion team.

The Interface Project development will be done with groups of individual interfaces on a flow basis, using the interface team members to create a set of interfaces and then move to the next group of interfaces. Most interfaces are triggered by the same event so it is important to be able to create test cases that include all the interfaces that will be triggered as opposed to entering multiple test cases to create the same situation but to only test a single interface. To minimize the need for re-running multiple, similar test scenarios for each interface, testing planning will be coordinated with the functionality testing of the system and with all the interfaces that can be tested with the individual test scenarios and scripts.

Testing

The MJ Freeway/Oracle testing strategy for the project ensures all project deliverables comply with approved quality standards including:

- Project requirements and test cases are tracked in the Requirements Traceability Matrix
- Design solutions reviews and test cases/test results verify requirements are met
- Acceptance test planning is a joint effort between Commonwealth staff and MJ Freeway/Oracle project teams. We develop a high-level acceptance test plan including testing approach, testing schedules, and issue/defect tracking and resolution. Acceptance test plan sections include an MJ Freeway acceptance test, API data uploads, and data interfaces.
- Our Project Manager is responsible for communicating approved changes to the project team and updating all project plans and documentation.

Testing is essential for achieving maximum productivity with minimum wasted work. We are sticklers for proper testing. The table below contains a brief description on each testing type the MJ Freeway/Oracle team expects to conduct during the project.

The Test Management Function will be one of the key pillars of this project. The Test lead will carry out Test Management activities including Defect Management.

The specific activities that will be carried out during various phases and the deliverables for each phase of testing are listed below.

Activities and Deliverables for Each Phase of Testing

Development Phases	Test Activities	Key Deliverables
Plan	Requirement gathering Test strategy development Define Metrics	Requirement Specification Requirement Response matrix Test strategy document Metrics specification
Design	Test Plan and Test Scenarios Creation	Detailed test Plan. High level Test Scenarios
Build	Test cases Perform Test data validation	Test case documents Test cases in Test Management Tool Test data validation complete
Testing	Test case execution	Test case execution reports

Development Phases	Test Activities	Key Deliverables
	Unit Testing, System Test Defect reporting and tracking to closure Metrics reporting Stress/Load test execution	System test report Defect reports and logs Metrics reports Stress/Load test report
Deploy	Perform project readiness and closure	Test sign off report Test summary report
Support	User Acceptance Testing Defect reporting and tracking	User Acceptance Test report

Test data will be a key ingredient for the success of QA cycle. The test data required for the testing will be identified during the design phase. The MJ Freeway/Oracle QA team will work with development team to identify the source for test data.

Following are the test assets that will be managed.

- Test Cases/Scenarios will be stored in Test management tool.
- Traceability between Requirements and Test Cases will be maintained in Test management tool.
- Defect Management
- Reporting

At the onset of the project, the MJ Freeway/Oracle test team will work jointly with the development team and Business users to perform requirement analysis. The MJ Freeway/Oracle Test Lead will create a detailed test strategy/ test plan and start evolving the test scenarios. Based on the implementation timeline detailed test cases will be written covering all the functional requirements covering all types of testing. Reviewed test cases will be uploaded in the testing tool.

Metrics are important to monitor and measure the effectiveness of testing and efficiency will be measured and reported with agreed frequency. MJ Freeway/Oracle will utilize a defect tracking tool for management and reporting of system defects.

SYSTEM TESTING

System Testing will test the End to End business process and all integrations for the Seed to Sale solution. This will verify that various workflows are working as expected. This test phase will also cover all use cases to prove that the end to end solution works as per design documents and solution is business usable. This testing will also validate the interfaces between the solution and other systems. In order for the business process to work correctly it's of paramount importance that the connections between various systems work seamlessly.

SIT will ensure:

- Technical integration points and transactions are functioning as per the business process without any issues;
- Defects that may have been introduced in one or more end to end processes that could not have been uncovered in Functional Testing are detected.
- The cross-system integration scenarios are working as per requirement.

All upstream systems and downstream systems integration points will be tested. SIT test scenarios will include tests around events, messages, transactions, response/ACKs etc. Events in the source systems will trigger message construction targeted for receiver systems. SIT message tests will include message formation tests in source system, message routing, message transformation tests in the integration layer and finally, message consumption in the target system etc.

System Test Entry Criteria

- Smoke testing is complete and no critical/showstopper defects have been identified
- Test Cases have been prioritized by Test Team and Business Analysts
- Test Data and Test environment is available
- Unit testing for all components is completed. All high priority defects reported in this phase are fixed.
- Availability of an System Test Environment
- Acceptance criteria for System Testing is defined and signed off.

System Test Exit Criteria

- All test cases have been executed
- All defects logged have been fixed or future defect resolution plan is agreed upon by all stakeholders
- System Test Results report and Defect Summary Report are accepted/signed off by stakeholders
- Go/No go decision made on whether the tested component is ready to be moved to next phase of testing

USER ACCEPTANCE TESTING (UAT)

UAT will be carried out with migrated data on the Test environment. Additional master data and transaction data will be created along with the Commonwealth team as required. MJ Freeway/Oracle will work with the Commonwealth to perform the following during UAT:

- Identify test scenarios to be executed as part of UAT.
- Support Commonwealth Business Users team on UAT execution
- Track/Manage defects
- UAT will be conducted upon completion of the System Test Testing in the Test Environment

Testing Assumptions:

- Approved set of reference documents (Business process design documents etc.) will be provided by the Commonwealth.
- Access to testing environment will be provided to testing team
- Dedicated Test environment to be provided by Commonwealth to perform test
- Master data will be provided by the Commonwealth and already available in the test environment
- Relevant security roles have been built already
- Test Plan and Test Cases will be approved by the Commonwealth prior to test execution for each testing phase
- Test execution results, defect reports and test summary reports will be signed off by the Commonwealth.

Entry Criteria

- All UAT scenarios are identified

- Test Cases have been prioritized by test team
- Ensure that all integrated systems are ready prior to start of Acceptance testing
- Test Data is available in the Test environment

Exit Criteria

- All defects logged have been resolved or future defect resolution plan is agreed upon by all stakeholders
- Defect Summary Report is signed off by stakeholders

STRESS/LOAD TESTING

The primary objective of the Stress/Load Testing phase will be to verify the non-functional requirements (NFR's) through load tests. The performance testing will be the responsibility of MJ Freeway/Oracle and the resolution of performance issues may require the input from multiple parties within the solution team and technical infrastructure team.

During the stress/load testing the following activities will be performed:

- Understand the performance requirements from Subject Matter Expertise (SMEs) and design team
- Prepare test plan based on the identified performance test requirements
- Prepare test load model based on the inputs gathered related to # of scripts, user load, other parallel activities during execution
- Prepare performance schedule plan for executing stress/load test
- Execute test as per the detailed schedule plan
- Capture baseline and response times on each specified load for all test cases
- Analyze test results

Entry Criteria

- Signed-off System Test results
- Signed-off System Test completion report
- Test environment loaded with required test data

Exit Criteria

- All stress/load test cases have been executed
- All logged defects have been fixed or future defect resolution plan is agreed upon by all stakeholders
- Stress/Load Test results report is accepted/signed off by stakeholders
- Go/No-Go decision made on whether the tested components are ready to be moved to next phase of testing

Implementation

MJ Freeway/Oracle will utilize our methodology to meet the Commonwealth's requirements for the Operational Readiness Review (ORR). We do not see the ORR as a standalone activity. Instead, it is the final step in a natural progression of executing various project activities and verifying their successful completion. The ORR process leverages the outputs from other project processes and activities, especially the Requirements Management and Quality Management processes.

Each project activity results in one or more work products that verify the successful completion of that activity. These work products generally fall into one of five categories:

Requirements – what do we need to implement?

Plans and specifications – how will we do it?

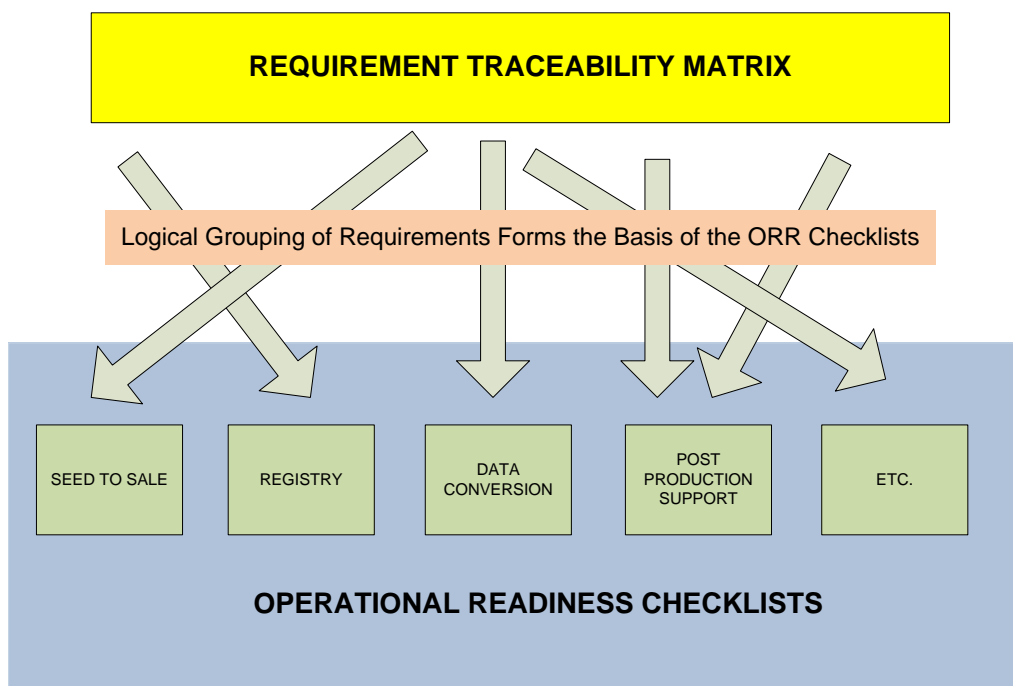
Architectural components – we did it.

Test results and traceability – and we know it works.

Documentation (training, process, etc.) – and we know how to use it.

Each succeeding activity uses one or more previously generated work products as its input and foundation. As the project progresses, an increasingly holistic picture of the solution and its readiness emerges. The ORR is the final, comprehensive review of this picture to verify all components of the solution are ready to support the Commonwealth’s mission of a successful, integrated, federally-compliant delivery of the Medical Marijuana program.

Team MJ Freeway approach to the ORR, as defined by our SDF methodology, starts with the requirements. We use the work products to verify the successful implementation of all functional and non-functional requirements. The requirements traceability matrix (RTM) serves as the starting input to the ORR process. The logical grouping of requirements forms the basis of the ORR checklists. The level of detail of the checklists is driven by the level of verification needed for operational readiness verification.



Ideally, all requirements would be traced to successfully implemented components of the solution before the team moved forward with the ORR process. The process can, however, start with open items or exceptions if the appropriate stakeholders are aware and agree to move forward.

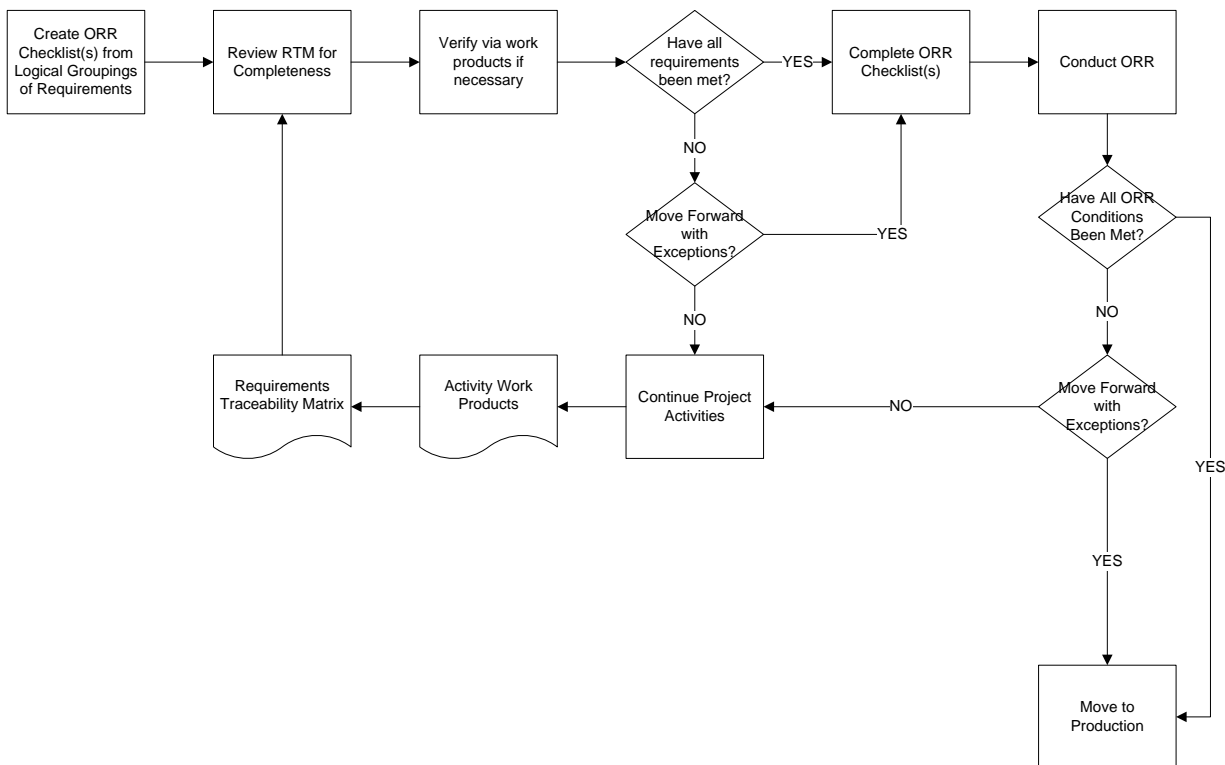
In preparation for the ORR, the ORR checklists are completed using the RTM and other project work products as input. The checklists are published, and the ORR is scheduled.

If exceptions are found, they must be evaluated on a case-by-case basis. All exceptions must be documented. If there are workarounds, or the team feels they can move forward with a plan in place to address the exceptions at a later time, then the team can move forward and place the solution into the production environment.

If the team determines there are no workarounds, or they cannot move forward with exceptions, then corrective actions must be identified. This work must be incorporated into the project schedule with appropriate resources. Once all corrective actions are complete, the RTM and ORR checklists are updated, and the ORR process is resumed.

Figure below shows an overview of the MJ Freeway SDF Operational Readiness Review process.

OPERATIONAL READINESS REVIEW PROCESS



Training

Pennsylvania management, staff and Licensees require training to maximize the efficiency and effectiveness of MJ Freeway/Oracle. Our training team is fluent in Spanish and English and has extensive, hands-on cannabis industry experience as well as in-depth knowledge of our system. Our experienced training team first tailors our existing Training Plans to incorporate any unique needs for Pennsylvania to create a comprehensive, multi-faceted training program. We design our training to minimize impacts on ongoing operations, while maximizing trainee understanding of the MJ Freeway/Oracle registry and seed-to-sale inventory tracking system.

Our training plan includes:

- Training specifically designed for Pennsylvania DOH deployment of MJ Freeway/Oracle registry and seed-to-sale inventory tracking system
- Hands-on training for DOH staff
- Web-based training included live and recorded webinars
- Training materials to support self-training and reference needs
-

MJ Freeway/Oracle’s comprehensive, hands-on user training meets the needs for all positions within the Pennsylvania staff as well as licensees and Registry users. Our training ensures the long-term success of the seed-to-sale inventory tracking system and full understanding of the registry functionality and workflow. With the collaborative approach and multiple knowledge sources which MJ Freeway/Oracle bring, users develop in-depth expertise and ease of use with the seed-to-sale inventory tracking system and the registry.

We use the most suitable training methodologies for Pennsylvania staff, licensees and registrants. The graphic below illustrates below our Blended Learning Approach combining onsite and offsite classroom delivery, coaching or one-on-one mentoring, business and technical workshops, virtual classrooms, and e-learning.



Excellent Training Results. Blended Learning Methodologies which are inclusive for all learning types.

Purpose of Plan

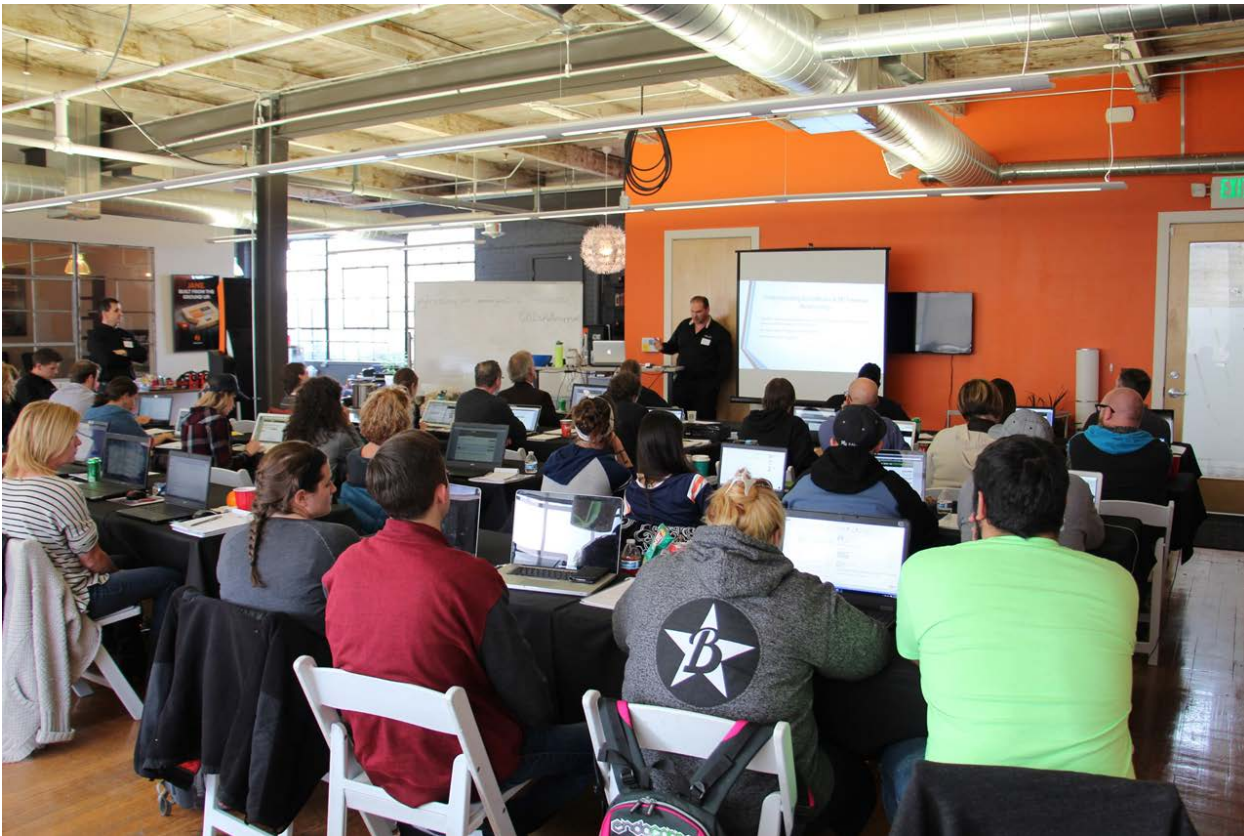
The Training Plan’s purpose is to document the overall strategy for the successful implementation of a training program meeting and exceeding the needs of DOH, licensees, and registrants. To ensure success, we develop the plan with Pennsylvania prior to implementation.

Organization of Plan

We organize our Training Plans into training approaches, methodologies, and training courses. The establishment of an effective training program includes considering not only training course requirements with differing learning styles, but also requirements that directly impact training such as installation schedules, operation and maintenance concepts, personnel as well as training logistics support requirements. The Training Plan is the primary document for identifying training and personnel requirements, including any training facilities, training equipment, and training materials necessary to implement the strategy. We use the Training Plan to control the planning and implementation activities for meeting the training requirements educating the trained personnel required to use the MJ Freeway/Oracle seed-to-sale inventory tracking system. The Training Plan also includes installation and configuration guides for each System component.

Maintenance of Plan

This Training Plan begins as a baseline document and is updated accordingly throughout the applicable areas in the project life cycle. This overview represents MJ Freeway/Oracle baseline version of the plan. Subsequent changes to this plan, based upon Pennsylvania comments or requirement changes, adheres to all established change control management and quality assurance processes.



Licensee Training - our blended learning approach to training enables all students - no matter their learning style - to pass the training.

Training Approach and Methodologies

MJ Freeway/Oracle overall approach for successfully implementing the training program for Pennsylvania is based on:

- Providing a highly-experienced team to develop and deliver the training curriculum
- Leveraging the investment we make in the development of training material for other users
- Providing a training approach to meet the vast array of learning styles
- Providing a comprehensive training curriculum to address not only subject matter requirements for each key role, but also support continuing education components
- Providing a long-term, evolutionary in nature program, including continuous updates to ensure ongoing training needs are met

Overall Training Methodologies

We use the most suitable training methodologies for Pennsylvania staff, licensees, and registrants. MJ Freeway/Oracle employ a blended approach to learning combining one-on-one mentoring, onsite and offsite classroom delivery, business and technical workshops, virtual classrooms, and e-learning. Each of our training program adheres to the following standard outline:

- Management Orientation/Training Needs Assessment
- Classroom Training Component
- Focused Learning Sessions and Workshops
- Hands-on Training Component
- Training Materials
- User Documentation
- Continuing Training
- Web-based Instructor Training
- Course Training Evaluations

Management Orientation/Training Needs Assessment

Management Orientation provides a technical overview of all relevant technical staff. The overview consists of a high-level, yet technically detailed presentation of the seed-to-sale and registry systems. It includes an introduction of training personnel, a review of the training objectives, and an overview of the training materials.

Following the Project Kick-Off Meeting, Freeway/Oracle conducts a Training Needs Assessment to map training needs for all types of Pennsylvania users. After completing the Training Needs Assessment, the training team recommends standard courseware, custom development with special e-training and testing offerings. Benefits of our Training Needs Assessment include:

- Reduced time and costs to train and prepare training. Acquiring specific and detailed learning objectives for each of the learning groups reduces the time to develop and deliver training
- Reduced reliance on help desk support staff. With an improved level of knowledge in the day-to-day use of the tools, users require less help desk assistance
- Customized curriculum option. MJ Freeway/Oracle provide a great deal of flexibility as part of the blended learning approach. Our training team welcomes the opportunity customize our curriculum to best meet your needs

Classroom Training Component

MJ Freeway/Oracle offers individualized, role-based on-site classroom training. The format is lecture and lab, with an emphasis on practical hands-on application learning and discussion. At the beginning of the class, MJ Freeway/Oracle's trainers clearly outline learning objectives for students by presenting a checklist and describes the lessons. The examples and content presented by the trainers are relevant to the work performed by the students. As each lesson is covered, users partake in relevant hands-on practice with the system.

Focused Learning Sessions and Workshops

Depending on the training content, only a short learning session may be required. Users who have limited time availability may find it helpful to have concepts explained by an instructor in a short, focused session of one to two hours. Focused Learning Sessions can be formal, instructor-led, hands-on classroom sessions accompanied by manuals or quick reference materials or they can be workshop style sessions with quick reference guides as handouts. Short, focused classroom-based learning sessions are recommended when the content can be segmented into short learning sessions or students cannot attend orientation for longer than a few hours at one time.

Hands-on Training Component

The most effective form of learning is through hands-on practice. Students have the opportunity to complete hands-on exercises to become more comfortable with the new system. They work through standard workflows and scenarios using the instructional system. This hands-on training reinforces what was learned in the classroom and allows the student to apply their knowledge in a real-world setting.

Training Materials

MJ Freeway/Oracle's training materials include formal user documentation in a training system environment emulating the operational system. All training material guides and instructional systems include realistic mock scenarios and manual activities as well as system-supported activities.

User Documentation

MJ Freeway/Oracle's team of in-house technical writers customize user manuals for Pennsylvania and the Licensees. These user manuals include easy-to-follow, step-by-step instructions for performing all system functions. Electronic and hardcopy user guides are available in English and Spanish. MJ Freeway/Oracle include installation and configuration guides for each system component. We also provide training exercises for each specific course offered to test the effectiveness of the training session and to identify trainees that may require additional training.

Continuing Training

Prior to software upgrades, our Project Manager receives a Training Schedule for Pennsylvania staff with the upgrades in a test environment. Ongoing training occurs when significant upgrades are introduced, however, other needs for ongoing training may be identified by Pennsylvania or Licensees. MJ Freeway/Oracle are committed to providing the most appropriate ongoing training for the needs of Pennsylvania and Licensees.

Web-based Instructor Training

MJ Freeway/Oracle offers a complete online training program. Virtual learning classes feature the same course content, instructors, and courseware as the standard, instructor-led classroom training courses. These are real-time courses with live instructors with delivery through web conferencing technology. Training materials are available prior to the start of the class and web-based course.

Course Training Evaluations

Effectiveness of the training is evaluated through the use of controlled test exercises and web-based instructor and course evaluation forms to be completed at the conclusion of each course. We provide Pennsylvania staff feedback forms for each course including summary reports on instructors, course evaluation forms, and training exercises. MJ Freeway/Oracle collaborates with DOH to determine appropriate intervals in which to implement any modifications.

With any new system, providing the necessary training is one of the keys to success. By aligning our approach with the implementation phasing strategy, the MJ Freeway/Oracle training program is designed to meet the needs of the specific end users from in both IT and business and accelerate their adoption of the system. This reduces the time needed for individuals to gain necessary skills and improves the accuracy of their work. An effective training program can be the difference between success and failure for any new system roll-out. Our Training team will be embedded in all design and development activities and integrate the process solution into all relevant training programs and materials, developing guidance and instructions that address the actions to be taken by each specific employee and stakeholder audience to implement the new process.

Our training strategy will involve an audience analysis to identify sub-groups within the learners and customize learning solutions to best meet their competency-based needs. MJ Freeway/Oracle will provide a Training Coordinator to administer and manage the Training Plan. That Training Plan will include tracks for each audience sub-group. For each sub-group, the Plan will include the seven elements listed below as well as a description of the material that will be collected on the portion of the knowledge base established for that sub-group or department:

- Different user groups;
- Each user group's training needs;
- The types of training proposed for each group;
- The proposed delivery mechanisms;
- The proposed training topics;
- The proposed duration; and
- Any prerequisites that need to be satisfied for users to be able to participate in training

Our Training approach is specifically assigned to develop and deliver Just-In-Time training to the Commonwealth to assist them in being productive on Day One. Oracle has divided the training into the following groups:

- Administrator Training: Deep technical training for those administrative users who will maintain and modify the system.
- Power User Training: Training for the most experienced users in the field. These individuals will not only understand the system at a detailed level, but will be able to provide support to other users.
- Basic User Training: Training customized for the basic users. This training is aligned to specific functions and requirements. It is designed to quickly allow staff to fulfill their job functions serving the stakeholders such as the providers.
- Executive Reporting Training: Training designed to support the executive leadership team in the organization. This training enables the executive leadership to see and understand the reporting systems and monitor the performance of the system and the medical marijuana program.

Solution Operation and Support

Solution Support

When Pennsylvania DOH staff, licensees or registrants contact the MJ Freeway/Oracle Systems Support Desk they reach specialists with extensive knowledge of our systems. The Support Desk is our first line of communication with you so we ensure DOH staff, licensees or registrants directly reach knowledgeable specialists.

We use the industry leading Support Desk Software Salesforce Call Center for online support and ticket tracking allowing the user who submitted the inquiry to track tickets as they move through the resolution process. DOH management and MJ Freeway managers have access at any time to track progress of support tickets.

We have a Systems Support Desk 800 number dedicated to MJ Freeway/Oracle support communications and support is available 7 days a week from 7AM to 9 PM Eastern Time. For emergencies during non-business hours, our System on-call manager and the PM Karen Kaussner and her designated deputy are accessible 24x7.

Our Systems Support Desk team has excellent customer service skills as well as technical expertise to assist with DOH, licensee, and registrant systems inquiries such as:

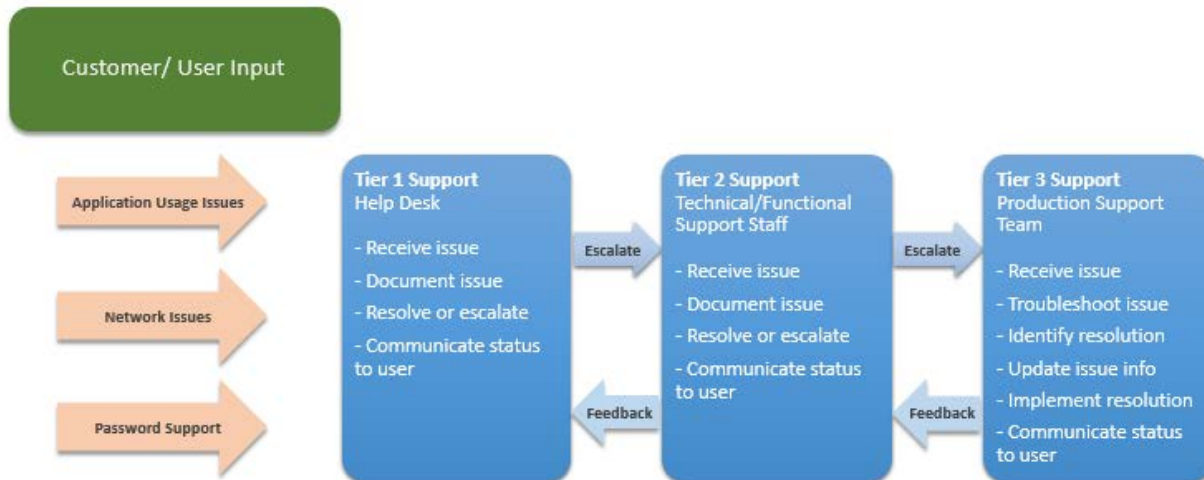
- Everyday system and production support - over 75 percent of calls handled by Tier One team
- Processes for reporting identified incidents which may indicate a problem in the system
- Workarounds for verified defects
- Information/updates on verified defects previously identified by users and reported to MJ Freeway/Oracle
- Creating and adding appropriate documentation to the system help files or other mutually agreed upon tools to address issues
- Connectivity issues
- Outages

Our live support queue ensures that initial support begins as soon as an issue or inquiry is received during normal business hours. Many issues or inquiries can be handled immediately by the Tier One team including:

- Password reset requests
- General inquiries on how a particular feature of the software works
- Basic troubleshooting and problem resolution

When additional troubleshooting is required, the ticket is advanced to the Tier Two team for assessment and determination on resolution approach. If code changes are required, the ticket moves to Tier Three support where the Production Support Team develops, tests, and installs the code change needed to resolve the issue.

All incidents are recorded, independent of the method of reporting, into Salesforce Call Center, our Support Desk solution system. Ticket numbers are assigned to each incident and each ticket is assigned a specified severity level. Ticket numbers are provided to the originating party as a method of tracking the resolution of the incident. Incidents may be escalated by contacting support services, referencing the ticket number, and requesting an escalation of the issue. A full ticket history can be viewed at any time. Committed, proactive support is provided to DOH enforcement staff as well as licensees and registrants.



Responsive System Support Desk. When Pennsylvania users contact MJ Freeway/Oracle Support Desk they reach service desk specialists with extensive knowledge of our systems to effectively and efficiently solve their inquiries.

Project Management Services

The MJ Freeway/Oracle team will use following framework to consistently plan, control, and complete the implementation. The program management approach for the Seed to Sale project is distributed across four main areas:

- **Planning** – Planning activities focus on the development and implementation of the Seed to Sale Project strategy and direction. It sets the guidelines that drive the project to effectively develop and apply the components of the other process areas. Commonwealth project stakeholders will be engaged during the planning process to ensure the State’s goals and objectives are addressed.
- **Program Control** – Program control activities define the operational elements of the project management approach. Program control activities and artifacts are consistently applied to facilitate optimized program execution and quality. Program control activities support internal activities and reporting issues, risks, activities, status, as well as externally-oriented activities such as Financial reporting, Business Cases, etc. The MJ Freeway/Oracle team project manager will work closely with his Commonwealth counterpart to ensure the entire program, which includes state staff and related activities is effectively managed.
- **Program Quality** – Program quality activities focus on providing the program management and staff an accurate and quality-oriented perspective on how activities will be elaborated and executed. Quality management, control and mitigation, quality-related activities will help the Program Management Office (PMO) respond to the interests of the Commonwealth sponsors, and considers the views that all parties have on the realization of project. Program quality will advise, guide, police and help control activities carried out on the program within the framework of the methodology and the compliance set of rules.
- **Other Practices** – Other practices complement the above project management activities in providing structural and organizational guidance, standards development and implementation support, fostering communication, along with professional development of the integrated project team members.

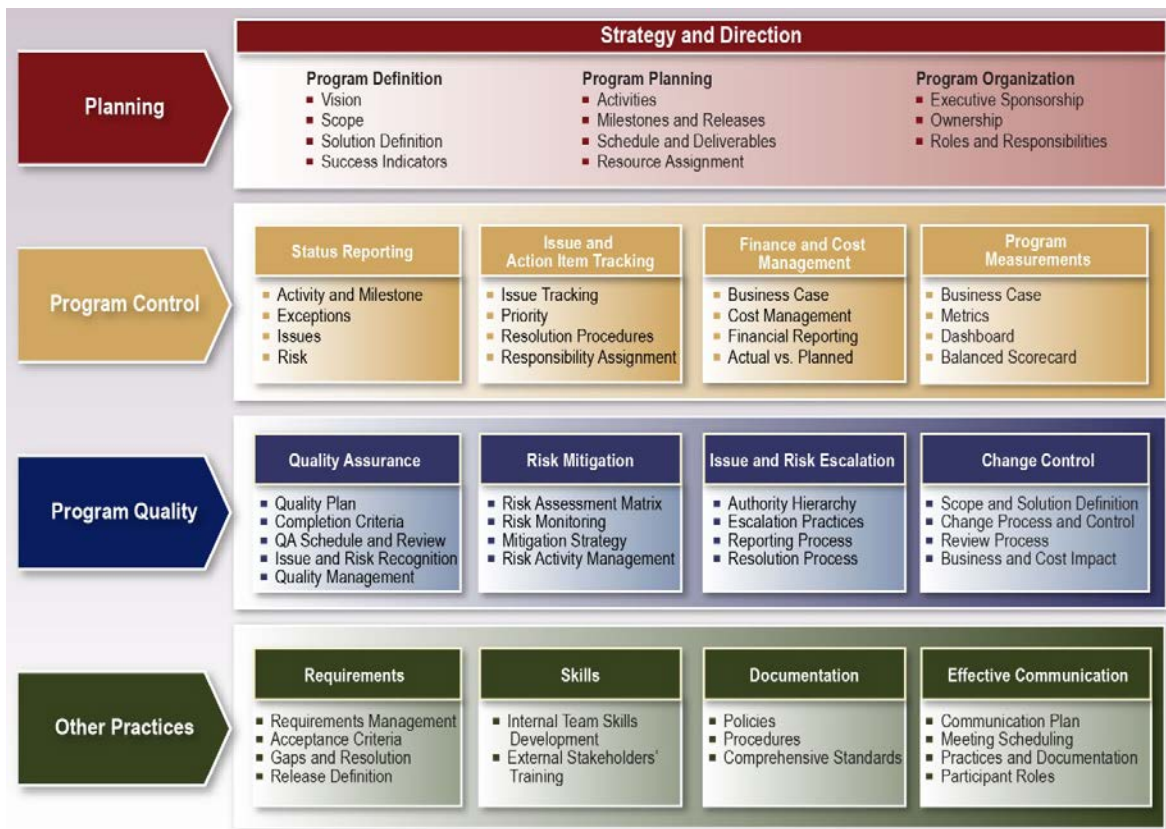


FIGURE XX: PROJECT MANAGEMENT APPROACH

Work Plan

The objective of this plan is to describe how the project schedule will be established and managed. The schedule for the project will be managed through an Integrated Work and Task Plan (IWTP).

The IWTP serves as the master schedule for the project and will have detailed sets of tasks for the project. The IWTP contains a listing of activities and deliverables as per the scope of the Seed to Sale implementation with planned start and end dates, task durations, resource allocations and task dependencies. The Seed to Sale project involves close collaboration and will have activities with cross-domain dependencies.

The IWTP is maintained in Microsoft Project and resources are assigned to each task. The resource leveling reports built into Microsoft Project are utilized to level resources. When resources are over-allocated, we can reassign tasks, extend the time or bring additional resources into the project as appropriate.

Communication Plan

Effective, appropriate and efficient communications are essential for a well-run project accomplishing its milestones. Our Communications Management Plan sets the communications framework throughout the duration of the project and is updated as communication requirements change. Our Project Manager takes the lead role in ensuring effective communication. This plan includes a communications matrix which maps the communication requirements of this project, as well as communication conduct for meetings and other communication forms. The Communications Matrix that follows is a guide for the communication type, description, frequency, format, participants or distribution, deliverable and owner.

Communication Type	Description	Frequency	Format	Participants/ Distribution	Deliverable	Owner
Kick-Off Meeting	Review project objectives and management approach Introduce the project team.	Once	In Person	Project Sponsor, Team, and Stakeholders	Agenda, Meeting Minutes	Project Manager
Project Team Meetings	Review status of the project with the team	Weekly	In Person Conf Call	Project Team	Agenda, Meeting Minutes	Project Manager
Technical Design Meetings	Discuss and develop technical design solutions for the project	As Needed	In Person	Project Technical Staff	Agenda, Meeting Minutes	Technical Lead
Project Status Reports	Report the status of the project including activities, progress and issues	Semi-monthly	Email	Project Sponsor, Team and Stakeholders	Project Status Report	Project Manager
Permittee Communications	Updates on the project and implementation for the Permittees	Periodic	Email	Project Sponsor and Team	Information update	Project Manager

Sample Communications Matrix – PA DOH project team preferences to be incorporated.

Communications Conduct

Email

We ensure all project email is professional, free of errors, and provides brief, clear communication. Email is distributed to the correct project participants in accordance with the Communication Matrix above based on its content. All attachments are in one of the organization’s standard software suite programs and adhere to established

company formats. An email conveying an issue provides a brief background on the issue and gives a recommendation to correct the issue. The Project Manager should be included on any email pertaining to the project.

Informal Communications

While informal communication is a part of every project and is necessary for successful project completion, any issues, concerns or updates from informal discussion between team members must be communicated to the Project Manager so the appropriate action may be taken.

Meetings

The Project Manager distributes a meeting agenda prior to all scheduled meeting and takes meeting notes on the discussion and decisions. All team representatives attend scheduled meetings or are represented by an alternate. The alternate representative has the knowledge and authority to contribute and make decisions on the agenda topics. The meeting notes are emailed to the meeting attendees, selected managers, and posted to project's documentation drive for easy access by project staff.

The Project Kick-Off Meeting is held after contract approval and prior to work performed. Kick-Off Meeting topics are:

- Deliverable review process
- Determining format and protocol for project status meetings
- Establish format for project status reports
- Setting schedule for meetings to develop detailed plan
- Reviewing the project mission
- Pinpointing high-risk or problem areas
- Issue resolution process

Project Manager Karen Kaussner schedules and leads all the weekly Team Meetings, between PA DOH and MJ Freeway/Oracle project teams. Meeting announcements, agendas, and relevant documents are emailed to participants before the meeting. The recurring topics include:

- Status Updates
- Contract Status/Issues/Resolutions
- Quality Assurance Status
- Action Item Review
- Schedule Review
- Work completed since last meeting
- Work in Progress
- Planned work for next two weeks
- Date/Time for next meeting

The Technical Leader or Project Manager schedules conducts the Technical Design meetings with technical representatives to review and resolve issues. Meeting notes are taken during each meeting emailed to participants and posted on the shared drive.

Status Reporting

Project Manager Kaussner delivers Status Reports to the PA DOH Project Manager by the third working day following the end of each reporting period. Status reports are prepared monthly. The Status Report includes:

- Overall project status
- Accomplishments during the period
- Plans for the next period
- Challenges and issues
- Quality assurance status
- Resource review
- Project timeline

Licensee Communication

Per instruction, we prepare and distribute via email periodic communications to the PA licensees. Depending on the subject matter, the emails may be from the PA DOH team or the MJ Freeway/Leaf Data Systems team. Examples of licensee Communication include:

- General information about the project and objectives
- Timeline for implementation
- Technical information such as information about the API
- Training information

Document Storage and Disposal

Documents are stored by MJ Freeway/Oracle during the contract period. PA DOH may choose to create and store the document in a library in which they determine the duration of retaining the documents. At a minimum, MJ Freeway/Oracle retain project documents for the duration of the contract.

Change Management Plan

The intent of the Change Management Plan (CMP) is to define the mechanisms for requesting, evaluating, deciding, and monitoring possible internal changes to the scope of the project or external changes identified outside of the project and all related activities and deliverables.

The Change Management process, established through the CMP, ensures the following:

- **Change Request (CR) Initiation:** CRs are submitted with clear, concise documentation using a CR form.
- **Change Request (CR) Analysis:** Impact analysis, feasibility of the change and effort required to implement the change is presented to the Change Control Board (CCB).
- **Change Request Adjudication and Authorization:** The CCB evaluates each CR's potential costs, impacts, and benefits to the project and provides recommendations to the Project Board. Changes to the project baseline are authorized by the Project Board, which is the final authority to approve or deny a change. If there is a major impact to the project due to a change, the Project Board will submit the change to the Steering Committee and authorize the change upon receiving Steering Committee approval. The Requirements Traceability Matrix (RTM) and IWTP are updated appropriately before a change is taken up for implementation.

- ***Change Request (CR) Tracking and Monitoring*** - The Change Manager will be responsible for tracking and monitoring the CRs throughout the change management workflow.

Quality Management Plan

This Quality Management Plan (QMP) describes the approach the project will use for managing quality throughout the project's life cycle. The Quality Management plan describes the review/checkpoint process, authorities, policies, tools, and techniques that will be followed to ensure that the technical solution satisfies requirements, complies with standards and best practices, ensures project excellence, and reduces cost and eliminates unnecessary corrections and/or changes.

The Project Quality Management for the Seed to Sale project includes Quality Assurance and Quality Control.

Quality Assurance: The QMP establishes a consistent method to define, execute, and monitor Quality Assurance activities in the Project. This includes quality metrics measurement and metrics analysis against identified threshold periodically. The quality assurance activities also includes conducting assessments and audits to understand the adherence of the project team to processes and standards, identify the gaps, if any, work with the project team to address the gaps, and work towards continuous improvement initiatives in the project.

Quality Control: The quality control portion of quality management deals with employing a variety of quality control activities such as reviews, inspections, and other observation processes to ensure project objectives are achieved in accordance with the plan. This section describes the multi-layer review process that is used in the project to ensure completeness and correctness of deliverables and work products. This section will also describe how the anomalies and problems in the project will be recorded, tracked, resolved, and reported. Quality control also deals with how project processes will be reviewed and modified to improve the quality.

Risk Management Plan

The purpose of the Risk Management Plan (RMP) is to establish the framework in which the MJ Freeway/Oracle team will identify risks and develop strategies to mitigate or avoid those risks during the project life cycle. A good risk management plan ensures that all risks are reviewed and mitigated before they become an issue.

The risk management approach for the project will consists of the following steps:

- **Risk Identification:** This step helps in determining all possible risks that have the potential of affecting the project. Risks will be captured in the risk management log, with each risk documented to include description, impact, probability, impacted area, and overall characteristics. Depending on the complexity of a given risk response, a separate document may be required to accurately and completely define a response.
- **Risk Analysis:** Once the risk is identified, the MJ Freeway/Oracle team Project Manager assigns a risk owner to the risk. The risk and the related artifacts are analyzed by the risk owner.
- **Risk Mitigation and Contingency Plan:** The Risk Mitigation plan involves developing a plan to prevent the risk from occurring or reduce its impact or probability of occurrence. A mitigation strategy to reduce the likelihood and/or the consequences of a risk being triggered will be planned and executed.
- **Risk Monitoring, Controlling, and Reporting:** Risk monitoring involves tracking risks and its associated mitigation and contingency plan execution progress. This process also involves monitoring risks for their increasing or decreasing significance to the project and adjusting the values of the risk parameters appropriately. Project risks will be tracked, monitored, controlled, and reported weekly in the project management meetings throughout the project life cycle.

- Risk Closure: A risk will be considered closed when the risk is successfully mitigated by executing the mitigation plan or the project management team determines the identified risk is not valid any more.

Service Management

System Enhancements. The system configuration baseline is established during the contract phase and customized to the PROJECT' specific needs during the business analysis phase. Modifications and enhancement will likely arise over time due to changes in the regulatory and legislative environment. System enhancements are managed through the Change Order process, which is described in detail in the Project Implementation Plan section of our RFP response.

When Pennsylvania DOH requests enhancements or modifications to PROJECT baseline, we will respond within 10 business days or less with an estimate of hours and other resources that may be needed for completing the enhancement. For system enhancements or modifications, MJ Freeway/Leaf Data Systems use a process engineering concept "stage-gate" to create a product pipeline process. We use this pipeline to manage the ongoing development work to the system. The process allows the business owners to transparently decide the priority of all enhancements within a development capacity model. Our project and production teams works with Pennsylvania DOH staff to capture detailed enhancement specifications and determine level of effort required.

Once the Change Order is fully approved, the MJ Freeway/Leaf Data Systems project team works with the Pennsylvania DOH team to ensure the change is prioritized properly in the product pipeline and that all stakeholders are apprised of expected completion timing.

Adaptive and Preventive Maintenance

MJ Freeway/Leaf Data Systems' approach to system support and maintenance is based on Information Technology Infrastructure Library (ITIL) standards. The ITIL approach focuses on uptime of the services by running through rigorous testing methodologies to keep incidents from occurring on the production system. When incidents do occur, priority is always to restore service first and then restore full feature set. All incidents undergo a review process to determine root cause as well as set up a short-term work around if needed. Incidents are later reviewed in the development cycle to build a long-term resolution.

Performance Maintenance

Through proactive, diligent monitoring of Pennsylvania DOH's MJ Freeway/Leaf Data Systems implementation, we optimize system operations and identify weaknesses before they impact performance.

From our continuous monitoring, we provide regular updates regarding changes with potential impact to the software. Some of the regular updates include hardware, software, and hosting. Our in-house technical writers document and communicate changes to the software environment such as:

- Patching –MJ Freeway/Leaf Data Systems installs hardware and software patches, updates, and other utilities according to industry best practices, including the installation of critical patches and updates within 30 days of general release
- Version Control – MJ Freeway/Leaf Data Systems maintains, tracks, and audits modifications to the application's components.
- Turnover Management – MJ Freeway/Leaf Data Systems manages the software promotion changes including the recording of the approval process, production turnover, and software migration control
- Platform Change – All changes to the platform follow the approval process agreed upon by Pennsylvania DOH. MJ Freeway/Leaf Data Systems require changes to the PROJECT solution and hosting platform to be consistent with the SOW and documented change management procedures defined during the Leaf Data Systems PROJECT solution implementation

Documentation Updates

The MJ Freeway/Leaf Data Systems Knowledge Base is updated when software updates or releases are implemented and usually include:

- Release notes are posted in the Knowledge Base
- For larger items/significant changes to functionality, a detailed Knowledge Base article is posted and a link is included in release notes

A Pennsylvania DOH Project Team member designates users to receive email notifications of updates to the Knowledge Base, and can also get a pop-up notification within the Leaf Data Systems application. The Knowledge Base is segregated by role, so Pennsylvania DOH determines the appropriate users to receive the email notifications. For example, Pennsylvania DOH may view more extensive information than Permittees can access. We also provide quarterly review and update training documentation as appropriate.

MJ Freeway periodically deploys releases of the software into both testing and production environments. The deployment releases follow the protocol agreed upon with Pennsylvania DOH and includes the following details:

- Activation Date
- Description of update content
- Date and time of deployment
- Time period required to complete the deployment update
- Results from the pre-production testing environment

Status Reporting

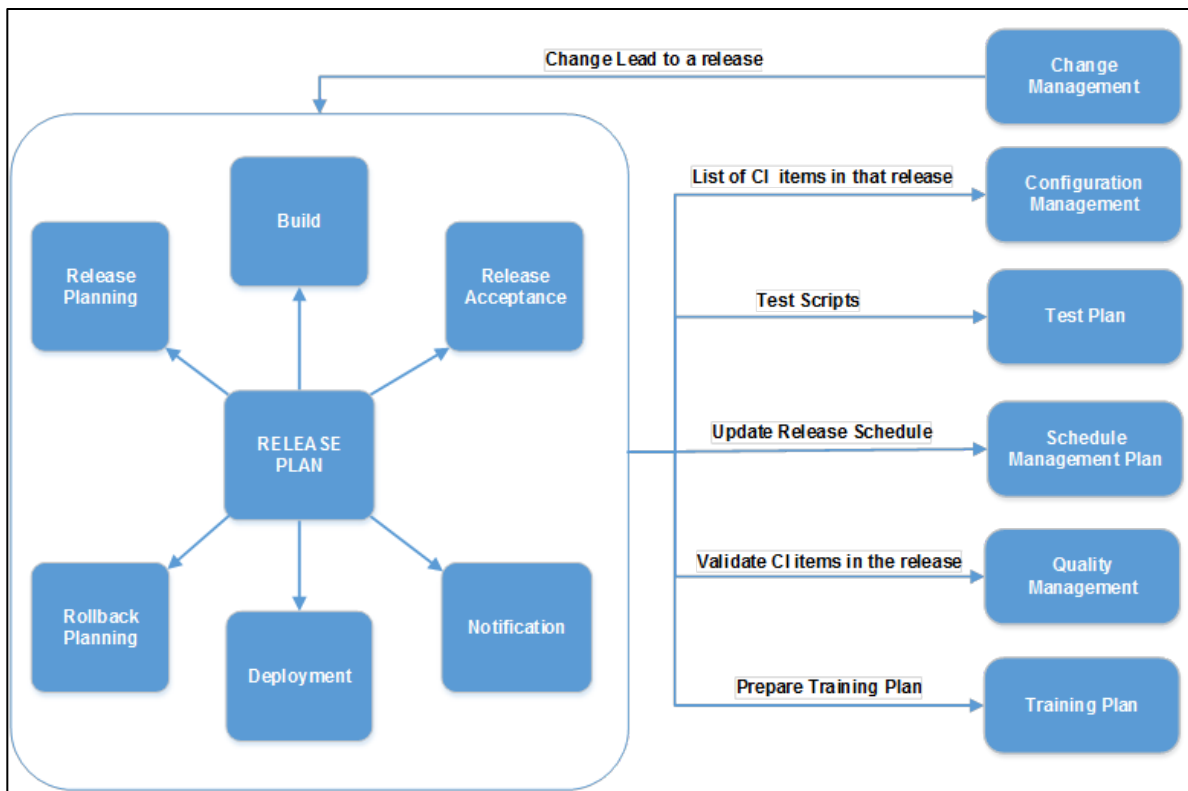
The MJ Freeway/Oracle team Project Manager delivers Status Reports to the PA DOH Project Manager by the third working day following the end of each reporting period. Status reports are prepared monthly. The Status Report includes:

- Overall project status
- Accomplishments during the period
- Plans for the next period
- Challenges and issues
- Quality assurance status
- Resource review
- Project timeline

Release Management

Software release is an engineering process intended to oversee the schedule-driven release of an application, which contains, but is not limited to, software including source code, data, and reports as per the Work Plan. A release is a delivery cycle in a development project that is used to operationalize the product roadmap. The Release Plan provides a high-level view of the delivery schedule and functionalities that will be part of each release. The project team will define the Release Plan by considering Commonwealth priorities, goals and dependencies. The scope of the Release Plan is to manage application releases from the Development phase through System Testing (end-to-end testing), User Acceptance Testing (UAT), production (go-live) and post-production support (production maintenance) releases.

The Release Plan will manage software release (patches, upgrades) as it does any other content for a release. The responsibility of monitoring releases in the project scope will fall into the scope and change management domains.



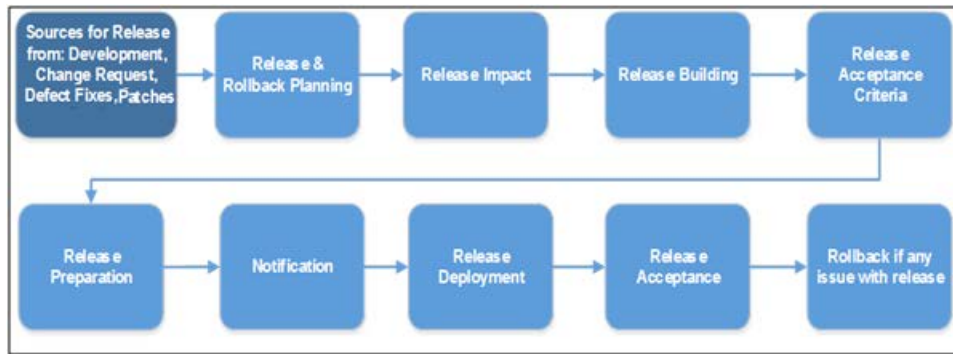
Release Management Overview

The Release Plan will define the below high-level activities as shown in the figure above:

- Planning and scheduling releases - planning is the process of preparing the release content and release schedule.
- Design and build release
- Build and deploy the release from one environment to other environment.
- Notification before and after release
- Deploy release to target environment
- Prepare Rollback Plan
- Prepare the Rollback Plan for each release with the details of how to get the previous working application back in case of any issue with the new release

Release Management Approach

The release management approach oversees the process of managing application releases from the planning phase through the release acceptance and rollback, if any issue with release, as depicted in the figure below.



Release Management Approach

The proposed approach for the different release environments are listed below:

- **Releases for Integration Testing:** Module-based iterative release for application after discussing with the Commonwealth.
- **Releases for System Testing, UAT, Production (Go-Live):** Follows 'Big Bang' approach where all functionalities will be delivered as a single release package.
- **Releases in Production Stabilization Period:** Releases will be based on the defects and potential CRs and initial draft according to Commonwealth priorities.
- **Release Types** to be followed in the project are listed below:
 - **Product Release:** Product release is a development release that will be released for the first time from the Development phase to System Testing, UAT and production (go-live). The following releases are planned to fix the defects raised in System Testing.
 - **Minor Release:** Minor release fixes medium and low priority defects, which are raised during System Testing, will be implemented every two weeks.
 - **Major Release:** Major releases to fix critical and high priority defects, which are raised during System Testing and will be implemented every week.
 - **Emergency Release:** Emergency releases will be implemented immediately with any show stopper impacting working of the application.

Hosting Requirements

MJ Freeway/Leaf Data Systems' infrastructure and software is available 24 hours a day, seven days a week, with a verifiable 99.99%+ uptime, including 100% uptime during peak use. For designated Pennsylvania DOH staff, we provide reporting and visibility into any system issues. We use sophisticated, real-time network and system monitoring tools to continually check more than 1,000 data points of system and application health including the Open Systems Interconnections (OSI) inter-layer connections, critical exceptions within the applications, login rates for capacity and security, and internet connectivity. Our underlying technology is Nagios™, allowing us to build custom monitors as the need arises. With our central monitoring system, we send alerts via web, email, and SMS.

While working with Pennsylvania DOH, we present a formal Network Monitoring Plan including a detailed listing of physical devices such as servers, routers, switches, and firewalls as well as detailed information regarding URLs, websites, and other monitored resources. We detail confidentiality, integrity, and availability concepts in a previous section of this submittal.

MJ Freeway/Leaf Data Systems' infrastructure and software used for this project are designed to be available at all times (outside of maintenance windows) with a special emphasis on maintaining 100% uptime during peak usage hours. Typical peak usage hours are 7AM – 9PM ET but can vary depending on locale. A proposed maintenance

window is planned for 12 AM to 4 AM ET nightly – timing and duration are dependent on Pennsylvania DOH approval.

We use a Change Advisory Board (CAB) process to review all planned system changes and software updates, allowing for timeline planning and an appropriate Pennsylvania DOH approval process to be in effect. Notifications will be sent to all designated parties after the maintenance window has been scheduled and approved. Meetings are monthly or more often if needed to approve planned changes.

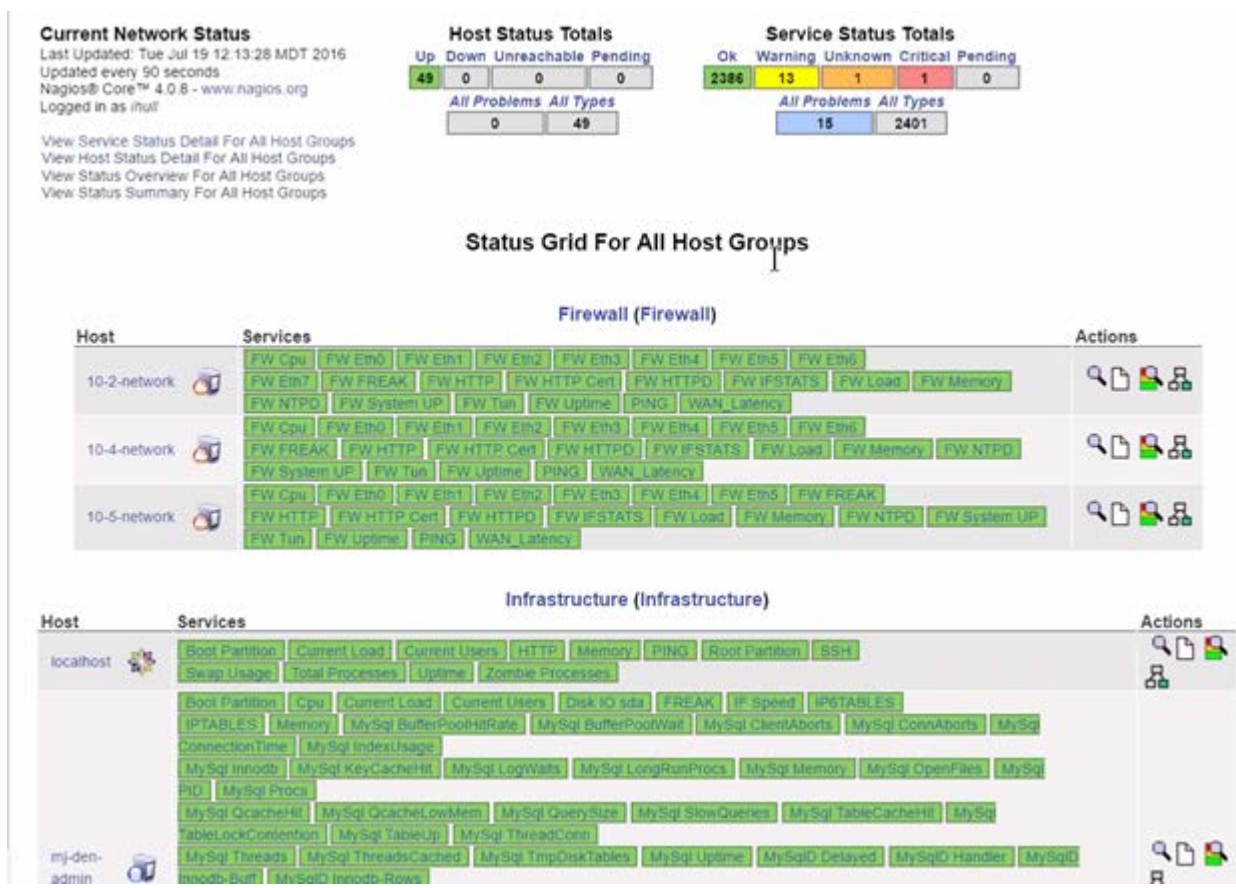
MJ Freeway/Leaf Data Systems uses several tools to monitor performance of all aspects of the seed-to-sale system availability. All of these tools provide extensive reporting options and will satisfy the County’s requirements for reporting either through online access or through extracts compiled from the various monitoring tools. A few examples are included below but are by no means all the options available to the county.

Systems Monitored	Monitoring Tool	Benefits Gained
Seed to Sale system (PROJECT) User Experience	Site24x7	Provides website availability monitoring & the ability to assess availability from multiple locations. Monitoring metrics with this tool include performance, DNS server, REST API & RESTful APIs, web services and real user monitoring (RUM).
Virtual Infrastructure Servers (Virtual Machines) Application Database Network Firewall	Nagios/Sensu	Performance monitoring and alerting for all infrastructure including application, server, security, and network components. All systems are monitored for alerting purposes (i.e. up/down, customer impacting) alerting instantly identifies any area of concern for rapid issue resolution and research. Extensive metrics are gathered against each component for proactive planning. Examples of trending metrics include performance characteristics such as CPU Utilization, Current Load, Disk IO, Memory Utilization, Paging, Uptime, network latency, and Round trip times, OS processes, disk latency, RDMS metrics, web application metrics. We currently collect over 1,000 data points in our monitoring solution.
Entire Deployment (server & network)	Alert Logic	Security Monitoring. Provides IDS (intrusion Detection) & Centralized Logging. PCI certified external scanning. Ensures assets, sensitive data and applications are protected against threats and attacks. Includes monitoring, vulnerability scanning and alert notifications of security events or activities that might require remediation.

Pennsylvania DOH Top Performance. Our infrastructure and software is available 24 hours a day, seven days a week, with a verifiable 99.99%+ uptime, including 100% uptime during peak use.

MJ Freeway/Leaf Data Systems uses monitoring tools like Nagios and Site24x7 to identify any potential trouble spots – these spots are then assessed and remediated. The cloud architecture employed by Leaf Data Systems provides significant flexibility in remediation options – if the issue cannot be quickly resolved, a new service or module can very quickly be provisioned and brought online to replace the trouble spot. While this type of provisioning is transparent to the end user, Pennsylvania DOH would be consulted to reach agreement on whether the issue required immediate action or the resolution could be implemented during the maintenance window. The MJ Freeway/Leaf Data Systems team can accommodate the County’s preferences in maintenance schedules and as a matter of normal process would address maintenance issues during off hours to avoid impacting daily operations.

Leaf Data Systems uses Nagios for infrastructure and network monitoring and firewall monitoring and can provide Pennsylvania DOH staff online access to reporting or can compile a report document.



This image shows the firewall and infrastructure status grid for multiple host groups within the network.

MJ Freeway/Leaf Data Systems also uses Nagios for server and network performance monitoring.



Server performance graphs for one week and for a five-week period can be seen above as an example of the performance metrics available with the Nagios tool.

These images reflect the service state information that is available and constantly being monitored for changes in status.

Service Information

Last Updated: Tue Jul 19 12:22:04 MDT 2016
Updated every 90 seconds
Nagios® Core™ 4.0.8 - www.nagios.org
Logged in as ihul!

View Information For This Host
View Status Detail For This Host
View Alert History For This Service
View Trends For This Service
View Alert Histogram For This Service
View Availability Report For This Service
View Notifications For This Service

Service
Current Load
On Host
mj-den-db01
(mj-den-db01)

Member of
No servicegroups.

10.2.200.151

Service State Information

Current Status: **OK** (for 8d 10h 2m 50s)
Status Information: OK - load average: 1.31, 1.14, 1.13
Performance Data: load1=1.310,10.000,15.000,0; load5=1.140,26.000,40.000,0; load15=1.130,24.000,32.000,0;
Current Attempt: 1/3 (HARD state)
Last Check Time: 07-19-2016 12:18:53
Check Type: ACTIVE
Check Latency / Duration: 0.000 / 0.331 seconds
Next Scheduled Check: 07-19-2016 12:28:53
Last State Change: 07-11-2016 02:19:14
Last Notification: N/A (notification 0)
Is This Service Flapping? **NO** (0.00% state change)
In Scheduled Downtime? **NO**
Last Update: 07-19-2016 12:21:56 (0d 0h 0m 8s ago)

Active Checks: **ENABLED**
Passive Checks: **ENABLED**
Obsessing: **ENABLED**
Notifications: **ENABLED**
Event Handler: **ENABLED**
Flap Detection: **ENABLED**

Service Commands

- Disable active checks of this service
- Re-schedule the next check of this service
- Submit passive check result for this service
- Stop accepting passive checks for this service
- Stop obsessing over this service
- Disable notifications for this service
- Send custom service notification
- Schedule downtime for this service
- Disable event handler for this service
- Disable flap detection for this service

Service State Trends

Last Updated: Tue Jul 19 12:22:35 MDT 2016
Nagios® Core™ 4.0.8 - www.nagios.org
Logged in as ihul!

View Trends For This Host
View Availability Report For This Service
View Alert Histogram For This Service
View Alert History For This Service
View Notifications For This Service

Service 'Current Load' On Host 'mj-den-db01'

07-18-2016 12:22:35 to 07-19-2016 12:22:35
Duration: 1d 0h 0m 0s

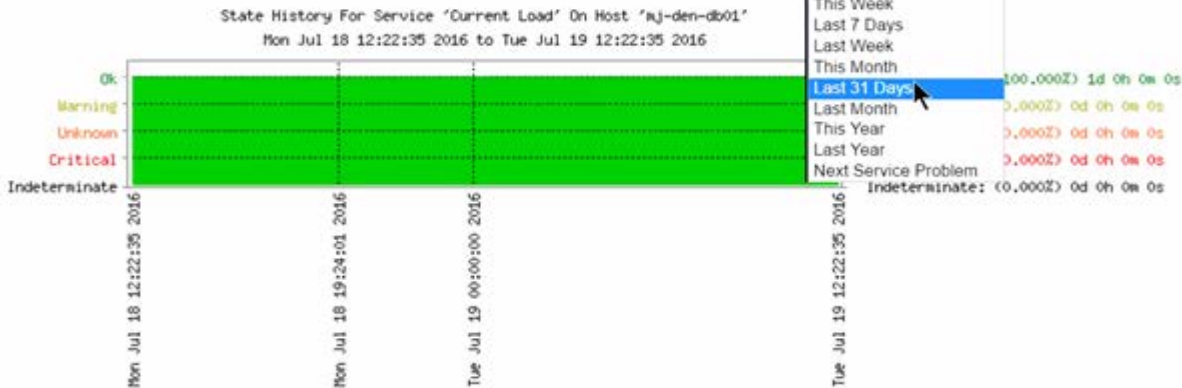
First assumed service state: Unspecified

Backtracked archives: 4

Report period: Last 24 Hours

Zoom factor: 4

Update



Monitoring metrics and alerts set on key performance elements within the MJ Freeway/Leaf Data Systems environment provide confidence that issues can be quickly and proactively addressed.

Incident Resolution Times

Our scope of incident management includes any event that disrupts or could disrupt a Service Capability. This includes events from users, as well as incidents detected and reported by technical staff or monitoring tools. Incident models

ensure standard approaches are followed and timescales are met. For example, we use well-defined solutions for common types of incidents such as managing security incidents. The table below lists the level, description, time to respond and resolution time for most common incidents.

Level	Description	Time to Respond	Target Resolution Time
1 – Critical	Serious issue, major impact on client functioning as a business	30 minutes	1 hour
2 – High	High impact affects parts of the organization and certain key functions of client	30 minutes	2 hours
3 – Medium	Client can function as a business but with decreased productivity or impact services for many people or key functions	2 Hours	12 Hours
4 – Low	Low impact has little or no effect on client as a business. Severity may increase or impact service for one person or lower level functions	2 Hours	1 Business Day

Problem Resolution Times

The scope of problem management includes diagnosing causes of incidents, determining the resolution, and ensuring the resolution is implemented. Problem management uses the same tools as incident management, and similar categorization, impact, and severity levels. We use problem models ensuring consistent handling of similar types of problem. Reactive problem management is part of service operation; proactive problem management is the activity in continual service improvement that identifies problems based on analysis of incident data. The table below shows our problem resolution levels, description of the issue type, and problem resolution times.

Level	Description	Problem Resolution Time		
		Root-Cause Analysis	Root-Cause Report	Problem Remediation Plan
1 – Critical	Serious issue, major impact on client functioning as a business.	24 Hours	36 hours	48 hours
2 – High	High impact affects parts of the organization and certain key functions of client.	36 Hours	48 hours	72 hours
3 – Medium	Client can function as a business but this will decrease productivity or impact services for many people or key functions.	2 Weeks	5 Days	15 Days
4 – Low	Low impact has little or no effect on client as a business. Severity may increase or impact service for one person or lower level functions.	4 Months	5 Months	6 Months

The Oracle Cloud Hosting Policy can be found as an attachment at the end of the Technical Submittal.

MJ Freeway/Oracle views security as an utmost critical factor to enable the success of the Medical Marijuana initiative. We have studied the Cyber Security policies from the Commonwealth web site and we are confident that our proposed solution and approach will exceed the Commonwealth’s standards.

Additionally, Amazon Web Services Government Cloud and Oracle Service Cloud have been FedRAMP JAB Certified. The Commonwealth should consider a Medical Marijuana platform that is already a FedRAMP JAB (Joint

Authorization Board) Certified SaaS. Specifically, it is important to understand that not all FedRAMP certifications are alike. More to the point a JAB FedRAMP certification must be scrutinized by the “Board”, comprised of the Chief Information Officers (CIOs) of the U.S. Department of Homeland Security (DHS), U.S. Department of Defense (DOD), and U.S. General Services Administration (GSA). This board is responsible for prioritizing authorizing cloud services that will be widely used across government. To obtain FedRAMP JAB certification, the CIOs of DoD, DHS and GSA must agree that the Cloud Service Providers (CSPs):

- Strictly meets all controls
- Presents an acceptable risk posture for use across the federal government
- Conveys a baseline level of likely acceptability for government-wide use

It is important to note that the FedRAMP JAB certification puts the onus of maintaining certification on the Cloud Service Providers (CSPs), and *not* on the city/county/agency obtaining the service. Additional CSP responsibilities are listed below.

- CSPs must use an accredited Third Party Assessor Organization (3PAO)
- FedRAMP PMO manages continuous monitoring activities; agencies review results

Proven benefits of working with a company that has FedRAMP JAB certification include:

- It’s the most rigorous, (although slowest) path to authorization.
- JAB authorization offers the LOWEST risk tolerance level
- HIPPA controls (AT-101) and FISMA NIST 800-53 Moderate Controls are included

Oracle Service Cloud is designed and certified to meet many of the compliance requirements of the most demanding environments. The security landscape continues to evolve, and you can rely on the Oracle Service Cloud to stay ahead of threats. Note that some compliance offerings are unique to the Oracle Service Cloud, and not all regulatory frameworks listed below are applicable to all available Oracle Service Cloud environments.

- PCI DSS Service Provider Level 1 (Payment Card Industry Data Security Standard)
- HIPAA (Health Insurance Portability and Accountability Act)
- Family Education Rights and Privacy Act
- GLBA (Gramm-Leach-Bliley Act)
- NIST 800-53 Moderate Control (National Institute of Standards and Technology 800-53)
- FISMA (Federal Information Security Management Act)
- U.K. Data Protection Act 1998, and all other E.U. National Legislation
- E.U. Data Privacy Directive 95/46/EC
- DIACAP (DoD Information Assurance Certification and Accreditation Process)
- FIPS 140-2 (Federal Information Processing Standard)
- SSAE 16 (Statement on Standards for Attestation Engagements 16)
- E.U. – U.S. Safe Harbor Registration SOC 1 / SOC 2 (Service Organization Controls)

There are multiple levels of security checks, testing, threat and risk assessments, vulnerability scanning and penetration testing to validate the system controls including file integrity. Audit and compliance checks are also conducted to identify changes to the "known-good" posture and take corrective or improvement actions as needed. Oracle Cloud operations team regularly tests security requirements with code scanning, vulnerability scanning, and penetration tools and methods to identify new or existing vulnerabilities not previously detected. Any findings or issues are formally

assessed, prioritized, and tracked to remediation. This process is ongoing throughout the system lifecycle. Oracle Cloud quality assurance process includes security specific test plans for every cloud release (major, minor, patch). These test plans include the review of data visibility, access control, password control, administrative privileges, end-user role privileges, and data access rules. In addition, cross-customer data security (visibility) is thoroughly tested. Security specific testing focuses on correct operation and application processing in accordance with Oracle Cloud design and specifications.

Our proposed solution security policy enforces "least privileged" and "default deny" access control principles as a means of limiting access to the SaaS service and service delivery infrastructure. Both principles are prohibitive approaches in which everything that is not explicitly permitted is forbidden. Below is a brief description of each:

- Least privilege is a system-oriented approach in which user permissions and system functionality is carefully evaluated and access is restricted to only the resources required for users or systems to perform their duties.
- Default-deny is a network-oriented approach that implicitly denies the transmission of all traffic, and then specifically allows only required traffic based on protocol, port, source, and destination.
- Oracle SaaS operations system access is provisioned through a centralized account provisioning system that is integrated with Oracle's HR database. Access privileges are granted based on job role and require Cloud line of business management approval.
- Authorization is dependent on authentication. All authorization decisions for granting, approval, and review of access are based on the following principles:
 - Need-to-know: Does the user require this access for their job function?
 - Segregation of duties: Will the access result in a conflict of interest?

Our comprehensive information security policy contains:

- Risk assessment
- Risk management
- Security awareness training and education
- Business continuity
- Consequences for non-compliance with corporate policies
- Responsibilities for information security management
- Acceptable use
- Access control
- Application security
- Change control
- Clean desk
- Computer and communication systems access and use
- Data handling
- Desktop computing
- Disaster recovery
- Email
- Constituent accountability

- Encryption
- Exception process
- Information classification
- Internet/Intranet access and use
- Mobile computing
- Network security
- Operating system security
- Personnel security and termination
- Physical access
- Policy maintenance
- Remote access
- Security incident and privacy event management
- Secure disposal
- Social media and Social networking
- Vulnerability management

The Oracle Security organization is composed of various teams and individuals involved in information security at Oracle, including the following: Executive-level oversight committee; Corporate information, product, and physical security organizations; Oracle Cloud operations Security organizations in various lines of business; Individual Information Security Managers (ISMs), who are assigned by each line of business to represent the security leadership of that organization. Management actively supports security initiatives, requirements, and compliance objectives through strategic planning, ongoing compliance and audit measures, and a commitment to maintaining a secure service environment.

Oracle Global Physical Security assesses and implements physical security controls at all Oracle locations world-wide. For example, Oracle Physical Security controls include:

- A. Authorization is required to enter Oracle facilities and access is monitored.
- B. Official identification must be worn while onsite.
- C. Visitors must sign a visitor's register and be escorted when on the premises.
- D. Possession of keys/access cards and the ability to access locations is managed based upon role requirements. Staff leaving Oracle employment must return keys/cards.

Additional Physical Security controls are in place at all Oracle Cloud Data Centers. For example, some of these include:

- A. Continuous monitoring by CCTV.
- B. Physical barriers are designed to prevent persons and vehicles from unauthorized entry.
- C. Entrances are manned 24 hours a day, 365 days a year by security guards who perform visual identity recognition and visitor escort management.

Oracle Cloud Services utilize Network Intrusion Detection Systems (nIDS) to protect the environment. nIDS sensors are deployed in either IPS (Intrusion Prevention Mode) or IDS (Intrusion Detection Mode) on the network to monitor and block suspicious network traffic from reaching the internal network. Monitoring is in place for the client's inbound and outbound traffic between the internet and the cloud platform, between the client's cloud platform to another client's cloud platform, and between client's cloud platform to the cloud staff environment.

nIDS alerts are routed to a centralized monitoring system that is managed by the security operations teams 24x7x365.

The lobby areas of Oracle's data centers are manned 24 hours a day, 365 days a year. Only Oracle employees, third party vendors, contractors on an approved sponsor list, and visitors with prior approval are allowed to enter Oracle's data centers.

Access to Oracle's data centers by visitors must be approved by Oracle data center senior management in advance of the visit and requests for visits must include the anticipated duration of the visit.

Upon arrival at an Oracle data center, visitors must provide proof of their identity through an Oracle- or government-issued photo ID. The visitor is then documented on a sign-in sheet and issued a temporary badge. Visitors are banned from possessing weapons, recording devices, and alcohol while on Oracle data center premises. Visitor badges are inventoried on a nightly basis. Any badge identified as missing will be promptly deactivated.

Oracle data center doors are linked to a security application running on a secure host. The application is used to zone the building and grant access to areas on an as needed basis. Access lists for each Oracle data center are reviewed monthly.

Upon an employee's termination or transfer from an Oracle data center, the employee's access privileges are revoked.

To control physical access to Oracle data centers and other sensitive areas, Oracle uses an integrated security management system with electronic photo ID badges, cardholder access control, biometrics, recorded digital video surveillance, and alarm monitoring. Main entrances are staffed 24x7x365 by equipped and trained security guards who perform visual identity recognition and visitor escort management. Intrusion detection alarm systems, vehicle barrier fencing, and a 24/7-armed security protection unit secure the building perimeter. All security incidents are investigated for root cause and tracked to closure.

In addition, Oracle logs certain audit and security related activities on operating systems, applications, databases, and network devices. Systems are configured to log access to the environment or Oracle programs, as well as system alerts, console messages, and system errors. Oracle implements controls to protect against operational problems, including the log file media becoming exhausted, failing to record events, or logs being overwritten. At a minimum and where technically feasible, security-related logs entries capture the following information:

- Date
- Time
- Time zone
- User account name, IP address, or both
- Source IP address information, software or configuration changed, identity of operation
- Original value (when applicable)
- New value (other than for changes such as a password change) (when applicable), and
- Location of change (host name, file name, or table name).

Disaster Recovery

MJ Freeway/Leaf Data Systems Disaster Recovery Plan includes off-site backups and Pennsylvania DOH system restoration within hours. We protect all of Pennsylvania DOH's stored data and systems by:

- Performing an immediate and thorough operational assessment
- Quickly recovering and resuming operations

- Maintaining or restoring access to your systems to your staff and Permittees

Our Disaster Recovery Plan anticipates internal and external Significant Business Disruptions (SBDs) affecting the ability to maintain operations and provide access to Pennsylvania DOH MJ Freeway/Leaf Data Systems data and systems. Examples of internal disruptions might be burst pipe or electrical fire in the building while external disruptions are events out of our control such as terrorist attacks or severe weather.

Our Disaster Recovery Plan includes specifics for Pennsylvania DOH PROJECT implementation and contain the following elements:

- Disaster recovery data center
- Data backup and recovery
- Business function recovery
- Communication plan
- Recovery time objectives

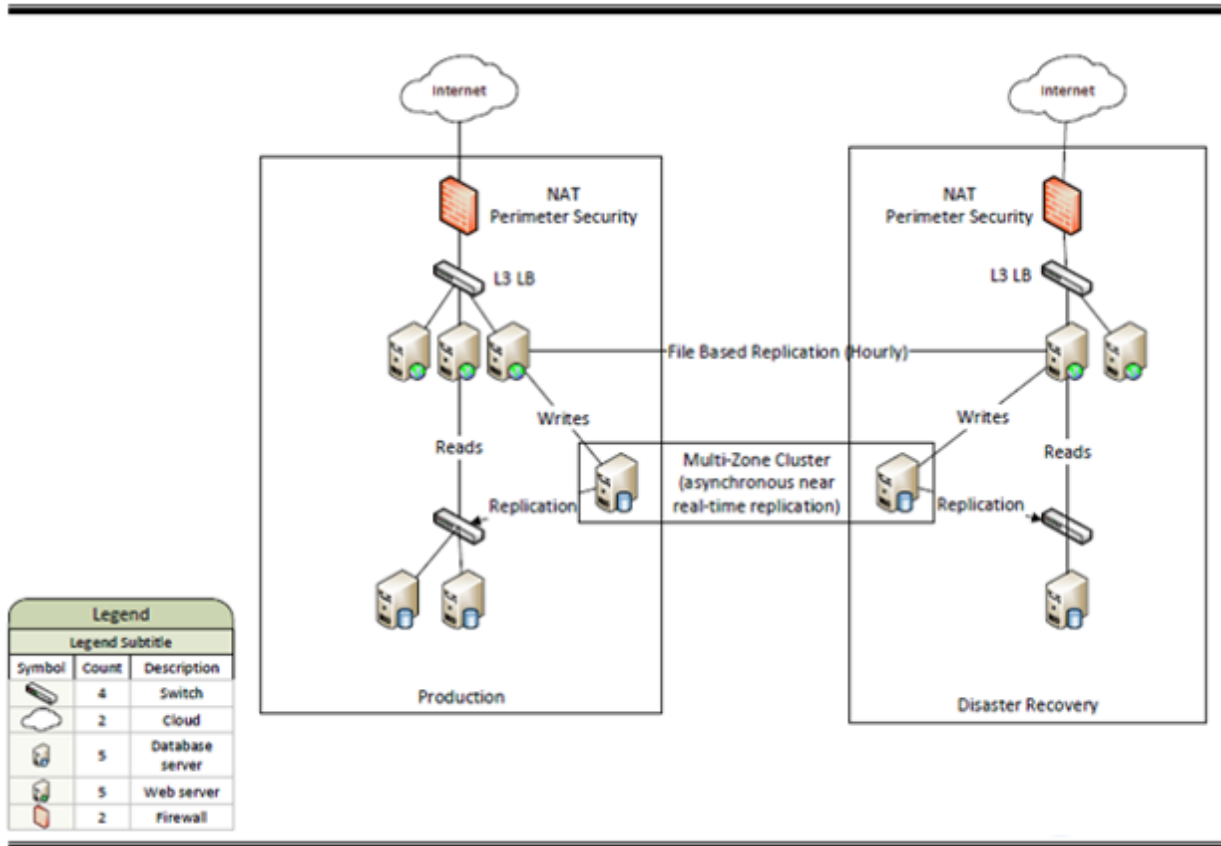
In anticipating internal and external disruptions, we have the people, locations, and processes to ensure your objectives of protecting your systems and data from natural disasters, hardware and software failures, human error, and other contingencies interrupting services.

People - MJ Freeway/Leaf Data Systems is a virtual company, meaning that employees need not travel to a central, physical location to perform their job functions. In the event of an SBD affecting a regional geography, employees relocate to continue their work. Key employees are residing in Colorado, Georgia, Texas, and Hawaii. In the event of an SBD affecting MJ Freeway's internal communications, MJ Freeway/Leaf Data Systems have alternate methods of communication through mobile and telecommunications networks.

Disaster recovery data center locations - Our Business Continuity and Disaster Recovery Data Center is connected via private line with VPN encryption and is at least 250 miles from the primary facility. Geographically separated data centers provide stability in the face of weather related events, localized service interruptions and other issues.

We use separate, multiple, and geographically separated hosting sites, with mirrored data capabilities, to facilitate rapid failover scenarios with extremely quick mean time to repair and recovery time objectives, including system restoration within hours. MJ Freeway/Leaf Data Systems fully manages all our infrastructure and software. Below is a sample illustration of the Pennsylvania DOH Freeway/Leaf Data Systems architecture and the mirrored redundancy ensuring immediate recovery from a disruption.

Systems architecture and the mirrored redundancy ensuring immediate recovery from a disruption.



Pennsylvania DOH Disaster Protection. Hourly file based replication plus asynchronous near real-time replication to the Disaster Recovery environment provide rapid and effective response capabilities when dealing with a business continuity event.

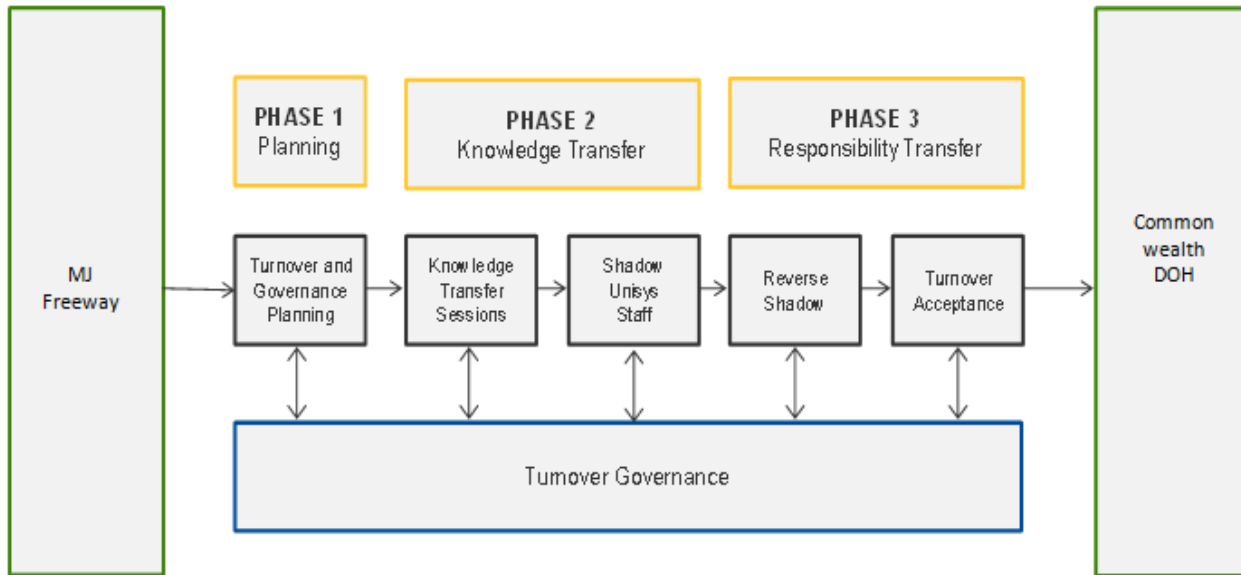
Data Backup and Recovery Processes – Business continuity and disaster recovery processes are supported by MJ Freeway/Leaf Data Systems’ multiple tier-3 data centers, hardware, and software configurations. MJ Freeway/Leaf Data Systems allow data management processes including archival and destruction methods. We use local backups with replication to our disaster recovery data center. We take daily, weekly, and/or monthly backup, store, and encrypt all SQL, static file, administrative, and audit data. In the event of an SBD, MJ Freeway/Leaf Data Systems engineers immediately identify the most effective means to communicate with Pennsylvania DOH Project Manager and Permittees. Our alternative communication options are in-system notification, SMS message alerts, voicemail message alerts, telephone alerts, and email alerts.

Recovery-time objectives are our planning and testing goals. As part of detailed project requirements discussions, Pennsylvania DOH and MJ Freeway/Leaf Data Systems review business continuity objectives and determine appropriate SBD recovery time objective.

Turnover Plan

Team MJ Freeway understands and is committed to supporting the objectives above. We will utilize our Solution Development Framework (SDF) methodology for managed services to define and provide the appropriate planning, technical, and operating services to enable the Commonwealth to make an orderly, complete and controlled transition to the Commonwealth or your selected successor contractor(s). During this time, MJ Freeway/Oracle will maintain system responsibility through the effective final date of the transfer and the completion of the reconciliation of the final day processing. This proven methodology has been used successfully in the transition of managed services for major MJ Freeway and Oracle clients throughout the world.

Figure below provides an overview of the MJ Freeway/Oracle Managed Services Transition Methodology.



MJ Freeway Managed Services Transition Methodology

A complete and thorough Turnover Plan is essential to the orderly, complete, and controlled transition desired by the Commonwealth and MJ Freeway/Oracle; it is required to avoid disruptions to processing and services provided the members, providers, and operational users of the Seed to Sale and Registry systems. Per our methodology for managed services, the Turnover Plan will also include a description of the:

- Critical Success Factors (CSFs)
- Transition Governance Model
- Roles and responsibilities
- Risks involved and any mitigating actions identified
- Assumptions and constraints
- Exit and acceptance criteria.

II-5. Prior Experience

MJ Freeway successfully delivers marijuana-tracking technology to state and local government agencies and commercial private businesses. *Today, nearly 50 percent of medical and recreational cannabis businesses in US regulated markets, Australia, Canada, Europe, and South America use MJ Freeway in English, Spanish and French.* In a typical month, MJ Freeway platform processes more than 750,000 transactions totaling more than \$50 million in medicinal and recreational cannabis sales for over 1,000 government and business entities. Because of the high public profile medical marijuana, governments and businesses choose MJ Freeway and Leaf Data Systems for transparency, scalability, and responsive customer service all ensuring compliance with state regulation, and control of inventory at all times.

We are a woman-owned company, we invented seed-to-sale tracking for cannabis and are patent pending on both the concept and the software methodology. Our Leaf Data Systems software is specifically created and designed for cannabis compliance tracking for Government agencies. Recently, the State of Nevada selected our MJ Freeway/Leaf Data Systems as the seed-to-sale tracking system for Nevada's medical cannabis program.

MJ Freeway has experience and historical data in cannabis compliance and tracking spanning over 1,000 cannabis business operations and more than 50 years of cumulative experience in cannabis compliance, tracking, and operations, is the ideal partner for Pennsylvania to ensure the launch of the medical marijuana tracking program is a success. MJ Freeway's patent-pending traceability platform has processed nearly \$5 Billion in transactions. MJ Freeway provides the Commonwealth with a team cannabis compliance and tracking professionals as well as an engineering staff of highly-trained, US-based software professionals. The wealth of data and experience MJ Freeway provides Pennsylvania will ensure the success of the medical marijuana tracking program.

MJ Freeway has seven (7) years of experience in the design, development, and deployment of inventory management solutions specifically for the medical cannabis industry. MJ Freeway's clients, both government and business, consistently express high levels of satisfaction with the company's solutions and performance. Not only does MJ Freeway specialize in inventory management solutions, but these solutions were developed with cannabis, and only cannabis, in mind. Thus, MJ Freeway's inventory management solutions are not adaptations from platforms designed for markets outside of cannabis; this relevance has been a key factor in the ability of MJ Freeway to provide lasting, compliant solutions that are designed to incorporate best practices for cannabis inventory management and also meet the inventory oversight needs of public regulatory officials. MJ Freeway was incorporated in the State of Colorado on January 29, 2010.

MJ Freeway partners with Oracle to provide Registry components. Oracle is the world's largest enterprise software company, and is a strategic applications and technology partner to public sector clients worldwide, including significant footprint in the Commonwealth of Pennsylvania and the commercial sector located in the Commonwealth. Oracle's industry-focused solutions automate key processes, such as those in the Cannabis information systems, enabling public sector organizations to provide the right information to the right people at the right time – Simplification, Standardization, Automation, and Innovation. These principles underlie everything we do at Oracle. Oracle is committed to making software a source of continual innovation for customers.

Oracle was engaged by New York State Department of Health (DOH) to provide full life cycle implementation support from Inception through Production for the Medical Marijuana Program (MMP). Oracle employed an iterative and incremental approach to development and deployment of the Medical Marijuana Data Management System (MMDMS). During Inception phase, Oracle collaborated with the State to gain concurrence among all stakeholders on the high level use cases and lifecycle objectives. Oracle then moved development of the solution from the scoping and high-level requirements performed during the Inception phase to developing the detailed requirements, partitioning the solution into processes such as Patient Certification, Patient Registration, Caregiver Registration, Change in Circumstances, DOH Portal, creating any necessary prototypes to validate requirements and familiarizing the stakeholder to the user experience, and base lining the architecture of the system to provide a stable basis for the design

and implementation effort in the Construction phase. Throughout the Construction phase, Oracle involved DOH in the review and validation of the in progress functionality via Conference Room Pilot (CRP's) sessions.

Oracle supported DOH to validate that the system is configured and tested systematically and is available for end users, ultimately, deployed into production. Post Production Oracle supported the State to operate the newly developed system, and monitor and address system issues. This includes monitoring the system and acting appropriately to maintain continued operation; measuring system performance; operating and maintaining supporting systems; responding to help requests, error reports and feature requests by users; and supporting the applicable change control process so that defects and new features may be prioritized and assigned to future releases and put into a plan for future enhancements to the application system, as well as determining, developing, and implementing required updates.

Oracle's consulting team is an experienced global provider of innovative and practical solutions for the public sector. We have helped hundreds of public sector organizations address their business objectives with the use of Oracle applications and technology. With Oracle specialists in 145 countries serving over 20 million users, Oracle Consulting knows how to best optimize an investment in Oracle products and can provide the Department with the most efficient, cost-effective, and 'future proof' rules solution throughout their ownership experience. Our customer profile exceeds 4,000 success cases where we have been able to transition our service benefits into the client's desirable outcome. Our teams are managed by skilled project management professionals trained in the methods of risk management to deliver project success within a structured, proven approach. We consistently provide the services that our customers return to as their businesses advance in their respective industries.

For this bid, we have also engaged with two Pennsylvania companies as key delivery partners. The Premier Personal Healthcare, LLC/Empyreal Electronic Medical Records team brings a wealth of knowledge and experience from the medical practitioner space as well as close relationships with Carnegie Mellon University technical experts. This team will be focused on the testing and training aspects of this project. TreCom Systems Group, LLC has significant technical expertise in software development and management and will be participating with business analysis and providing tier one support.

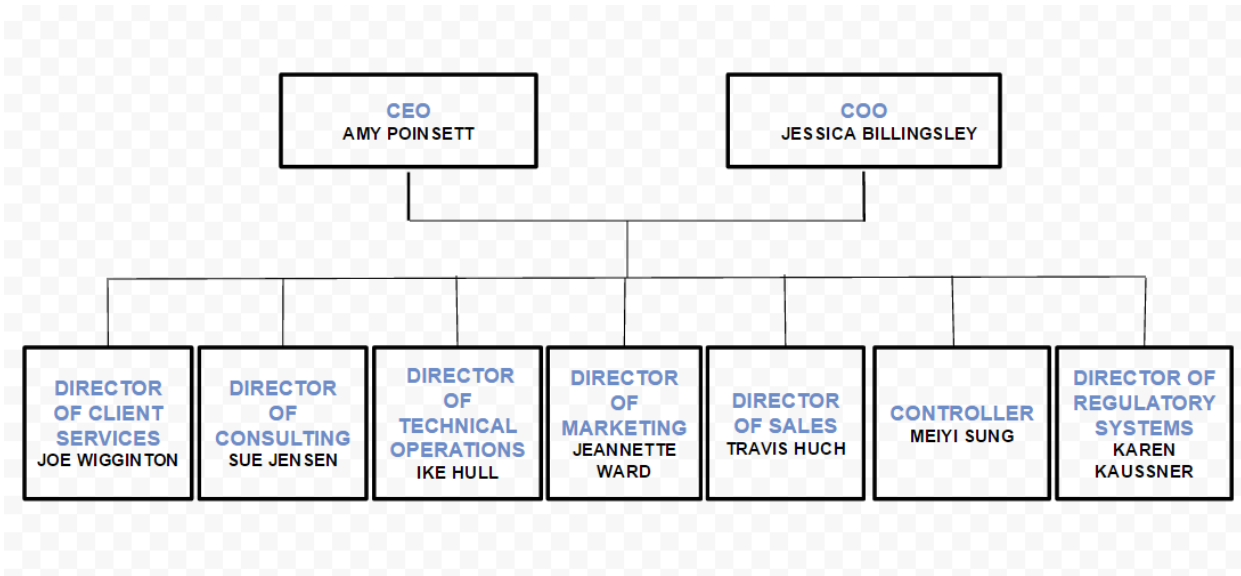
References are included in Appendix D – Project References.

II-6. Personnel

MJ Freeway has defined a robust project organization for the effective and efficient delivery of the proposed solution. We understand and fully support the Commonwealth's desire for continuity of staffing, and we are prepared to make the expected commitment to maintain staff continuity throughout the development and into the maintenance and operations project phases. We have assembled experts from across our corporation and have carefully chosen Oracle, Premier Healthcare Partners, and TreCom Systems as partners to form the best possible team. When choosing subcontractors, we utilize the "best of breed" in the areas of expertise needed to deliver the this project to the Commonwealth. Together we function as one team, Team MJ Freeway.

All team members bring a wide array of industry and Enterprise-solutions implementation experience to the project. All members assigned to the team will be knowledgeable of the DOH RFQ, the MJ Freeway/Oracle proposal, and all related documents. The key personnel supporting the Pennsylvania DOH design and implementation are proven leaders in technology, software implementation, project management, inventory tracking, and the regulated cannabis arena. MJ Freeway/Oracle guarantees the availability of these key personnel to maintain regular communication with Pennsylvania staff as well as to address any issues in accordance with proposed procedures. MJ Freeway/Leaf Data Systems key personnel are backed by an impressive staff of over 70 full-time, US-based, highly experienced and educated cannabis industry professionals including many former successful owner/operators of cannabis cultivation facilities, infused product manufacturing operations, as well as medical and recreational cannabis dispensaries. In addition to these industry experts, we also employ talented professionals with diverse backgrounds, including

accounting, marketing, business management, public policy, foreign languages, government contracting, consulting, computer information systems, and information systems management. All our staff are US citizens working in the United States. We closely manage our Support Desk, Development or Project Management services so we are able to monitor and maintain quality and timeliness in serving the Commonwealth of Pennsylvania.



Team resumes can be found in Appendix E.

MJ Freeway/Oracle core staff commitment to the DOH project:

Key Project Staff	Job Title/Project Role	Availability to the Project
<i>Amy Poinsett</i>	<i>CEO/Executive Sponsor</i>	<i>25%</i>
<i>Jessica Billingsley</i>	<i>COO/Executive Sponsor</i>	
<i>Ike Hull</i>	<i>Director of Technical Operations/ Technical Lead</i>	<i>40%</i>
<i>Joe Wigginton</i>	<i>Director of Client Services/ Services Lead</i>	<i>40%</i>
<i>Karen Kaussner, PMP</i>	<i>Director of Regulatory Systems & Compliance/ Project Manager</i>	<i>100%</i>
<i>Andy Hopkins</i>	<i>Product Manager</i>	<i>60%</i>
<i>John Vavul</i>	<i>Software Engineer</i>	<i>100%</i>
<i>Justin Soklin</i>	<i>Technical Support Manager</i>	<i>60%</i>
<i>Dr. Kim Hyatt</i>	<i>Training Lead</i>	<i>Training Cycles</i>
<i>Dr. Artur Dubrawski</i>	<i>Testing Lead</i>	<i>Testing Cycles</i>
<i>Vanessa Otway</i>	<i>Business Analyst</i>	<i>100%</i>
<i>Paul Morin</i>	<i>Oracle Technical Director/Implementation Lead</i>	<i>100%</i>
<i>Aparajit Malli</i>	<i>Oracle Technical Manager/Solution Architect</i>	<i>100%</i>

II-7. Training

Training for the Pennsylvania DOH will encompass education on using the seed-to-sale solution as well as the registry solution. Both MJ Freeway and Oracle have excellent training content already developed so the focus will be on fine-tuning materials to best suit the DOH project objectives.

Pennsylvania management, staff and Licensees require training to maximize the efficiency and effectiveness of MJ Freeway/Oracle. Our training team is fluent in Spanish and English and has extensive, hands-on cannabis industry experience as well as in-depth knowledge of our system. Our experienced training team first tailors our existing Training Plans to incorporate any unique needs for Pennsylvania to create a comprehensive, multi-faceted training program. We design our training to minimize impacts on ongoing operations, while maximizing trainee understanding of the MJ Freeway/Oracle registry and seed-to-sale inventory tracking system.

Our training plan includes:

- Training specifically designed for Pennsylvania DOH deployment of MJ Freeway/Oracle registry and seed-to-sale inventory tracking system
- Hands-on training for DOH staff
- Web-based training included live and recorded webinars
- Training materials to support self-training and reference needs

MJ Freeway/Oracle's comprehensive, hands-on user training meets the needs for all positions within the Pennsylvania staff as well as licensees and Registry users. Our training ensures the long-term success of the seed-to-sale inventory tracking system and full understanding of the registry functionality and workflow. With the collaborative approach and multiple knowledge sources which MJ Freeway/Oracle bring, users develop in-depth expertise and ease of use with the seed-to-sale inventory tracking system and the registry.

We use the most suitable training methodologies for Pennsylvania staff, licensees and registrants. The graphic below illustrates below our Blended Learning Approach combining onsite and offsite classroom delivery, coaching or one-on-one mentoring, business and technical workshops, virtual classrooms, and e-learning.



Excellent Training Results. Blended Learning Methodologies which are inclusive for all learning types.

Purpose of Plan

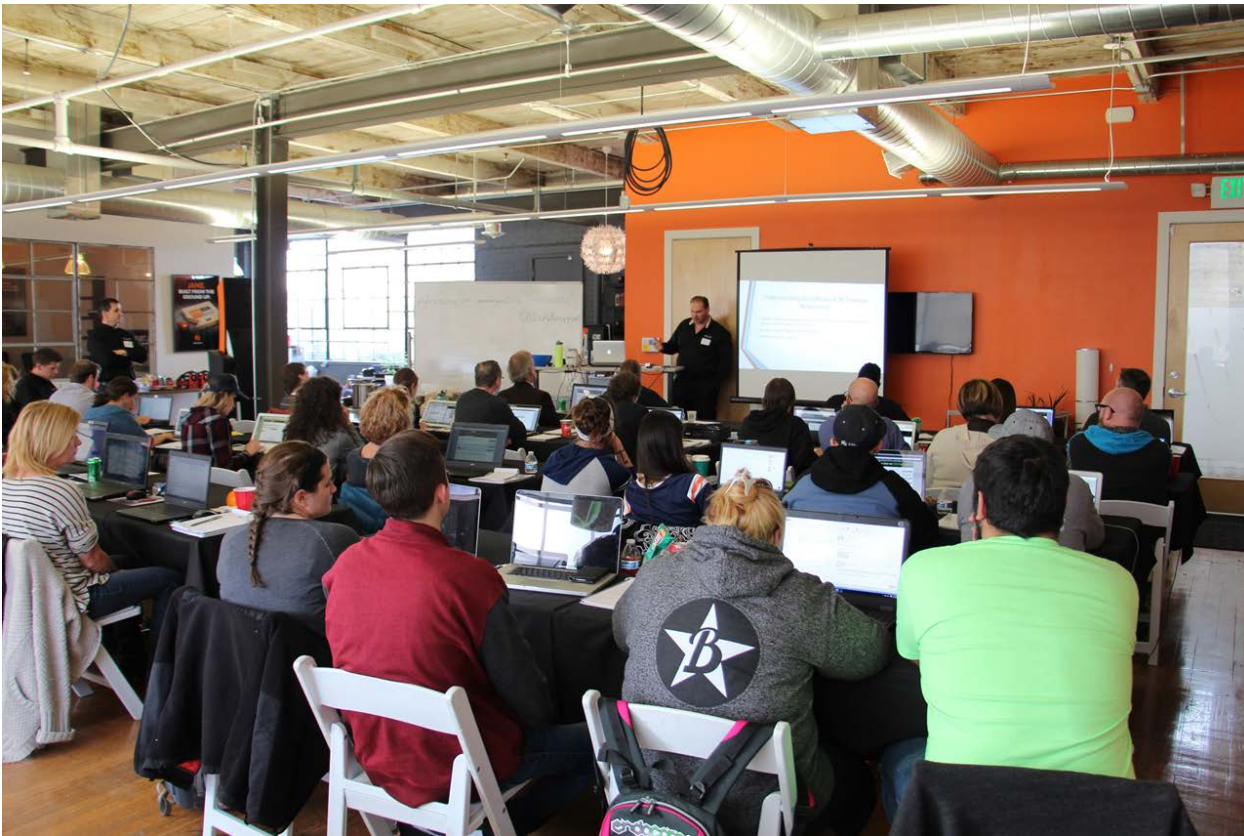
The Training Plan’s purpose is to document the overall strategy for the successful implementation of a training program meeting and exceeding the needs of DOH, licensees, and registrants. To ensure success, we develop the plan with Pennsylvania prior to implementation.

Organization of Plan

We organize our Training Plans into training approaches, methodologies, and training courses. The establishment of an effective training program includes considering not only training course requirements with differing learning styles, but also requirements that directly impact training such as installation schedules, operation and maintenance concepts, personnel as well as training logistics support requirements. The Training Plan is the primary document for identifying training and personnel requirements, including any training facilities, training equipment, and training materials necessary to implement the strategy. We use the Training Plan to control the planning and implementation activities for meeting the training requirements educating the trained personnel required to use the MJ Freeway/Oracle seed-to-sale inventory tracking system. The Training Plan also includes installation and configuration guides for each System component.

Maintenance of Plan

This Training Plan begins as a baseline document and is updated accordingly throughout the applicable areas in the project life cycle. This overview represents MJ Freeway/Oracle baseline version of the plan. Subsequent changes to this plan, based upon Pennsylvania comments or requirement changes, adheres to all established change control management and quality assurance processes.



Licensee Training - our blended learning approach to training enables all students - no matter their learning style - to pass the training.

Training Approach and Methodologies

MJ Freeway/Oracle overall approach for successfully implementing the training program for Pennsylvania is based on:

- Providing a highly-experienced team to develop and deliver the training curriculum
- Leveraging the investment we make in the development of training material for other users
- Providing a training approach to meet the vast array of learning styles
- Providing a comprehensive training curriculum to address not only subject matter requirements for each key role, but also support continuing education components
- Providing a long-term, evolutionary in nature program, including continuous updates to ensure ongoing training needs are met

Overall Training Methodologies

We use the most suitable training methodologies for Pennsylvania staff, licensees, and registrants. MJ Freeway/Oracle employ a blended approach to learning combining one-on-one mentoring, onsite and offsite classroom delivery,

business and technical workshops, virtual classrooms, and e-learning. Each of our training program adheres to the following standard outline:

- Management Orientation/Training Needs Assessment
- Classroom Training Component
- Focused Learning Sessions and Workshops
- Hands-on Training Component
- Training Materials
- User Documentation
- Continuing Training
- Web-based Instructor Training
- Course Training Evaluations

Management Orientation/Training Needs Assessment

Management Orientation provides a technical overview of all relevant technical staff. The overview consists of a high-level, yet technically detailed presentation of the seed-to-sale and registry systems. It includes an introduction of training personnel, a review of the training objectives, and an overview of the training materials.

Following the Project Kick-Off Meeting, Freeway/Oracle conducts a Training Needs Assessment to map training needs for all types of Pennsylvania users. After completing the Training Needs Assessment, the training team recommends standard courseware, custom development with special e-training and testing offerings. Benefits of our Training Needs Assessment include:

- Reduced time and costs to train and prepare training. Acquiring specific and detailed learning objectives for each of the learning groups reduces the time to develop and deliver training
- Reduced reliance on help desk support staff. With an improved level of knowledge in the day-to-day use of the tools, users require less help desk assistance
- Customized curriculum option. MJ Freeway/Oracle provide a great deal of flexibility as part of the blended learning approach. Our training team welcomes the opportunity customize our curriculum to best meet your needs

Classroom Training Component

MJ Freeway/Oracle offers individualized, role-based on-site classroom training. The format is lecture and lab, with an emphasis on practical hands-on application learning and discussion. At the beginning of the class, MJ Freeway/Oracle's trainers clearly outline learning objectives for students by presenting a checklist and describes the lessons. The examples and content presented by the trainers are relevant to the work performed by the students. As each lesson is covered, users partake in relevant hands-on practice with the system.

Focused Learning Sessions and Workshops

Depending on the training content, only a short learning session may be required. Users who have limited time availability may find it helpful to have concepts explained by an instructor in a short, focused session of one to two hours. Focused Learning Sessions can be formal, instructor-led, hands-on classroom sessions accompanied by manuals or quick reference materials or they can be workshop style sessions with quick reference guides as handouts. Short, focused classroom-based learning sessions are recommended when the content can be segmented into short learning

sessions or students cannot attend orientation for longer than a few hours at one time.

Hands-on Training Component

The most effective form of learning is through hands-on practice. Students have the opportunity to complete hands-on exercises to become more comfortable with the new system. They work through standard workflows and scenarios using the instructional system. This hands-on training reinforces what was learned in the classroom and allows the student to apply their knowledge in a real-world setting.

Training Materials

MJ Freeway/Oracle's training materials include formal user documentation in a training system environment emulating the operational system. All training material guides and instructional systems include realistic mock scenarios and manual activities as well as system-supported activities.

User Documentation

MJ Freeway/Oracle's team of in-house technical writers customize user manuals for Pennsylvania and the Licensees. These user manuals include easy-to-follow, step-by-step instructions for performing all system functions. Electronic and hardcopy user guides are available in English and Spanish. MJ Freeway/Oracle include installation and configuration guides for each system component. We also provide training exercises for each specific course offered to test the effectiveness of the training session and to identify trainees that may require additional training.

Continuing Training

Prior to software upgrades, our Project Manager receives a Training Schedule for Pennsylvania staff with the upgrades in a test environment. Ongoing training occurs when significant upgrades are introduced, however, other needs for ongoing training may be identified by Pennsylvania or Licensees. MJ Freeway/Oracle are committed to providing the most appropriate ongoing training for the needs of Pennsylvania and Licensees.

Web-based Instructor Training

MJ Freeway/Oracle offers a complete online training program. Virtual learning classes feature the same course content, instructors, and courseware as the standard, instructor-led classroom training courses. These are real-time courses with live instructors with delivery through web conferencing technology. Training materials are available prior to the start of the class and web-based course.

Course Training Evaluations

Effectiveness of the training is evaluated through the use of controlled test exercises and web-based instructor and course evaluation forms to be completed at the conclusion of each course. We provide Pennsylvania staff feedback forms for each course including summary reports on instructors, course evaluation forms, and training exercises. MJ Freeway/Oracle collaborates with DOH to determine appropriate intervals in which to implement any modifications.

With any new system, providing the necessary training is one of the keys to success. By aligning our approach with the implementation phasing strategy, the MJ Freeway/Oracle training program is designed to meet the needs of the specific end users from in both IT and business and accelerate their adoption of the system. This reduces the time needed for individuals to gain necessary skills and improves the accuracy of their work. An effective training program can be the difference between success and failure for any new system roll-out. Our Training team will be embedded in all design and development activities and integrate the process solution into all relevant training programs and materials, developing guidance and instructions that address the actions to be taken by each specific employee and stakeholder audience to implement the new process.

Our training strategy will involve an audience analysis to identify sub-groups within the learners and customize learning solutions to best meet their competency-based needs. MJ Freeway/Oracle will provide a Training Coordinator to administer and manage the Training Plan. That Training Plan will include tracks for each audience sub-group. For each sub-group, the Plan will include the seven elements listed below as well as a description of the material that will be collected on the portion of the knowledge base established for that sub-group or department:

- Different user groups;
- Each user group's training needs;
- The types of training proposed for each group;
- The proposed delivery mechanisms;
- The proposed training topics;
- The proposed duration; and
- Any prerequisites that need to be satisfied for users to be able to participate in training

Our Training approach is specifically assigned to develop and deliver Just-In-Time training to the Commonwealth to assist them in being productive on Day One. Oracle has divided the training into the following groups:

- Administrator Training: Deep technical training for those administrative users who will maintain and modify the system.
- Power User Training: Training for the most experienced users in the field. These individuals will not only understand the system at a detailed level, but will be able to provide support to other users.
- Basic User Training: Training customized for the basic users. This training is aligned to specific functions and requirements. It is designed to quickly allow staff to fulfill their job functions serving the stakeholders such as the providers.
- Executive Reporting Training: Training designed to support the executive leadership team in the organization. This training enables the executive leadership to see and understand the reporting systems and monitor the performance of the system and the medical marijuana program.

II-8. Financial Capability

MJ Freeway is financially stable and has the economic capability to perform the project requirements. Included below are two years of confidential financial statements for MJ Freeway.

REDACTED

REDACTED

II- Emergency Preparedness

MJ Freeway's hosted infrastructure is enterprise-class and of the highest caliber available in the seed to sale marijuana tracking industry. No other vendors approach the level of cloud hosting and systems provided, or the responsiveness of the Company's technical teams. The MJ Freeway software solution is hosted via a secure tier-3+ data center, certified SSAE16, and utilizes a Converged Infrastructure solution, which allows for rapid growth and expandability. The business continuity and disaster recovery data center is situated over 250 miles away from the primary facility. The use of multiple, geographically disparate hosting sites, combined with mirrored data capabilities, allows for rapid failover scenarios with extremely quick mean time to repair (MTTR) and recovery time objectives (RTO).

MJ Freeway/Oracle maintain disaster recovery plans, which will include the DOH implementation of the seed to sale inventory tracking software as well as the registry solution. The plan includes off-site backups and system restoration within less than twenty-four (24) hours. The plan also includes processes for responding to Significant Business Disruption (SBD) events in the following areas:

- **Disaster recovery data center**
 - The MJ Freeway business continuity and disaster recovery data center is geographically separated from the primary facility to minimize impacts from localized issues such as weather events.
 - The use of multiple hosting sites, more than 250 miles apart, combined with mirrored data capabilities, allow for rapid failover scenarios with extremely quick mean time to repair (MTTR) and recovery times objectives (RTO), including system restoration within less than 24 hours.
 - The data center design used for this project includes a disaster recovery data center that is directly connected via private line. All systems and data are replicated to the disaster recovery data center.
 - The MJ Freeway fully manages all infrastructure and software that is part of the seed to sale inventory tracking software.
- **Data backup and recovery**
 - The MJ Freeway's seed to sale inventory tracking software allows for data management which includes archival and destruction methods.
 - The backup solution is designed as a two-fold solution, using both local backups along with immediate replication to the disaster recovery data center.
 - The backups include SQL data, static file data, administrative data, and audit data.
 - All backups are stored with an encrypted key. While the key is not stored directly next to the backups, processes will be in place to rapidly access the key to facilitate timely restores.
 - Configuration of backups on a daily, weekly, and/or monthly basis are within the MJ Freeway's seed to sale inventory tracking software capabilities.
- **Recovery time objectives**
 - MJ Freeway's infrastructure and software is designed to be available 24 hours/day, 7 days/week, with a verifiable 99.99%+ uptime, including 100% uptime during peak usage hours.

- Business continuity and disaster recovery processes are supported by the MJ Freeway’s Infrastructure as a Service (IaaS), which is comprised of multiple tier-3 data centers, hardware, and software configurations. MJ Freeway fully manages all infrastructure and software that is part of the seed to sale inventory tracking system.
- Recovery-time objectives provide goals to plan for and test against. They are not, however, hard and fast deadlines that must be met in every emergency situation, and various external factors surrounding a disruption, such as time of day, scope of disruption, and status of critical infrastructure—particularly telecommunications—can affect actual recovery times.
- As part of detailed project requirements discussions, MJ Freeway and DOH will review business continuity objectives and determine appropriate RTO(s) in the event of an SBD.
- **Communication plan**
 - In the event of an SBD, MJ Freeway will immediately identify what means will be most effective in communicating with the DOH and Licensees.
 - Although the effects of an SBD will determine the means of alternative communication, the communications options employed will include in-system notification, SMS message alerts, voicemail message alerts, telephone alerts, and email alerts.
- **Business function recovery**
 - MJ Freeway’s policy as it relates to the DOH installation of the seed to sale inventory tracking software is to respond to a Significant Business Disruption (SBD) proactively; safeguarding employees’ lives, MJ Freeway property, and seed to sale inventory tracking software by:
 - Making an immediate and thorough operational assessment.
 - Quickly recovering and resuming operations.
 - Protecting all of the DOH installation of seed to sale inventory tracking software stored data.
 - Maintaining or restoring access to DOH installation of seed to sale inventory tracking software to the DOH and Licensees.
 - The MJ Freeway’s disaster recovery plan anticipates two kinds of SBD: internal and external.
 - Internal SBDs affect MJ Freeway’s ability to maintain operations of and provide access to DOH installation of seed to sale inventory tracking software.
 - External SBDs prevent the operation or access to DOH installation of seed to sale inventory tracking software due to an external event, such as a terrorist attack, severe weather, or a wide-scale regional disruption. MJ Freeway’s response to an external SBD relies more heavily on other organizations and systems.
 - Office and Employee Locations
 - MJ Freeway is a virtual company, meaning that employees need not travel to a central, physical location in order to perform their job functions.
 - In the event of an SBD affecting a regional geography, employees are able to re-locate to continue work. Key employees are distributed across the country, residing in multiple cities from coast to coast.

- In the event of an SBD affecting MJ Freeway's internal communications, MJ Freeway has an identified a tree of alternate methods of communication through mobile and telecommunications networks.
- If an SBD occurs that impacts Pennsylvania, staff will be deployed appropriately to mitigate the issue, whether that means sending additional team members to be onsite in Pennsylvania or convening resources virtually to address the SBD from other locations.

Appendix D – Project References

Name of Client & Project Title	State of Nevada Division of Public and Behavioral Health (DPBH) Seed to Sale Inventory Tracking System	
Contract Value	\$603,393	
Nature and Scope of Project:	<p>The scope of this project involves the implementation of Leaf Data Systems for the State of Nevada, Division of Public and Behavioral Health (DPBH) for the purpose of collecting, reviewing, and analyzing all data needed to effectively manage the Medical Marijuana Program in Nevada and provide the needed accountability and controls required to protect the health and well-being of the population of the State of Nevada.</p> <p>As the system of record for medical marijuana transactions in the State of Nevada, Leaf Data Systems provides aggregation, analysis, and reporting of all Licensee data state-wide. The State of Nevada Seed to Sale Inventory Tracking and Management System (SSITMS), powered by MJ Freeway’s Leaf Data Systems, is designed to address the need for a central repository that allows DPBH to collect, analyze, and report on inventory tracking and sales data for each licensed Medical Marijuana Enterprise (MME) in the State. SSITMS tracks each plant and each gram of cannabis throughout the entire distribution cycle: cultivation, harvest, disposal of unusable material, processing, testing, transfer or distribution, inventory, and customer sale.</p> <p>SSITMS also accounts for the transport of any marijuana products between MMEs, patients, and caregivers, while keeping track of the movement of marijuana and marijuana products within a single MME facility.</p> <p>DPBH requires that the system be capable of accepting the required data in a standardized format from Licensees through web services, Application Program Interface (API) or equivalent technology, and ease of adoption by Licensees regardless of the in-house inventory tracking or point of sale systems used by those Licensees. In addition, Licensees have access to the Seed to Sale system for upload/download of data as well as access to limited reporting for their establishment. Leaf Data Systems is developed to accept Licensee data via a secure API, and an API test application is built into the system to allow for direct testing of all API calls. This will promote rapid adoption of the API by DPBH and Licensees.</p>	
Project Duration:	Start Date Year: 2016	End Date Year: Ongoing

Nature of the Client:	State of Nevada Division of Public and Behavioral Health (DPBH)
Nature of Client Audience:	State of Nevada Division of Public and Behavioral Health (DPBH) program managers, inspectors and auditors, all Nevada licensees (cultivators, producers, dispensaries, labs).
Number of Users:	Approximately 500
# & Composition of Vendor Employees & Consultants Assigned:	Vendor PM and approximately 5 primary advisors plus MJ Freeway PM and approximately 5-10 internal resources (analyst, developers, systems, QA)
Client Contact Information:	Reference Contacts: REDACTED

Name of Client & Project Title	Harborside Health Center Commercial off the Shelf & Customization Project	
Contract Value	The budget for this scope of work involved MJ Freeway’s retail COTS system, currently in use by Harborside. Specific items that have contributed to the budget include custom development and a range of professional services offerings. Because Harborside is a private client, MJ Freeway is not permitted to share actual budget figures	
Nature and Scope of Project:	For Harborside Health Center (Harborside), MJ Freeway conducted large scale custom development on top of MJ Freeway’s existing COTS infrastructure, including the provisioning of a separate hosting environment. Harborside is an extensively regulated marijuana operation, the largest such operation in the world. Harborside has over 200,000 patients, over 10,000 different products, a delivery business, and a highly specialized segmentation of departments, workflows, and roles. As part of the project scope, MJ Freeway helped manage this complexity by aggregating four different software platforms that were in use by Harborside, and performing all related data conversion and data imports. MJ Freeway’s professional services offerings, which are unique among vendors of Seed to Sale technology, are also a significant part of the budget and ongoing relationship with Harborside. MJ Freeway consultants have produced over a dozen training videos and over 20 documents for Harborside that include flow charts, plans, best practices, and standard operating procedures	
Project Duration:	Start Date Year: 2013	End Date Year: On-going
Nature of the Client:	Harborside Health Center is one of the largest marijuana operations in the world.	
Nature of Client Audience:	Harborside Health Center staff at multiple locations in California.	
Number of Users:	100	
# & Composition of Vendor Employees & Consultants Assigned:	Harborside Health Center Core team – lead and several key employees plus MJ Freeway team lead and 5-10 internal resources (product manager, developers, QA, systems, implementation lead)	
Client Contact Information:	Reference Contacts: REDACTED	

Name of Client & Project Title	New York State Department of Health (DOH) - Medical Marijuana Data Management System (MMDMS)	
Contract Value	1.7M	
Nature and Scope of Project:	<p>Oracle was engaged by New York State Department of Health (DOH) to provide full life cycle implementation support from Inception through Production for the Medical Marijuana Program (MMP). Oracle employed an iterative and incremental approach to development and deployment of the Medical Marijuana Data Management System (MMDMS). During Inception phase, Oracle collaborated with the State to gain concurrence among all stakeholders on the high level use cases and lifecycle objectives. Oracle then moved development of the solution from the scoping and high-level requirements performed during the Inception phase to developing the detailed requirements, partitioning the solution into processes such as Patient Certification, Patient Registration, Caregiver Registration, Change in Circumstances, DOH Portal, creating any necessary prototypes to validate requirements and familiarizing the stakeholder to the user experience, and baselining the architecture of the system to provide a stable basis for the design and implementation effort in the Construction phase. Throughout the Construction phase, Oracle involved DOH in the review and validation of the in progress functionality via Conference Room Pilot (CRP's) sessions.</p> <p>Oracle supported DOH to validate that the system is configured and tested systematically and is available for end users, ultimately, deployed into production. Post Production Oracle supported the State to operate the newly developed system, and monitor and address system issues. This includes monitoring the system and acting appropriately to maintain continued operation; measuring system performance; operating and maintaining supporting systems; responding to help requests, error reports and feature requests by users; and supporting the applicable change control process so that defects and new features may be prioritized and assigned to future releases and put into a plan for future enhancements to the application system, as well as determining, developing, and implementing required updates.</p> <p>Throughout the life cycle, Oracle provided knowledge transfer to the project team members. We developed a shared ownership and 'peer review' strategy in which design and development deliverables were assigned across the integrated team that cultivated knowledge sharing, maximized Oracle product knowledge, and minimized delivery risk. The project went live in December 2015.</p>	
Project Duration:	Start Date Year: August 2014	End Date Year: March 2016
Nature of the Client:	New York State Department of Health	
Nature of Client Audience:	Providers, Patients, Caregivers, Law Enforcement, State workers, State Supervisors. Business partners include ID card services, Department of Motor Vehicle (DMV), and payment processor.	

Number of Users:	As of January 2017, 824 practitioners have registered for the NYS Medical Marijuana Program, and 12,530 patients have been certified by their practitioners.
# & Composition of Vendor Employees & Consultants Assigned:	The project was a blend between Oracle and State resources with emphasis on knowledge sharing and on the job learning and mentoring from Oracle to State staff. Oracle and the State provided 5 and 10 resources respectively to the project on average during the project execution. The stated level was maintained throughout until testing and production roll out when the State increased resource level to ensure successful go live.
Client Contact Information:	Per policy, the State has provided guidance as to who can serve in this role. Reference Contacts: REDACTED

Name of Client & Project Title	Pennsylvania Department of Environmental Protection – Application Service Desk Support	
Contract Value	\$6,250,000	
Nature and Scope of Project:	TreCom was engaged to provide application services desk support for all PADEP enterprise application system implementations. A key activity of this project is the validation and verification tasks associated with application system implementations. The TreCom Team insures that all application functionality has been included in system software releases by reviewing documented business and system requirements, and developing and executing quality assurance plans. The application systems include complex, custom-written and COTS-based systems that support over 10,000 employees within the DEP enterprise.	
Project Duration:	Start Date Year: 2011	End Date On-Going
Nature of the Client:	PA DEP is responsibility for regulatory activities of Pennsylvania’s environmental assets. The Bureau of Information Technology manages the TreCom project.	
Nature of Client Audience:	Project users include employees within the PADEP. This includes administrative, IT, and program technical personnel. Users are located at multiple offices across Pennsylvania as well as Central Office in Harrisburg.	
Number of Users:	10,000+	
# & Composition of Vendor Employees & Consultants Assigned:	TreCom staffing is at 10 FTEs and is led by a TreCom project manager who reports to IT management personnel.	
Client Contact Information:	Reference Contacts: REDACTED	

Appendix E – Personnel Experience by Key Position

POSITION	PERSONNEL NAME	COMMITMENT	CURRICULA VITAE			
			# YEARS PRIOR EXPERIENCE IN POSITION	OTHER RELEVANT EXPERIENCE	EDUCATION	OTHER PROFESSIONAL QUALIFICATIONS
(Include at least one row for all positions identified as Key Positions by DOH in II-6 of the RFQ, as well as any additional positions you've identified as integral to the work delineated in your proposal.)	(Identify by first/last name the person who will fulfill this position.)	(Provide the percentage of this person's time to be committed to the proposed project.)	(List the number of years this person has acted in the same role on prior projects similar in nature to the proposed project.)	(Provide a brief narrative of other experience this person has had that may be relevant to his/her role in the proposed project.)	(List all postsecondary degrees completed for this person.)	(List any certifications and/or professional memberships for this person that may be <u>relevant</u> to this position.)
Project Manager	Karen Kaussner	100%		Responsible for all elements of Project Management for implementation of MJ Freeway's Leaf Data Systems seed-to-sale cannabis tracking solution. Major	<ul style="list-style-type: none"> • Masters in Computer Information Systems, University of Denver • Masters in Telecommunications, University of Denver • Bachelors in Business, University of Denver 	Project Management Professional (PMP) Certified Scrum Master (CSM)

				<p>responsibilities include client communication and reporting, project management of all phases of configuration, implementation, training, and support.</p> <p>Leadership of Operations and Engineering teams.</p> <p>Manage and negotiate multiple vendor relationships.</p> <p>Financial Crimes Enterprise View of the Customer – expansive data capture and data warehousing project focused on linking customer data across the enterprise in support of Financial</p>		
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				<p>Crimes Risk Management team objectives (total budget \$3.1m).</p> <p>Program Manager for IT Resiliency Program – 20+ infrastructure projects annually, focused on enhancing disaster recovery capabilities and resiliency (total budget \$1.25m).</p>		
Implementation Lead/Product Specialist	Aparajit Malli	100%	5	<p>Aparajit has over 10 years of experience in all phases of business requirements, design, development, and implementation of enterprise software applications, with focus in Health and Human Services. He</p>	<ul style="list-style-type: none"> • MS in Management Information Systems, University of Illinois at Chicago • BE in Electronics and Communication Engineering, Madurai Kamaraj University 	<p>Certified in Siebel Case Management, Oracle Service Cloud, and Oracle Policy Automation</p>

				<p>has worked for clients within the public sector, automotive, high tech & communications, pharmaceuticals, insurance, high volume call center environment, and services industries. His areas of expertise include Business & Solution Architecture, Siebel Case Management, Oracle Policy Automation, Oracle Service Cloud (RightNow) Agent Desktop Customization & Integration, Oracle Service Cloud (RightNow) Customer Portal Customization, Oracle Service Cloud (RightNow) Administration, Oracle</p>		
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				Siebel CRM Integrations using standards like Web Services, Case Management, Oracle Policy Automation Integration with Siebel Connector and Business Intelligence reporting. He has expertise in customizing Oracle Service Cloud (RightNow) in C#.net and PHP and customizing Siebel Applications in Open UI using JavaScript, HTML5 and CSS and. He is adept at facilitating sessions defining user requirements, developing and delivering architecture blueprint, creating and maintaining		
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				<p>project schedules, and preparing and presenting project briefings to executives. Aparajit has most recently served as the Business Architect as well as Lead Solution Architect for the NYS Medical Marijuana Program (MMP) that was successfully launched in December 2015.</p>		
Testing Lead	Artur Dubrawski	4 work-weeks	16	<p>27 years in developing high-tech software and hardware solutions in government, academia, and industry, including 16 years in leadership positions. Multiple intelligent information systems built, tested and</p>	<p>Postdoctoral in Machine Learning (Carnegie Mellon University), PhD in Robotics and Artificial Intelligence (Polish Academy of Sciences), Postgraduate in Applied Mathematics (Polish Academy of Science), MS in Aerospace Engineering (Warsaw</p>	<p>Member of IEEE, INFORMS, AAAI, IMLS, ASA, AMIA</p>

				<p>deployed with the US government (including DoD, national security solutions with DHS, food safety and public health solutions with USDA and CDC)</p>	<p>University of Technology)</p>	
<p>Business Analyst</p>	<p>Vanessa Otway</p>	<p>100% 3/1/17 – 12/31/17</p>	<p>17+ years</p>	<ul style="list-style-type: none"> <p>AARP, Washington, DC - Conduct user stakeholder requirements analysis, identify and analyze as-is business processes . Develop future-state process maps based on subject matter experts (SMEs), draft business rules, and set</p> 	<p>Masters of Business Administration, 1989 Howard University, Washington, DC</p> <p>B.S. Chemical Engineering, 1980, Rice University, Houston, TX</p>	<p>ISO9001 Internal Auditor Certification, 2009;</p> <p>Certified SCRUM Master</p>

				<p>performance targets.</p> <ul style="list-style-type: none"> • ETL Public Comment Application - Facilitate requirements development for changes to the Salesforce CRM cloud application that captures public comments to toll changes for the Express Toll Lane, part of the \$1.08 billion I-95 Improvement Project. 		
Registry Business Analyst	Paul Morin	100%	20	<p>Paul has over twenty years of experience in the analysis, design, development, and</p> <ul style="list-style-type: none"> • Moscow Mining University, Bachelor of Science, Civil Engineering • Johnson & Wales 	Case Management Certified Consultant	

				<p>implementation of enterprise applications, specifically in Public Sector Health & Human Services. For the past fifteen years, Paul focused on the implementation of the Siebel case management applications in the context of person-centric case management, eligibility, healthcare industries and benefits management. Paul has experience in all stages of the project lifecycle with specific focus on solution design. In a series of successful engagements, Paul performed in a multitude of roles as a hands-on product</p>	<p>University, ESL, courses in Computer Science and Business Administration</p>	
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				<p>expert, business analyst, technical lead, and solution architect.</p> <p>As the lead Business Analyst on the NYS DOH Medical Marijuana Data Management System, Paul worked with the customer to translate the emerging regulations into the business requirements and process flows. Paul then collaborated with the customer IT and Oracle tech leads to devise a comprehensive solution enabling various stakeholders to perform required tasks. Throughout the</p>		
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				<p>implementation on Paul conducted the knowledge sharing sessions and demonstrations to familiarize the customer with the devised system.</p> <p>Paul also provided support to training and change management staff to effectively transition the State to operationalize the program. Throughout this process, Paul utilized Oracle Unified Methodology and tools to support the design and development of the interface between the Medical Marijuana Data Management System and</p>		
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				other components such as Payment Processing, Card Generation, and Seed to Sale System.		
Lead Trainer	Dr. Kim Hyatt	6 weeks	20+	<p>Associate Teaching Professor at Carnegie Mellon University</p> <p>Educational and Instructional Technology Consultant (National and International Organizations) -- Concentrations in Curriculum & Development, Assessment, Accreditation, and Communications</p> <p>Associate Editor for International</p>	<p>University of Pittsburgh, Doctor of Education (Ed.D): Higher Education & Management Program</p> <p>Carnegie Mellon University, K-12 Leadership and Principal Certifications: Master of Public Management Program</p> <p>University of Pittsburgh, Master of Arts in Teaching (MAT) and Bachelor of Arts in English and Communications</p>	<p>4 Pennsylvania Teaching Certifications</p> <p>2 Pennsylvania Administrative Certifications</p> <p>USA Liaison: Information and Communication Technology Education for the International Higher Education Teaching and Learning Association</p> <p>Associate Editor: Journal in Applied Research in</p>

				<p>l Academic Journals</p> <p>Founder and President of Team RobotiX, a 501 (c)(3) Nonprofit Organization</p> <p>University Graduate Education Program Director and Accreditation Coordinator</p>		<p>Higher Education</p> <p>Member of the International Review Board (IRB): International Higher Education Teaching and Learning Association</p> <p>Associate Editor: International Journal of Information & Communication Technology Education</p> <p>Member of the Editorial Board: Journal of Meaning-Centered Education</p> <p>Member of the Editorial Board: Universal Journal of</p>
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Amy Poinsett

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Phone: 888-932-6537, ext 701 • E-Mail: Amy@MJFreeway.com

Experience

MJ Freeway, LLC – Co-Founder and CEO April 2010 to Current

Amy Poinsett is a co-founder and the Chief Executive Officer of MJ Freeway Business Solutions, a woman-owned software company focused on providing a business software platform including point of sale, inventory tracking, manufacturing, and cultivation management software for marijuana businesses.

A talented and well-respected leader, Amy provides strategic direction and guides the high-performance culture of her team. Her determination for regulating the medical marijuana industry is widely-known, as is her passion for creating the best software platforms for the medical and adult-use marijuana industry.

An alumnus of the University of Denver, Amy has directed technology development teams in software, application design, and research analysis across various business sectors within financial services, luxury tourism, and medical technology, resulting in high revenue returns and stable corporate growth. As a successful entrepreneur, Amy has founded, directed and held COO and CEO positions for various high-earning technology start-up companies in the point of sale and e-commerce spaces.

Amy is recognized nationally as an industry expert and has been a frequent guest speaker at many industry events. She has been interviewed and quoted by many local and national media outlets including CNN Money, Fortune, Wall Street Journal, USA Today, WIRED, and Forbes. She was featured in Cannabis Now's Eight Cannabis Entrepreneurs to Watch in 2014 and was included in Entrepreneur Magazine's Annual List of 100 Brilliant Companies.

WonderDog Corporation – Co-Founder and Chief of Web Operations 2003 to 2011

Launched and built web development arm of this provider of technology solutions.

Mesa National Bank & WestStar Bank – Mortgage Lending 2002 to 2003

Managed mortgage loan process from application to closing.

Southern Cross Club – General Manager 2000 to 2001

Managed a high-end, all-inclusive, 11-room fishing and diving resort with greater than 80% year-round occupancy and approximately US\$1.5 million in revenue.

WRQ, Inc. – Various Technical Management Positions 1993 to 2000

Identified consulting opportunities and developed and delivered service offerings.

MGMA/CRAHCA – Research Analyst 1991 to 1993

Coordinated design and development of financial analysis software for medical groups.

Education

University of Denver June 1993

B.S.B.A. in Business and graduate studies in Information Technology

Jessica Billingsley

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Experience

MJ Freeway, LLC – Co-Founder and COO

April 2010 to Present

When the first marijuana businesses opened in Colorado, Jessica Billingsley co-founded MJ Freeway Business Solutions to fill a fast growing need to track and manage inventory. As Chief Operating Officer, Billingsley and her partner made the timely decision to launch a tech firm specifically for the cannabis industry. MJ Freeway provides an enterprise software platform for government agencies, cultivation operations, processing and manufacturing operations, and retail operations. MJ Freeway also provides cannabis consulting services. Since its inception, the women-owned firm has been recognized in numerous major media outlets and was listed in the prestigious INC 5000 in 2015. In addition, Billingsley has been named to Fortune Magazine’s list of Top 10 Most Promising Women Entrepreneurs.

Billingsley’s deep management skills and strategic vision consistently result in cohesive teams and large profit margins. Billingsley’s respected reputation has also won her a board member seat several years running on the National Cannabis Industry Association.

Prior to forming MJ Freeway, Billingsley cut her teeth building and managing technology operations with an emphasis on executive management, corporate culture, finance, and strategic relations. She has been a successful founder, owner, director, COO, and CEO of companies with revenues exceeding eleven million (\$11M).

Zoco, LLC– President and CEO

April 2001 to Present

- Provide complete solution contract Information Technology services and support to small business clients.
- Provide Specialty Contract services in conjunction with partners.
- Manage business scheduling, ordering, and accounting responsibilities.
- Network and System Administration: Windows Servers 2008, 2003, 2000, and NT; Linux (Suse, Debian).
- Computer Sales and System Configurations.

- Custom Database Programming.
- Prepare and Analyze Interim Financials for various firms.
- Individual and Group Training and Instruction.

Patient Care Technologies – Technical Resources Programmer

September 1998 to April 2001

- Managed upper level technical support for clinical software.
- Coordinated and focused team resources.
- Programmed code as necessary for special projects and deadlines.
- Designed program specifications for development programmers.
- Instructed client IT on resolutions for communication, hardware, and network problems.
- Supervised research and directed support analysts.
- Administered network for in-house training facilities.

Education

University of Georgia

June 1998

Bachelor of Science, Computer Science & Communications

Languages: Native English, fluent French, proficient Spanish

Ike Hull

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Phone: 720-446-8866 • E-Mail: Ike@MJFreeway.com



Experience

MJ Freeway, LLC – Director of Technical Operations

February 2015 to Present

- Responsible for all development, support, and systems operations within the company. Primarily focuses on the business needs first and foremost, then builds an IT strategy that enables tangible business performance gains.
- Strategic duties include; managing partner relationships, building consistent integration points, corporate IT strategy, associate career development, and sales enablement.
- Moved the MJ Freeway architecture from a dedicated single geographical computing location to a compliance based geographically disperse modular design.
- Specialties: IT Systems architecture, Problem solving, Project Management, Operating systems, IT Budgeting & Financial Modeling, Process Improvement, Management, and Leadership
- Manage and negotiate multiple vendors throughout the system and order fulfillment processes.

Long View Systems– Practice Lead, Solutions Architect 2015

July 2013 to February

- Built client relationships, sold new work, managed a portfolio of programs across clients, associate career development, and client delivery.
- Built an architecture practice for the Denver branch consisting of seven solutions architects that is currently on pace to add two more resources to the branch for 2015.
- Developed sales methodology for growing the practice and services deployed out of the Denver branch. Current estimate of over \$300K in monthly recurring revenue supported in sales deployments.

Windstream Hosted Solutions – Solutions Architect, Western Region

April 2013 to July 2013

- Developed and trained Solutions consultants for a green team of 8+ sales representatives in the western region.
- Solutions Architecture practice included full suite of products around infrastructure as a service.

Datria Systems – Customer Solutions Director

September 2012 to April 2013

- Provided architectural direction and support for customer solutions.
- Consulted with customers regarding business requirements and business processes and made recommendations related to software design scope, operating systems, databases, security, service delivery and infrastructure.

ViaWest, Inc – Sales Engineering Manager

July 2007 to July 2012

- Managed the Sales Engineering team for the largest privately held Data Center and Managed Services company in North America.
- Lead architect for the largest managed service deployment in ViaWest’s history. Solution included over eighty-eight servers utilizing clustering, SAN and SAN fabric and full windows system support.

RealGo, Inc – Operations Manager

April 2005 to June 2007

- Managed all aspects of operations for the northern Colorado Multiple Listing Service used by all Realtors.

MapQuest.com

January 2000 to March 2005

Senior Software Engineer (Jan 2004 – Mar 2005)

Senior Systems Administrator (Jan 2001 – Dec 2003)

Systems Architect (Jan 2000 – Dec 2000)

Education

University of Colorado, Denver

June 1996

Bachelor of Science, Computer Science

University of Colorado, Denver

In Progress

Post-graduate studies, Computer Science

Karen Kaussner, PMP, CSM

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Phone: 888-932-6537 • E-Mail: Karen@MJFreeway.com



Experience

MJ Freeway, LLC – Director, Regulatory Systems & Compliance November 2015 to Present

Responsible for all elements of Project Management for implementation of MJ Freeway's Leaf Data Systems seed-to-sale cannabis tracking solution. Major responsibilities include client communication and reporting, project management of all phases of configuration, implementation, training, and support.

- Leadership of Operations and Engineering teams.
- Manage and negotiate multiple vendor relationships.

Wells Fargo – Senior Project Manager July 2014 to October 2015

- Financial Crimes Enterprise View of the Customer – expansive data capture and data warehousing project focused on linking customer data across the enterprise in support of Financial Crimes Risk Management team objectives (total budget \$3.1m).
- Anti-Money Laundering (AML) Monitoring – data warehouse and imaging project focused on capturing cash letter image transaction data and archiving images.
- Ensure strict compliance with the Technology Operations Group Project Management methodology.

Great-West Financial – Senior Project Manager/Program Manager October 2012 to June 2014

- Program Manager for IT Resiliency Program – 20+ infrastructure projects annually, focused on enhancing disaster recovery capabilities and resiliency (total budget \$1.25m).
- Portfolio Manager for over 100 Planview Enterprise application IT Infrastructure projects.
- Awarded President's Award for 2013 for partnership, integrity, and commitment

Janus Capital Group – Senior Project Manager November 2009 to October 2012

- Worked with Architects and Engineers to evaluate, test, procure, and implement new technology for the enterprise.
- Led Mobile Device Program, Technology Refresh Program, and email migration project.

Aurora Bank – Project Manager in Application Engineering Group 2009 Contract

- Managed development of correspondent program with multiple project teams and business customers.
- Managed development, testing, and implementation for asset management database tool.

CoBank – Project Manager in Application Development Group 2008 – 2009 Contract

- Worked with business users, developers, vendors, and outside consultants to develop and deploy software solutions.
- Managed simultaneous projects with multiple project teams and business customers.

Fiserv Investment Support Services – Project Coordinator

2008 Contract

- Worked with users, developers, and vendor to ensure compliance with design specifications and business requirements using Agile framework.
- Coordinated testing efforts - tracked and managed defects (bugs, gaps, functionality issues) using Mantis tool, coordinated testing efforts of business user test groups, tracked and reported testing results, coordinated change control process, tracked and mapped test cases to business requirements, provided analytical reporting to senior management on testing efforts and results.

Education

University of Denver

June 1997

Master of Computer Systems and Master of Telecommunications (dual degree)

University of Denver

June 1981

Bachelor of Science, Business Administration

John Vavul

1601 Arapahoe Street, Suite 900, Denver, Colorado 80202

Phone: 888-932-6537 • E-Mail: John@MJFreeway.com



Experience

MJ Freeway, LLC – Software Engineer

July 2015 to Current

John Vavul designs and build highly scalable SaaS applications in a cloud environment using LAMP, Laravel, Bootstrap and JQuery. John implemented MVC architecture to efficiently separate design from business logic. He designed an API to accommodate outside systems to report to the central database and has architected high performance data models to ensure speed and reliability.

Extantware – Lead Software Engineer

2012 to 2015

- Built large SaaS ecommerce applications in a cloud environment using LAMP, Laravel, Bootstrap and JQuery using OOP techniques.
- Integrated internal systems and many external systems with websites.
- Configured and integrated HA systems in the cloud consisting of database, web and app tiers to ensure scalability and reliability.
- Implemented release procedures and oversaw software deployments.
- Oversee and manage web servers, app servers, database servers and load balancers in a Rackspace hybrid private/public cloud environment.
- Integrated an eCommerce site with multiple disparate APIs including Facebook, eBay, Yelp, Amazon, Google Ad Words, AuthorizeNet, PayPal, POS systems, accounting systems, multiple shipping connectors and many comparison shopping engines.

Tetris – Lead Software Architect

2006 to 2012

- Developed and maintained web and server architecture and infrastructure for a top 5 Facebook game using LAMP, Java, Tomcat, replication, load balancing and monitoring.
- Developed hybrid solution of dedicated and cloud servers to handle over 5 million DAU, 15 million MAU.
- Built custom CMS solution and REST APIs
- Integrated social gaming components on Facebook.
- Managed programming and deployment teams for 5 game sites.
- Architected and built CentOS based dev, staging and production environments.
- Implemented release procedures and oversaw deployments.
- Designed stress tests to find bottlenecks and breaking points.

Ezrez Travel Software (now Switchfly) – Founder & Chief Architect 2000 to 2006

- Founded and served as chief architect for the leading travel industry SaaS travel software company.
- Developed leading travel ecommerce solution which currently processes billions of dollars per year in sales.
- Developed travel booking engine solutions for Hotwire, Expedia, American Airlines, United Airlines, Qantas, American Express Travel, Jet Blue, Starwood Vacations, Lufthansa and many more.
- Integrated air, room, car, hotel, activity and redemption systems together into a completely configurable booking engine solution

Education

96

Purdue University

May 1994

Computer Science

University of Hawaii

May 1996

Asian Studies

Justin Soklin

1601 Arapahoe Street, Suite 900, Denver, Colorado 80202

Phone: 888-932-6537 • E-Mail: Justin@MJFreeway.com



Experience

MJ Freeway, LLC – Manager of Technical Support

March 2015 to Current

Justin Soklin leads a team of technicians responsible for ensuring MJ Freeway's clients are assisted with the upmost customer service and best solutions. Justin oversees communication regarding troubleshooting, handles escalated requests and works closely with the sales, consulting and development departments.

Kind Love LLC – Dispensary Retail Manager

2010 to 2015

- Developed and implemented Standard Operating Procedures.
- Responsible for hiring, reviewing, terminating and creating schedules for a team of up to 10 people.
- Created lasting relationships with clients and reached new sales records.
- Performed basic accounting practices on a daily basis.
- Efficiently reduced overhead costs by managing employee hours, identifying best cost of goods and reducing inventory loss.
- Increased employee retention and client satisfaction.
- Responsible for ordering products and analyzing demand requirements.

Gravity Music Gear – Online Sales

2006 to 2010

- Purchased used local music equipment, repaired and cleaned.
- Created online auctions for items.
- Used analytical software to maintain profitability.

Education

Metropolitan State University of Denver

August 2004

BS Marketing

Andy Hopkins

1601 Arapahoe Street, Suite 900, Denver, Colorado 80202

Phone: 888-932-6537, ext 812 • E-Mail: Andy.Hopkins@MJFreeway.com



Experience

MJ Freeway, LLC – Product Owner

April 2016 to Current

Andy Hopkins draws from prior cannabis industry experience to lead software functionality planning as Product Owner at MJ Freeway. Andy helps determine feature priorities by applying knowledge gained as a cannabis retail operations manager to ensure the product meets the needs of MJ Freeway clients in various stages of their operation. Andy documents common procedures and technical requirements while communicating with compliance and sales departments.

The Clinic Marijuana Centers – Retail Operations Manager

2010 to 2016

- Led growth of retail division from six to over 40 staff members.
- Created and implemented Standard Operating Procedures based on comprehension of rules and regulations; created training manuals for each employee level that were used in three regulated U.S. states.
- SOP and policy creation have led to five years of deficiency-free audits by state and local authorities.
- Determined pricing based on competitive analysis in the most mature and saturated regulated U.S. market, Colorado.
- Implemented marketing campaigns and strategies based on current environment to gain market share.
- Interviewed, hired, trained and terminated all employees for the retail division.
- Encouraged team building and familial atmosphere resulting in lowest turnover rates in company.
- Intermediary between The Clinic and our web based services MJ Freeway and Colorado's cannabis traceability system, METRC.

Education

Kent State University

August 2003

BSA Marketing



Paul Morin

Health & Human Services Solution Architect

Paul has over twenty years of experience in the analysis, design, development, and implementation of enterprise applications, specifically in Public Sector Health & Human Services. For the past fifteen years, Paul focused on the implementation of the Siebel case management applications in the context of person-centric case management, eligibility, healthcare industries and benefits management. Paul has experience in all stages of the project lifecycle with specific focus on solution design. In a series of successful engagements, Paul performed in a multitude of roles as a hands-on product expert, business analyst, technical lead, and solution architect.

Professional Experience

Siebel 8.2 Public Sector

Oracle Policy Automation 10.2

Medical Marijuana Program

System Design for Medical Marijuana Program. As a Solution Architect, Paul worked with the customer to translate the emerging regulations into the business requirements and process flows. Paul then collaborated with the customer IT and Oracle tech leads to devise a comprehensive solution enabling various MMP participants to perform required tasks. Throughout the implementation Paul conducted the knowledge sharing sessions and demonstrations to familiarize the customer with the devised system.

Paul also provided support to training and change management staff to effectively transition the State to operationalize the program. Throughout this process, Paul utilized Oracle Unified Methodology and tools to support the design and development of the interface between the Medical Marijuana Data Management System and other components such as Payment Processing, Card Generation, and Seed to Sale System.

Siebel 8.2 Public Sector

Health Insurance Exchange

Implementation of Health Insurance Exchange. As a Solution Architect, Paul served as a liaison between the customer, business analysts, and the technical team responsible for designing a comprehensive functional solution leveraging capabilities of the acquired software packages – Siebel, Web Center, SOA Suite, IDM - and legacy systems. Working with business SMEs Paul devised business processes compliant with the evolving state and federal regulations and integrated with internal and external systems. In collaboration with the technical leads Paul architected the technical solution enabling the end-to-end cross-platform business processes. Through multiple phases of the implementation Paul guided the technical team towards developing the system which fully meets business objectives. Paul also supported the rollout of the developed system to the business users by developing and reviewing job-aids and training materials as well as delivering end user training.

<p>CRM OnDemand v19</p>	<p>Solution Architect for Phase 2 of the implementation. As a Solution Architect, Paul quickly learned the business processes and underlying system implemented in Phase 1 and worked with the customer and OCS team to extend its capabilities.</p>
<p>Intellectual Property Management</p>	
<p>Siebel Upgrade 7.0.5 to 8.1.4</p>	<p>Upgrade of the Complaint Tracking System from Siebel 7.0.5 to 8.x. As a Solution Architect, Paul worked with customer resources and OCS team to plan and successfully execute the 2-step technical upgrade while simultaneously rolling out new capabilities. Paul also conducted knowledge sharing sessions with the business and IT managers to educate them about the new features of Siebel 8.x and prepare for company-wide rollout of the upgraded system.</p>
<p>Financial Industry</p>	
<p>Siebel 8.1</p> <p>Insurance Industry</p>	<p>Siebel 8.x as a CRM platform: Implementation Planning and Solution Design. As a Solution Architect, Paul facilitated a series of workshops with the business SMEs to capture existing business processes and requirements, identify process improvement opportunities, and translate them into the implementable system design. Subsequently Paul performed Gap Analysis and estimated implementation effort and staffing needs. Paul also worked with the technical leads to secure their support of the proposed solution design, implementation effort, and timeline.</p>
<p>Siebel 8.1</p> <p>Consumer Goods Industry</p>	<p>Siebel 8.x as an enterprise Loyalty platform: Solution Design and Development. As a Solution Architect, Paul orchestrated the efforts of Loyalty and Integration teams to create a global enterprise Loyalty platform integrated with the legacy front-end applications in Japan and other countries. Deployment of Loyalty as a service consumable by SOA-enabled legacy applications dramatically accelerated the development cycle and lead to faster attainment of ROI goals.</p>
<p>Siebel 8.1</p> <p>Telecommunications Industry</p>	<p>Siebel 8.x as an enterprise CRM platform: Implementation Planning and Solution Development. As Solution Architect Paul participated in the planning and solution development for a web-facing eCommerce platform leveraging Siebel Order Capture and cross-channel Product Catalog capabilities. Developed an enterprise solution comprised of Siebel 8.1.1 Self Service (E-Commerce and E-Support), agent-facing Call Center application, and Customer Master integrated with legacy systems.</p>
<p>Siebel 8.0</p> <p>Telecommunications Industry</p>	<p>Siebel 8.x Call Center: multi-tier customer support application. Performed analysis of the business process alignment with the existing technologies, identified main pain points, and devised solution to alleviate them. Working with customer business experts, architected a multitier customer support solution which effectively leveraged skills of various call center agents while delivering optimal customer experience. Improved integration with external document management application to expedite problem solving</p>

and reduce call handling time.

Call Center Application Optimization: assessed effectiveness of the current business process enablement and re-architected the implemented system to meet key performance indicators, improve its performance and scalability.

- Siebel 8.0**
Telecommunications Industry
Complete Siebel eTOM footprint: Implementation Planning. As Siebel Solution Architect Paul participated in the planning of a multi-year IT transformation project to decommission and replace various legacy applications with cutting edge applications including Siebel Call Center, Telcordia, and SingleView. Analyzed the current IT ecosystem and defined the end-state architecture in accordance with eTOM. Worked with various vendors and system integrators to ensure full enablement of closed-loop business processes spanning BSS and OSS systems.
- Siebel 7.8**
Entertainment Industry
Marketing Resource & Campaign Management: Solution Architecture. Architected custom solution for managing theatrical release performance, related merchandise sales goals, and street dates. Integrated de-normalized external movie data without sacrificing the application data integrity.
- Siebel 7.8**
Oracle BPEL BPM
Telecommunications Industry
Integration of Siebel Order Capture with legacy back-end via Oracle BPM: Planning, Analysis, and POC. Architected the functional side of the integration between Siebel Call Center (capturing customer, contract, and order data) and the back-office applications. Applied the capabilities of Oracle BPEL Business Process Manager to the problem at hand and architected an integration approach which was successfully prototyped.
- Siebel 7.8**
Telecommunications Industry
Call Center Order Capture: from Planning to Development. Working with customer, integrator, and vendor resources, Paul performed in the order management solution architect role for enterprise implementation a new B2C system comprised of Siebel, Yantra, SingleView, and legacy applications. Actively participated in requirements gathering, gap analysis, and enterprise level solution design spanning multiple new and legacy systems. Ensured that proposed solutions for individual functional gaps fit in overall application design. Validated product and pricing design in the context of implemented business processes in Siebel and other vendor applications and ensured adherence to Siebel best practices. Educated client's management and technical resources on specifics of customizable product and pricing lifecycle in the context of Asset Based Ordering and their effect on implemented business processes. Facilitated knowledge transfer to the client's and the integrator's resources through a series of live demonstrations and prove-of-concept work.
- Siebel 7.5**
Software Industry
Re-Design of Quote and Order Capture: from Planning to Development. Lead product normalization effort to mask SKU complexity of the legacy ERP system from sales users through attribute driven product configuration and uniform product hierarchy across the enterprise. Analyzed the impact of the new product structure on the existing application and redesigned the latter to ensure it is capable to of handling the new product

structure across all implemented business processes. Working with a team of business analysts and developers, identified major bottlenecks in the implemented business processes and architected a streamlined solution which reduced the number of incorrect orders and cost associated with their correction and re-processing, enforced discounting rules and triggered required approvals thus eliminating loss of revenue and providing visibility into 'creative' sales practices.

Siebel 7.5
Telecommunications Industry
Order Management: from Analysis to Design. Working with an integrator, Paul performed in the solution architect role for enterprise implementation of Siebel Order Management. Actively participated in requirements gathering, gap analysis, and solution design. Ensured that proposed design solutions for individual functional gaps fit in the overall application design. Validated product and pricing designs in the context of the entire application. Oversaw development of customizable products and their pricing across several lines of business and ensured adherence to Siebel best practices. Educated client's management and technical resources on specifics of customizable product lifecycle in the context of MACD and its effect on business processes. Facilitated knowledge transfer to the client's and the integrator's resources.

Siebel 7.5
Manufacturing Industry
Order Management: Design and Development. Working alongside a third-party integrator, Paul solved several major outstanding design issues that involved eConfigurator and ePricer thus enabling the project team to catch up with the project schedule and meet the production rollout date. Facilitated knowledge transfer to the client's and the integrator's resources.

Siebel 7.5
Wholesale Distribution Industry
Quote and Order Management: Design and Development. Re-architected the application designed by a third-party integrator to leverage the out-of-the-box interaction of Quotes and ePricer. Prototyped all custom functionality required to close the remaining functional gaps. Enabled the project team to catch up with the project schedule and complete the development phase on time.

Siebel 7.5
Insurance Industry
Group Policy Configuration: Design and Development. Working with an offshore integrator and client's subject matter experts, Paul analyzed outstanding design issues, identified potential design approaches, performed their comparative analysis, and presented the recommended approach to the decision makers. Once accepted, Paul prototyped the recommended approach and handed it off to the project team.

Siebel 7.5
Healthcare Industry
Call Center Implementation: from Planning to Development. Working closely with client's subject matter experts, Paul evaluated business and functional requirements, performed gap analysis, conceived approaches/options to close the identified functional gaps, designed and developed the necessary custom functionality and facilitated

knowledge transfer the client's resources. Paul led a team of client's developers through prototyping and development of the designed application.

Siebel 7

Manufacturing
Industry

Order Management: from Planning to Development. Paul lead the team of client project members through all phases of the project lifecycle including requirement gathering, gap analysis and resolution, identifying development tasks and estimating required time and resources to complete them, prototyping and documenting the proposed solution, developing, testing, and transferring the knowledge to the client through a series of workshops and on-site training.

Skills Summary

Siebel Applications

- Siebel 8.2 Public Service
- Siebel 8.1 Insurance
- Siebel 8.1 Loyalty
- Siebel 8.0 eCommunications
- Siebel 7.8 eCommunications
- Siebel 7.8 eConfigurator & ePricer
- Siebel 7.8 Marketing Resource Management
- Siebel 7.8 Marketing Campaign Management
- Siebel 7.5 Call Center
- Siebel 7.5 Financial Services
- Siebel 7.5 eHealthcare

Business Processes

- Medical Marijuana Program, Health Insurance Exchange, Quotes, Order Management (including Asset Based Ordering a.k.a. MACD), Insurance Underwriting, Pharmacy Benefits Management, Loyalty Member Management, Marketing Campaign and Resource Management

Siebel Modules

- Public Sector, Loyalty, Marketing Campaigns, Call Center, Quotes, Order Entry and Order Management including Asset Based Ordering, Agreements and Entitlements, Group Policies, eConfigurator, ePricer, eCatalog, eSales/eCustomer
- Tools Configuration and Scripting, System Administration, Workflow Manager
- Windows 7, 2003, NT
- IBM ES 390, AIX

Hardware & Operating Systems

Databases

- Oracle 9.x, IBM DB2, MS SQL Server, Sybase SQL Anywhere

Programming Languages

- JavaScript, eScript, Java, Browser DOM, XML, HTML, SQL

Tools & Methods

- Oracle Unified Method, Siebel Implementation Methodology: eRoadmap, Object Oriented Analysis and Design, User Productivity Kit R12.1

Other Accomplishments**Education**

- Moscow Mining University, Bachelor of Science, Civil Engineering
- Johnson & Wales University, ESL, courses in Computer Science and Business Administration

Certifications & Associations

- Siebel 8 Certified Consultant, Customer Certified Consultant, Siebel 7 Certified Consultant

Recognition & Awards

- Siebel CEO's Circle Award is given to the 25% of the company's best performing employees

Languages

Russian, read, write, speak – High proficiency



APARAJIT MALLI JAWAHAR BAPU, MS in MIS Graduate

Technical Lead

The Consultant is a MIS (Management Information Systems) Graduate with ten years of experience in all phases of design, development, and implementation of enterprise software applications, with focus in Health and Human Services. He has worked for clients within the public sector, automotive, high tech & communications, pharmaceuticals, insurance, high volume call center environment, and services industries. His areas of expertise include Solution Architecture, Siebel Case Management, Oracle Policy Automation, Oracle Service Cloud (RightNow) Agent Desktop Customization & Integration, Oracle Service Cloud (RightNow) Customer Portal Customization, Oracle Service Cloud (RightNow) Administration, Oracle Siebel CRM Integrations using standards like Web Services, Case Management, Oracle Policy Automation Integration with Siebel Connector and Business Intelligence reporting. He has expertise in customizing Oracle Service Cloud (RightNow) in C#.net and PHP and customizing Siebel Applications in Open UI using JavaScript, HTML5 and CSS and. He is adept at facilitating sessions defining user requirements, developing and delivering end-user training, creating and maintaining project schedules, and preparing and presenting project briefings to executives. He has management, functional Siebel and technical application development experience within Commercial and Public Sectors.

PROFESSIONAL EXPERIENCE

Siebel 8.2 Public Sector

Oracle Policy Automation 10.2

Medical Marijuana Program

Medical Marijuana Solution Architect: Manage & Architect a Siebel Case Management solution for managing, administering and tracking Medical Marijuana per the state regulations.

- Manage CRM solution for eService portal and Public Sector to facilitate Physician, Patient, Caregiver, and Case Worker Portals.
- Analyze & brainstorm complex requirements & regulations to formulate the design specifications
- Conduct Design workshops with visuals – presentation, mockups & spreadsheets for Siebel Self Service and Siebel Public Sector applications
- Discuss with external teams and Design integration touch points between Patient database and external systems
- Draft, Review and finalize Design deliverables for Physician, Patient, Caregiver, Case worker, Change of Circumstances, Seed to Sale interface, Payment Gateway interface, ID Card interface, and reporting.

- Led the full life cycle implementation of the different applications, e.g., Portals, for the different actors in the system
- Collaborated with the business users to conduct conference room pilots (CRPs) to secure acceptance to the deployed application including post production support

US Government Agency

Oracle Service Cloud (RightNow) Developer: Develop a proof of concept solution for US Government Agency in Oracle Service Cloud (RightNow)

- Configure/customize Agent Desktop with custom objects, workspaces and custom fields
- Customize Desktop add-ins using C#.net
- Customize Customer Portal using PHP
- Develop Agent Scripts and Workflows for users to support daily tasks/activities
- Integrate with facebook
- Configure Social Monitor (Facebook, Twitter, Youtube)
- Setup widgets in Customer Portal

US State Health Agency

Siebel Architect: Manage & Migrate Siebel environment from a external data center to internal data center & perform Regression/SIT testing

- Manage end-to-end project schedule
- Analyze, document and fix integration issues for QA environment pre-testing
- Setup Siebel environment (install servers, install database, setup file system, change integration points etc) in internal data center
- Perform Regression/SIT testing
- Support Go Live migration

US Ticket Resale Company

Siebel Open UI Architect: Siebel Call Center 8.1.1.11 in Open UI mode

- Fixed issue with Back button in Open UI Mode.
- Analyzed Siebel process crashes (FDR) after Open UI upgrade and provided detailed analysis (cause, solution, logs, timestamps, server info etc).
- Presented workaround solutions for Multiple Tabs feature in Siebel Open UI

US Federal Agency

Siebel Open UI Architect: Siebel Service Portal (new application in Siebel 8.2.2.4) in Open UI mode for a pre-sales demo

- Implemented a Siebel (self) Service Portal for citizens to create, submit, view status of benefits in Open UI for a pre-sales demo
- Implemented Navigation Links for social apps and Upcoming events and videos.

US Satellite Television Company

Siebel Open UI Architect: Siebel Partner Portal, Partner Management and Call Center 8.2.2.3 in Open UI mode.

- Implemented a complex custom navigation menu in Siebel Open UI aligning customer's brand identity with their website using Open UI framework, JavaScript, HTML5 and CSS
- Analyzed, & fixed issues with Siebel Open UI – Presentation Model and Physical Renderer for dynamically displaying fields, custom headers and fixed issue with Open UI Navigation Links(Carousels)

US State Social Services Agency

Solution Architect: Siebel 8.2 Siebel Public Sector implementation for state health insurance exchange in **Siebel Open UI** and HI modes.

- Analyzed Business Requirements for implementing for citizen health benefits eligibility determination, enrollments and processes involved in life change events
- Implemented Siebel – OPA Integration using out of the box connector
- Implemented Siebel integration with external systems (CMS, SERFF, Carriers) through Oracle SOA using Web services
- Implemented Siebel Open UI Customizations in Local dev environment.
- Implemented Siebel data load of Providers, Networks, Facilities and related data from external source
- Led Oracle development teams to deliver solution.
- Managed, triaged and fixed QA defects.
- Designed and implemented various components of the solution which included technologies primarily of Siebel, along with Oracle Policy Automation, Web Services and XML.

US State Social Services Agency

Solution Architect: Oracle OPA Implementation for analyzing Medicaid Management Information System (MMIS) rules.

- Designed and authored Oracle OPA Rules for Medicaid Management Information System (MMIS) business rules.
- Participated in Business Requirements gathering meetings.
- Analyzed and provided solution options and recommendations to client
- Developed test scripts and data, loaded into OPA and analyzed the results
- Demonstrated interim and final solution to business executives and leadership

Global Automotive Company

Lead Business Analyst: Siebel 8.1 Siebel Automotive implementation for various departments like Collections, Recovery, Customer Service, Compliance and Remarketing.

- Upgraded to Siebel 8.1.1.11 and demonstrated **Siebel Open UI customizations & capabilities** to client management & executive team
- Moderated and led Business Requirements gathering meetings.

- Defined business requirements for many complex modules like Compliance letters(Cure Notice, NOI, NOS and SOS) and Recovery(Repossession, Reinstatement and Promise To Pay)
- Managed resource on-boarding, roll off and project allocations.
- Planned, Organized, Developed and delivered end-user training.

US Financial Services Company

Solution Architect: Siebel 8.0 Siebel Call Center implementation.

- Participated in the entire project lifecycle, from gathering requirements through design and development, all the way to testing and go-live, in order to implement a Siebel Call Center application for a US Financial Services Company.
- Analyzed Oracle On Demand application in order to move the functionalities to Siebel On Premise application
- Integrated Siebel with Eloqua Marketing application. Designed Integrations using web services and SOA in order to implement integrations between Siebel and Eloqua
- Integrated Siebel with Oracle CCOD (Call Center On Demand) to enable integrated CTI.
- Implemented Oracle BI Publisher reports
- Exploited Oracle Siebel Best Practices, Siebel OOB solutions, workflows, entities, Application administration (Data Validation Manager, Run Time Events, LOV etc.) and features and extended/configured to meet business requirements. Ensured customization to a minimum for easier maintenance and better performance.
- Single Point of Contact for all client interactions and offshore communications

US Pharmaceutical Services Company

Lead Developer: Siebel 8.2 Pharma application, Formscape, Onbase and TecSys

- Involved in requirements gathering for Campaign Management, Providers Practice Intervention(PPI) and Order Management
- Integrated Siebel with Formscape, Onbase and Tecsys using Web Services.
- Implemented Cognos Business Intelligence reports.
- Developed Order Management and Validation (Recurring & Single Orders) for Siebel Pharma Application.
- Designed and loaded employee data using Siebel EIM.

US University Department

Senior Developer: Cognos Reports implementation.

- Analyzed & Built Cognos packages in Cognos Framework Manager, built Cognos OLAP Cubes using Cognos Transformer, build Cognos Analysis Reports using the Cognos OLAP Cubes.
- Built packages, data sources and reports in Query Studio, Report Studio and Event Studio.

- Analyzed the business underlying the insurance product iRMARp – Interactive Risk Management Analysis and Reporting prime. Analyzed the multi-dimensional database schema - Snowflake schema.

**US University
Department**

Senior Developer: Implementation and maintenance of information systems

- Researched on Joomla open source CMS components for using it as a substitute for “HR Forms” web site. Installed tomcat server, MySQL Db server and Joomla CMS (Content Management System) in Windows Server and Mac OS X Server. Installed “Art Forms” Joomla component and developed PHP scripts to extend its functionality and meet the “HR Forms” requirements. Enhanced and fixed bugs in “HR Forms” web site written in PHP.
- Implemented Pathology website using **Javascript** web pages, **CSS3 and HTML**.
- Enhanced and fixed bugs in “Lab Search” web site written in JSP. Installed “WordPress” blogging website and created users.
- Administered the Windows Server and Mac OS X Server. Administered daily billing and dialysis reports.

**Communications
Company**

Senior Developer: Siebel 7.8 Communications implementation.

- Involved in technical Analysis of different modules like Order Management, Inventory Manager, Numbering Cards & EAI – Integration (Billing, SAP, SDP .Net, MS CCF, TIBCO, Web Methods)
- Involved in setting up the Siebel 8.0 environment like setting up Siebel Components (Siebel eService, Siebel Call Center, Siebel Partner Portal, Siebel Call Center & Siebel eChannel), Developer Environment and other master data (WFs, State models, LOVs etc). Involved in completing Proof of Concept for Siebel 8.0 Task UI & Haley Authority Business Rules Engine.
- Involved in installing servers - Gateway Server, Enterprise Server, Siebel Server, Db Server, Actuate Server and SWSE for the web server.
- Lead number of projects like Siebel Upgrade, Order Management, Number Inventory and Post Sales Order Management.
- Conducted trainings for Siebel community and played the role of a Lead Presenter in Siebel 8.0 New Features & Enhancements Training.

- Involved in the design of workflows for Order Management. Field Service (Contract Management, Asset Management), Billing Invoice Management and Dunning Management.
- Involved in EIM Data Loading of SIM Cards & MSISDN using Workflows. Involved in EIM Batch Prepaid Load for Asset Creation

Australia State Agency

Senior Developer: Siebel 7.7, Actuate 7 eReport Designer Professional, Sun Server V240 & Solaris 9

- Involved in Low Level Design of Siebel Configuration Objects from understanding the business and High Level Design of Siebel Public Sector application.
- Involved in Migration of Reference Data to On-site environment as SDC Reference Data coordinator.
- Involved in Low Level Design of Reports from High Level Design.
- Involved in writing Test Scripts for extensive testing of Reports.
- Developing & Building Actuate Reports in Actuate eReport Designer Professional 7 to meet the business needs.
- Involved in writing custom Visual Basic VB code inside the Actuate Tool in order to achieve the business requirements.
- Involved in deploying Reports in thick client and thin client environments.
- Involved in intensive Defect Fixing related to Configuration and Reports that included Severity 3 and Severity 4 defects.

US Financial Services Company

Senior Developer: Siebel 7.7, Actuate 7 eReport Designer Professional

- Involved in creating Siebel Configuration Objects like Applets, Views, BC Fields and Links for Siebel Call Center.
- Created and ran Test Scripts for local bug fixing and testing of Configuration.
- Involved in design of Actuate Reports. Involved in Building of reports using Actuate Tool.
- Involved in deployment of Reports in thick client and thin client.

Skills Summary

Oracle Applications and Technologies

- | | |
|---|--|
| ● Oracle Service Cloud (RightNow) | ● Siebel eService, Public Sector |
| ● PHP, C#.Net (for RightNow) | ● Siebel Open UI (JavaScript, CSS3, HTML5) |
| ● Oracle Policy Automation | ● Oracle CCOD |
| ● Oracle Social Relationship Management | ● Oracle BI Publisher |
| ● Oracle User Productivity Kit | ● Cognos |
| ● Oracle Database 9i, 10g | ● Oracle Eloqua |

- Oracle CRM On Demand

Engagement Experience

- Business Requirements Documentation
- Design Documentation
- Data Conversion Mapping
- International Project Coordination
- End User Training – create and deliver
- Off Shore Resource Planning

Other Accomplishments

Education MS in Management Information Systems, University of Illinois at Chicago

BE in Electronics and Communication Engineering, Madurai Kamaraj University

Certifications & Associations

Siebel 7.0 Certified Expert

Recognitions & Awards

- Infosys Champion Award – Golden Player
- Infosys – Equifax Valuable Player award
- Infosys – “You are spotted” award twice
- Accenture Celebrates Excellence award

Languages

Tamil - Fluent

Hindi – Moderate Fluency

Spanish - Beginner

DR. KIM J. HYATT

hyatt@cmu.edu <https://www.linkedin.com/in/drkimhyatt>

SUMMARY OF PROFESSIONAL EXPERIENCES

Associate Teaching Professor at Carnegie Mellon University

Educational and Instructional Technology Consultant (National and International Organizations)

Associate Editor for International Academic Journals

Founder and President of Team RobotiX, a 501 (c)(3) Nonprofit Organization

Robotics Coach: FIRST Tech Challenge (high school) and VEX IQ (middle school/elementary)

University Graduate Education Program Director and Accreditation Coordinator

Middle/High School English/Communications Teacher (grades 7-12)

4 Pennsylvania Teaching Certifications (PK, K-8, Communications and English)

2 Pennsylvania Administrative Certifications (Elementary and Secondary Principal)

Specialized training to teach ESL (English Second Language) students

Concentrations: Curriculum & Development, Assessment, Accreditation, and Communications

EDUCATION

University of Pittsburgh

Doctor of Education (Ed.D.): Higher Education Management Program

Carnegie Mellon University

K-12 Leadership and Principal Certifications: Master of Public Management Program

University of Pittsburgh

Master of Arts in Teaching (MAT)

Bachelor of Arts (BA): Dual degrees in English and Communications

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PROFESSIONAL EXPERIENCE

CARNEGIE MELLON UNIVERSITY 2011 - Present

Associate Teaching Professor

Strategic Presentation Skills

Professional Writing

Business English

Created new course (fall 2017): Strategic Management Communication for Leaders

A variety of instructional technology tools are utilized to enhance student learning experiences: Acclaim, AvayaLive, Camtasia, GoToWebinar, LeapMotion, MindMeister, PollEverywhere, TheBrain, Virtual Reality (VR), WikiSpaces, Write Experience (artificial intelligence), etc.

PREVIOUS EMPLOYMENT: HIGHER EDUCATION

DUQUESNE UNIVERSITY 2001 – 2011

SERVICE: CARNEGIE MELLON UNIVERSITY

Mentor: Barbara Smith Women's Mentoring Program (January 2016 - Present)

Currently serving as a CMU mentor (full-year mentorship program).

Coach for Heinz Graduation Student Speaker (2013 - Present) Member of the Communications Program Committee (2011 - Present)

Review curriculum and discussed programmatic changes.

Member of the Heinz Journal Advisory Board (2011 - Present)

Student-conceived and student-run publication dedicated to publishing works that link critical and theoretical analysis and policy implementation.

Member of the Master of Public Management (MPM) Program Committee (2011 - Present) Provide career-track professionals with skill sets needed to assume leadership roles in organizations across the public, private, government and not-for-profit sectors.

Writing Advisor: Research Fellows from the Army War College (2014 – Present)

Assist students with their research papers.

Member of the NASPAA Accreditation Communication Competency Committee (2014)

Created rubrics to evaluate written and oral communication skills.

MPM Program Advisor (2012-2014)

Met with students to review options for course selection.

Heinz Faculty Instructional Technology Consultant (2012 – 2014)

Integrated instructional technology with teaching practices for instructors on an individual basis.

Co-hosted faculty sharing session.

Hosted student-sharing sessions.

Hosted summer faculty technology workshop.

Member of the Digitizing Classrooms Committee (2013)

Determined technology tools and resources needed for digitizing classrooms in the core areas.

Member of the Teaching Committee (2013)

Participated in discussions about the perceptions of our students' capabilities from employers and alumni.

Guest Speaker for "Girls of Steel" at CMU Robotics Institute (2013)

1st Meeting: Prepared team for a conference presentation at SWATposium.

2nd Meeting: Conducted an instructional technology workshop using Leap Motion.

Consultant at the Entertainment Technology Center - ETC (2012 - 2013)

Used Bloom's revised taxonomy to assess learning objectives for two educational games. Completed research and publications about how to use video games to teach writing.

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Dotdotdot (2013): <http://www.etc.cmu.edu/projects/dotdotdot/>

“dotdotdot” developed an interactive experience designed to encourage kids to write stories. Children and their families will be able to create their own stories in a fun, playful environment while learning to organize their thoughts and tell their stories in a linear fashion. By allowing children to play within a classical story structure and create their own personalized story, dotdotdot hopes to create a sense of accomplishment and an appreciation for the written word.”

StemPower (2012): http://www.etc.cmu.edu/projects/stempower/?page_id=4

“StemPower created a STEM (Science, Technology Engineering and Mathematics) game for kids based on research by Stella Vosniadou. StemPower is exploring misconceptions school-aged children may have about the relationships of cycles between the earth, the moon, and the sun. The goal is to create an educational and entertaining Unity3D powered game for the web that teaches students the process of acquiring knowledge about our physical world.”

Special Project with the StemPower Team: Hosted an after-school technology workshop (using Makey Makey) at Boyce Middle School with ETC graduate students (2012).

Capstone Project Advisor at Heinz: Client - Thomson Reuters (Spring 2012)

Students created an online social architecture geared around photography and telling stories.

KEYNOTE SPEAKER

KEYNOTE: National Forum on Critical Thinking, Xian, China 2015

Hyatt, K.J. (2015). *Using effective questioning techniques to develop critical thinking skills*. Keynote speaker for the National Forum on Critical Thinking, Xian, China.

KEYNOTE: Point Park University's 3rd Annual Summer Academy, Pittsburgh, PA 2015

Hyatt, K.J. (2015). *Using student-centered learning to teach problem-solving skills*. Keynote speaker for Point Park University's 3rd Annual Summer Academy, Pittsburgh, PA.

LEADERSHIP ROLES: PROFESSIONAL ORGANIZATIONS

Associate Editor: International Journal of Information & Communication Technology Education (2010-Present): The purpose of the International Journal of Information and Communication Technology Education (IJICTE) is to grow a body of research, propose new applications of technology for teaching and

learning, and document those practices that contribute irrefutable verification of information technology education as a discipline.

Editorial Board Member: <http://www.igi-global.com/journal/international-journal-information-communication-technology/1082#editorial-board>

Member of the International Review Board (IRB): International Higher Education Teaching and Learning Association (2011-Present): The aim of HETL is to bring together higher education professionals and thought leaders from around the world to dialogue, network, and collaborate on issues relevant to teaching and learning in higher education.

International Board Member: <https://www.hetl.org/board-members/page>

Associate Editor: Journal in Applied Research in Higher Education (2012-Present): The Journal of Applied Research in Higher Education (JARHE) is an online peer-reviewed journal. The central aim of the journal is to promote improved practice by encouraging informed debate into pedagogic and related matters in higher education. All such papers are refereed.

Editorial Board Member: http://www.emeraldinsight.com/products/journals/editorial_team.htm?id=jarhe

USA Liaison: Information and Communication Technology Education for the International Higher Education Teaching and Learning Association (2012 - Present)

Higher Education Teaching and Learning Association liaisons are volunteers (academics, scholars, and educators) who represent HETL to the global higher education community. Their goal is to...

Support higher education development and sustainable learning all over the world.

Support social responsibility and ethical practices in all disciplines/modes of learning.

Liaison: <https://www.hetl.org/liaisons/page/5/>

Member of the Editorial Board: Journal of Meaning-Centered Education (2013 - Present)

The Institute for Meaning-Centered Education (ICME) is an international think-tank of scholars and educators whose vision is to advance the scholarship and practice of meaning-centered education (MCE) and meaning-centered learning (MCL).

Editorial Board Member: <http://www.meaningcentered.org/about/>

Member of the Editorial Board: Universal Journal of Communications & Network (2013 - Present) Horizon Research Publishing, USA (HRPUB), is a worldwide open access publisher serving the academic research

and scientific communities by launching peer-reviewed journals covering a wide range of academic disciplines.

Editorial Board Member: http://www.hrpub.org/journals/jour_editorialboard.php?id=27

CONSULTING WORK

ChinaLinks (2010 – Present)

Provide faculty development programs for professors at universities in China focused on best practice techniques, technology integration, and assessment to inform instruction.

Schell Games (Summer 2013)

Consulted on games developed for English/Language Arts instruction (grades 6-8).

Pennsylvania (PA) Department of Education (2009 - 2011)

Content certification program reviewer for the Department of Education in PA.

University of Pittsburgh (UPG) – Greensburg Campus (2008)

Lead consultant for UPG's submission to the PA Department of Education. Wrote the self-study, the benchmarks, and the English report for accreditation.

The Art Institute of Pittsburgh (2006)

Provided an in-service program on best practice techniques for 50+ instructors focused on classroom workshops, authentic experiences, and reflective assessments.

PA Distinguished Educator Initiative (2005)

Intervention team member addressing the PA Accountability System for struggling school districts.

A+ Schools – Symposium: David L. Lawrence Convention Center (2005)

Facilitated breakout sessions with administrators and district teams. Long-term goal to create a regional strategy for the support of distributed leadership development in school systems.

Teacher Excellence Recognition Program, Southwest PA (2005)

Judged essays and conducted personal interviews with the 100 honorees.

Point Park University (2004)

Reviewed programs to meet PA accreditation standards: Early Childhood Education, Elementary Education, Elementary Education & Theater, Citizenship for Secondary Education, Communications for Secondary Education, Secondary Mathematics, Secondary Science, and Secondary English.

VANESSA OTWAY

Professional Profile

- ❖ Sr. Business Analyst with over 17 years of IT systems integration experience. Highly effectively in communicating with stakeholders to document requirement specifications, process diagrams, test scripts, and business uses cases.

Relevant Professional Experience

Sr. Business Analyst, TreCom Systems Group, Inc (formerly Veridyne Inc.), Havertown, PA

Nov 2014- present

Client: *Division of Information Technology (DOIT) at MDTA*. Steady contributor on projects spanning all divisions.

Sr. Business Analyst, Modis, Inc., Jacksonville, FL

July 2014- Nov 2014

Client: **American Nurses Association, Silver Spring, MD**

Sr. Business Analyst

Interview and assist business to define/ translate organizational needs into documented business needs and priorities; perform business and system analysis to document functional specifications for PMO. Project initiatives include:

- ecommerce integration of new vendor to Personify
- ANF/ PAC - Give at Rejoin Process
- Learning Mgmt Syst Platform
- ANF/PAC Online Donations
- Nursebooks Redesign
- ANF - new website

Sr. Business Analyst, Veridyne Inc., Havertown, PA Oct 2010- July 2014

Client: *Division of Information Technology (DOIT) at MDTA*. Steady contributor on projects spanning all divisions.

- **2013 MDTA Project Contributions:**

- **HR Training Certification Tracking System** (current) - Facilitate requirements development; evaluate software for functional gaps for replacement with new Learning Management System (LMS); and new Learning Content Management System and (LCMS). Document AS-IS workflow, data tracking and reporting requirements. Facilitate new validated workflow, and report updates.
- **Purchase Card custom upgrade** (current) - Facilitate requirements development using Survey Monkey tool for replacement system to track MDTA financial credit card transaction. Prepare to test by developing a Traceability Matrix including issues tracking, test scenarios. System will integrate with MS Dynamics.

- **Miss Utility Tracking System (MUTTS)** - Facilitate requirements development for upgrade to Salesforce CRM cloud computing application. Application implements performance dashboard for Miss Utility MD, a one-call center that notifies MDTA of new underground facility excavation plans.
- **ETL Public Comment Application** - Facilitate requirements development for changes to the Salesforce CRM cloud application that captures public comments to toll changes for the Express Toll Lane, part of the \$1.08 billion I-95 Improvement Project.
- **MS Windows 7 Migration** – Elicit of training requirements from deployed software users using Survey Monkey tool. Analyze and report data.
- **2012 MDTA Project Contributions:**
 - **Capital Asset Database** - Facilitate requirements development and testing for middle-ware (Bassets) to calculated depreciation for MDTA capital assets and pass to Microsoft (MS) Dynamics financial system.
 - **MS Dynamics SL 7.0 Upgrade** - Testing, issue tracking and resolution for MDTA financial system.
 - **ETC-NG Vector Interface** (full SDLC including process modeling, and systems testing). Led analysis to document technical specifications to design/build/ test custom interface to allow financial toll data to move from an external server to the MDTA server for access by the MS Dynamics application. Documented business requirements, FTP process flows, and worked with system administrator and vendor to test and resolve issues.
 - **Windows 7 Migration** – Analyze existing hardware and software inventory to establish project baseline to identify which units required replacement; documented existing unit image.
 - **Program Management System** – Conducted Business Process (BPI/M) /Workflow Automation analysis for the Capital Planning process to initiate a project and to track associated project data; to reduce data redundancy, to improve the overall data hand-off, to reduce approval redundancies, and paper documentation. Worked with SMEs and SOP documents to map the processes and data using IDEF0 and Visio diagrams.
- **2011 Project Contributions:**
 - **Procurement Information Management Systems.** Developed system gap and BPI/Analysis using IDEF0 and Visio current- and future-state diagrams.
 - **Laptop Encryption** – Worked with Security Administrator to evaluate and test vendor software prior to rollout and implementation.
 - **Inventory Data Migration** (MS ACCESS) interim solution – Led requirements analysis, testing and implementation for project.
 - **Real Estate Database** - Led business case and requirements analysis.
- **2010 Project Contributions:**
 - As part of team, develop remaining standard operating procedures, and correct MS Word documentation issues. Develop business cases for existing projects: Project Estimating Tool; Dynamics SL 7.0 Upgrade; Laptop Encryption.

Sr. Business Analyst, Otway and Associates, Hyattsville, MD

2009 - 2010

Client: *Sympora Technologies*

- Facilitate and document business requirements and technical specifications. Analyze existing processes and data needs for Customer Relationship Management application implementation. Facilitate discussion with users to determine how CRM application addresses customer needs and to identify gaps. Analyze system utilization to understand usability and navigation enhancement requirements. Perform requirements traceability and data

mapping. Lead project to clarify business needs, act as bridge between client and technical team. Prevent scope creep, track issues and lead issue resolution working with technical team and customer. Maintain documentation, including business training materials.

Sr. Business Analyst, Vision Consulting, Washington, DC

2006 – 2009

Client: AARP, Washington, DC

Dec 2008 – April 2009

- Conduct user stakeholder requirements analysis, identify and analyze as-is business processes. Develop future-state process maps based on subject matter experts (SMEs), draft business rules, and set performance targets. Liaise and interface between operations and management to support new operational vision and strategic plan.

Client: DC Office of State Superintendent of Education, Wash., D.C.

Jul 2008 – Nov 2008

- Project establishes approach for retiring organization-wide file and document management system. Facilitate user stakeholder requirements analysis, identify and analyze current-state business processes. Develop to-be process maps based on subject matter experts (SMEs), draft business rules, and set performance targets. Design new process to support strategic decisions during transition of city agency to state-level agency.
- *Key results:* Development of concept of operation, data specifications, system architecture requirements, and workflow tools. Deliverables include file management recommendations to leverage previously purchased IBM FileNet8 to reduce future implementation costs; SOPs, flowcharts and control aspects for all aspects of program implementation e.g. contract and budget compliance for report monitoring.

Client: Center for Naval Analysis (CNA), Alexandria, VA, Sr.

Jun 2007 – Jun 2008

- Post-implementation of Deltek/Costpoint accounting system. Conduct user stakeholder requirements analysis, identify and analyze As-Is business processes to resolve issues in financial reporting errors that prevent realization of revenue and project portfolio expansion. Audit and map contract data in the system setup process; diagram processes for cost analysis, invoice generation, and revenue reporting. Design To-Be process diagrams from SME input. Advise management on implementation of improved business processes, develop metric plan to track invoice production. Assist in all phases of implementation activities, conduct training, and facilitate process deployment.

Other Experience History

Apr 2005 – Jun 2006	Sr. Analyst/ Project Manager	Ivy Planning, Rockville, MD Client: State of Maryland- MDOT , Hanover, MD
Oct 2002 – Jun 2005	Sr. Project Manager	Howard University- NMAETC, Washington, DC
Sep 1995 – Sep 2002	Sr. Analyst/ Project Manager	MODIS IT, Bethesda, MD Clients: Fannie Mae, Marriott, Freddie Mac , MCI
Jul 1994 – Aug 1995	IT PMO Manager	Bell Atlantic, (Verizon), Arlington, VA
Aug 1991– Oct 1993	IT Staff Consultant	Andersen Consulting (Accenture), Washington, DC Clients: U.S. Treasury Dept., Florida Light & Power
Jun 1980 – Dec 1986	Process Engineer	Atlantic Richfield, Houston, TX

Education

Masters of Business Administration, 1989 Howard University, Washington, DC

Certification

ISO9001 Internal Auditor Certification, 2009;
BaBOK Certification (In Process)

Technical Skills

Requirement Tools:	Use Case Modeling, IDEF0 Process Modeling, DOORS, Case
Project Management Tools:	MS Project
Testing Tools:	Rational
Software:	MS Office Suite, VISIO, Costpoint Deltek, PeopleSoft
RDBMS:	SQL

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Dubrawski, Artur Wladyslaw

eRA COMMONS USER NAME (agency login): DUBRAWSKI

POSITION TITLE: Senior Systems Scientist and Adjunct Professor, Director of the Auton Lab (Carnegie Mellon University), Founding Member (Auton Systems LLC; Critica LLC; and Marinus Analytics LLC)

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date	FIELD OF STUDY
Warsaw University of Technology, Warsaw, Poland	M.Sc., M.Eng	02/1990	Mech. Eng. (Aerospace)
Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland	Ph.D. (honors)	09/1999	Technical Sciences (Robotics and Artificial Intelligence)

A. PERSONAL STATEMENT

I research foundations and deploy applications of scalable statistical algorithms to facilitate discovery of informative patterns in large amounts of highly multidimensional data. I bring extensive experience in statistical analysis, machine learning and data mining research, as well as documented capability in transitioning successful research to relevant practice. I am a senior faculty at the Carnegie Mellon University School of Computer Science where I direct the Auton Lab, an applied analytics research team of 45. For 15 years I have been regularly teaching self-developed graduate courses on data mining, business intelligence, and data science at the CMU Heinz College School of Information Systems and Management. I am also an adjunct faculty at the University of Pittsburgh School of Medicine. I am, or recently was, a lead PI in fundamental and applied research projects funded by the NSF, NIH, CDC, USDA, FDA, DoE, DoD, DHS, DoJ, and by multiple industrial partners. I gave numerous invited lectures and tutorials to scientific, industrial and government audiences on topics directly relevant to the core of my expertise.

B. POSITIONS AND

HONORS Positions and

Employment

1990-2001	Researcher then Assistant Professor, Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland
1992-2001	Founding Partner, Director of R&D, AT Advanced Technologies S.C., Warsaw, Poland
1992-1993	Visiting Researcher, Institut National Polytechnique de Grenoble, France

1995-1996	Visiting Scientist, Robotics Institute, Carnegie Mellon University, Pittsburgh, PA
1999-2002	Senior Research Scientist, Schenley Park Research, Inc., Pittsburgh, PA
2000-2003	Part-time Adjunct Faculty, Carnegie Mellon University, Pittsburgh, PA
2001-2003	Chief Technology Officer, Aethon, Inc., Pittsburgh, PA
2003-now	Senior Systems Scientist, Robotics Institute, Carnegie Mellon University, Pittsburgh, PA
2003-now	Adjunct Faculty, Heinz College, Carnegie Mellon University, Pittsburgh, PA
2006-now	Adjunct Faculty, Dept. of Biomedical Informatics, University of Pittsburgh School of Medicine
2007-now	Founding Member, Auton Systems, LLC, Pittsburgh, PA (applied machine learning)
2010-now	Founding Member, Marinus Analytics, LLC, Pittsburgh, PA (counter human trafficking)
2015-now	Founding Member, Critica, LLC, Pittsburgh, PA (data driven acute care medicine)
2015-now	Founding Member, Critica, LLC, Pittsburgh, PA (data driven acute care medicine)

Other Experience and Professional Memberships

1993-2001	Founder and PC member of the International Symposia on Intelligent Robotic System
1995-1996	William J. Fulbright Foundation Junior Research Grant (spent at the Robotics Institute, CMU)

2006-2013	Organizer and Chair of Invited Sessions on Data Mining at INFORMS Annual Meetings
2008-2010	Data Mining Section Official, INFORMS
2010-now	Associate Editor, Social Network Analysis and Mining Journal (a Springer Journal)
2011-2014	Chair and Organizer of Data Mining Clusters at INFORMS Healthcare conferences
Current	Memberships: INFORMS (Institute for Operations Research and the Management Science); ASA (American Statistical Association); IEEE (Institute of Electrical and Electronics Engineers); IMLS (International Machine Learning Society); AMIA (American Medical Informatics Association)

C. Contribution to Science

For over 25 years my work has been a combination of fundamental and translational research driven by real-world applications, most notably in the areas of health informatics, public health surveillance, food safety, nuclear safety, health of equipment, and predictive maintenance. I research machine learning algorithms and data structures to facilitate probabilistic modeling, predictive analysis, interactive exploration, and understanding of complex data. My research and applications support discovery of informative patterns in multiple sources of sparse, noisy, and multivariate data. I research and apply efficient algorithms and data representation techniques, methods for rapid, reliable and computationally efficient detection of emerging patterns in large multi-dimensional databases, and for combining data-driven and human-driven analytics through interactive visualization and machine learning. I co-developed and now I maintain solo a sizable research group funded by multiple government and industrial sponsors, I advise several graduate students and regularly teach graduate courses on data mining and data science.

1. Scalable models for Machine Learning. I have led development of algorithms and data structures to enable massive-scale searches for patterns in complex heterogeneous data. The results of this research made analysis of very large (in terms of the number of records) and complex (in terms of number of variables) data sets feasible at interactive speeds, making massive scale data mining and interactive visualizations of such data possible even on standard computers and without parallelization or distributed computing systems (but these additional capabilities can provide further improvements). The methods developed made tangential impact on multiple disciplines including astrophysics, public health, bed-side informatics, equipment maintenance, and others.

- Dubrawski A. Extracting Useful Information from Multivariate Temporal Data. In *Big Data and Business Analytics*, ed. Jay Liebovitz, Taylor & Francis, 2013. ISBN: 9781466565784
- Dubrawski A. The Role of Data Aggregation in Public Health and Food Safety Surveillance. In: *Biosurveillance: Methods and Case Studies*, Eds.: T. Kass-Hout and X. Zhang. Taylor & Francis, 2010. ISBN-13: 978-1439800461
- Dubrawski A. Detection of Events in Multiple Streams of Surveillance Data. In *Infectious Disease Informatics and Biosurveillance*, Eds. D. Zeng, H. Chen, C. Castillo-Chavez, W. Lober, and M. Thurmond. Springer-Verlag, 2010, 2011; 27 145-171. DOI: 10.1007/978-1-4419-6892-0_7 ISBN: 978-1-4419-6892-0

2. Explainable models for Machine Learning. I have led development algorithms and specific data modeling techniques to enable human interpretability of the resulting models. Many advanced artificial intelligence solutions are actually black-boxes, i.e. their users do not have access to the insights that motivate a computer program to make particular inferences or predictions. This is disadvantageous in many contexts, including decision support scenarios where the ultimate decision must be made by a human. I have been working on developing novel approaches which would constitute ‘translucent boxes’ which, besides making accurate predictions and inferences, would also explain

these results in a form easy to interpret by humans. This new ‘explanatory machine learning’ discipline is making its way to real-world applications including clinical decision support, food safety, and nuclear physics.

- Guillame-Bert M, Dubrawski A. “Classification of Time Sequences using Graphs of Temporal Constraints”. *Journal of Machine Learning Research*, 2017 (accepted for publication).
- Fiterau M, Dubrawski A. Informative Projection Recovery for Classification, Clustering and Regression Conference: *12th International Conference on Machine Learning and Applications (ICMLA) 2013*. Pp.15-20. Miami, Florida, December 2013. DOI: 10.1109/ICMLA.2013.11

- Fiterau M., Dubrawski A. Projection Retrieval for Classification, *Neural Information Processing Systems NIPS 2012*, Lake Tahoe, NV, December 2012. NIPS 2012: 3032-3040

3. Application of Machine Learning to inform clinical care. I have led development of multivariate and multi-stream algorithms to support effectiveness of critical care by improving awareness of clinicians at the bed side who are challenged with the need to quickly analyze large amounts of disparate data provided to them via variety of health monitoring systems prevailing in modern operating room or intensive care unit environments. This research thrust over past five years has resulted in a number of publications and opportunities of transitioning the developed and proven concepts to industrial practice. I was able to show how machine learning can improve detectability of cardio-respiratory insufficiency at substantially lower latencies than currently practiced, how it can increase effective forecast horizon when predicting an impending health crisis, and how to use hemodynamic monitoring data to triage patients using expected outcomes based on tracking evolution of their clinical risk estimates.

- Pinsky MR., Dubrawski A. Gleaning Knowledge from Data in the ICU. *J Respir Crit Care Med.* 2014 Jul 28; 190(6): 606-610. DOI: 10.1164/rccm.201404-0716CP PMID: 25068389 PMID: PMC4214111
- Liu C, Gomez H, Narasimhan S, Dubrawski A., Pinsky MR, Zuckerbraun B. Real-time Analysis of Microvascular Blood Flow for Critical Care. *CVPR 2015*, Boston, MA, June 2015.
- Hravnak M, Chen L, Dubrawski A., Bose E, Clermont G, Pinsky MR. Real Alerts and Artifact Classification in Archived High-Frequency Multi-signal Vital Sign Monitoring Data—Implications for Mining Big Data. *J. of Clinical Monitoring and Computing.* 2015; (DOI) 10.1007/s10877-015-9788-2.

4. Application of Machine Learning to improve nuclear safety. I have led development of intelligent components of various systems built to enhance nuclear safety. Some of these systems are currently being deployed through the US government agencies. My methods enabled boosting of detectability of nuclear threat and in some cases reduction of false alerts by more than order of magnitude, even though these systems used unchanged sensing modalities and the only difference was the analytics.


- Miller K, Huggins P, Labov S, Nelson K, Dubrawski A. “Evaluation of Coded Aperture Radiation Detectors using a Bayesian Approach”. “Multimodal Data Fusion for Threat Detection Using Low Count Spectrometry”, *Nuclear Inst. and Methods in Physics Research*, A. 2016 (accepted for publication).
- Tandon P, Huggins P, Maclachlan R, Dubrawski A., Labov S, Nelson K. Detection of Radioactive Sources in Urban Scenes Using Bayesian Aggregation of Data from Mobile Spectrometers. *Information Systems Journal* 57(195). 2016.
- Huggins P, Jin J, Dubrawski A., Labov S, Nelson K. Using Gaussian Rate Priors with Poisson Data Likelihoods for Improved Detection of Sources of Known Types in Cluttered Background Scenes. *2014 IEEE Nuclear Science Symposium*, Seattle, WA, November 2014. N40-6.

**APPENDIX B
PROPOSAL COVER SHEET
COMMONWEALTH OF PENNSYLVANIA
OFFICE FOR INFORMATION TECHNOLOGY
MEDICAL MARIJUANA RFQ 6100040415**

Enclosed in three separately sealed submittals is the proposal of the Contractor identified below for the above-referenced RFQ:

Contractor Information:	
Contractor Name	MJ Freeway, LLC
Contractor Mailing Address	1601 Arapahoe St. Ste. 800 Denver, CO 80202
Contractor Website	www.mjfreeway.com
Contractor Contact Person	Amy Poinsett
Contact Person's Phone Number	970-708-0213
Contact Person's Facsimile Number	970-708-0213
Contact Person's E-Mail Address	amy@mjfreeway.com
Contractor Federal ID Number	27-2354485
Contractor SAP/SRM Vendor Number	0000519825

Submittals Enclosed and Separately Sealed:	
<input checked="" type="checkbox"/>	Technical Submittal
<input checked="" type="checkbox"/>	Small Diverse Business Participation Submittal
<input checked="" type="checkbox"/>	Cost Submittal

	<i>Signature</i>
Signature of an official authorized to bind the Contractor to the provisions contained in the Contractor's proposal:	
Printed Name	Amy Poinsett
Title	Co-Founder & CEO

FAILURE TO COMPLETE, SIGN AND RETURN THIS FORM WITH THE CONTRACTOR'S PROPOSAL MAY RESULT IN THE REJECTION OF THE CONTRACTOR'S PROPOSAL

Appendix D – Project References

Name of Client & Project Title	State of Nevada Division of Public and Behavioral Health (DPBH) Seed to Sale Inventory Tracking System	
Contract Value	\$603,393	
Nature and Scope of Project:	<p>The scope of this project involves the implementation of Leaf Data Systems for the State of Nevada, Division of Public and Behavioral Health (DPBH) for the purpose of collecting, reviewing, and analyzing all data needed to effectively manage the Medical Marijuana Program in Nevada and provide the needed accountability and controls required to protect the health and well-being of the population of the State of Nevada.</p> <p>As the system of record for medical marijuana transactions in the State of Nevada, Leaf Data Systems provides aggregation, analysis, and reporting of all Licensee data state-wide. The State of Nevada Seed to Sale Inventory Tracking and Management System (SSITMS), powered by MJ Freeway’s Leaf Data Systems, is designed to address the need for a central repository that allows DPBH to collect, analyze, and report on inventory tracking and sales data for each licensed Medical Marijuana Enterprise (MME) in the State. SSITMS tracks each plant and each gram of cannabis throughout the entire distribution cycle: cultivation, harvest, disposal of unusable material, processing, testing, transfer or distribution, inventory, and customer sale.</p> <p>SSITMS also accounts for the transport of any marijuana products between MMEs, patients, and caregivers, while keeping track of the movement of marijuana and marijuana products within a single MME facility.</p> <p>DPBH requires that the system be capable of accepting the required data in a standardized format from Licensees through web services, Application Program Interface (API) or equivalent technology, and ease of adoption by Licensees regardless of the in-house inventory tracking or point of sale systems used by those Licensees. In addition, Licensees have access to the Seed to Sale system for upload/download of data as well as access to limited reporting for their establishment. Leaf Data Systems is developed to accept Licensee data via a secure API, and an API test application is built into the system to allow for direct testing of all API calls. This will promote rapid adoption of the API by DPBH and Licensees.</p>	
Project Duration:	Start Date Year: 2016	End Date Year: Ongoing

Nature of the Client:	State of Nevada Division of Public and Behavioral Health (DPBH)
Nature of Client Audience:	State of Nevada Division of Public and Behavioral Health (DPBH) program managers, inspectors and auditors, all Nevada licensees (cultivators, producers, dispensaries, labs).
Number of Users:	Approximately 500
# & Composition of Vendor Employees & Consultants Assigned:	Vendor PM and approximately 5 primary advisors plus MJ Freeway PM and approximately 5-10 internal resources (analyst, developers, systems, QA)
Client Contact Information:	Reference Contacts: REDACTED

Name of Client & Project Title	Harborside Health Center Commercial off the Shelf & Customization Project	
Contract Value	The budget for this scope of work involved MJ Freeway’s retail COTS system, currently in use by Harborside. Specific items that have contributed to the budget include custom development and a range of professional services offerings. Because Harborside is a private client, MJ Freeway is not permitted to share actual budget figures	
Nature and Scope of Project:	For Harborside Health Center (Harborside), MJ Freeway conducted large scale custom development on top of MJ Freeway’s existing COTS infrastructure, including the provisioning of a separate hosting environment. Harborside is an extensively regulated marijuana operation, the largest such operation in the world. Harborside has over 200,000 patients, over 10,000 different products, a delivery business, and a highly specialized segmentation of departments, workflows, and roles. As part of the project scope, MJ Freeway helped manage this complexity by aggregating four different software platforms that were in use by Harborside, and performing all related data conversion and data imports. MJ Freeway’s professional services offerings, which are unique among vendors of Seed to Sale technology, are also a significant part of the budget and ongoing relationship with Harborside. MJ Freeway consultants have produced over a dozen training videos and over 20 documents for Harborside that include flow charts, plans, best practices, and standard operating procedures	
Project Duration:	Start Date Year: 2013	End Date Year: On-going
Nature of the Client:	Harborside Health Center is one of the largest marijuana operations in the world.	
Nature of Client Audience:	Harborside Health Center staff at multiple locations in California.	
Number of Users:	100	
# & Composition of Vendor Employees & Consultants Assigned:	Harborside Health Center Core team – lead and several key employees plus MJ Freeway team lead and 5-10 internal resources (product manager, developers, QA, systems, implementation lead)	
Client Contact Information:	Reference Contacts: REDACTED	

Name of Client & Project Title	New York State Department of Health (DOH) - Medical Marijuana Data Management System (MMDMS)	
Contract Value	1.7M	
Nature and Scope of Project:	<p>Oracle was engaged by New York State Department of Health (DOH) to provide full life cycle implementation support from Inception through Production for the Medical Marijuana Program (MMP). Oracle employed an iterative and incremental approach to development and deployment of the Medical Marijuana Data Management System (MMDMS). During Inception phase, Oracle collaborated with the State to gain concurrence among all stakeholders on the high level use cases and lifecycle objectives. Oracle then moved development of the solution from the scoping and high-level requirements performed during the Inception phase to developing the detailed requirements, partitioning the solution into processes such as Patient Certification, Patient Registration, Caregiver Registration, Change in Circumstances, DOH Portal, creating any necessary prototypes to validate requirements and familiarizing the stakeholder to the user experience, and baselining the architecture of the system to provide a stable basis for the design and implementation effort in the Construction phase. Throughout the Construction phase, Oracle involved DOH in the review and validation of the in progress functionality via Conference Room Pilot (CRP's) sessions.</p> <p>Oracle supported DOH to validate that the system is configured and tested systematically and is available for end users, ultimately, deployed into production. Post Production Oracle supported the State to operate the newly developed system, and monitor and address system issues. This includes monitoring the system and acting appropriately to maintain continued operation; measuring system performance; operating and maintaining supporting systems; responding to help requests, error reports and feature requests by users; and supporting the applicable change control process so that defects and new features may be prioritized and assigned to future releases and put into a plan for future enhancements to the application system, as well as determining, developing, and implementing required updates.</p> <p>Throughout the life cycle, Oracle provided knowledge transfer to the project team members. We developed a shared ownership and 'peer review' strategy in which design and development deliverables were assigned across the integrated team that cultivated knowledge sharing, maximized Oracle product knowledge, and minimized delivery risk. The project went live in December 2015.</p>	
Project Duration:	Start Date Year: August 2014	End Date Year: March 2016
Nature of the Client:	New York State Department of Health	
Nature of Client Audience:	Providers, Patients, Caregivers, Law Enforcement, State workers, State Supervisors. Business partners include ID card services, Department of Motor Vehicle (DMV), and payment processor.	

Number of Users:	As of January 2017, 824 practitioners have registered for the NYS Medical Marijuana Program, and 12,530 patients have been certified by their practitioners.
# & Composition of Vendor Employees & Consultants Assigned:	The project was a blend between Oracle and State resources with emphasis on knowledge sharing and on the job learning and mentoring from Oracle to State staff. Oracle and the State provided 5 and 10 resources respectively to the project on average during the project execution. The stated level was maintained throughout until testing and production roll out when the State increased resource level to ensure successful go live.
Client Contact Information:	Per policy, the State has provided guidance as to who can serve in this role. Reference Contacts: REDACTED

Name of Client & Project Title	Pennsylvania Department of Environmental Protection – Application Service Desk Support	
Contract Value	\$6,250,000	
Nature and Scope of Project:	TreCom was engaged to provide application services desk support for all PADEP enterprise application system implementations. A key activity of this project is the validation and verification tasks associated with application system implementations. The TreCom Team insures that all application functionality has been included in system software releases by reviewing documented business and system requirements, and developing and executing quality assurance plans. The application systems include complex, custom-written and COTS-based systems that support over 10,000 employees within the DEP enterprise.	
Project Duration:	Start Date Year: 2011	End Date On-Going
Nature of the Client:	PA DEP is responsibility for regulatory activities of Pennsylvania’s environmental assets. The Bureau of Information Technology manages the TreCom project.	
Nature of Client Audience:	Project users include employees within the PADEP. This includes administrative, IT, and program technical personnel. Users are located at multiple offices across Pennsylvania as well as Central Office in Harrisburg.	
Number of Users:	10,000+	
# & Composition of Vendor Employees & Consultants Assigned:	TreCom staffing is at 10 FTEs and is led by a TreCom project manager who reports to IT management personnel.	
Client Contact Information:	Reference Contacts: REDACTED	

Master Information Technology (IT) Services Invitation to Qualify (ITQ) Contract
APPENDIX I, Domestic Workforce Utilization Certification

To the extent permitted by the laws and treaties of the United States, each proposal will be scored for its commitment to use the domestic workforce in the fulfillment of the contract. Maximum consideration will be given to those offerors who will perform the contracted direct labor exclusively within the geographical boundaries of the United States or within the geographical boundaries of a country that is a party to the World Trade Organization Government Procurement Agreement. Those who propose to perform a portion of the direct labor outside of the United States and not within the geographical boundaries of a party to the World Trade Organization Government Procurement Agreement will receive a correspondingly smaller score for this criterion. In order to be eligible for any consideration for this criterion, offerors must complete and sign the following certification. This certification will be included as a contractual obligation when the contract is executed. Failure to complete and sign this certification will result in no consideration being given to the offeror for this criterion.

I, CEO of MJ Freeway a Colorado corporation or other legal entity, ("Contractor") located at 1601 Arapahoe St. Denver, CO 80202, having a Social Security or Federal Identification Number of 27-2354485, do hereby certify and represent to the Commonwealth of Pennsylvania ("Commonwealth") (Check one of the boxes below):

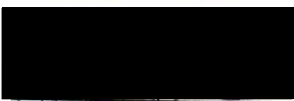
All of the direct labor performed within the scope of services under the contract will be performed exclusively within the geographical boundaries of the United States or one of the following countries that is a party to the World Trade Organization Government Procurement Agreement: Aruba, Austria, Belgium, Bulgaria, Canada, Chinese Taipei, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Liechtenstein, Lithuania, Luxemburg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom

OR

[] percent [Contractor must specify the percentage] of the direct labor performed within the scope of services under the contract will be performed within the geographical boundaries of the United States or within the geographical boundaries of one of the countries listed above that is a party to the World Trade Organization Government Procurement Agreement. Please identify the direct labor performed under the contract that will be performed outside the United States and not within the geographical boundaries of a party to the World Trade Organization Government Procurement Agreement and identify the country where the direct labor will be performed: [Use additional sheets if necessary]

The Department of General Services [or other purchasing agency] shall treat any misstatement as fraudulent concealment of the true facts punishable under Section 4904 of the *Pennsylvania Crimes Code*, Title 18, of Pa. Consolidated Statutes.

Attest or Witness:

 11/24/17

Signature/Date

Mindy Erickson/Executive Assistant
Printed Name/Title

MJ Freeway, LLC
Corporate or Legal Entity's Name

 11/24/17

Signature/Date

Amy A. Poinsett/Co-Founder & CEO
Printed Name/Title



**APENDIX J
CONTRACTOR CERTIFICATION
AND
ACCEPTANCE OF RFQ MANDATORY REQUIREMENTS
SOLICITATION # 6100040415**

CONTRACTOR NAME: MJ Freeway, LLC

CONTRACTOR ADDRESS: 1601 Arapahoe Street, Suite 800, Denver, CO 80202

CONTRACTOR FEDERAL ID NUMBER: 27-2354485

CONTRACTOR SAP/SRM VENDOR NUMBER: 0000519825

CERTIFICATION: I, the undersigned official of the above-named Contractor, do hereby certify that the Contractor owns a medical marijuana Seed to Sale tracking software solution and has the ability to operate it as a hosted, Software as a Service (SaaS). I further certify that I am authorized to provide this certification on behalf of the above-named Contractor.

I understand that false statements made herein are subject to the penalties of 18 Pa. C.S.A. Section 4904 relating to unsworn falsification to authorities and I am making this statement under penalty of perjury.

	<i>Signature</i>
Signature of an official authorized to bind the Contractor to the provisions contained in the Contractor's proposal:	
Printed Name Amy Poinsett	
Title Co-Founder & CEO	

FAILURE TO COMPLETE, SIGN AND RETURN THIS FORM WITH THE CONTRACTOR'S PROPOSAL WILL RESULT IN THE REJECTION OF THE CONTRACTOR'S PROPOSAL

APPENDIX K
NON-COMMONWEALTH HOSTED APPLICATION SERVICES REQUIREMENTS

The purpose of this appendix is to define requirements for technology solutions procured by the Commonwealth that are not hosted within Commonwealth infrastructure.

A. Hosting Requirements

1. The selected Contractor shall supply all hosting infrastructure required for performance of the Contract.
2. The selected Contractor shall provide secure access to all levels of users via the internet.
3. The selected Contractor is responsible for purchase, setup and maintenance of all required software and hardware needed to support the implementation of the system and all follow-up on maintenance and support.
4. The selected Contractor shall use commercially reasonable resources and efforts to maintain adequate internet connection bandwidth and server capacity to maintain compliance with the Service Level Agreements as described in **Appendix M - Service Level Agreements**.
5. The selected Contractor shall maintain all hosting equipment (hardware and software) and replace as necessary to maintain compliance with the Service Level Agreements as described in **Appendix M - Service Level Agreements**.
6. The selected Contractor shall monitor, prevent and deter unauthorized system access. Any and all known attempts must be reported to the Commonwealth within the timeframe set out by the RFQ. In the event of any impermissible disclosure, loss or destruction of Confidential Information, the receiving Party must immediately notify the disclosing Party and take all reasonable steps to mitigate any potential harm or further disclosure, loss or destruction of such Confidential Information. In addition, pertaining to the unauthorized access, use, release, or disclosure of data, the selected Contractor shall comply with state and federal data breach notifications regulations and is to report security incidents to the Commonwealth within one (1) hour of when the selected Contractor knew of such unauthorized access, use, release, or disclosure of data.
7. The selected Contractor shall allow the Commonwealth or its delegate, at times chosen by the Commonwealth, to review the hosted system's location and security architecture.
8. The selected Contractor staff, directly responsible for day-to-day monitoring and maintenance, shall have industry standard certifications applicable to the environment and system architecture used.
9. The selected Contractor shall locate servers in a climate-controlled environment. Contractor shall house all servers and equipment in an operational environment that meets industry standards including climate control, fire and security hazard detection, electrical needs, and physical security.
10. The selected Contractor shall examine system and error logs daily to minimize and predict system problems and initiate appropriate action.
11. The selected Contractor shall completely test and apply patches for all third-party software products before release.

12. The selected Contractor shall provide evidence that its hosting platform/cloud service provider is FedRAMP certified.

B. System Availability

1. The selected Contractor shall make available the system and any custom software on a 24 x 7 basis as established by the RFQ, with the exception of pre-planned maintenance.
2. The selected Contractor shall perform routine maintenance during planned downtime windows, with the approval of DOH. Routine maintenance shall include, but is not limited to, server upgrades/patching, software upgrades/patching and hardware maintenance.
3. The selected Contractor shall perform non-routine maintenance at a mutually agreeable time with two (2) weeks advance notice to the Commonwealth.
4. From time to time, emergency maintenance may be required to bring down the system. In such situations, if possible, the selected Contractor shall give advance notice, before the system goes down for maintenance, to the Commonwealth. The selected Contractor will limit the emergency maintenance to those situations which require immediate action of bringing down the system that cannot wait for the next scheduled maintenance period.

C. Security Requirements

1. The selected contractor shall provide evidence that the application boundary for their solution(s), including infrastructure and security controls, follows the guidelines and standards of FedRAMP. The selected Contractor shall permit the Commonwealth, at its sole discretion, to audit the solution's compliance to FedRAMP standards.
2. The selected Contractor shall conduct a third party independent security/vulnerability assessment at its own expense on an annual basis and submit the results of such assessment to the Commonwealth.
3. The selected Contractor shall comply with Commonwealth directions/resolutions to remediate the results of the security/vulnerability assessment to align with the standards of the Commonwealth.
4. The selected Contractor shall use industry best practices to protect access to the system with a firewall and firewall rules to prevent access by non-authorized users and block all improper and unauthorized access attempts.
5. The selected Contractor shall use industry best practices to provide system intrusion detection and prevention in order to detect intrusions in a timely manner.
6. The selected Contractor shall use industry best practices to provide virus protection on all servers and network components.
7. The selected Contractor shall limit access to the system and servers and provide access only to those staff that must have access to provide services proposed.

8. The Selected Contractor will provide all Services, using security technologies and techniques in accordance with industry best practices and the Commonwealth's security policies, procedures, and requirements, including those relating to the prevention and detection of fraud and any other inappropriate use or access of systems and networks.
9. All data in transit and at rest must be encrypted. All data in transit and rest must remain in the continental United States.

D. Data Storage

1. The selected Contractor shall use industry best practices to update all systems and third party software security patches to reduce security risk. The Selected Contractor shall protect their systems with anti-virus, host intrusion protection, incident response monitoring and reporting, network firewalls, application firewalls, and employ system and application patch management to protect its network and customer data from unauthorized disclosure.
2. The selected Contractor shall be solely responsible for all data storage required.
3. The selected Contractor shall take all necessary measures to protect the data including, but not limited to, the backup of the servers to meet the Recovery Point Objective and Recovery Time Objective established in the Service Level Agreements. in accordance with industry best practices and encryption techniques.
4. The selected Contractor agrees to have appropriate controls in place to protect critical or sensitive data and shall employ stringent policies, procedures, and best practices to protect that data particularly in instances where sensitive data may be stored on a selected Contractor controlled or owned electronic device.
5. The selected Contractor shall utilize a secured backup solution to prevent loss of data, back up all data every day and store backup media. Storage of backup media offsite is required. Data retention period has been established as the term of this contract. Stored media must be kept in an all-hazards protective storage safe at the worksite and when taken offsite. All back up data and media shall be encrypted.

E. Disaster Recovery

1. The selected Contractor shall employ reasonable disaster recovery procedures to assist in preventing interruption in the use of the system.
2. The selected contractor will perform an annual disaster recovery exercise to test their procedures and establish a Recovery Point Objective (RPO) and Recovery Time Objective (RTO).
3. The selected Contractor support and problem resolution solution shall provide a means to classify problems as to criticality and impact and with appropriate resolution procedures and escalation process for each classification of problem.

F. Data Exchange/Interface Requirements

1. PCI Compliance

The Selected Contractor is obliged to adhere to the Payment Card Industry Data Security Standard (PCI DSS) if it processes payment card data. Moreover, The Selected Contractor certifies that their Information Technology practices conform to and meet current PCI DSS standards as defined by The PCI Security Standards Council at https://www.pcisecuritystandards.org/security_standards/index.php.

The Selected Contractor will monitor these PCI DSS standards and its Information Technology practices and the Selected Contractor will notify the Commonwealth within one (1) week, if its practices should not conform to such standards. The SELECTED CONTRACTOR will provide a letter of certification to attest to meeting this requirement and agrees to the Commonwealth's right-to-audit either by Commonwealth or external 3rd party auditors.

Selected Contractor agrees that it may (1) create, (2) receive from or on behalf of Commonwealth, or (3) have access to, payment card records or record systems containing cardholder data including credit card numbers (collectively, the "Cardholder Data"). Selected Contractor shall comply with the Payment Card Industry Data Security Standard ("PCI-DSS") requirements for Cardholder Data that are prescribed by the payment brands (as appropriate including Visa, MasterCard, American Express, Discover), as they may be amended from time to time (collectively, the "PCIDSS Requirements"). Selected Contractor acknowledges and agrees that Cardholder Data may only be used for assisting in completing a card transaction, for fraud control services, for loyalty programs, or as specifically agreed to by the payment brands, for purposes of this Agreement or as required by applicable law.

G. Adherence to Policy

1. The selected Contractor support and problem resolution solution shall provide a means to classify problems as to criticality and impact and with appropriate resolution procedures and escalation process for each classification of problem.
2. The selected Contractor shall abide by all the Commonwealth's policies (Information Technology Policies (ITPs)).
3. The Selected Contractor shall comply with all pertinent federal and state privacy regulations.

H. Closeout

1. All data shall remain the property of the Commonwealth and will be delivered in a Commonwealth approved format.

2. The selected Contractor shall delete all data from its servers upon approval from DOH that the data has been delivered in a Commonwealth approved format.
3. The selected Contractor shall verifying that all of the data has been delivered to the Commonwealth and removed from the Contractor's servers per Commonwealth ITPs.
4. Additional closeout details are provided in the system requirements.

<p>Explanatory Notes: 1) The temporary Bridge data management solution must be capable of storing and providing interim regulatory tracking of inventory, point of sale, and data for all approved grower/processors, testing laboratories, dispensaries and research institutions in Pennsylvania. Requirements applicable to the temporary Bridge solution are identified in a separate column. The intention is to focus this effort on meeting immediate core requirements. 2) The 'Timing' column is intended to provide information regarding phasing. 'Day 1' requirements are needed at time of solution production implementation; '+' indicates the number of days after the initial solution production implementation that the functionality needs to be in place. 3) Bidders must complete the table highlighted in blue. Select the correct answer from the drop down box in each column. As necessary, include additional information in the 'Explanation' column. Requirements that involve customization and/or subcontracting must include an explanation, including estimated effect on</p>														
Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation	
	Table Example			The registry solution must be able to communicate information of interest to registered users through broadcast postings on the registry's home page.					No	No	Yes	No	Customization is necessary to fulfill requirement. Work effort is projected to be sized small at 25 hours (inclusive of all SDLC steps). Added cost estimated at \$2,500; this work will be done concurrently with other project tasks and will not add time to the project schedule.	
<p>The Registry solution must provide functionality to register, authorize, credential and administer patients, caregivers, practitioners and medical providers according to requirements specified by DOH.</p>														
Registry	Functional	Audit	SOW-001	Data & Reporting/ Tracking	The registry solution must track and retain an auditable database history, including modifications to any information in the database(s).		High	Registry Day 1	Applies to all data requirements	Yes				The Registry component of the Solution includes audit trail functionality to track modifications to any data elements in the registry.
Registry	Functional	Audit	SOW-002	Data & Reporting/ Tracking	For the purpose of monitoring registry usage, the registry solution must include an audit history that shows all user activity, such as logons, failed logons, changes, additions, deletions, searches, and data requests by any system or users including a date/time stamp and user ID.		High	Registry Day 1	Applies to all data requirements	Yes				The Audit Trail in the Registry component of the Solution the standard functionality to track any changes to information as well as logon attempts. Additional configuration will be performed to track search details and search information.
Registry	Functional	Audit	SOW-003	Data & Reporting/ Credentials	The registry solution must include full administrative capabilities to define, control, periodically review and update system access and privileges for internal and external (outside of pa.gov domain) users, including creating user security groups, granting general or granular access to users and groups, revoking or modifying access, and granting read-only or change capability to users and groups.		High	Registry Day 1	Applies to all data requirements	Yes				The Registry component of the Solution includes capabilities to control and monitor the security functions of end users and groups.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Registry	Functional	External	SOW-004	Integration	The registry solution must provide all supporting equipment, including barcode scanners, scanning devices, identification card production and scanning equipment, and cash registers. As noted in SOW-017, DOH reserves the right to produce identification cards using an external source.		High	Registry Day 1	BR012	Yes				MJ Freeway's proposal includes equipment for 33 growers/processors, 198 dispensaries, 30 laboratories, as outlined in the RFQ. The proposal also includes additional equipment for breakage and replacement.
Registry	Functional	External	SOW-005	Data & Reporting	The registry solution must include full administrative capabilities to define, produce and electronically store both ad hoc and preconfigured queries and reports in a specified format. Functionality must permit queries and reports against all database fields, and provide authorized users the ability to build queries and reports and select file type (CSV, .PDF) using dropdown lists or other automated tools; data field access needs to be limited by user or group roles.		High	Registry Day 1	BR003 BR004	Yes				The Registry component of the Solution is based on a configurable platform. Administrators define the data that is accessible and updateable by specific users and groups. User and groups with the proper security credentials can perform searches on any available database fields. Results of searches and reports can be exported to standard formats such as CSV, PDF, HTML, XML, etc. Security is very
Registry	Functional	External	SOW-006	Integration	The registry solution must be capable of secure SSL data exchanges (both import and export) that comply with Commonwealth of PA Information Technology Policies and use file formats and transmission protocols conforming to national standards, including SFTP, XML, ASCII, and CSV; APIs/web services must be based on open standards.		High	Registry Day 1	Applies to Program directive	Yes				The Registry component of the Solution is built on a highly secure platform that is in compliance with HIPAA and FedRamp standards. The component also adheres to industry standards for file formats and protocols.
Registry	Functional	External	SOW-007	Data & Reporting	For reporting and queries, the registry solution must provide a data repository copy of the production database(s) that is refreshed according to DOH requirements.		High	Registry Day 1	Applies to all data requirements	Yes				As part of the provisioning for the environment, we will provide an additional environment that will be refreshed from the production environment periodically based on DOH requirements. Typically this isn't needed as the Registry component of the Solution is robust and scalable to handle reports and queries.
Registry	Functional	External	SOW-008	Data & Reporting	The registry's repositories must include a detailed data dictionary with coding definitions that is made available to authorized staff.		High	Registry Day 1	Applies to all data requirements	Yes				Authorized staff will have access to a detailed data dictionary for the Registry component of the Solution. The data dictionary includes definitions for standard as well as custom fields and objects.
Registry	Functional	Internal	SOW-009	Credentials	The registry solution must uniquely identify each patient, caregiver, practitioner, medical provider, and user while accommodating multiple roles for a single entity.		High	Registry Day 1	BR046 BR054	Yes				The Registry component of the Solution provides unique identifiers for each person in the system. People in the Solution can act as many different roles based on context.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Registry	Functional	Internal	SOW-010	Registration	The registry solution must track patient, caregiver, practitioner, and medical provider information during the registration and eligibility processes, including saving partial records for later completion.		High	Registry Day 1	BR047 BR055 BR056		Yes			The Registry component of the Solution tracks patients, caregivers, practitioners, and medical providers during the registration and eligibility process. The intake for registration will be performed using a highly dynamic application tool. This tool is capable of capturing all of the specific information and the right time. This tool can also save in process or partial records for later
Registry	Functional	Internal	SOW-011	Registration	The registry solution must allow patients, caregivers, practitioners and medical providers to generate and change user credentials; submit, update, and approve application forms based on DOH requirements, which may require processing of data feeds from external parties; acknowledge DOH notices using a checkbox; upload and store supporting documents; follow review/approval workflows defined by DOH; allow users to input data using online screens or fillable pdf forms.		High	Registry Day 1	BR045 BR049 BR054 BR056	Yes				The Registry component of the Solution includes a fully functional portal. The portal provides context sensitive self service functions for the various groups communication with the agency. The functions available will be dependent on the type of user using the portal. Example functions include maintain credentials, generating forms, submitting information, or simply checking status information.
Registry	Functional	Internal	SOW-012	Registration	The registry solution must link associated patient, caregiver, practitioner, medical provider and dispensary accounts to support processing workflows, as defined by DOH requirements.		High	Registry Day 1	BR002 BR053		Yes			The Registry component of the Solution includes relationships between the various types of users and accounts. The component also include workflow capabilities to automate the processing of DOH requirements.
Registry	Functional	Internal	SOW-013	Registration	The registry solution must support the definition of multiple categories of patients, caregivers, practitioners and medical providers, each with separate combinations of processing workflows.		High	Registry Day 1	BR060		Yes			The Registry component of the Solution enables users to be subclassified into a number of different types. Each classification of user can drive the specific workflow related to that type of user.
Registry	Functional	Internal	SOW-014	Registration	The registry solution must link patient and caregiver accounts to identification cards.		High	Registry Day 1	BR052 BR053		Yes			The Registry component of the Solution will link patient and caregiver accounts to identification cards.
Registry	Functional	Internal	SOW-015	Integration	The registry solution must integrate and share data with seed-to-sale as necessary to ensure ongoing compliance with DOH tracking requirements, including reconciliation of data updates made in either system.		High	STS +30 Days	BR006 BR010		Yes			The Registry component of the Solution includes industry standard integration components and techniques. Specific integration between the registry and the seed-to-sale components will be provided as part of the implementation.
Registry	Functional	Internal	SOW-016	Integration	Medical marijuana product information and dispensing information tracked in the seed-to-sale solution must be linked to each patient's registry record to track recalls.		High	Registry +30 days	BR016 BR020 BR044		Yes			Integration between the seed-to-sale component and the registry component will be performed as part of the implementation to link product and dispensing information with registry records to track recalls.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Registry	Functional	Internal	SOW-017	Registration	The solution must be able to produce patient and caregiver identification cards. DOH reserves the right, at its sole discretion, to have the identification cards printed through another source. In the event that DOH uses another source to print the cards, the solution must provide the patient/caregiver unique identification number and account/application information to the external source via data file for inclusion on the identification card.		High	Registry Day 1	BR052		Yes			The MJ Freeway team will work with the Commonwealth to determine the service necessary to generate patient and caregiver identification cards. The Registry component integration object provides an agreed upon data structure that is based on open, industry standard that can be electronically exchanged with third party printing service. The MJ Freeway team has the capability to produce patient and caregiver identification cards if the Commonwealth determines they would like them printed by a Pennsylvania company. However, production and distribution of MM ID cards are not currently considered to be in scope.
Registry	Functional	Output	SOW-018	Registration	The registry solution must generate workflow-based emails, with links to associated portal pages, for patients, caregivers, practitioners, medical providers, and approved dispensaries to support DOH administrative tasks, including account setup.		High	Registry Day 1	BR045 BR046 BR053 BR054		Yes			One of the strengths of the Registry component of the Solution is the ability to communicate with users. Automated workflow driven emails will be defined by administrators. These emails can drive the various user groups to the portal for any number of tasks.
Registry	Functional	Output	SOW-019	Data & Reporting	The registry solution must include tools that will electronically analyze activity data to assist in the identification of at-risk and unprofessional activities.		High	Registry +60 days	Applies to all data requirements	Yes				The Solution includes data analytics and reporting tools to analyze activity data to help identify at-risk or unprofessional activities.
Registry	Functional	Output	SOW-020	Data & Reporting	The registry solution must include full administrative capabilities to configure automated, unsolicited system and email/text alerts to notify DOH staff and other users of incidents, events and required actions.		High	Registry +60 days	Applies to all data requirements	Yes				The Registry component of the Solution includes capabilities to send automated alerts to DOH staff. The specific conditions for these alerts will be configurable by DOH System Administrators.
Registry	Functional	Output	SOW-021	Data & Reporting	The registry solution must be able to set and change threshold levels for defined fields and generate unsolicited alerts to DOH and registered entities who exceed specific threshold levels.		High	Registry +60 days	Applies to all data requirements	Yes				Alerts and administrative notices are completely configurable within the Registry component of the Solution. DOH System Administrators have the ability to set and change threshold levels for any number of fields and conditions.
Registry	Functional	Security & Privacy	SOW-022	Credentials	The registry solution must include a mechanism for DOH and/or designee(s) to grant or revoke user security privileges.		High	Registry Day 1	BR042 BR043 BR044 BR047 BR052	Yes				The Registry component of the Solution enables DOH System Administrators and/or designees the ability to grant or revoke security privileges.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Registry	Functional	Security & Privacy	SOW-023	Credentials	The registry solution must allow a registered user to establish or deactivate a delegate subaccount(s) for their designee(s), and further, include a mechanism for the user to monitor system activity of their designee(s) online and through a reporting mechanism.		High	Registry Day 1	BR035 BR058 BR059			Yes		Customization of the Registry component of the Solution would be required to create a subaccount related to a primary account. This is not a delivery function of the Solution however with customization it could be created.
Registry	Functional	Security & Privacy	SOW-024	Registration	The registry solution must authenticate user access requests through a streamlined online registration process that links individuals to a system-generated, unique identification/personal identification number, including associating uploaded documents, forms, and copies of identification.		High	Registry Day 1	BR054 BR055	Yes				The Registry Component of the Solution includes a configurable online registration process. The process is configurable to support DOH specific requirements for registration.
Registry	Functional	Security & Privacy	SOW-025	Registration/ Credentials	The registry solution must notify users via email when their registration is denied including a reason for denial.		High	Registry Day 1	BR038 BR047 BR060		Yes			Workflow rules in the Registry component of the Solution will be established to automatically send users emails when their registration is denied including a reason for denial.
Registry	Functional	Security & Privacy	SOW-026	Registration/ Credentials	The registry solution must notify users in advance via email when their passwords are about to expire; timing of the password expiration and the expiration notice to be based on parameters set by DOH.		High	Registry Day 1	Applies to Security & Privacy requirements		Yes			Workflow rules in the Registry component of the Solution will be established to automatically send users emails in advance of password expirations. The exact specifications of when to send the email will be configured based on DOH parameters.
Registry	Functional	Security & Privacy	SOW-027	Data & Reporting	The registry solution must include full administrative, privilege-based capabilities to extract/import/export data to/from dispensaries and other organizations in an ad hoc or preconfigured manner; the data extraction process must permit DOH to define frequency and must make a detailed data dictionary with coding definitions available to administrative staff.		High	Registry Day 1	BR007 BR011 BR055	Yes				The Registry component of the Solution enables authorized users the ability to export and import data from the Solution. Exports and imports can be scheduled or can be performed on an ad hoc basis
Registry	Functional	Security & Privacy	SOW-028	Data & Reporting	For the registry solution, the contractor must provide data access, data management, cleansing capabilities and normalization integrated with data mining for ease of data analysis.		High	Registry Day 1	Applies to all data requirements	Yes				The Registry component provides a comprehensive data management toolset that facilitates data cleansing and normalization capabilities.
Registry	Functional	Security & Privacy	SOW-029	Data & Reporting	Based on user security access and roles, the registry solution must allow authorized users to search/query the system to request and receive information without intervention.		High	Registry Day 1	Applies to all data requirements	Yes				The Registry component of the Solution will allow authorized users the ability to search for information without intervention.

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Registry	Functional	Security & Privacy	SOW-030	Credentials	The registry solution must include a secure and automated method for obtaining system login credentials for users at approved entities based on the system-assigned, unique identification/personal identification number.		High	Registry Day 1	BR010	Yes				The Registry component of the Solution enables creation of login credentials for users at approved entities based on personal identification number.
Registry	Functional	Security & Privacy	SOW-031	Data & Reporting	The registry solution must allow review and approval of information requests and responses when required for certain user roles.		High	Registry Day 1	BR003		Yes			The Registry component of the Solution supports review and approval of information requests.
Registry	Functional	Security & Privacy	SOW-032	Data & Reporting	The registry solution must include full administrative capabilities to extract, import, and export data to internal and external parties in an ad hoc or preconfigured manner, based on access privileges. The data extraction process must permit DOH to define frequency and file type (CSV, .PDF) and provide a detailed data dictionary with coding definitions to authorized staff.		High	Registry Day 1	Applies to all data requirements	Yes				The Registry component of the Solution enables authorized users the ability to export and import data from the Solution. Exports and imports can be scheduled or can be performed on an ad hoc basis. The component supports many types of file formats including PDF, CSV, XML, HTML, etc.
Registry	Functional	User Interface	SOW-033	Portal	The registry solution must provide a single portal to serve DOH, patients, caregivers, practitioners, medical providers, dispensaries and all approved entities.		High	Registry Day 1	BR045 BR048 BR049 BR051 BR055 BR056 BR058 BR060		Yes			The Registry component of the Solution includes a fully functional, dynamic and configurable portal for use by DOH, patients, caregivers, practitioners, medical providers, dispensaries, and all approved entities. As users log into the portal the functions available will be based on the type of user logging into the system.
Registry	Functional	User Interface	SOW-034	Portal	The registry portal must include secure, web-based interface for data entry, display, document upload, administration, reporting for DOH and authorized users, and interfacing with other entities as needed.		High	Registry Day 1	BR050 BR055	Yes				The Registry component's portal is highly secure and includes functions for data entry, display, document upload and administration.
Registry	Functional	User Interface	SOW-035	Portal	The registry solution must be able to communicate information of interest to registered users through broadcast postings on the registry's home page.		High	Registry Day 1	BR011 BR024 BR073		Yes			The Registry component's portal supports broadcast postings on the registry's home page. The portal also supports a highly sophisticated knowledge base to provide information to the various types of users accessing the portal.
Registry	Functional	User Interface	SOW-036	Registration	The seed-to-sale solution must notify users via email when their attempted registration is still incomplete after a configurable amount of time has passed.		High	Registry Day 1	BR055		Yes			Workflow rules in the Registry component of the Solution can be configured to send emails to users about incomplete registrations. The specific timeframes and triggers will be determined by DOH parameters.

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Registry	Functional	Internal	SOW-037	Integration	The registry solution must allow authorized dispensary staff to access the registry to view patient, caregiver, practitioner, and medical provider records and to input changes to patient and/or caregiver certification and dispensing information.		High	Registry +30 days	BR002 BR014 BR018	Yes				Security rules within the Registry component will be created to enable dispensary staff access to registry information.
Registry	Functional	Output	SOW-038	Data & Reporting	The registry solution must be able to generate patient, caregiver, practitioner, medical provider, and dispensary history reports compatible with printing and electronic distribution.		High	Registry Day 1	BR050 BR055	Yes				History in the Registry component of the Solution can be produced in many different formats including printing and electronic distribution methods.
Registry	Non-Functional	Performance	SOW-039	Portal	The registry solution shall provide system messages at login to notify users of emergency maintenance or other system events.		High	Registry Day 1	Applies to Program directive		Yes			The Registry component of the Solution supports system messages on login for notifications or system events.
Registry	Non-Functional	Performance	SOW-040	Portal	The registry solution shall display a continual notification of system scheduled maintenance, starting seven (7) days prior to the scheduled maintenance period and ending after the scheduled maintenance is completed.		High	Registry Day 1	Applies to Performance requirements		Yes			The Registry component of the Solution can be configured to display maintenance information.
Registry	Non-Functional	Performance	SOW-041	Portal	A notification of scheduled maintenance to the registry system shall be delivered to the Commonwealth fourteen (14) days prior to the scheduled maintenance.		High	Registry Day 1	Applies to Performance requirements	Yes				The Registry component of the Solution is a highly efficient component that requires little maintenance. When maintenance is required a schedule is produced and the Commonwealth will be notified more than 14 days prior to the maintenance.

Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation	
<p>The Seed-to-Sale solution must provide a central data management solution capable of providing and storing regulatory tracking of inventory, point of sale, and data for all approved grower/processors, testing laboratories, dispensaries and research institutions in Pennsylvania.</p>														
Seed-to-Sale	Functional	Audit	SOW-042	Data & Reporting/ Tracking	The seed-to-sale solution must track and retain an auditable database history, including modifications to any information in the database(s).	Yes	High	STS Day 1	Applies to all data requirements	Yes				Leaf Data Systems' chain of custody methodology centers on complete accountability. All actions affecting system objects, such as plants, customers, purchase orders, sales orders, transfers, conversions, manifests, packages, wholesale transactions, and users are recorded, in real-time, with a time/date stamp and the system user ID for the individual who affected the change. The audit
Seed-to-Sale	Functional	Audit	SOW-043	Data & Reporting/ Tracking	For the purpose of monitoring seed-to-sale usage, the seed-to-sale solution must include an audit history that shows all user activity, including failed logons and original data when changes are made, with date/time stamp and user ID.	Yes	High	STS Day 1	Applies to all data requirements	Yes				The Leaf Data Systems component of the Solution includes audit trail functionality to track modifications to any data elements in the seed-to-sale system.
Seed-to-Sale	Functional	Audit	SOW-044	Data & Reporting/ Credentials	The seed-to-sale solution must include full administrative capabilities to define, control, periodically review and update system access and privileges for internal and external (outside of pa.gov domain) users, including creating user security groups, granting general or granular access to users and groups, revoking or modifying access, and granting read-only or change capability to users and groups.		High	STS Day 1	Applies to all data requirements	Yes				Leaf Data Systems offers a comprehensive approach to user access control. Access control features include: * Role-Based Access Controls (RBAC) allows administrators to easily provision users with the correct level of access * Standard user groups include DOH system administrators, DOHC staff users, Licensee
Seed-to-Sale	Functional	Audit	SOW-045	Tax	The seed-to-sale solution must include the ability to respond to GAAP Audit inquiries regarding the total number of tax postings, payments received, and dollar value of payments received with details down to the individual transaction level.		High	STS +90 Days	DOR Directive			Yes		Leaf Data Systems includes tax related data and can be configured to provide inquiry responses. Leaf Data Systems collects complete sales transaction information from Licensees, including precise data on excise taxes and sales taxes collected. This is tracked in Leaf Data Systems and available to the Commonwealth through a reporting dashboard. Licensees also have several reports
Seed-to-Sale	Functional	External	SOW-046	Integration	The seed-to-sale solution must provide all supporting equipment, including mobile devices, scales, 2D barcode scanners, scanning devices, identification card scanning equipment, and cash registers.	Yes	High	STS Day 1	BR012	Yes				MJ Freeway/Leaf Data Systems integrates with commonly used USB point-of-sale hardware, such as barcode scanners, cash drawers, and receipt printers. MJ Freeway's proposal includes equipment for 33 growers/processors, 198 dispensaries, 30 laboratories, as outlined in the RFQ. The proposal also includes additional equipment for breakage and replacement.

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Seed-to-Sale	Functional	External	SOW-047	Data & Reporting	The seed-to-sale solution must send and receive data transmissions via secure FTP, secure email, Virtual Private Network (VPN) , SSL website telephone modem, physical media, and other agreed upon media.	Yes	High	STS Day 1	Applies to all data requirements	Yes	Yes			Leaf Data Systems is designed to facilitate data transmissions with external sources and can accommodate a wide variety of methodologies.
Seed-to-Sale	Functional	External	SOW-048	Data & Reporting	The seed-to-sale solution must allow registered organizations under common ownership to submit their data in a single joint transmission.	Yes	High	STS Day 1	Applies to all data requirements	Yes				Leaf Data Systems includes the capability to relate organizations under common ownership
Seed-to-Sale	Functional	External	SOW-049	Data & Reporting	The seed-to-sale solution must process and upload into the database accurate, complete and real time data from all reporting entities and document receipt of each data transmission from all reporting entities. For the temporary bridge solution, real time data is not required.	Yes	High	STS Day 1	Applies to all data requirements	Yes	Yes			If the Commonwealth selects a closed loop approach, data will process in the MJ Freeway business solution platform and then upload directly into the Leaf Data Systems environment using API. This is a real time solution. If the Commonwealth selects a decentralized approach, Leaf Data Systems provides three methods of access and interaction for licensees:
Seed-to-Sale	Functional	External	SOW-050	Data & Reporting	When a data file submitted to the seed-to-sale system by a reporting entity does not meet validations for accuracy and completeness, the solution must include notifying the entity, specifying the problem with the data, and ensuring that the data is corrected and resubmitted by the entity; rejected files must be securely stored and/or purged.	Yes	High	STS Day 1	Applies to all data requirements	Yes				Leaf Data Systems provides validation and response feedback for submitted data, whether submitted through the API, through CSV upload, or through the data entry portal. These validation checks include: 1. Ensuring the completion of required data elements 2. Validating the format of data submitted
Seed-to-Sale	Functional	External	SOW-051	Data & Reporting	The seed-to-sale solution must receive electronic tracking information transmitted directly from approved entities seven days per week 24 hours per day.	Yes	High	STS Day 1	Applies to all technical requirements and solutions	Yes				Leaf Data Systems' infrastructure and software is designed to be available around the clock.
Seed-to-Sale	Functional	External	SOW-052	Data & Reporting	The seed-to-sale solution must include full administrative capabilities to define, produce and electronically store both ad hoc and preconfigured queries and reports in a specified format. Functionality must permit queries and reports against all database fields, and provide authorized users the ability to build queries and reports and select file type (CSV, .PDF) using dropdown lists or other automated tools; data field access needs to be limited by user or group roles.	Yes	High	STS Day 1	BR003 BR004	Yes				Leaf Data Systems includes a business intelligence reporting platform which provides the ability to search multiple datasets including datasets specific to customers, plants, sales, and inventory. The platform also contains a number of predefined, function-specific analytical reports, which can be modified and saved by any user. Users can also create ad hoc analytic reports, which can be
Seed-to-Sale	Functional	External	SOW-053	Integration	The seed-to-sale solution must be capable of secure SSL data exchanges (both import and export) that comply with Commonwealth of PA Information Technology Policies and use file formats and transmission protocols conforming to national standards, including SFTP, XML, ASCII, and CSV; APIs/web services must be based on open standards.		High	STS Day 1	Applies to Program directive	Yes				The seed-to-sale solution, Leaf Data Systems, is built on a highly secure platform that is in compliance with HIPAA and FedRamp standards. The component also adheres to industry standards for file formats and protocols.

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Seed-to-Sale	Functional	External	SOW-054	Data & Reporting	For reporting and queries, the seed-to-sale solution must provide a data repository copy of the production database(s) that is refreshed according to DOH requirements	Yes	High	STS Day 1	Applies to all data requirements	Yes				As part of the provisioning for the environment, we will provide an additional environment that will be refreshed from the production environment periodically based on DOH requirements. Typically this isn't needed as the seed-to-sale solution, Leaf Data Systems, is robust and scalable to handle reports and queries.
Seed-to-Sale	Functional	External	SOW-055	Data & Reporting	The seed-to-sale's repositories must include a detailed data dictionary with coding definitions that is made available to authorized staff.	Yes	High	STS Day 1	Applies to all data requirements	Yes				Authorized staff will have access to a detailed data dictionary for the Leaf Data Systems seed-to-sale component of the Solution. The data dictionary includes definitions for standard as well as custom fields and objects.
Seed-to-Sale	Functional	Internal	SOW-056	Credentials	The seed-to-sale solution must uniquely identify each patient, caregiver, practitioner, medical provider, and user while accommodating multiple roles for a single entity.		High	STS Day 1	BR046 BR054	Yes				The Solution provides unique identifiers for each person in the system. People in the Solution can act as many different roles based on context.
Seed-to-Sale	Functional	Internal	SOW-057	Integration	The seed-to-sale solution must integrate and share data with the registry as necessary to ensure ongoing compliance with DOH tracking requirements, including reconciliation of data updates made in either system.	Yes	High	STS +30 Days	BR006 BR010		Yes			The Leaf Data Systems seed-to-sale component of the Solution includes industry standard integration components and techniques. Specific integration between the registry and the seed-to-sale components will be provided as part of the implementation.
Seed-to-Sale	Functional	Internal	SOW-058	Tracking	The seed-to-sale solution must allow DOH to input, store and change information about approved entities, including an indicator for status (approved, suspended, others); upon initial approval, the system will register the approved entity and generate an approval letter to the approved entity.	Yes	High	STS Day 1	BR006 BR015			Yes		The seed-to-sale and Registry components have the ability to facilitate end to end licensing, permitting, certification, registration processes for a given entity as it is transitioned from one status to another. The solution further provides the capability to generate letter and/or other forms of communications as preferred by either the Commonwealth or the entity.
Seed-to-Sale	Functional	Internal	SOW-059	Tracking	The seed-to-sale solution must support multiple locations for a given registered organization.	Yes	High	STS Day 1	BR006	Yes				The seed-to-sale solution, Leaf Data Systems, includes the capability to relate multiple locations for registered organizations
Seed-to-Sale	Functional	Internal	SOW-060	Tracking	The seed-to-sale solution must track the movement of medical marijuana through all activities related to the acquisition, planting, growing, possession, cultivation (including the application of fertilizers, pesticides and any other compounds and/or products applied to each individual plant), harvest, processing, production, storage, testing, transport, dispensing, sale, destruction/exchange and recall of medical marijuana.	Yes	High	STS Day 1	BR008 BR010 BR025 BR028 BR030 BR031 BR044	Yes				Leaf Data Systems is designed to track every action performed on each plant from its creation (i.e. from seed, clone, or tissue) through any changes of form, transactions, and transportation, all the way to the sale to a patient of finished Cannabis product. This all-encompassing process is commonly referred to as "seed to sale" tracking, and MJ Freeway is patent pending on that important reference. The purpose of

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Seed-to-Sale	Functional	Internal	SOW-061	Tracking	The seed-to-sale solution must allow approved grower/processors, testing labs, dispensaries and research institutions to input and update inventory transaction data directly via a user interface or automated, real time certified API interface. For the temporary bridge solution, an automated data load is acceptable in place of the real time API interface.	Yes	High	STS Day 1	BR001	Yes				Leaf Data Systems provides three methods for Licensees to securely submit data into the system: • RESTful API – This allows for real-time upload of plant data, product inventory tracking data, retail sales transactions, and fee and tax information from Licensees through their integrated business management software. • CSV Upload – This allows for batch upload of
Seed-to-Sale	Functional	Internal	SOW-062	Tracking	The seed-to-sale solution must uniquely identify every seed, clone, graft, plant and inventory item recorded in the system(s), including RFID tracking, barcode.	Yes	High	STS Day 1	BR008 BR024 BR033 BR036	Yes				Each object in Leaf Data Systems' database, including plants, seeds, clones, and grafts, is assigned a globally unique, non-repeating identification number upon creation within the database table. Tags bearing the unique ID are attached to every item, including plants, packages, and infused or edible products. Leaf Data Systems supports both RFID and barcode tags.
Seed-to-Sale	Functional	Internal	SOW-063	Tracking	The seed-to-sale solution must: receive inventory, view/search inventory, add/edit location, add/edit product type, create work order, create batch, create lot, transfer to a location inside the organization, transfer to an external organization, adjust inventory, send/receive/report for quality assurance testing activities, creating/updating transport manifest, dispensary sales and inventory transaction data.	Yes	High	STS Day 1	BR022 BR025 BR026 BR029 BR030	Yes				Leaf Data Systems is designed to track every action performed on each plant from its creation (i.e. from seed, clone, or tissue) through any changes of form, transactions, and transportation, all the way to the sale to a patient of finished Cannabis product. This all-encompassing process is commonly referred to as "seed to sale" tracking, and MJ Freeway is patent pending on that important reference. The purpose of
Seed-to-Sale	Functional	Internal	SOW-064	Tracking	The seed-to-sale solution must track in U.S. customary and metric units; allow for input using either measurement, and provide automatic conversion between both measurements.	Yes	High	STS Day 1	BR026 BR031	Yes				Leaf Data Systems was designed to support both US customary and metric units. While the system is natively metric, it is programmed to convert to US customary units, i.e. ounces and pounds, and fractions of each. Either metric or US customary units may be entered by a user into an input field in Leaf Data Systems.
Seed-to-Sale	Functional	Internal	SOW-065	Tracking	The seed-to-sale solution must track medical marijuana by: tag or label system-generated unique ID, form, strain, description (seedling, clone, mother plant), number/quantity/weight/volume, lot or batch, status in processing cycle, manufacture date, expiration date, added by (employee #), physical location, time/date stamp, number of immature plants, number of medical marijuana products ready for sale, number of damaged, defective, expired or contaminated plants/grafts/seeds.	Yes	High	STS Day 1	BR024 BR034 BR037 BR038	Yes				Leaf Data Systems' chain of custody methodology centers on complete accountability. All actions affecting system objects, such as plants, customers, purchase orders, sales orders, transfers, conversions, manifests, packages, wholesale transactions, and users are recorded, in real-time, with a time/date stamp and the system user ID for the individual who affected the change. The audit
Seed-to-Sale	Functional	Internal	SOW-066	Tracking	The seed-to-sale solution must allow approved growers/processors to produce a label for medical marijuana which lists: form, quantity and weight; single dose THC and CBD content in milligrams; an identifier that is unique to a particular batch, including a number assigned to each lot in the batch; packaging date; employee # of preparer, packager and shipper; name and address of receiving dispensary; expiration date; and instructions and/or notices to be determined by DOH.	Yes	High	STS Day 1	BR032 BR039		Yes			Leaf Data Systems includes the ability to print labels based on DOH specifications.
Seed-to-Sale	Functional	Internal	SOW-067	Tax	The seed-to-sale solution must electronically produce ad hoc reports for dynamically specified time frames reflecting sales transactions between approved growers/processors and dispensaries.		High	STS +90 Days	BR013	Yes				Leaf Data Systems includes a business intelligence reporting platform which provides the ability to download and search multiple datasets, including datasets specific to customers, plants, sales, and inventory. The platform contains several predefined, function-specific analytical reports, which can be modified and saved by authorized users. Users can also create ad hoc analytic reports, which can be

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Seed-to-Sale	Functional	Internal	SOW-068	Tax	The seed-to-sale solution must electronically produce reports to display the calculation of the amount of excise tax due based on the sales amounts for a specified period; excise tax values to be set by administratively configurable parameters.		High	STS +90 Days	BR061	Yes				Leaf Data Systems collects complete sales transaction information from Licensees, including precise data on excise taxes and sales taxes collected. This is tracked in Leaf Data Systems and available the Commonwealth through a reporting dashboard. Licensees also have several reports available to them providing details on taxes collected at granular levels, i.e. city, county, etc.
Seed-to-Sale	Functional	Internal	SOW-069	Tax	The seed-to-sale solution must allow approved grower/processors to electronically remit excise tax payments.		High	STS +90 Days	DOR Directive			Yes		The Solution can be customized to accept excise tax payments from approved growers/processors.
Seed-to-Sale	Functional	Internal	SOW-070	Tax	The seed-to-sale solution must permit the manual posting of tax payment(s) received outside of the system.		High	STS +90 Days	DOR Directive			Yes		The Solution can be customized to permit manual posting of tax payments received outside of the system.
Seed-to-Sale	Functional	Internal	SOW-071	Tax	The seed-to-sale solution must provide the ability to clear the tax payment against the gross receipts tax liability for the specified time period.		High	STS +90 Days	DOR Directive			Yes		The Solution can be customized to provide the ability to clear tax payments against gross receipts tax for the specified period of time.
Seed-to-Sale	Functional	Internal	SOW-072	Tax	The seed-to-sale solution must deposit gross receipts tax payments directly into an established Medical Marijuana fund.		High	STS +90 Days	DOR Directive			Yes		The Solution can be customized to deposit gross receipts tax payments directly into an established Medical Marijuana Fund.
Seed-to-Sale	Functional	Internal	SOW-073	Transport	The grower/processor must be able to input, store and change descriptive and status information with effective date about approved transportation vendors to the seed-to-sale system; vendors must be displayed on a drop down list specific to each grower/processor.	Yes	High	STS Day 1	BR041 BR042		Yes			Leaf Data Systems can be configured to manage information about approved transportation vendors and to assign transportation vendors to specific growers/processors. Approved transportation vendors would be displayed in a drop down list specific to each grower/processor.
Seed-to-Sale	Functional	Internal	SOW-074	Transport	The seed-to-sale solution must allow approved entities to generate a printed and electronic transport manifest that accompanies every transport vehicle and contains: name, address, permit number, and designated representative of the grower processor; name, address, permit number and designated representative of the organization receiving the delivery; quantity by weight or unit and identification number of each batch or lot contained in the transport; date and time of departure; date and estimated time of arrival; transport vehicle information; and identifying information for each delivery	Yes	High	STS Day 1	BR040 BR041		Yes			With all types of transfers, a record of the receipt is maintained in Leaf Data Systems, including date and time product was sent and received, and which Licensee agents received the products and verified their weights. If the transfer will leave the physical facility of the Licensee, a transportation manifest will be generated. Alerts can be enabled to send

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Seed-to-Sale	Functional	Internal	SOW-075	Testing	Upon offline approval of a testing laboratory, the seed-to-sale solution must allow DOH to input, store and change descriptive and status information about approved testing labs and assign labs to specific grower/processors; approved labs need to be displayed on a drop down list specific to each grower/processor.	Yes	High	STS Day 1	BR013		Yes			Leaf Data Systems can be configured to give DOH the ability to manage information about approved testing labs and to assign labs to specific growers/processors. Approved labs would be displayed in a drop down list specific to each grower/processor.
Seed-to-Sale	Functional	Internal	SOW-076	Testing	The seed-to-sale solution must support two (2) or more separate workflows for testing laboratories (test and re-test).	Yes	High	STS Day 1	BR023		Yes			Leaf Data Systems can support multiple workflows for testing labs.
Seed-to-Sale	Functional	Internal	SOW-077	Testing	The seed-to-sale solution must record and track the transfer, receipt and all processing steps of product sent to an approved testing facility for quality assurance testing.	Yes	High	STS Day 1	BR040 BR041	Yes				All samples sent to testing laboratories, are tracked in Leaf Data Systems. Data about the sample, such as date of transfer, source Licensee and license number, name/type of sample, weight of sample, batch/lot information, and date of harvest are all included with the sample record and remain as part of the record. Each sample sent to another Licensee is accompanied by a transport manifest.
Seed-to-Sale	Functional	Internal	SOW-078	Data & Reporting	The seed-to-sale solution must standardize data to improve quality and consistency.	Yes	High	STS Day 1	Applies to all data requirements	Yes				The Solution standardizes data for quality and consistency.
Seed-to-Sale	Functional	Output	SOW-079	Data & Reporting	The seed-to-sale solution must include tools that will electronically analyze activity data to assist in the identification of at-risk and unprofessional activities.		High	STS +60 Days	Applies to all data requirements	Yes				The Solution includes data analytics and reporting tools to analyze activity data to help identify at-risk or unprofessional activities.
Seed-to-Sale	Functional	Output	SOW-080	Data & Reporting	The seed-to-sale solution must include full administrative capabilities to configure automated, unsolicited system and email/text alerts to notify DOH staff and other users of incidents, events and required actions.		High	STS +60 Days	Applies to all data requirements	Yes				Leaf Data Systems includes the ad-hoc capability to create real-time alerts of significant events. This robust tool allows state users to create alerts on any data element captured in the system, including but not limited to those related to plants, harvests, distributions, acquisitions, transfers, transportation, sales, and inventory levels. Alert notifications can be configured to display in
Seed-to-Sale	Functional	Output	SOW-081	Data & Reporting	The seed-to-sale solution must be able to set and change threshold levels for defined fields and generate unsolicited alerts to DOH and registered entities who exceed specific threshold levels.		High	STS +60 Days	Applies to all data requirements	Yes				Leaf Data Systems alerts can be configured to set and change threshold levels for defined fields and to generate alerts to DOH and registered entities.

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Seed-to-Sale	Functional	Output	SOW-082	Transport	The seed-to-sale solution must permit each recipient of transported medical marijuana to provide the grower/processor with a printed and electronic receipt for the medical marijuana received.	Yes	High	STS Day 1	BR041	Yes				Leaf Data Systems provides printed receipts, electronic receipts and system recognition of product received.
Seed-to-Sale	Functional	Security & Privacy	SOW-083	Credentials	The seed-to-sale solution must include a mechanism for DOH and/or designee(s) to grant or revoke user security privileges.	Yes	High	STS Day 1	BR042 BR043 BR044 BR047 BR052	Yes				Leaf Data Systems, the seed-to-sale component of the Solution, enables DOH System Administrators and/or designees the ability to grant or revoke security privileges.
Seed-to-Sale	Functional	Security & Privacy	SOW-084	Credentials	The seed-to-sale solution must allow a registered user to establish or deactivate a delegate subaccount(s) for their designee(s), and further, include a mechanism for the user to monitor the system activity of their designee(s) online and through a reporting mechanism.		High	STS Day 1	BR035 BR058 BR059			Yes		Customization of the seed-to-sale component of the Solution would be required to create a subaccount related to a primary account. This is not a delivery function of the Solution however with customization it could be created.
Seed-to-Sale	Functional	Security & Privacy	SOW-085	Registration/ Credentials	The seed-to-sale solution must notify users via email when their registration is denied including a reason for denial.		High	STS Day 1	BR038 BR047 BR060		Yes			Workflow rules in the Solution will be established to automatically send users emails when their registration is denied including a reason for denial.
Seed-to-Sale	Functional	Security & Privacy	SOW-086	Registration/ Credentials	The seed-to-sale solution must notify users in advance via email when their passwords are about to expire; timing of the password expiration and the expiration notice to be based on parameters set by DOH.		High	STS Day 1	Applies to Security & Privacy requirements		Yes			Leaf Data Systems, the seed-to-sale component of the Solution, can be set up to automatically send users emails in advance of password expirations. The exact specifications of when to send the email will be configured based on DOH parameters.
Seed-to-Sale	Functional	Security & Privacy	SOW-087	Data & Reporting	As part of the seed-to-sale solution, the contractor must provide data access, data management, cleansing capabilities and normalization integrated with data mining for ease of data analysis.	Yes	High	STS Day 1	Applies to all data requirements	Yes				Leaf Data Systems, the seed-to-sale component of the Solution, provides a comprehensive data management toolset that facilitates data cleansing and normalization capabilities.
Seed-to-Sale	Functional	Security & Privacy	SOW-088	Data & Reporting	Based on user security access and roles, the seed-to-sale solution must allow authorized users to search/query the system to request and receive information without intervention.	Yes	High	STS Day 1	Applies to all data requirements	Yes				Leaf Data Systems, the seed-to-sale component of the Solution, will allow authorized users the ability to search for information without intervention.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Seed-to-Sale	Functional	Security & Privacy	SOW-089	Credentials	The seed-to-sale solution must allow DOH and/or designee(s) to assign roles for internal and external users based upon each user's functional use of the system(s).	Yes	High	STS Day 1	BR009	Yes				Leaf Data Systems offers a comprehensive approach to user access control. Access control features include: * Role-Based Access Controls (RBAC) allows administrators to easily provision users with the correct level of access * Standard user groups include Commonwealth system administrators, Commonwealth staff users.
Seed-to-Sale	Functional	Security & Privacy	SOW-090	Credentials	The seed-to-sale solution must include a secure and automated method for obtaining system login credentials for users at approved entities based on the system-assigned, unique identification/personal identification number.	Yes	High	STS Day 1	BR010	Yes				The Solution enables creation of login credentials for users at approved entities based on personal identification number.
Seed-to-Sale	Functional	Security & Privacy	SOW-091	Credentials	The seed-to-sale solution must allow users to generate and change their own password.		High	STS Day 1	BR007	Yes				Leaf Data Systems includes functionality for users to generate and change their own password.
Seed-to-Sale	Functional	Security & Privacy	SOW-092	Credentials	The seed-to-sale solution must authenticate user access requests through a streamlined online registration process, including associating uploaded documents, forms, and copies of identification.	Yes	High	STS Day 1	BR005 BR026	Yes				The seed-to-sale component of the Solution will utilize the same online registration requests as the Registry component.
Seed-to-Sale	Functional	Security & Privacy	SOW-093	Tracking	The seed-to-sale solution must allow organizations to input, store and change employee identification information, including status (approved, suspended, others).	Yes	High	STS Day 1	BR005	Yes				The Solution supports organizations making changes to employee identification information and status information.
Seed-to-Sale	Functional	Security & Privacy	SOW-094	Data & Reporting	The seed-to-sale solution must allow review and approval of information requests and responses when required for certain user roles.	Yes	High	STS Day 1	BR003		Yes			The Solution supports review and approval of information requests.
Seed-to-Sale	Functional	Security & Privacy	SOW-095	Data & Reporting	The seed-to-sale solution must include full administrative capabilities to extract, import, and export data to internal and external parties in an ad hoc or preconfigured manner, based on access privileges. The data extraction process must permit DOH to define frequency and file type (CSV, .PDF) and provide a detailed data dictionary with coding definitions to authorized staff.	Yes	High	STS Day 1	Applies to all data requirements	Yes				Leaf Data Systems allows authorized users the ability to export and import data from the Solution. Exports and imports can be scheduled or can be performed on an ad hoc basis. The component supports many types of file formats including PDF, CSV, XML, HTML, etc.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Seed-to-Sale	Functional	User Interface	SOW-096	Portal	The seed-to-sale solution must provide a single portal to serve DOH, patients, caregivers, practitioners, medical providers, dispensaries and all approved entities. Limitations may apply to the temporary bridge solution.	Yes	High	STS Day 1	BR045 BR048 BR049 BR051 BR055 BR056 BR058 BR060		Yes			The Solution includes a fully functional, dynamic and configurable portal for use by DOH, patients, caregivers, practitioners, medical providers, dispensaries, and all approved entities. As users log into the portal the functions available will be based on the type of user logging into the system.
Seed-to-Sale	Functional	User Interface	SOW-097	Portal	The seed-to-sale solution must be able to communicate information of interest to registered users through broadcast postings on the seed-to-sale's home page.		High	STS Day 1	BR011 BR024 BR073		Yes			The Leaf Data Systems portal supports broadcast postings on the seed-to-sale home page.
Seed-to-Sale	Functional	User Interface	SOW-098	Portal	The seed-to-sale solution must include a secure web-based user interface for data entry, display, and reporting by approved entities.	Yes	High	STS Day 1	Applies to all UIs	Yes				Leaf Data Systems' portal is highly secure and includes functions for data entry, display, and reporting by approved entities.
Seed-to-Sale	Functional	User Interface	SOW-099	Portal	The seed-to-sale solution must include a secure user interface for Commonwealth staff for user administration, system administration, display of inventory and tax/revenue information, reporting and data analysis. For the temporary bridge solution, users could be limited to DOH staff and tax/revenue information may not be required.	Yes	High	STS Day 1	Applies to all UIs	Yes				A secure user interface with access to all functionality of Leaf Data Systems will be provided through an online, secured web portal. This portal will be available to authorized Commonwealth staff for user administration, system administration, display of inventory and tax/revenue information, reporting and data analysis. Functionality can be restricted based on user role to
Seed-to-Sale	Functional	User Interface	SOW-100	Credentials	The seed-to-sale solution must notify users via email when their attempted registration is still incomplete after a configurable amount of time has passed.		High	STS Day 1	BR005		Yes			Workflow rules in the Solution can be configured to send emails to users about incomplete registrations. The specific timeframes and triggers will be determined by DOH parameters.
Seed-to-Sale	Non-Functional	Performance	SOW-101	Portal	The seed-to-sale solution shall provide system messages at login to notify users of emergency maintenance or other system events.	Yes	High	STS Day 1	Applies to Program directive		Yes			Leaf Data Systems supports messages at login to notify users of emergency maintenance or other system events.
Seed-to-Sale	Non-Functional	Performance	SOW-102	Portal	The seed-to-sale solution shall display a continual notification of system scheduled maintenance, starting seven (7) days prior to the scheduled maintenance period and ending after the scheduled maintenance is completed.	Yes	High	STS Day 1	Applies to Performance requirements		Yes			Leaf Data Systems can be configured to display maintenance information.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Seed-to-Sale	Non-Functional	Performance	SOW-103	Portal	A notification of scheduled maintenance to the seed-to-sale system shall be delivered to the Commonwealth fourteen (14) days prior to the scheduled maintenance.	Yes	High	STS Day 1	Applies to Performance requirements	Yes				Leaf Data Systems, the seed-to-sale component of the Solution, is highly efficient and requires little maintenance. When maintenance is required a schedule is produced and the Commonwealth will be notified more than 14 days prior to the maintenance.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
All solutions must provide global functionality.														
Global	Functional	Purge	SOW-104		The solution must provide the ability to override purge process for specific record types for a given time period. Purge override data will be captured for audit purposes.	Yes	High	All Solutions Day 1	Applies to all data requirements		Yes			The purge process in the Solution is highly configurable and there are no specific default rules for purging information. As a highly configurable item, override rules and processes can be built into the purge process and match the exact specifications of DOH.
Global	Functional	Purge	SOW-105		The solution must be able to purge information based on DOH directive.	Yes	High	All Solutions Day 1	Applies to all data requirements	Yes				The Solution enables data to be purged based on DOH policies and procedures.
Global	Non-Functional	Environment	SOW-107		The solution must be flexible, evolving platforms to meet future needs.	Yes	High	All Solutions Day 1	Applies to all technical requirements and solutions	Yes				The Solution is based on a highly flexible and dynamic platform. Constant improvements occur with the platform and the platform is designed to meet the demands of whatever future requirements may arise.
Global	Non-Functional	Environment	SOW-108		The solution must support standard database disaster recovery and back-up procedures which comply with the Commonwealth of Pennsylvania Database Management System guidelines. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx Locate the Information Domain section (ITP INF001). See supporting document OPD INF001B	Yes	High	All Solutions Day 1	Applies to all data requirements	Yes				The Solution utilizes failover and backup and recovery methods to ensure no information is lost.
Global	Non-Functional	Environment	SOW-109		All data must reside within and not traverse outside of the boundaries of the continental United States.	Yes	High	All Solutions Day 1	Applies to all data requirements	Yes				All of the data centers for the Solution are based in the United States.
Global	Non-Functional	Environment	SOW-110		The contractor must provide to DOH full physical data models and data dictionaries of the delivered systems, including data warehouses or repositories.	Yes	High	All Solutions Day 1	Applies to all data requirements	Yes				Data models and data dictionaries will be made available as part of the implementation.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Global	Non-Functional	Environment	SOW-111		The solution must adhere to the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for information processing. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Information Domain section.	Yes	High	All Solutions Day 1	Applies to Performance requirements	Yes				The MJ Freeway/Oracle team adheres to the Commonwealth Technology Standards outlined in the requirement in the context of the proposed COTS Seed-to-Sale and Registry solution architecture, implementation methodology, pricing structure and associated assumptions expressed in the cost proposal.
Global	Non-Functional	Environment	SOW-112		The solution must adhere to the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for information data storage. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Security Domain section.	Yes	High	All Solutions Day 1	Applies to Performance requirements	Yes				The MJ Freeway/Oracle team adheres to the Commonwealth Technology Standards outlined in the requirement in the context of the proposed COTS Seed-to-Sale and Registry solution architecture, implementation methodology, pricing structure and associated assumptions expressed in the cost proposal.
Global	Non-Functional	Environment	SOW-113		The solution must adhere to the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for information secure communications. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Security Domain section.	Yes	High	All Solutions Day 1	Applies to all technical requirements and solutions	Yes				The MJ Freeway/Oracle team adheres to the Commonwealth Technology Standards outlined in the requirement in the context of the proposed COTS Seed-to-Sale and Registry solution architecture, implementation methodology, pricing structure and associated assumptions expressed in the cost proposal.
Global	Non-Functional	Environment	SOW-114		The solution must enforce Secure Socket Layer (SSL) encryption for all system transactions and interactions.	Yes	High	All Solutions Day 1	Applies to all data requirements	Yes				The Solution utilizes Secure Socket Layer encryption for system transactions and interactions.
Global	Non-Functional	Environment	SOW-115		The solution must encrypt all data in the database as well as encrypt all back-ups and any interim storage.	Yes	High	All Solutions Day 1	Applies to all data requirements	Yes				The Solution encrypts all data in the database, backups and interim storage.
Global	Non-Functional	Environment	SOW-116		The solution must protect the privacy and security of data in a way that complies with HIPAA policies and standards, including encrypting the transmission of data to the database. See links for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Privacy and Security Domain sections Also see - http://www.hhs.gov/ocr/privacy/index.html	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements	Yes				The Solution is HIPAA compliant.
Global	Non-Functional	Environment	SOW-117		The solution must protect all data in accordance with the Commonwealth of Pennsylvania Electronic Information Privacy Policy. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Privacy Domain section	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements	Yes				The MJ Freeway/Oracle team adheres to the Commonwealth Technology Standards outlined in the requirement in the context of the proposed COTS Seed-to-Sale and Registry solution architecture, implementation methodology, pricing structure and associated assumptions expressed in the cost proposal. Upon the completion of security assessment and discovery workshops, the MJ

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Global	Non-Functional	Environment	SOW-118		The solution must adhere to the accessibility standards as set forth in the Commonwealth of Pennsylvania IT Accessibility Policy in accordance with the Americans with Disability Act 508. See links for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Access Domain section See also http://www.ada.gov/	Yes	High	All Solutions Day 1	Applies to all UIs	Yes				The Solution adheres to accessibility standards in accordance with the Americans with Disability Act.
Global	Non-Functional	Performance	SOW-119		The application infrastructure(s) must be highly scalable to support several hundred thousand users accessing the systems at the same time, achieving high end user satisfaction from a performance perspective.	Yes	High	All Solutions Day 1	Applies to all UIs	Yes				The Solution is build on a highly scalable cloud based infrastructure capable of scaling to the expected users for the Commonwealth.
Global	Non-Functional	Performance	SOW-120		The solution must provide for 24/7 remote web access, with the exception of downtime for pre-planned maintenance during non-peak usage hours.	Yes	High	All Solutions Day 1	Applies to Performance requirements	Yes				The Solution is available 24/7 with the exception of pre-planned maintenance.
Global	Non-Functional	Performance	SOW-121		The contractor must provide comprehensive, intuitive Web Portals that are branded according to DOH requirements. The web site design and branding must comply with the Governor's Office Management Directive 205.40 - Commonwealth Branding, and to DOH standards for electronic and printed materials. The web design is subject to written approval by the DOH.	Yes	High	All Solutions Day 1	BR008 BR009 BR010 BR011 BR012 BR014 BR015 BR016		Yes			The portal component of the Solution is highly configurable and can match the branding and design standards of the Commonwealth.
Global	Non-Functional	Performance	SOW-122		The software Web Portal interface development must follow the approach of Responsive Web Design, to provide the optimal viewing and interaction experience across devices. The Web Portals must support web browsers and browser versions currently in use by over 95% of web users (e.g., Edge, Internet Explorer, Firefox, Safari, Chrome, and Opera). The platform must adhere to World Wide Web Consortium (W3C) recommendations and other standards of interoperability.	Yes	High	All Solutions Day 1	Applies to all UIs	Yes				The portal component of the Solution utilizes a Responsive Web Design and is supported on the browsers in this requirement.
Global	Non-Functional	Performance	SOW-123		In the event of an unplanned outage that affects the system(s) availability, contractor must provide email and text notifications to a DOH contact list within 30 minutes of the outage; the notice must include a summary of the event and its cause, and the expected resolution time.	Yes	High	All Solutions Day 1	Applies to Performance requirements	Yes				In the event of an unplanned outage affecting systems availability, DOH contact list will be notified within 30 minutes of outage; notice will include a summary of the event and its cause, and the expected resolution time.
Global	Non-Functional	Security & Privacy	SOW-124		The contractor must provide data breach notifications to all impacted parties in accordance with HIPAA regulations and DOH requirements.	Yes	High	All Solutions Day 1	Applies to all data requirements	Yes				In the event of a data breach, notifications to all impacted parties will be made in accordance with HIPAA regulations and DOH requirements.

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Global	Non-Functional	Security & Privacy	SOW-125		The solution must adhere to the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for assigning user IDs. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx See Security Domain section - ITP SEC007	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements	Yes				The format of user IDs is configurable in the Solution and will be matched to the Commonwealth standards.
Global	Non-Functional	Security & Privacy	SOW-126		The solution must ensure that each internal and external user log-on be password-protected and follow the Commonwealth of Pennsylvania Information Technology Standards, Bulletins, and guidelines for password creation and expiration. http://www.oa.pa.gov/Policies/Pages/itp.aspx See Security Domain section - ITP SEC007	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements		Yes			The password creation and expiration rules in the Solution are configurable and will match the Commonwealth standards.
Global	Non-Functional	Security & Privacy	SOW-127		The solution shall implement prudent and effective practices for the protection and security of information resources, including routine and recurring security assessment and testing in compliance with Commonwealth of Pennsylvania Information Technology Standards, Bulletins and guidelines for Security Assessment and Testing. See link for details: http://www.oa.pa.gov/Policies/Pages/itp.aspx#business See ITP-SEC 023	Yes	High	All Solutions Day 1	Applies to Security & Privacy requirements	Yes				The Solution is based on highly secure components and techniques. The Solution maintains a number of certifications for security and compliance including FedRAMP compliance.
Global	Non-Functional	System Support	SOW-128		The contractor must prepare and provide to approved entities any instructions needed to comply with the reporting requirements, including technical assistance. PA DOH reserves the right to review and approve any communication prior to it being distributed.	Yes	High	All Solutions Day 1	BR003 BR021 BR025 BR029 BR035 BR043 BR044	Yes				The MJ Freeway/Oracle will provide the necessary instructions to approved entities in accordance with the project schedule and delivery scope. We welcome PA DOH participation in the review and approval process of such communications.
Global	Non-Functional	System Support	SOW-130		The solution must provide online user reference materials to enable users to research and resolve issues.	Yes	High	All Solutions Day 1	Applies to all technical requirements and solutions	Yes				The Commonwealth will have access to the full documentation of the system. In addition Commonwealth users will have access to online communities and support to ask and receive answers.
Global	Non-Functional	System Testing	SOW-131		The solution must provide the capability and adequate time for DOH to perform user testing, including testing of data converted from the temporary bridge solution and API interfaces, prior to implementing the new system.	Yes	High	All Solutions Day 1	Applies to all technical requirements and solutions	Yes				The MJ Freeway/Oracle team designs our test management plans and manage testing activities for quality assurance validation of system operations. This includes verification that the hardware, software, data (including that converted from the bridge solution) and network of the project are functioning as designed. This establishes that functional and non-functional requirements and
Global	Non-Functional	System Testing	SOW-132		The solution must provide for the contractor (and the Commonwealth, at its discretion) to completely test all application software modifications and patches, including API interfaces, in the contractor's testing environment(s) before being applied in the production environment.	Yes	High	All Solutions Day 1	Applies to all technical requirements and solutions	Yes				The MJ Freeway/Oracle team performs regression testing of the software modifications and patches with each technical and functional release, as well as Integration Testing for the interfaces. The test cases and scripts will be developed by our team based on the requirements documented for each interface. The initial SIT test scripts and testing will involve the creation of simple test cases that mimic

	Category	Subcategory	SOW ID	Function Description	Requirement Statement	Requirement Applicable to Bridge Solution?	Priority	Timing	BR ID	OOB	CFS	CUS	SUB	Explanation
Global	Non-Functional	System Training	SOW-133		The contractor must propose an approach to train all authorized user groups; proposal must include type of training (on-site, web-based, self-training, etc.) and be included as a component in the project plan.	Yes	High	All Solutions Day 1	R025 R159 R165 R188 R210 R249 R250	Yes				The MJ Freeway team takes a blended learning approach to training and includes onsite and offsite classroom delivery, coaching or one-on-one mentoring, business and technical workshops, virtual classrooms, and e-learning.

APPENDIX M

SERVICE LEVEL AGREEMENTS

Performance Metric	Performance Target	Definition	Calculation	Frequency of Review	Service Credit
System availability during core business hours	99.9%	This service level measures the percentage of time the system and all functionality is available during core business hours, with the exception of approved downtime for maintenance, per quarter. This Service Level measurement is by the availability of the Service during the core business hours of 7:00 AM and 9:00 PM Eastern Time (ET), seven (7) days per week. This includes all the hardware, software, infrastructure or other items required by the selected Offeror to deliver the Service as described in the RFQ.	$A=(T-M-D)/(T-M) \times 100\%$ A=Availability T=Total Quarterly Minutes during core business hours M=Approved Quarterly Maintenance Downtime during core business hours D=Downtime minutes during core business hours	quarterly	<99.89% - 99.85% - credit will be 2.5% of quarterly SaaS subscription <99.85% - 99.80% - credit will be 5% of quarterly SaaS subscription <99.80% or < - credit will 10% of quarterly SaaS subscription
System availability during non-core business hours	95.0%	This service level measures the percentage of time the system and all functionality is available during non-core business hours. Non-core business hours are defined as any time outside of 7:00 AM and 9:00 PM ET, seven (7) days per week. This Service Level measurement is by the availability of the Service during non-core business hours. This includes all the hardware, software, infrastructure or other items required by the selected Offeror to deliver the Service as described in the RFQ.	$A= (T-M-D)/(T-M) \times 100\%$ A=Availability T=Total Quarterly Minutes during non-core business hours M=Approved Quarterly Maintenance minutes during non-core business hours D=Downtime minutes during non-core business hours	quarterly	<95.0% - credit will be 1.0% of quarterly SaaS subscription

<p>Non-degradation of service availability during core business hours.</p>	<p>98.0%</p>	<p>This Service Level is the percentage of time the application is non-degraded during core business hours. This measurement is by application, not by server instance. Degradation shall mean a Service that tests as fully operational but is degraded below the baselines established during acceptance testing. This includes, but is not limited to slow performance and/or intermittent system errors. This Service Level is measurement is by the degradation of the Service during core business hours. This includes all the hardware, software, infrastructure or other items required by the selected Offeror to deliver the Service as described in the RFQ. The Service Level measurement does not include any degradation of the Service experienced outside of the selected Offeror's application gateway.</p>	<p>$N=(T-M-D)/(T-M) \times 100\%$ N= Non-Degradation T=Total Quarterly Minutes during core business hours M=Approved quarterly maintenance minutes during core business hours D=Time Service is Degraded (Total number of minutes during core business hours the system is degraded per quarter)</p>	<p>quarterly</p>	<p>2.5% of the quarterly SaaS subscription</p>
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Non-degradation of service availability during non-core business hours.	95.0%	This Service Level is the percentage of time the application is non-degraded during non-core business hours. This measurement is by application, not by server instance. Degradation shall mean a Service that tests as fully operational but is degraded below the baselines established during acceptance testing. This includes, but is not limited to slow performance and/or intermittent system errors. This Service Level is measurement is by the degradation of the Service during non-core business hours. This includes all the hardware, software, infrastructure or other items required by the selected Offeror to deliver the Service as described in the RFQ. The Service Level measurement does not include any degradation of the Service experienced outside of the selected Offeror's application gateway.	$N = \frac{(T - M - D)}{(T - M)} \times 100\%$ <p>N= Non-Degradation T=Total Quarterly Minutes during non-core business hours M=Approved quarterly maintenance minutes during non-core business hours D=Time Service is Degraded (Total number of minutes during non-core business hours the system is degraded per quarter)</p>	quarterly	1% of quarterly SaaS Subscription
Problem circumvention or resolution time	*** 1-Urgent Priority within 2 hours 2-High Priority within 4 hours 3-Standard Priority within 3 business days 4-Low Priority within week	The time required for circumvention or solution after a problem/incident is reported to vendor based on priority level.	Time from problem/incident is reported until the problem/incident is resolved or circumvented.	continual	2.5% of quarterly SaaS subscription per incident

System unavailability notification	within thirty (30) minutes	Notification to contact list provided by DOH, of any non-scheduled system unavailability within thirty (30) minutes of discovery or notice during core business hours. Notification will include a brief explanation of the issue, criticality level, and projected resolution time.	Time from discovery or receiving notice of system unavailability until notification is sent to DOH.	continual	2.5% of the quarterly SaaS subscription per incident
Disaster Recovery	Recovery Point Objective (RPO) of less than 1 hour; Recovery Time Objective (RTO) of less than 24 hours	RPO is the maximum targeted period in which data might be lost from an IT service or business process due to a disruptive incident. RTO is the duration of time within which a business process must be restored after a disruptive incident in order to avoid unacceptable consequences associated with a break in business continuity	RTO and RPO calculated during annual disaster recovery exercise.	annual	2.5% of annual subscription per failure
Scheduled maintenance notification	100%	Notification of scheduled maintenance to contact list provided by DOH no less than 14 days prior to scheduled maintenance window.	Notification of days within the 14 days scheduled maintenance that notification is not sent to DOH until notification is sent	quarterly	.5% of quarterly SaaS subscription
Response to other methods of contact	80%	Goal is 30 minutes or less. Measures average length of time from receipt of email, voicemail, or other method of contact (excluding phone call) to the time a responding email is sent or return call is placed	Total number of minutes from receipt until response to other contact methods / Total number of contacts (excluding phone call)	daily, weekly, monthly, quarterly, annually	5% of the total monthly cost (derived from the total annual cost divided by 12).
First Call Resolution	65% or higher	Measures percentage of calls resolved first time per agent	Total number of phone calls per agent resolved in one phone call / Total phone calls between live help desk agent and caller "One call" includes: 1) The 1st call from an individual that is answered by a live help desk agent and,	daily, weekly, monthly, quarterly, annually	10% of the total monthly cost (derived from the total annual cost divided by 12)

			<p>2) 1st call returned by a live help desk agent responding to voicemail that is answered by the original caller</p> <p>Excludes calls that cannot be resolved by the help desk agent and must be, by procedures, escalated to another group for resolution</p>		
Help Desk availability	99.9% or higher	Help desk must be available as per predefined days and times.	Total time Help Desk unavailable during operating hours / Total operating hours commitment	daily, weekly, monthly, quarterly, annually	10% of the total monthly cost (derived from the total annual cost divided by 12)
Calls that receive a busy signal	99% of all calls do not receive a busy signal	<p>Measures the average number of calls placed that receive a busy signal.</p> <p>Goal is 0 calls receiving a busy signal</p>	Total number of phone calls placed that receive a busy signal / Total number of phone calls placed quarterly	quarterly	<p>>1% - credit will be 3% of the quarterly SaaS subscription</p> <p>>3% - credit will 5% of the quarterly SaaS subscription</p>
Dropped call by user rate*	3% or less of all calls > 60 seconds	Measures percentage of unanswered phone calls (hang ups before call is answered by a live help desk agent)	Total number of abandoned calls after 60 seconds / Total number of calls placed quarterly	quarterly	>3% - credit will be 5% of the quarterly SaaS subscription
After Hours Message Center	Never more than a full day of outage	<p>After hours message center must always be available for playing recorded messages of:</p> <ul style="list-style-type: none"> • Help Desk operating hours • emergency numbers and the information needed from a caller <p>Goal is 100% availability</p>	24 Hour clock starts from time of reported outage	daily check from start of reported outage	1% of the quarterly SaaS subscription for each 24 hour period
On Hold Wait Time	95% or higher	Measures average on hold wait time of users from the time a caller is placed on hold by a live agent until the time a live agent is back on the phone with the caller.	Total number of minutes on hold/Total number of calls placed on hold	quarterly	1% of the quarterly SaaS subscription

		Goal is 1 minute or less			
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If any of the SLA metrics defined in this document are not met, DOH, at its sole discretion may require the Contractor to develop a corrective action plan.

Definitions:

Service Level Credit: a credit available to the Commonwealth should the service provider fail to meet target service levels.

Maximum at Risk Amount: a defined percentage of quarterly service fees or a total dollar value which is not exceeded when assessing service credits. Maximum at risk amount is 20% of the annual invoice amount).

Notes:

*For calculation purposes, phone calls abandoned within 60 seconds (ASA standard) are not counted as a call placed.

*****Priorities:**

- 1- Urgent Priority = Hosted system or major functionality of system is not available or operational for all users
- 2-High Priority = Hosted system or major functionality of system is not available or operational for multiple users
- 3-Standard Priority = Minor function of hosted system is not operational for multiple users, but all other functionality is available and operational for users
- 4-Low Priority = Minor function of hosted system is not operational for single user, but all other functionality is available and operational for users

Quarters are defined as:

- January through March
- April through June
- July through September
- October through December

The Contractor will be notified by email and letter of the results of the review of the quarterly report within 10 days of receipt of the quarterly report and any SLA credits due as a result of SLA’s not being met.

Contractor Fees withheld as set forth above shall not constitute liquidated damages for the corresponding failure to perform, and the Department shall be free to pursue any and all remedies available under the Contract with respect thereto, provided that any such credits actually paid by the Contractor to the Commonwealth shall be offset against any damages awarded to the Department for claims arising from the corresponding failure to perform.

APPENDIX N

MODEL FORM OF SMALL DIVERSE AND SMALL BUSINESS SUBCONTRACTOR AGREEMENT

This Subcontractor Agreement ("Subcontract") is made effective as of _____, 20____, by and between _____, ("Contractor") and _____, a Small Diverse Business or Small Business ("Subcontractor") (collectively referred to as the "Parties").

RECITALS

Contractor has entered into a contract dated _____ (the "Prime Contract") with the Department of _____ of the Commonwealth of Pennsylvania ("Commonwealth"). Under the Prime Contract, Contractor has agreed to provide certain supplies, services or construction ("Services") to the Commonwealth.

In connection with the Procurement leading to the Prime Contract, Contractor and Subcontractor entered into a letter agreement dated _____ ("Letter of Intent") whereby the Contractor committed a certain percentage of work ("Small Diverse Business or Small Business Commitment") under the Prime Contract to the Subcontractor.

As contemplated by the Letter of Intent and in accordance with the provisions of the Procurement and Prime Contract, the Parties have agreed to enter into this Subcontract to fulfill the Small Diverse Business or Small Business Commitment expressed in the Letter of Intent and as required by the Prime Contract.

DEFINITIONS

The following words and terms when used in this Subcontract shall have the following meanings:

Bureau – The Department's Bureau of Diversity, Inclusion and Small Business Opportunities.

Contracting Officer – The person authorized to administer and make written determinations for the Commonwealth with respect to the Prime Contract.

Department – The Department of General Services of the Commonwealth of Pennsylvania.

Issuing Office – The department, board, commission or other agency of the Commonwealth of Pennsylvania that issued the Procurement.

Procurement – The Invitation for Bids, Request for Quotes, Request for Proposals or other solicitation and all associated final procurement documentation issued by the Commonwealth to obtain proposals from firms for award of the Prime Contract.

Small Business – A business in the United States which is independently owned, not dominant in its field of operation, employs no more than 100 full-time or full-time equivalent employees, and earns less than \$7 million in gross annual revenues for building design, \$20 million in gross annual revenues for sales and services and \$25 million in gross annual revenues for those businesses in the information technology sales or service business.

Small Diverse Business – A Department-verified minority-owned small business, woman-owned small business, veteran-owned small business, service-disabled veteran-owned small business, LGBT-owned small business, or disability-owned small business.

AGREEMENT

Now, therefore, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound, the Parties hereby agree as follows:

1. Subcontractor Representations. Subcontractor represents and warrants to Contractor as follows:

(a) Subcontractor is self-certified as a Small Business in accordance with the requirements and procedures established by the Bureau of Diversity, Inclusion and Small Business Opportunities; [Subcontractor is also verified as a Small Diverse Business by the Bureau of Diversity, Inclusion and Small Business Opportunities in accordance with the requirements and procedures established by the Bureau;]

(b) Subcontractor possesses the necessary knowledge, experience, expertise, capital, resources and personnel required to perform the Services it will provide under this Subcontract;

(c) Subcontractor (i) is duly organized, validly existing and in good standing under the laws of its state of incorporation or organization, (ii) has the power and authority to own its properties and to carry on business as now being conducted, and (iii) has the power to execute and deliver this Subcontract;

(d) The execution and performance by Subcontractor of the terms and provisions of this Subcontract have been duly authorized by all requisite action, and neither the execution nor the performance of this Subcontract by Subcontractor will violate any provision of law, any order of any court or other agency of government, the organizational documents of Subcontractor or any indenture, agreement or other instrument to which Subcontractor is a party, or by which Subcontractor is bound, or be in conflict with, result in a breach of, or constitute (with due notice or lapse of time or both) a default under, or except as may be provided by this Subcontract, result in the creation or imposition of any lien, charge or encumbrance of any nature whatsoever upon any of the property or assets of Subcontractor pursuant to, any such indenture agreement or instrument;

(e) Subcontractor has obtained all licenses, permits and approvals required to perform the Services it will provide under this Subcontract; and

(f) Subcontractor is not under suspension or debarment by the Commonwealth or any other governmental entity, instrumentality or authority.

2. Contractor Representations. Contractor represents and warrants to Subcontractor as follows:

(a) Contractor (i) is duly organized, validly existing and in good standing under the laws of its state of incorporation or organization, (ii) has the power and authority to own its properties and to carry on business as now being conducted, and (iii) has the power to execute and deliver this Subcontract;

(b) The execution and performance by Contractor of the terms and provisions of this Subcontract by Contractor have been duly authorized by all requisite action, and neither the execution nor the performance of this Subcontract will violate any provision of law, any order of any court or other agency of government, the organizational documents of Contractor or any indenture, agreement or other instrument to which Contractor is a party, or by which Contractor is bound, or be in conflict with, result in a breach of, or constitute (with due notice or lapse of time or both) a default under, or except as may be provided by this Subcontract, result in the creation or imposition of any lien, charge or encumbrance of any nature whatsoever upon any of the property or assets of Contractor pursuant to, any such indenture agreement or instrument;

(c) Contractor has obtained all licenses, permits and approvals required to perform the Services to be provided by Contractor under the Prime Contract; and

(d) Contractor is not under suspension or debarment by the Commonwealth or any other governmental entity, instrumentality or authority.

3. Relationship of the Parties. The provisions of this Subcontract are not intended to create, nor shall be deemed or construed to create, any joint venture, partnership or other relationship between Contractor and Subcontractor, other than that of independent entities contracting with each other solely for the purpose of carrying out the provisions of this Subcontract. Neither of the Parties to this Subcontract, nor any of their respective employees, agents, or other representatives, shall be construed to be the agent, employee or representative of the other party. Neither party shall have the authority to bind the other party, nor shall a party be responsible for the acts or omissions of the other party, unless otherwise stated in this Subcontract. Similarly, the Parties expressly acknowledge that neither the Contractor nor the Subcontractor is an agent, employee or representative of the Commonwealth and each party covenants not to represent itself accordingly.

4. Prime Contract Flow-Down.

(a) General. This agreement is a subcontract under the Prime Contract and all provisions of the Prime Contract and any amendments thereto applicable to the Services being performed by the Subcontractor shall extend to and be binding upon the Parties as part of this Subcontract.

(b) Specific. The Parties agree to comply with the following provisions of the Prime Contract, which are incorporated herein by reference:

- (1) The Americans with Disabilities Act Provisions.
- (2) Nondiscrimination/Sexual Harassment Clause.
- (3) Contractor Integrity Provisions.
- (4) Contractor Responsibility Provisions.

(c) Termination. Should the Prime Contract be terminated pursuant to the terms and conditions provided in the Procurement, such termination shall have the same effect on this Subcontract. Payment for Services provided as of the date of termination must be made in accordance with the Section 13 of this Subcontract.

(d) Audit Provisions. The Commonwealth shall have the right, at reasonable times and at a site designated by the Commonwealth, to audit the books, documents, and records of the Parties to the extent that the books, documents, and records relate to the Parties' compliance with the provisions set forth in subsection (b) above or to the Small Diverse Business or Small Business Commitment effectuated through this Subcontract. The Parties shall preserve such books, documents, and records for a period of three years from the date of final payment hereunder. The Parties shall give full and free access to all such records to the Commonwealth and/or its authorized representatives.

5. Order of Precedence. The Letter of Intent, Procurement and Prime Contract are incorporated herein by reference into this Subcontract. In the event of any conflict or inconsistency among the individual components of this Subcontract, such conflict or inconsistency shall be resolved by observing the following order of precedence:

- (a) This Subcontract;
- (b) The Letter of Intent;
- (c) The Prime Contract; and
- (d) The Procurement.

6. Further Action. The Parties shall take such actions and complete, execute and deliver any and all documents or instruments necessary to carry out the terms and provisions of this Subcontract, to effectuate the purpose of this Subcontract, and to fulfill the obligations of each party hereunder.

7. Description of Services. Subcontractor will perform the following Services for the Contractor which Contractor is obligated to provide to the Commonwealth under the Prime Contract:

[DESCRIBE IN DETAIL THE SPECIFIC SUPPLIES, SERVICES OR CONSTRUCTION THE SUBCONTRACTOR WILL PROVIDE OR PERFORM]

8. Small Diverse Business or Small Business Commitment. The above-referenced Services represent ___ % of the final negotiated total cost for the initial term of the Prime Contract. Any proposed change to the Small Diverse Business or Small Business Commitment must be submitted in writing to the Bureau which will make a recommendation to the Commonwealth Contracting Officer regarding a course of action.

9. Performance of Services. Subcontractor may not subcontract more than 50% of the work subcontracted to it hereunder without written permission from the Bureau. Subcontractor will perform the Services strictly in accordance with any applicable plans and specifications as contained in the Prime Contract and the reasonable deadlines set by Contractor in view of the requirements of the Prime Contract, and in a good workmanlike manner consistent with industry standards, meeting all applicable local, state and federal laws, regulations and policies.

10. Location of Services. Subcontractor will provide the Services at the following address(es):

11. Timeframe for Performance of Services. The Services will be provided by Subcontractor during the initial term of the Prime Contract, and during any extensions, options or renewal periods of the Prime Contract exercised by the Commonwealth, as more specifically set forth below:

[IDENTIFY THE SPECIFIC TIME PERIODS DURING THE INITIAL CONTRACT TERM AND EXTENSIONS, OPTIONS AND RENEWALS WHEN THE SUBCONTRACTOR WILL PERFORM COMPONENT SERVICES]

12. Pricing of Services. Subcontractor shall provide or perform the Services at the pricing specified in Exhibit ___ to this Subcontract. [ATTACH A BILL OF MATERIALS, RATE CARD OR OTHER APPROPRIATE COST SHEET COVERING THE SERVICES TO BE PROVIDED.]

13. Payment for Services. Contractor shall exert reasonable and diligent efforts to collect prompt payment from the Commonwealth. Contractor shall pay Subcontractor in proportion to amounts received from the Commonwealth which are attributable to the Services performed by Subcontractor. Contractor shall pay Subcontractor within fourteen (14) days after the Contractor receives such payment from the Commonwealth, unless the parties expressly agree upon a different payment schedule or structure as set forth below:

14. Utilization Reports. Both the Contractor and Subcontractor shall complete Quarterly Utilization Reports (or similar type documents containing the same information) and submit them to the Contracting Officer and to the Bureau within ten (10) business days at the end of each quarter. This information will be used to determine the actual dollar amount paid to Subcontractor and will also serve as a record of fulfillment of Contractor's Small Diverse Business and Small Business Commitments. If there was no activity during the quarter, then the form must be completed by stating "No activity in this quarter." A late fee of \$100.00 per day may be assessed against the Contractor if its Utilization Report is not submitted in accordance with the schedule above.

15. Change Orders. If the Commonwealth issues any change order or other formal contract instrument either expanding or limiting the work to be performed under the Prime Contract, the Parties shall accept such Change Orders. Contractor agrees to provide Subcontractor with written notice of any such change orders that affect the Services to be provided by the Subcontractor hereunder as soon as practical after Contractor receives such notice. Any resulting increase or decrease in the Services, Small Diverse Business or Small Business Commitment provided for in Paragraphs 7 or 8 above must be in writing, mutually agreed to, and signed by both Parties and communicated to the Bureau. If the Parties are unable to reach an agreement regarding any adjustment to the Services, Small Diverse Business or Small Business Commitment necessitated by a Commonwealth Change Order, the Parties must submit the matter in writing to the Bureau which will make a recommendation to the Contracting Officer regarding a course of action.

16. Force Majeure. Neither party will incur any liability to the other if its performance of any obligation under this Subcontract is prevented or delayed by causes beyond its control and without the fault or negligence of either party. Causes beyond a party's control may include, but are not limited to, acts of God or war, changes in controlling law, regulations, orders or the requirements of any governmental entity, severe weather conditions, civil disorders, natural disasters, fire, epidemic and quarantines, general strikes throughout the trade, and freight embargoes. The existence of such causes beyond a party's control shall extend the period for performance to such extent as may be necessary to enable complete performance in the exercise of reasonable diligence after the causes have been removed.

17. Dispute Resolution.

(a) The Parties will attempt to resolve any dispute arising out of or relating to this Subcontract through friendly negotiations.

(1) The Parties expressly acknowledge and confer upon the Bureau and Contracting Officer the authority to adjudicate disputes that the Parties cannot resolve amicably concerning the Parties' compliance with their Small Diverse Business and Small Business Commitments as provided in the Prime Contract and this Subcontract.

(2) The Bureau may recommend to the Contracting Officer a range of sanctions it deems appropriate if the Bureau determines a party has failed to satisfy or perform its Small Diverse Business or Small Business commitment. Such sanctions include, but are not limited to, one or more of the following: a determination that the party is not responsible under the Contractor Responsibility Program; withholding of Prime Contract and/or Subcontract payments; suspension or termination of the Prime Contract and/or Subcontract together with consequential damages; revocation of the party's Small Business self-certification status and/or Small Diverse Business verification status; and/or suspension or debarment of one or both parties from future contracting opportunities with the Commonwealth.

(3) The Parties' acknowledge that their prior performance in meeting their Small Diverse Businesses and Small Businesses contractual obligations will be considered by the Bureau during future procurement scoring processes. To the extent a party has failed to meet prior contractual commitments, the Bureau may recommend to the Issuing Office that the party be determined non-responsible for the limited purpose of eligibility to receive SDB/SB points or consideration as a qualified Small Diverse Business or Small Business.

(b) Nothing herein shall be construed to prevent either party from seeking such relief as provided by law in a court or tribunal of competent jurisdiction.

18. Notices. Any written notice to any party under this Subcontract shall be deemed sufficient if delivered personally, or by facsimile, telecopy, electronic or digital transmission (provided such delivery is confirmed), or by a recognized overnight courier service (e.g., DHL, Federal Express, etc.) with confirmed receipt, or by certified or registered United States mail, postage prepaid, return receipt requested, and sent to the following:

If to Contractor:

If to Subcontractor:

19. Waiver. No waiver by either party of any breach of this Subcontract shall be deemed to waive any other breach. No acceptance of payment or performance after any breach shall be deemed a waiver of any breach. No failure or delay to exercise any right by a party upon another's default shall prevent that party from later exercising that right, nor shall such failure or delay operate as a waiver of any default.

20. Severability. If any provision of this Subcontract shall be held to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any provision of this Subcontract is invalid or unenforceable, but that by limiting such provision it would become valid and enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.

21. Assignment. Neither party may assign or transfer this Subcontract without the prior written consent of the Commonwealth. If Contractor's Prime Contract with the Commonwealth is assigned to another contractor, the new contractor must maintain the Small Diverse Business and Small Business Commitment set forth in the Prime Contract as implemented through this Subcontract.

22. Applicable Law. This Subcontract shall be governed by the laws of the Commonwealth of Pennsylvania.

23. Entire Agreement. This Subcontract constitutes the entire agreement of the Parties regarding the subject of this Subcontract as of the date of execution. No other agreement or understandings, verbal or written, expressed or implied, are a part of this Subcontract unless specified herein.

24. Amendment. This Subcontract may be modified or amended only if made in writing and signed by both Parties. Any proposed change to the Contractor's Small Diverse Business or Small Business Commitment to Subcontractor must be submitted in writing to the Bureau which will make a recommendation to the Contracting Officer regarding a course of action.

25. Binding Effect. This Subcontract shall be binding upon, and inure to the benefit of, the Parties and their respective heirs, representatives, successors and assigns.

26. Counterparts. This Subcontract may be executed by the Parties in counterparts, each of which together shall be deemed an original but all of which together shall constitute one and the same instrument. A party's delivery of a duly executed signature page of this Subcontract in electronic format shall have the same force and effect as delivery of an original signature page.

ADDITIONAL TERMS AND CONDITIONS

[THE PARTIES MAY INCLUDE ADDITIONAL TERMS AND CONDITIONS APPROPRIATE FOR THE SERVICES TO BE PROVIDED SO LONG AS THEY ARE COMMERCIALY REASONABLE TERMS FOR THE APPLICABLE BUSINESS OR INDUSTRY, ARE NO LESS FAVORABLE THAN THE TERMS OF THE PRIME CONTRACT, AND DO NOT PLACE DISPROPORTIONATE RISK ON THE SMALL DIVERSE BUSINESS OR SMALL BUSINESS RELATIVE TO THE NATURE AND LEVEL OF THE SMALL DIVERSE BUSINESS' OR SMALL BUSINESS' PARTICIPATION IN THE PROJECT. SUCH TERMS MAY INCLUDE:

Background Checks
Confidentiality/Disclosure of Information
Data Security

Insurance
Invoicing Requirements
Environmental Protection
Intellectual Property Rights
Record Retention/Audits
Service Level Agreements (SLAs) (consistent with Prime Contract SLAs)
Public Works Construction Requirements (including Bonding, E-Verify, Prevailing Wage, and Prompt Payment provisions)

IN WITNESS WHEREOF, the Parties hereto have caused this Subcontract to be executed by their duly authorized officers as set forth below.

Contractor

Subcontractor

Insert Company Name

Insert Company Name

By: _____
Signature

By: _____
Signature

Printed Name

Printed Name

Title

Title

Date

Date