APPENDIX V

REQUIREMENTS FOR KEY, PRIMARY, AND SECONDARY RESOURCES

The selected Offeror will staff the contract with individuals who possess a significant depth of experience within their functional area of expertise and with projects of similar size and scope as PennDOT's Application Managed Services program. Proposed personnel should have experience in technical areas and/or project management areas to which they are assigned.

At a minimum, proposals shall include the following:

- Key positions are those positions the selected Offeror must provide to meet the needs of the RFQ throughout the contract duration. Rate cards and resumes are required.
- Primary positions are those positions the selected Offeror must provide to meet the needs of the RFQ throughout the contract duration. Rate cards are required and resumes are optional.
- Secondary positions are those positions that PennDOT anticipates will be required to be provided on an as needed basis. Only rate cards are required.

Vendors must provide rate cards for all positions within Appendix C, Cost Submittal.

Position Type	Position Name	Position Requirements
Key	IT Service Manager	• More than 5 years of relevant IT Service / Project Management experience along with 7 years of Applications Development/Maintenance experience • 4 year degree or equivalent technical study or advanced degree • Enterprise Project Management Methodology • Project Management software (Microsoft Project) • ITIL methodology and best practices
Key	Team Lead	• More than 5 years of relevant team leading experience along with 7 years of Applications Development/Maintenance experience • 4 year degree or equivalent technical study or advanced degree • Project Management software (Microsoft Project) • Enterprise Project Management Methodology • Oracle \ DB2 Database design • Entity Relationship Modeling • IBM Rational toolset (ClearCase, ClearQuest, RSA, etc.) • Automated Testing Tools (Rational / Mercury) • SQL (DB2 and Oracle-based) • Crystal Reports
Key	Senior Developer (J2EE)	• Object Oriented Programming Experience – minimum 8 years • Design/Develop and unit test server-side Java EE Code (experience with Eclipse and/or Rational Application Developer – minimum 8 years). • IBM Jazz suite (i.e. Rational Team Concert, Rational Quality Manager) and Training/Experience (minimum 2 years experience). • Java Frameworks (Spring, Hibernate, JSF, EJB 3.1, Primefaces). (Minimum 3 years experience.)

		• IBM Websphere Experience. (Minimum 2 years experience). • Database Programming/SQL experience with major DBMS (DB2, SQL Server, Oracle) (Minimum 5 years experience.). • Superior analysis and troubleshooting skills. • Systems Architecture Experience. (Minimum 3 years experience). • Superior oral and written communication skills. • 4 year degree or equivalent technical study or advanced degree • Javascript • HTML, HTML5 & CSS
Primary	Developer (J2EE)	• Object Oriented Programming Experience – minimum 5 years • Design/Develop and unit test server-side Java EE (experience with Eclipse and/or Rational Application Developer – minimum 5 years). • IBM Jazz suite (i.e. Rational Team Concert, Rational Quality Manager) and Training/Experience (minimum 2 years experience). • Java Frameworks (Spring, Hibernate, JSF, EJB 3.1, Primefaces). (Minimum 2 years experience.) • IBM WebSphere Experience. (Minimum 2 years experience). • Database Programming/SQL experience with major DBMS (DB2, SQL Server, Oracle) (Minimum 3 years experience.). • Strong analysis and troubleshooting skills. • Strong oral and written communication skills. • 4 year degree or equivalent technical study or advanced degree • Javascript • HTML, HTML5 & CSS
Key	Senior Developer (Microsoft.NET)	• More than 12 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • Microsoft Visual Studio • Microsoft Team Foundation Server (TFS) • C#.NET or VB.NET

		• .NET Framework 3.5 to 5.0 • HTML & CSS • HTML5 & CSS3 • JavaScript • Microsoft Internet Information Services (IIS) • Microsoft SQL Server (2008/2014) • SQL and Transact-SQL • JQuery • Crystal Reports • Data Modeling • Database Development
Primary	Developer (Microsoft.NET)	• Minimum of two years of relevant experience • 4 year degree or equivalent technical study or advanced degree • Microsoft Visual Studio • Microsoft Team Foundation Server (TFS) • C#.NET or VB.NET • .NET Framework 3.5 to 5.0 • HTML & CSS • HTML5 & CSS3 • JavaScript • Microsoft Internet Information Services (IIS) • Microsoft SQL Server (2008/2014) • SQL and Transact-SQL • JQuery • Crystal Reports • Database Development
Key	Senior Developer (COBOL)	• More than 12 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • COBOL MVS, COBOL II, Stored Procedures • MFS • IMS DB/DC

		• Oracle (11g) • DB2 • DEBUG • SAS
Primary	Developer (COBOL)	• Minimum of two years of relevant experience • 4 year degree or equivalent technical study or advanced degree • COBOL MVS, COBOL II, Stored Procedures • MFS • IMS DB/DC • Oracle (11g) • DB2 • DEBUG • SAS
Key	Senior Geospatial Information System (GIS) Developer	• More than 12 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • Four years developing in a spatial environment • Microsoft Visual Studio • Microsoft Team Foundation Server (TFS) • Oracle Spatial (11g / 12c) • PL/SQL • C#.NET or VB.NET • JavaScript • JSON • NuGet • .NET Frameworks 3.5 to current • Esri and/or Hexagon (Intergraph) • HTML & CSS • Crystal Reports
Primary	Geospatial Information System (GIS) Developer	• More than 2 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • One year developing in a spatial environment • Microsoft Visual Studio

		• Microsoft Team Foundation Server (TFS) • Oracle Spatial (11g / 12c) • PL/SQL • C#.NET or VB.NET • JavaScript • JSON • NuGet • .NET Frameworks 3.5 to current • Esri and/or Hexagon (Intergraph) • HTML & CSS • Crystal Reports

Primary	Business Analyst	• More than 4 years of relevant business analysis experience
		• 4 year degree or equivalent technical study
		• Experience in providing business analysis services managed with various project management methodology (waterfall, agile, and iterative)
		• Experience in providing business analysis services following the full range of SDLC including but not limited to:
		  o Identifying, documenting and maintaining traceability of Functional and non-functional requirements
		  o Managing system configurations and content management.
		  o Developing and implementing test plans
		  o Experience in various types of testing (regression, integration, user, etc.)
		  o Experience developing detail use cases from existing business requirements and adding the traceability with system requirements.
		  o Experience in developing user training materials
		• Strong organization skills
		• Strong written and verbal skills
		• Experienced developing graphic representations of complex business processes.
		• Strong facilitation skills

Key	Technical or Business Subject Matter Expert (Specified Area)	• More than 12 years of relevant technical experience • 4 year degree or equivalent technical study or advanced degree

		• 5 years or more of specialized Business and/or Technical knowledge that may include one or more of the following:
		  o One or more of PennDOT's mission-critical business applications or program areas
		  o Geospatial applications development
		  o Oracle Spatial
		  o Esri
		  o Intergraph (Hexagon)
		  o IBM FileNet and/or EMC Captiva
		  o Certified Enterprise Architect (e.g. TOGAF)
		  o Enterprise Application Integration
		  o IBM Integration Bus
		  o Data Warehouse & Data Integration
		  o Business Intelligence & Analytics
		  o Informatica PowerCenter

Key	Senior Developer (SharePoint)	• More than 12 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • Microsoft Visual Studio • Microsoft Team Foundation Server (TFS) • C#.NET or VB.NET • .NET Framework 3.5 to 5.0 • SharePoint 2010/2013/2016 • HTML & CSS • HTLM5 & CSS3 • JavaScript • Microsoft Internet Information Services (IIS) • Microsoft SQL Server (2008/2014) • SQL and Transact-SQL • JQuery • Crystal Reports • Data Modeling • Database Development

Primary	Developer (SharePoint)	• Minimum of two years of relevant experience • 4 year degree or equivalent technical study or advanced degree • Microsoft Visual Studio • Microsoft Team Foundation Server (TFS) • C#.NET or VB.NET • .NET Framework 3.5 to 5.0 • SharePoint 2010/2013/2016 • HTML and CSS • HTML5 & CSS3 • JavaScript • Microsoft Internet Information Services (IIS) • Microsoft SQL Server (2008/2014) • SQL and Transact-SQL • JQuery • Crystal Reports • Database Development
Key	Senior Developer (IBM Domino)	• Minimum of 10 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • IBM Domino R8, R9 • Formula Language • X Pages • Bootstrap • HTML, HTML5, CSS and CSS3 • LotusScript • Dojo Toolkit • jQuery • Team Studio CAIO, or other source control • IBM Data Studio (DB2)
Primary	Developer (IBM Domino)	• Minimum of two years of relevant experience • 4 year degree or equivalent technical study or advanced degree • IBM Domino R8, R9

		- Formula Language - X Pages - Bootstrap - HTML, CSS and CSS3 - LotusScript - Dojo Toolkit - jQuery - Team Studio CAIO, or other source control - IBM Data Studio (DB2)
Key	Senior Developer (Data Warehouse)	- Minimum of 10 years of relevant experience 4 year degree or equivalent technical study or advanced degree - Highly complex Oracle PL/SQL - Data Warehouse ETL (OLTP source to staging, ODS, facts, Type 1 & 2 SCD's, temporal, etc.) - Data Modeling (OLTP & Dimensional) - TOAD - ERWin
Primary	Developer (Data Warehouse)	- Minimum of two years of relevant experience 4 year degree or equivalent technical study or advanced degree - Complex Oracle PL/SQL - Data Warehouse ETL (OLTP source to staging, ODS, facts, Type 1 & 2 SCD's, temporal, etc.) - Data Modeling (OLTP & Dimensional) - TOAD - ERWin
Primary	Developer (Business Objects)	- Minimum of two years of relevant experience 4 year degree or equivalent technical study or advanced degree - Business Objects Business Intelligence (BOBI) - Crystal Reports - Web Intelligence - Excelcius

		• Advanced SQL query writing
Key	Senior Developer (Java Mobile/Web Services)	• More than 12 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • Oracle Database (9i / 10g / 11g) • DB2 Database • JDBC • SQL • MyBatis • Java 1.6 and later • Javascript – Dojo, AngularJS • HTML 5 and CSS • Entity Relationship Modeling • IBM Rational toolset (RSA, RTC, etc.) • JMS, IBM MQ • IBM WebSphere Application Server • Web Services – RESTful and SOAP • Batch job scripting
Primary	Developer (Java Mobile/Web Services)	• Minimum of 2 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • Oracle Database (9i / 10g / 11g) • DB2 Database • JDBC • SQL • MyBatis • Java 1.6 and later • Javascript – Dojo, AngularJS • HTML 5 and CSS • IBM Rational toolset (RSA, RTC, etc.) • Web Services – RESTful and SOAP
Key	Senior Developer (Mobile)	• More than 8 years of relevant experience • 4 year degree or equivalent technical study or advanced degree

		• Xcode 5 and later • iOS 9 and later • Objective-C • Swift 2 and later • AngularJS, JavaScript • Apple Frameworks: Foundation, UIKit, MapKit, WebKit, CFNetwork, Security • Core Data, SQLite • Storyboard • Auto Layout • JSON RESTful web services • Experience with Enterprise MDM • Expertise with managing Apple code-signing, distribution certs and provisioning profiles • Jenkins • Test Flight • Automated testing
Primary	Developer (Mobile)	• Minimum of 2 years of relevant experience • 4 year degree or equivalent technical study or advanced degree • Xcode 5 and later • iOS 9 and later • Objective-C • Swift 2 and later • AngularJS, JavaScript • Apple Frameworks: Foundation, UIKit, MapKit, WebKit, CFNetwork, Security • Core Data, SQLite • Storyboard • Auto Layout • JSON RESTful web services
Primary	SDLC Developer Support Specialist	• 2 years of programming experience in either Java or .Net • 4 year degree or equivalent technical study

		• Advanced knowledge of Agile Development, SCRUM and general SDLC principles • SQL • Crystal Reports or other industry standard reporting platform • Advanced knowledge of software configuration, code versioning, branching, merging, and parallel development. • Ant or another build script language (Maven, Groovy, etc.) • Prefer knowledge of code analysis tools for quality and security • Administrative knowledge of one of the upper right Gartner quadrant ALM tool suites (Atlassian JIRA, Microsoft TFS, IBM Rational) • Experience with automated testing using a test scripting tool for both performance and quality testing. (HP QTP, IBM RFT/RPT, Microsoft Testing Tools, Opensource (JMeter, Selenium)) • Microsoft Office • Strong verbal and print communication skills.

Secondary	Technical Architect	• More than 6 years of relevant experience as a Technical Architect
		• 4 year degree or equivalent technical study or advanced degree
		• Enterprise Architecture certification
		• ITIL methodology and best practices
		• Infrastructure design concerning:
		  o Capacity
		  o Availability
		  o Performance
		  o Optimal cost
		• Experience with the following technologies:
		  o IBM Integration Bus
		  o IBM WebSphere Application server
		  o IBM MQSeries
		  o Microsoft SQL Server Database
		  o Microsoft Internet Information Services
		  o Oracle Database

		- Computer Associates Identity and Access Management technologies - Operating systems services (Linux, Microsoft Windows) - Technical IT understanding involving: - Security - System and Network Management - Cross platform integration patterns - Excellent problem solving skills - Excellent written and verbal communications skills
Secondary	Enterprise Architect	- More than 10 years of relevant IT experience 4 year degree or equivalent technical study or advanced degree 7+ years of Information Technology Architecture Analysis experience 5+ years of development experience including full life cycle activities - Experience with both Waterfall and Agile methodologies - Experienced with TOGAF 9.1 methodology - Solid understanding of industry patterns for application architecture and integration 7+ years of experience building multi-tier applications using (applicable skill set such as Java, .Big Data, CI/CD, etc.) 5+ years building design workflow diagrams around 3 tier architectures - Excellent problem solving skills - Excellent written and verbal communications skills
Secondary	Application Architect	- More than 6 years of relevant experience as an Application Architect 4 year degree or equivalent technical study or advanced degree - Enterprise Architecture certification - ITIL methodology and best practices - In depth application design knowledge concerning:

		o Integration o Automation o Performance o UI/UX design • Experience in software development and coding in various languages (e.g., Java, .NET, etc.) • Excellent knowledge of modeling methods • Excellent problem solving skills • Excellent written and verbal communications skills
Secondary	CADD Administrator	• More than 8 years of relevant experience • 4 year college degree or equivalent technical study • CADD systems
Secondary	Database Administrator	• 3-4 years of relevant experience • 4 year college degree or equivalent technical study • Strong written and verbal communication skills • Business system analysis and design experience
Secondary	Senior Database Administrator	• More than 7 years of relevant experience • 4 year college degree or equivalent technical study • Strong written and verbal communication skills • Business system analysis and design experience • Highly skilled at database backup and recovery procedures, access security and database integrity, physical data storage design and data storage management • Knowledge of various database management system products
Secondary	Mobile Specialist	• 4 year college degree or technical study • 2-3 years experience preferred • Mobile Device Administration experience • Serves as the Designer, Developer and/or Engineer on Mobile Projects.

		• Meets with end users and technical staff of all types to gather business and system requirements
		• May work with Senior Mobile Specialist to propose comprehensive solutions based on business and technical requirements
		• Develops and/or engineers user interface, service tier, data tier components, infrastructure or security for Mobile Projects.
		• Develops standards, repeatable processes, and reusable components
		• Assists in project planning, including developing of timelines, composition of technical teams, and leveling of resources.
		• Mentors technical team leads and team members on Department processes and standards to promote consistency and improve productivity.
		• Assists in the development and review of technical deliverables on projects.
Secondary	Senior Mobile Specialist	• 4 yr. college degree or technical study
		• 4+ years experience in mobile device management
		• Serves as the Lead Architect/Designer/Developer /Engineer on Mobile Projects.
		• Meets with end users and technical staff of all types to gather business and system requirements.
		• Proposes comprehensive solutions based on business and technical requirements
		• Architects, designs, develops, and/or engineers user interface, service tier, data tier components, infrastructure or security for Mobile Projects.
		• Develops standards, repeatable processes, and reusable components

		• Leads project planning, including developing of timelines, composition of technical teams, and leveling of resources. • Mentors and manages technical team leads and team members on Department processes and standards to promote consistency and improve productivity. • Leads the development and review of technical deliverables on projects

Secondary	Product Specialist-SiteMinder	• 3-5 years as an IAM or IDM in an enterprise environment
		• Demonstrates competence in teaching/conveying technical and/or functional courses/concepts.
		• Develops contingency plans as necessary.
		• 4 year degree or equivalent technical study or advanced degree
		• ITIL methodology and best practices
		• Security infrastructure design concerning: Capacity, Availability, Performance and Optimal cost
		• Experienced or familiar with one or more of the following:
		    1) SiteMinder IAM
		    2) SiteMinder IDM
		• Excellent problem solving skills
		• Excellent written and verbal communications skills

Secondary	Senior Database Architect	• More than 8 years of relevant experience • 4 year college degree in computer science or related fields with advanced study preferred • Extensive knowledge of one or more database systems, and is capable of hands-on work in all phases of database design and management