

Procurement Practices for Partnering with Emerging Technology Providers

REPORT

October 28, 2020

ENTERPRISE TRANSPORTATION POOLED
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| 16. Abstract This report presents recent applications of new procurement practices, or traditional procurement practices applied in new ways, to partner with emerging technology providers. It includes information that may be useful to project managers as they carry out individual projects, to program managers exploring ways to proactively engage industry, and to contracting and procurement staff wanting information about new and innovative practices. The case studies and resources highlighted in this report were selected for how they addressed recent procurement challenges identified by ENTERPRISE members. The resources provide guidance on process, specialized information for specific technologies, and examples of procurement training. They represent a cross-section of general procurement and technology-specific procurement to help articulate agency needs, identify prospective partners, determine contracting processes, and guide projects through procurement when partnering with emerging technology providers. Case studies are presented in terms of the challenges that they address, and key procurement practices are also highlighted. They include a variety of innovative contracting approaches and project specific applications of different procurement processes. | | | |
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Project Champion

Elise Feldpausch, Michigan Department of Transportation, was the ENTERPRISE Project Champion for this effort. The Project Champion serves as the overall lead for the project.

ENTERPRISE Members

The ENTERPRISE Board consists of a representative from each of the following member entities of the program.

- Illinois Department of Transportation (IDOT)
- Iowa Department of Transportation (Iowa DOT)
- Kansas Department of Transportation (KDOT)
- Michigan Department of Transportation (MDOT)
- Minnesota Department of Transportation (MnDOT)
- Ontario Ministry of Transportation (MTO)
- Pennsylvania Department of Transportation (PennDOT)
- Texas Department of Transportation (TxDOT)
- Wisconsin Department of Transportation (WisDOT)

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1.0 Introduction

The transformational nature of intelligent transportation systems, or ITS, has always motivated private industry to develop innovative products and services that could potentially address transportation challenges. The rapid evolution of technology for communication, data, and automation has further accelerated the pace at which new products and services are emerging for transportation management and operations. Agencies continue to be interested in partnering with emerging technology providers to learn how transportation will change as a result of new technology and how it can be continuously improved by leveraging new technology for system management and operations.

Project Objective

To understand recent applications of new procurement practices, or traditional procurement practices applied in new ways, to partner with emerging technology providers.

Transportation agency procurement practices have gradually evolved to support agencies in their desire to partner with private industry in the development and evaluation of new products and services. However, the prevalence of ever-changing business models and entirely new businesses continuously impacts how agencies apply their procurement practices to emerging technologies for transportation. The objective of this project is to understand recent applications of new procurement practices, or traditional procurement

practices applied in new ways, to partner with emerging technology providers.

Emerging technologies are defined for this project as products or services that relate to ITS, connected and automated vehicles (CAV), or mobility services. Products may include, for example, roadside units for vehicle to infrastructure (V2I) applications or specialty data for traffic operations. Services could be related to research and development, testing, installation, operation, or maintenance related to such products.

This report includes information that may be useful to project managers as they carry out individual projects, to program managers exploring ways to proactively engage industry, and to contracting and procurement staff wanting information about new and innovative practices. It is important to note that this report highlights resources and case studies intended for use as references. Case studies featuring alternative procurement practices are not presented within the context of individual state statutes regarding procurement. Program and project management staff are encouraged to discuss such practices with contracting and procurement staff to ensure viability within their statutory requirements.

Furthermore, there is no single best approach or correct way to procure emerging technologies as each project is unique in scope, schedule, budget, and a variety of other conditions. A key recommendation from this work is for program and project management staff to establish good working relationships with contracting and procurement staff so business goals for emerging technologies are familiar and unique project conditions can be understood. Each party provides valuable information and knowledge that when combined will determine the most effective procurement approaches.

Identifying the most effective procurement approaches requires the combined knowledge of program and project management staff with contracting and procurement staff so business goals for emerging technologies and unique project conditions can be understood.

This report features procurement practices being used by agencies to partner with emerging technology providers in the following sections:

- 2.0 [Procurement Challenges](#): ENTERPRISE members identified prominent challenges they are facing in their efforts to partner with emerging technology providers.
- 3.0 [Resources to Support Procurement](#): In addition to the procurement innovation featured in the cases studies, this section highlights resources that offer insight on the foundational aspects of procurement.
- 4.0 [Case Studies of Partnering Success](#): Summaries of successful strategies used to procure emerging technology partners are presented in this section.
- 5.0 [Conclusion](#): Key takeaways for an agency to reference as they contemplate their next effort to partner with an emerging technology provider.

2.0 Procurement Challenges

Although procurement practices have evolved since the early days of ITS, there are still fundamental challenges with the requirements for and timing of competitively selecting partners for emerging technology projects. Often, these projects are fast-moving and involve an everchanging landscape of partners focused on areas such as infrastructure, vehicles, communication, artificial intelligence, security, and data. Each of these areas of technology have their own dynamics related to functions like product development, market demand, and business models, and often transportation is only one industry where these products and services are applied.

Just as procurement practices have changed over the past few decades, so have the challenges with procuring emerging technology. In the 1990s, many agencies and their staff had limited experience with contracting for what was then considered emerging technology. There were challenges with negotiating contract language around subjects like intellectual property and indemnification. As agencies gained experience with procurements such as road weather information systems, they were able to exchange lessons learned about contract areas including contract terms, scoping, and vendors.

Challenges in the early 2000s included operations and maintenance for emerging technology. Once an agency overcame barriers to selecting a partner to successfully demonstrate an emerging technology, it was often difficult for them to continue operating and maintaining the technology without the necessary knowledge, skills, and abilities. New contracting approaches arose for contractors to provide temporary or ongoing operations and maintenance support, as well as training for agency staff.

ENTERPRISE members were asked to identify what challenges have been most prominent in their recent work to partner with providers of emerging technology. Some of the challenges they cited are new, like unique funding situations surrounding the growing popularity of competitive grant opportunities. In contrast, other challenges are more persistent but with slightly newer twists. For example, approval processes have always taken a significant amount of time for review and leadership approval when subject matter is new and different. In more recent years, IT has taken a more prominent role in approval processes for work that involves software, produces data, or has network implications.



Challenges

- Articulating agency needs
- Procurement after R&D
- Lengthy approval processes
- Application of contracting process
- Unique funding situations

- **Articulating agency needs.** It can be difficult for an agency to clearly articulate their needs when emerging technologies are altogether new, have not been used in a transportation setting, or simply have not been previously used by an agency. This can make it especially challenging to develop language for an RFP, evaluate proposals, negotiate contract terms, and manage performance to ensure the agency does ultimately get what it needs.

- **Lengthy approvals.** Several things can hamper an agency's ability to contract fast enough with emerging technology partners who are understandably looking for impactful opportunities to demonstrate their products and services. Funding approvals, contracting types, risk assessments, IT reviews, and fiscal year constraints are all examples of things that extend the contracting process.
- **Procurement after R&D.** Agency research and development efforts around emerging technologies are driven by the need to solve transportation problems. When such efforts lead to success, there is a natural desire to consider whether it can be operationalized. Although vendors for the research and development may be competitively selected, it can be difficult to transition to an operational stage without another procurement process. Additional challenges can be encountered when technology is developed in small quantities for research but needed in larger quantities and production level quality for operations.
- **Application of contracting process.** Low-bid or specifications-based procurements for emerging technology may not always be appropriate or reasonable given the often undefined nature of such technology. There are a variety of procurement processes used by agencies and one size does not fit all projects. Procurement staff rely on project managers to provide enough information about the scope of their anticipated project to help them find the process that best meets the agency needs. Similarly, project managers need a basic understanding the contracting processes to question how those processes apply to their projects. Without this balance between procurement and project management staff, contracting processes can be inconsistently or inappropriately applied.
- **Unique funding situations.** In 2015, Congress passed the Fixing America's Surface Transportation (FAST) Act to address federal surface transportation spending. Several competitive federal grant programs were established in FAST Act, including the [Advanced Transportation and Congestion Management Technologies Deployment](#) (ATCMTD) and [Automated Driving Systems](#) (ADS) grants administered by FHWA and the [Accelerating Innovative Mobility](#) (AIM) grant administered by Federal Transit Administration (FTA). As competitive grant funding becomes more prominent around emerging technologies, agencies are challenged with identifying partners for grant proposals and then contracting with them if awarded.

These challenges may be present in different ways depending on the emerging technology being procured, available partners and their work experience with transportation agencies, funding requirements, state procurement statues, agency practices and other variables. The next two sections present resources and case studies that may be used by project managers, agency programs, and contracting staff to mitigate these challenges.

3.0 Resources to Support Procurement

Some of the challenges identified by ENTERPRISE members can be addressed with resources that are intended to guide procurement more generally and emerging technology more specifically. These resources offer insight on the foundational aspects of procurement that project managers can reference to articulate agency needs, identify prospective partners, determine contracting processes, and guide projects through procurement.

Resources presented in this section are loosely grouped into three categories – guidance, specialized, and training. Those referenced under guidance are oriented toward steps and how-to for procurement. Resources in the specialized category have been developed specifically for the emerging technologies defined for this project – ITS, CAV, and mobility services. The training category includes examples of resources that have been used to educate project managers on procurement.



Guidance

One of the most important steps in any project is establishing a clear understanding of who is driving the need for the project, what is needed, where it is needed, why, and by when. Understanding these key details establishes a foundation for

managing all aspects of the project, including procurement. For emerging technology, the systems engineering process – especially the development of a concept of operations – supports the identification of these key details. In fact, [Systems Engineering for Intelligent Transportation Systems](#) includes guidance for procurement throughout the systems engineering process. It offers insight on procuring commercial off the shelf products, procurement timing, and key considerations for various procurement approaches. These points are further emphasized in the guidance resources highlighted in this section.

Sponsored by the Transportation Research Board, [NCHRP Report 560 Guide to Contracting ITS Projects](#) was developed to help project managers and procurement staff understand when traditional low-bid procurements may not be best and when alternative approaches may be needed for ITS procurements. The guide highlights best practices and recommends contracting strategies, along with contract types/terms/conditions for ITS projects at various stages of development, integration, system acceptance, warranty, maintenance, and upgrade. At the core of the guide is an 8-step decision model for defining the most appropriate procurement approach for a project. The model begins with initial decisions about the project type and ends with recommendations on contract scope and terms and conditions. Other steps in the model include considerations for work distribution, method of award, contract form and type, as well as factors related to staff experience and agency policy.

The guidance offered in NCHRP Report 560 is general in the sense that it does not identify how state statutes and rules also influence procurement options for emerging technology. The Missouri Department of Transportation (MoDOT) recognized the relevance of this and developed a state-specific guide based on the NCHRP report. [Best Practices in ITS Equipment Procurement](#) provides guidance within the context of applicable Missouri statutes and rules. This provides a comprehensive point of reference for project managers as they consider how funding sources also impact procurement options. The guidance also presents conditions around MoDOT's general and ITS procurement environment, planning and

programming associated with ITS, and implications for information technology (IT, or information systems, IS). Although the MoDOT and NCHRP guides were developed around ITS, they are also relevant to the procurement of emerging technologies more broadly.

There is a wide variety of products and services procured by transportation agencies. Procurement and contracting staff rely on the technical expertise of project managers to help them understand the products and services that must be procured. They also gain insight on popular topics from professional associations such as the National Association of State Procurement Officials (NASPO). The [NASPO Tech Next Series](#) offers insight on several topics related to emerging technology, including leasing vs. owning hardware/software, procuring unmanned aerial vehicles (UAVs) or drones, electric and hybrid vehicles, and the Internet of Things (IoT). NASPO is currently working on an edition of Tech Next featuring 5G procurement that is expected to be released in early 2021. The [Procuring UAVs](#) edition of Tech Next highlights public uses for UAVs, regulations, and procurement considerations. NASPO also has a [cooperative purchasing agreement for UAVs](#) that allows state agencies to procure UAVs from among 13 contractors. NASPO provides [an introduction to cooperative purchasing](#) and offers access to numerous such agreements through their ValuePoint program. Many states have authority to enter into cooperative purchasing agreements; however, agency contracting staff should be consulted to understand the parameters of each state's authority.

General procurement guidance resources are also often provided by agency contracting and procurement staff to offer project managers with foundational knowledge of procurement practices. The [MnDOT Professional/Technical Contract Training Guide](#) and [VDOT Manual for the Procurement and Management of Professional Services](#) offer an introduction to contracting. Establishing a well-defined scope of work is emphasized in both and guidance is provided to facilitate the process. Various selection methods and their parameters are presented, including, for example, when direct and competitive selections may be used. Further direction is offered on topics such as diversity goals, selection, audit and negotiations, and contract execution and closeout. Both guides offer an excellent overview of the contracting process to provide foundational knowledge and to emphasize the importance and value of engaging contracting staff to support the procurement process with their deeper knowledge and experience.



Specialized

Projects involving emerging technologies often lack specifications and standards to guide both project work and procurement. This can present unique challenges for articulating agency needs and developing a suitable scope of work for procurement. Resources

highlighted in this section are categorized as such because they provide specialized information about emerging technologies that have been developed from both collective and individual experiences as standards and specifications continue to evolve.

It is common for professionals to form groups around emerging technology topics to support peer exchange and learning. Such groups might include pooled fund programs, association committees, working groups or task forces. The Cooperative Automated Transportation (CAT) Coalition, for example, was formed to promote public and private sector engagement and peer exchange on connected and automated vehicles. The Coalition sponsored the Signal Phase and Timing (SPaT) Challenge in 2017, encouraging states to deploy SPaT broadcasts in at least one corridor or network (approximately 20

signalized intersections) by January 2020. The process of broadcasting SPaT messages, accompanied by MAP and location correction information, was not something agencies had significant experience with at the time. Several resources were developed by the group to support agencies, including a [SPaT Procurement Resource](#) that summarizes successful procurements from several agencies. Components procured, an overview of successful elements, lessons learned, and copies of the agency procurement documents are included for reference and use by other agencies.

In addition to the SPaT Challenge, the wider state of connected vehicle procurement is more broadly captured in [Connected Vehicle Procurement State of the Practice Assessment](#). The assessment describes the state of the practice on connected vehicle technology procurement by transportation agencies, identifies lessons learned, and recommends actions to improve future procurement success. Much of the information reviewed for the project assessment focused on ITS with the notion of transferability to connected vehicles (and other emerging technologies). The assessment also captures specific case studies on connected vehicle procurements from Florida, Georgia, and Colorado. The details highlighted in these case studies provide useful reference points for other connected vehicle procurements. The assessment concludes that various procurement approaches have been successfully used to procure connected vehicle technology but there is no single best approach for agencies to use. As previously noted, it is essential to have basic knowledge of contracting principles and procurement approaches that have been successfully used, but working with agency procurement staff is strongly encouraged to leverage their deeper contracting knowledge and to determine which approaches are best for each project.

Additional specialized resources for mobility services are offered by the Shared Use Mobility Center (SUMC). The SUMC's [Shared-Use Mobility Toolkit](#) cites key policies that include recommended procurement practices. The toolkit recommends embedding specific requirements in solicitations to encourage the use of common technology platforms. For example, the Los Angeles Metro bikesharing RFP requested that the new service be compatible with the agency's existing transit card payment system. Public-private partnerships are also recommended to build first/last mile connections to transit. The toolkit suggests both formal and informal partnering opportunities ranging from joint marketing and awareness campaigns to linked mobile applications. Finally, data sharing requirements are also suggested as a way for agencies to assess impacts and integrate services into transportation plans. Agreements between San Francisco Metro Transit Authority and on-street carsharing operators are referenced as an example. In depth information about case studies featured in the toolkit are also available from the SUMC [Learning Center](#) by selecting "procurement" from the search by topic.



Training

In addition to the guidance and specialized resources already highlighted, this section presents examples of training available to project management staff on procurement. The Minnesota Department of Transportation (MnDOT) and the Texas Department of Transportation (TxDOT) both offer structured training available on contracting processes for project managers. TxDOT [Training and Professional Development](#) offers a series of contracting courses that are available to employees and external partners (e.g. contractors, consultants). The online [training catalog](#) provides information on over a dozen courses covering topics such as general transportation contracting, negotiating, ethics, and best value and other contracting types. One course, Introduction to

Contracting with Private Entities (CTR108), guides participants through the fundamentals of processing contracts with private entities. It reviews basic principles of contract law, identifies common challenges with TxDOT contracts, and reviews the basic processes for developing a scope of work, fee structure and invoicing, work authorization, performance, and change management.

MnDOT offers similar contract training, which follows the Professional/Technical Contract Training Guide that was previously referenced in this section. The Professional/Technical Contracts Training Course is a 1.5 day interactive event covering the entire professional/technical contract process, including roles and responsibilities, contract programs, selection methods, scope writing, diversity goals, consultant selection, negotiations, and contract execution and close out. The training is offered periodically to capture new staff. In addition to offering training and guidance on contracting processes, MnDOT has also supported partnerships with private industry through targeted education and awareness activities. One such activity is the Understanding Both Sides of the Fences Project Manager Workshop, an eight-hour interactive curriculum designed around project management processes and relationship building. Developed in partnership with the American Council of Engineering Companies-Minnesota, the workshop emphasizes learning about public and private sector processes to build awareness and understanding. The awareness and workshop interaction are intended to build relationships between MnDOT and consultant companies to promote more efficient and successful projects.

The ITS Joint Program Office Professional Capacity Building Program also sponsors a course through the National Highway Institute that specifically addresses ITS procurement practices. [ITS Procurement](#) is a 3.5-hour web-based course that builds on systems engineering principles to present procurement processes and strategies for ITS. Although this course and the previously referenced guidance on ITS contracting, were designed around ITS as the central topic, their procurement principles are relevant to most emerging technology procurements.

The guidance, specialized, and training resources highlighted in this section may be used as-is in some cases, while other resources may serve as reference points for agencies to consider adapting for their own purposes. The resources represent a cross-section of general procurement and technology-specific procurement, all of which can help project managers articulate agency needs, identify prospective partners, determine contracting processes, and guide projects through procurement when partnering with emerging technology providers.

4.0 Case Studies of Partnering Success

In addition to the resources presented in the previous section, following is a series of case studies selected for how they have addressed the challenges identified by ENTERPRISE members. Each case study is presented in terms of the challenges that it addresses, and key procurement practices are also highlighted. Some case studies, like the MnDOT CAV Challenge, represent innovative contracting approaches that agencies have developed to address procurement related to emerging technologies. Other case studies feature specific projects, like the Automated Bus Consortium, where unique procurement approaches have been used. Table 1 provides an at-a-glance summary of the case studies presented according to the challenges addressed and with links to jump to the details for each.

Table 1 Case Studies by Procurement Challenge

| Case Studies | Procurement Challenges | | | | |
|--|------------------------|-------------------|-------------------|---------------------|----------------|
| | Articulate needs | Lengthy approvals | Procure after R&D | Contracting process | Unique funding |
| MnDOT CAV Challenge | • | • | | • | |
| MnDOT Innovative Ideas | • | • | | • | |
| FDOT Procurement Framework | • | | | • | |
| Automated Bus Consortium | • | | • | • | |
| NYCDOT Connected Vehicle Pilot | • | | | • | • |
| MnDOT Rural ICWS | • | | • | | • |
| PennDOT ADS Grant | • | | | | • |
| MnDOT AIM Grant | • | | | | • |

MnDOT CAV Challenge

Contact: Cory Johnson, coryj.johnson@state.mn.us

| Challenges Addressed: | Articulate needs | Lengthy approvals | Contracting process |
|-----------------------|---|-------------------|---------------------|
| Description: | <p>MnDOT worked with the Office of State Procurement to develop a streamlined process for procuring CAV technology. The CAV Challenge is an open, rolling procurement process that allows partners to propose solutions that address areas of importance identified by MnDOT, such as utilizing CAV technology to improve safety and operations in work zones. The CAV Challenge RFP also identifies prospective corridors and test tracks available in Minnesota and describes access to high-definition mapping available throughout the states.</p> <p>The CAV Challenge did not require statutory changes and it meets requirements for fair and open competition. It is structured in a two-stage process. The first stage is optional and allows potential partners to request a pre-proposal meeting with MnDOT staff. The meeting allows a project concept to be presented for discussion and feedback from MnDOT. The meetings are considered confidential and information is not discussed with other respondents to the RFP. The second stage of the CAV Challenge is a full proposal. Proposals may be submitted at any time and are reviewed by MnDOT on a quarterly basis. Projects are awarded based on their alignment with goals and available funding.</p> <p>From its launch in October 2018, through the summer of 2020, MnDOT has hosted 68 pre-proposal meetings, received 39 full proposals, and awarded 14 projects. The process has provided more immediate access to emerging technology in contrast to spending time drafting specifications for technology that could become outdated before issuing an RFP. Although more time is typically spent on negotiations to ensure MnDOT needs are met, time saved overall in the procurement process is significant. There have been 14 projects awarded to-date. In a traditional solicitation model each project would have required separate RFPs, selection committees, and selection meetings. If each solicitation received five proposals, staff would have had to spend time reviewing 70 or more proposals. Under the CAV Challenge, one solicitation was prepared, one selection committee was used, and only eight selection meetings were needed to review 32 proposals. The traditional process could have easily taken several years to complete while the CAV Challenge approach allowed MnDOT to complete procurement in approximately 18 months.</p> Procurement Highlights: | | |

Procurement Highlights:

- Collaboration between MnDOT and the Office of State Procurement ensured that business and procurement needs were both addressed.
- Open, rolling procurement process allows project ideas to be submitted anytime.
- Two-stage approach allows prospective partners to receive MnDOT feedback on project concepts prior to developing a full proposal.
- Overall time for procurement with emerging technology partners is significantly reduced with the ongoing solicitation, even though additional time is often needed for negotiations.

MnDOT Innovative Ideas

Contact: Cory Johnson, coryj.johnson@state.mn.us

| Challenges Addressed: | Articulate needs | Lengthy approvals | Contracting process |
|---|------------------|-------------------|---------------------|
| <p>Description: MnDOT developed the Innovative Idea solicitation in the early 2000s as a mechanism for soliciting new and innovative ITS project concepts from public and private sector partners. The intent was to allow an open process for partners to propose their ideas and for MnDOT to select from them in a fair and competitive way. The solicitation was developed within Minnesota’s statutory requirements for best value selection.</p> <p>Proposals are sought to operationally test or demonstrate ITS technologies that address ITS development objectives identified in Minnesota’s Statewide Regional ITS Architecture. The initial rounds of solicitation generated 20-30 proposals each time that had to be evaluated. MnDOT transitioned to a two-stage process to relieve the burden of proposal preparation on partners and proposal evaluation on staff. The first stage is now a brief, 4-page proposal that defines what problems would be addressed by the project idea and explains the approach that would be used. Proposals are evaluated at the sole discretion of MnDOT without quantitative criteria. Shortlisted proposals are invited to submit full proposals in the second stage that expand the problem definition and approach and add a literature search, measures of success, risk assessment, qualifications, and a quality management plan. Proposals are then evaluated on a best value basis using weighted factors for technical merit and cost.</p> <p>The Innovative Idea RFP was last issued in the spring of 2020. It has been issued several other times and each round has produced an average of 40 Stage I project proposals, of which typically 8-12 move into Stage II proposals, resulting in 4-6 contracts being awarded.</p> <p>Procurement Highlights:</p> <ul style="list-style-type: none">• Solicitation allows public and private partners to share their project ideas with MnDOT and allows MnDOT to competitively select from those ideas.• Projects developed within statutory requirements allow for best value selection.• Two-stage proposal process reduces burden on partners to prepare and agency staff to evaluate. | | | |

FDOT Procurement Framework

Reference: [*Exploring the Modified Procurement Framework for Expediting Florida Connected Vehicle Deployments*](#)

| Challenges Addressed: | Articulate needs | Contracting process |
|-----------------------|---|---------------------|
| | <p>Description: The Florida Department of Transportation (FDOT) conducted an evaluation of their procurement processes for suitability with connected vehicle deployments. The evaluation includes a scan of practices with FDOT projects and projects in several other states. Nine other states were surveyed about their procurement practices with connected vehicle deployments. Most indicated that their procurement process was similar to what has been used with other ITS projects. Those that reported differences noted specific challenges with needing additional time to develop requirements, obtain equipment, and learn about new interfaces. Lessons learned and best practices specific to connected vehicle deployments and procurement are highlighted in the evaluation for topics such as map data, component testing, FCC approval, and system security.</p> <p>The evaluation culminates in the development of a connected vehicle procurement framework which is included in Appendix A of this report for reference. The framework acknowledges similarities with ITS deployments, as well as key differences around facets such as communication between roadside infrastructure and vehicle and the need for security credential management for that communication. The framework describes how stages of the project development process support and relate to procurement. For example, exploring prospective vendors is suggested in the post-planning phase to identify products and ascertain their capabilities. Knowledge gained from this effort can inform the concept of operations and requirements which are key elements used in the procurement process. Although each connected vehicle deployment is unique, the framework illustrates activities that are typically present in every project and can be used to ensure that procurement is accounted for in the project development process.</p> <p>Procurement Highlights:</p> <ul style="list-style-type: none">• Applying systems engineering during project development will support procurement with scope and schedule details, as well as information about required products and services.• Unique aspects of connected vehicle deployment, such as map data and security management, must be factored into project schedules and procurement efforts.• Establishing a common framework for project development that incorporates typical procurement steps can ensure consistency and avoid project delays caused by unanticipated or overlooked procurement activities. | |

Automated Bus Consortium

Reference: *ITS World Congress ALL-ACCESS, Automated Bus Consortium Program and Automated Bus Consortium*

| Challenges Addressed: | Articulate needs | Procure after R&D | Contracting process |
|---|------------------|-------------------|---------------------|
| <p>Description: The Automated Bus Consortium (ABC) was formed in response to growing interest to test automated full-size buses in the wake of successful tests with automated small shuttles and vendor feedback that a sizable order for automated full-size buses would be necessary for cost-effective production. ABC has attracted 12 agency partners that have collaborated with AECOM to engage industry and determine if their vision was feasible. That vision includes a cooperative purchase of 75-100 Level 4, automated full-size buses that will operate with safety drivers under a variety of environments and applications.</p> <p>A two-phased effort has been developed with the first phase focused on feasibility, pilot project scopes of work, specifications, and an electric vehicle charging strategy. The second phase began in 2020 with developing the procurement package while agencies secure funding. Early in 2021, each agency will make a go/no-go decision to move forward with procurement and deployment. Development and testing will continue through 2022 and service is scheduled to begin in late-2023 or early-2024. The consortium is allowing member agencies to combine their purchasing power, share risk, and maximize learning. It is leveraging what each party knows about a topic that is evolving rapidly. This was especially useful for developing the bus specification, which also included industry input from over 50 bus and technology companies.</p> <p>The Michigan Department of Transportation (MDOT) is leading the cooperative purchasing effort. They are working with the Michigan Economic Development Corporation and the Michigan Department of Technology, Management and Budget (DTMB) to engage prospective vendors and manage the bus procurement. DTMB supports routine bus procurements and is familiar with unique requirements associated with federal funding. MDOT will collaborate with other ABC members to develop the solicitation, and MDOT will contract with the vendor(s) for development and manufacturing of the buses. The other ABC member agencies will then purchase directly from the vendor for their desired quantity of buses.</p> <p>Procurement Highlights:</p> <ul style="list-style-type: none">• Consortium approach is combining purchasing power and knowledge to develop specifications for the automated full-size buses.• As the lead procurement agency, MDOT is leveraging their relationship with DTMB and previous bus procurement experience.• MDOT will execute a contract with the selected vendor(s) to develop and manufacture buses and other agencies will purchase their buses directly through that initial contract. | | | |

NYCDOT CV Pilot

Reference: [Connected Vehicle Pilot Deployment Program, Comprehensive Installation Plan – New York City](#)

| Challenges Addressed: | Articulate needs | Contracting process | Unique funding |
|--------------------------------|--|---------------------|----------------|
| Description: | <p>The New York City DOT (NYCDOT) connected vehicle pilot project aims to improve safety with the deployment of vehicle to vehicle and vehicle to infrastructure applications that warn and assist drivers and pedestrians in order to mitigate crashes. The project is one of the largest connected vehicle deployments in the country – with roadside units at more than 300 intersections and after-market safety devices in more than 8,000 vehicles. It is one of three projects funded by USDOT Connected Vehicle Pilot Deployment Program.</p> <p>The Deployment Program required all three projects to follow the systems engineering process. The project scope was developed during a preliminary planning phase and solidified during concept development. From project requirements, design, and operations and maintenance planning, a comprehensive installation plan (CIP) was developed to guide the procurement process and equipment installation.</p> <p>A bill of materials in the plan summarizes the type and quantity of devices, equipment, and software to be acquired (and installed), along with the procurement methods that will be used. Three primary methods of procurement were identified within the parameters of city and state regulations – request for expression of interest (RFEI), competitive sealed bid (CSB), and in-house purchases via master agreement and sole source. Each is summarized with their allowable requisition values and a description of the method. The plan also outlines procurement timing in relation to the overall deployment schedule and includes an outreach plan to engage prospective vendors. Finally, the plan addresses submission of the federally-required tangible property report (SF-428) – an example of a requirement unique to the federal funding that sponsored the project.</p> | | |
| Procurement Highlights: | <ul style="list-style-type: none">• Following the systems engineering process articulated the project scope and identified what would need to be procured within it.• Size and complexity of this deployment effort necessitated a CIP to guide procurement.• Outlining the type and quantities of equipment to be purchased (bill of materials) allowed three distinct procurement methods to be identified.• Time for procurement was specifically factored into the overall deployment schedule to ensure alignment with installation plans.• CIP documents submission of the tangible property report (SF-428), a requirement unique to the federal funding that sponsored the project. | | |

MnDOT Rural ICWS

Contact: Cory Johnson, coryj.johnson@state.mn.us

| Challenges Addressed: | Articulate needs | Procure after R&D | Unique funding |
|---|------------------|-------------------|----------------|
| <p>Description: MnDOT conducted several intersection conflict warning systems (ICWS) projects that culminated in a Rural ICWS project to deploy systems at over 50 intersections throughout the state. MnDOT received \$1.45M in federal funding from the Transportation Investment Generating Economic Recovery (TIGER) 2013 discretionary grant program.</p> <p>Following the systems engineering process, a project plan and concept of operations were developed early in the project to identify the scope of the project, as well as how the project would be managed and funded. The project plan also outlined the contractor support that would be needed for the project and the procurement process that would be used to secure it.</p> <p>The department recognized that innovation would be required to complete the ICWS design and construction, so they opted for a design-build approach for the project. This also allowed for a staged warranty period for the systems based on the installations that were also spread across three years dependent upon funding availability. The design-build contract specified original warranty terms and allowed for up to two optional warranty extensions. This section of the contract is included in Appendix B. During the initial 3-year warranty period, the contractor operated and maintained the systems. A warranty summary of work performed during that period was compiled at the end of the project and offered MnDOT insight on ongoing operation and maintenance to be provided by MnDOT.</p> <p>Procurement Highlights:</p> <ul style="list-style-type: none">• Project plan and concept of operations defined project scope which helped identify the design-build approach for the project.• Warranty contract requirements allowed for initial operation and maintenance of the systems with two optional warranty extensions. | | | |

PennDOT ADS Grant

Contact: Mark Kopko, markopko@pa.gov

| Challenges Addressed: | Articulate needs | Unique funding |
|---------------------------------------|---|-----------------------|
| | <p>Description: The Pennsylvania Department of Transportation (PennDOT) was awarded an Automated Driving Systems (ADS) Demonstration Grant from USDOT in 2019 to explore the safe integration of automated vehicles in work zones. Requirements for the competitive grant application process compelled PennDOT to articulate their needs for this effort by defining a vision, goals and objectives, who their key partners would be, the issues and challenges that would be addressed, the geographic area where the project would take place, their technical approach, and a proposed schedule.</p> <p>The PennDOT grant application and subsequent project features a team of emerging technology partners from other government agencies, consulting firms, academic institutions, and private industry. A variety of contracting methods were used, including intergovernmental agreements with other government agencies and universities, and task orders from existing open-ended agreements with consulting firms.</p> <p>Paid, private industry partners offered unique services and were listed as subrecipients in the grant application. Reimbursement agreements were used with these partners, allowing the federal grant funds to be passed through PennDOT and on to the industry partner as work is completed. Project staff engaged agency chief counsel and budget office staff to determine the best contracting method for partnering with private industry. In anticipation of the grant funding, project staff shared standard contracting language with partners early in the grant application process to allow time in advance for review.</p> | |
| <p>Procurement Highlights:</p> | <ul style="list-style-type: none">• Needs were articulated in project goals and technical approach as required in the grant application process.• Intergovernmental agreements with other government agencies and academic institutions.• Task orders from existing open-ended agreements with consulting firms.• Reimbursement agreement with private industry partners.• Engaged agency chief counsel and budget office to determine best contracting method for private industry partners. | |

MnDOT AIM Grant

Contact: Elliott McFadden, elliott.mcfadden@state.mn.us

Challenges Addressed:

Articulate needs

Unique funding

Description: The Federal Transit Administration (FTA) announced in early 2020 the availability of \$11 million in Public Transportation Innovation funds to support Accelerating Innovative Mobility (AIM) grants. AIM is designed to support innovation throughout the transit industry by promoting forward-thinking approaches to improve transit system service and enhance the rider experience. In preparation for their response to the AIM grant opportunity, MnDOT issued a request for information (RFI) to understand how prospective partners could contribute to a regional mobility as a service (MaaS) platform.

Included as [Appendix C](#), the RFI was used to share the approach that MnDOT planned to propose in the grant application. A series of tailored questions allowed the department to gather industry feedback and better understand how the proposed approach would follow FTA guidelines for procurement processes. This allowed prospective partners to respond within the context of their technology. MnDOT also did not identify the AIM grant in the RFI as they wanted to avoid having the funding source constrain responses and they wanted information from responses to be useable for their approach regardless of the final funding sources used.

The RFI process served as a validation step for MnDOT's project approach to ensure that it was both achievable and desirable. MnDOT received 21 RFI responses from companies in North America and Europe. Responses provided insight on prospective partners and how they could potentially contribute to the proposed approach. The RFI respondents and other companies that contacted MnDOT about the RFI also helped the department build a distribution list of companies to notify when a formal RFP is issued. MnDOT also believes the work that companies did to respond to the RFI will result in higher quality proposals to the RFP.

MnDOT was awarded an AIM grant in August 2020 and the department will next issue an RFP for the services to develop a regional MaaS platform. The RFI and grant writing process made drafting the RFP significantly easier as much of the scope and requirements had already been developed. This also saved time in the procurement process which is critical as the AIM grant requires MnDOT to implement their approach within one year of award.

Procurement Highlights:

- RFI provided an opportunity for MnDOT to validate their proposed approach for a regional MaaS platform as achievable and desirable.
- MnDOT was able to identify prospective partners from the formal RFI respondents and informal inquiries.
- Preparing the project approach for the grant application and RFI saved time when developing content for formal RFP.

5.0 Conclusion

Agency procurement practices will continue to evolve and so will the role of emerging technology in transportation. The case studies and resources highlighted in this report were selected for how they addressed recent procurement challenges identified by ENTERPRISE members. The resources and case studies are intended to help project and program managers, as well as contracting and procurement staff procuring emerging technology for ITS, CAV, and mobility services.

The resources provided guidance on process, specialized information for specific technologies, and examples of procurement training. The resources represent a cross-section of general procurement and technology-specific procurement to help articulate agency needs, identify prospective partners, determine contracting processes, and guide projects through procurement when partnering with emerging technology providers. Case studies were presented in terms of the challenges that they address, and key procurement practices are also highlighted. They include a variety of innovative contracting approaches and project specific applications of different procurement processes.

Key findings from the resources and case studies featured in this report have been formed into both program and project level considerations for agencies as follows.

Program-Level Considerations

- Consider alternatives like the CAV Challenge and Innovative Ideas and initiate discussions with agency procurement and IT staff to understand how they may fit within your agency.
- Talk with contracting and procurement staff to identify existing or develop additional guidance and training, as needed, to address both foundational procurement knowledge and specific knowledge of procurement issues specifically related to emerging technologies.
- Consider meeting periodically with contracting and procurement staff to make them aware of work surrounding emerging technologies and to learn about changes in procurement processes.
- Communicate with contracting and procurement staff about needs in advance whenever possible to foster relationships and knowledge that will be useful when more urgent needs do arise.

Project-Level Considerations

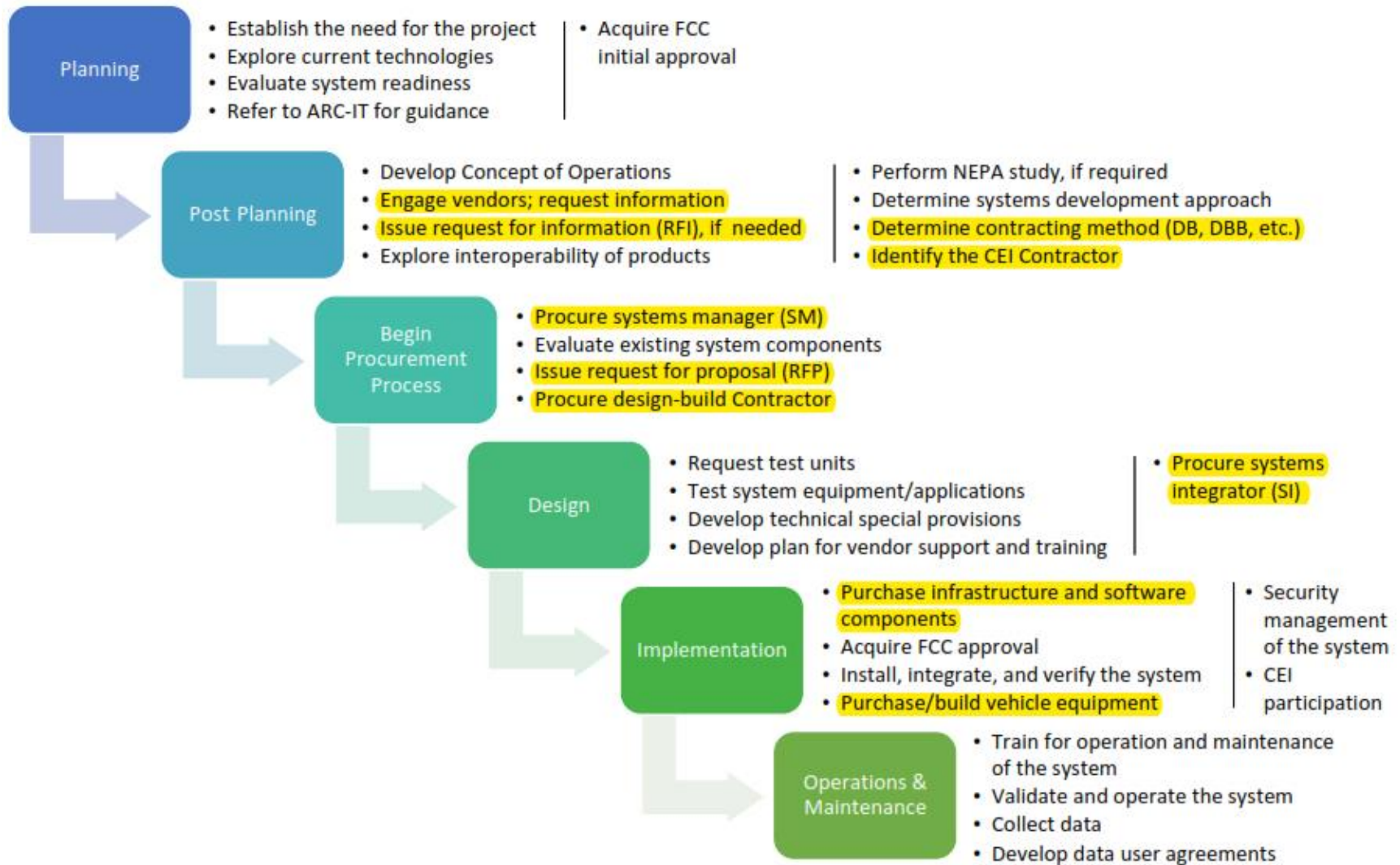
- Contact agency procurement and contract management staff to explore what resources may be available to support foundational procurement knowledge. Such knowledge can be used to inform how scopes of work are developed for projects, to develop working knowledge of available procurement options when networking with prospective partners, and to create an understanding of the value vs. barriers that procurement offers.
- Develop clear project plans – formal or informal – to articulate who is driving the need for a project, what is needed, where it is needed, why, and by when. Then engage procurement staff to mutually determine what procurement options are best for the project.
- Large and complex projects like the NYCDOT Connected Vehicle Pilot Deployment project may benefit from a more detailed acquisition (and installation) plan.
- Network with peers within and outside agencies on related project experiences to help articulate agency needs and model, when applicable, similar procurement approaches.

- Maintain knowledge of prospective partners through information networks to know who is doing what, where, and with whom. This can help identify prospective partners and inform scopes of work when projects arise. Requests for information, when used judiciously, can serve as a similar resource when knowledge is lacking in a specific area.

The most prominent finding from this work is that identifying effective procurement approaches requires the combined knowledge of program and project management staff with contracting and procurement staff so business goals for emerging technologies and unique project conditions can be understood. That mutual understanding will lead to successful procurement and projects with emerging technology partners.

Appendix A: FDOT Project Development and Procurement Framework

Procurement elements highlighted in yellow.



Appendix B: MnDOT Rural ICWS Design-Build Warranty Terms

21 WARRANTIES

21.1 Warranties by Contractor

21.1.1 Project Warranties

Contractor warrants that:

- (a) all design Work furnished pursuant to the Contract Documents shall conform to all professional engineering principles generally accepted as standards of the industry;
- (b) the Project shall be free of defects (including design defects except to the extent that such defects are inherent in prescriptive specifications included in the Contract Documents, unless (i) Contractor has actual or constructive knowledge of such defects and (ii) Contractor fails to request a change thereto by MnDOT);
- (c) materials and equipment furnished under the Contract Documents shall be of good quality and, when installed, shall be new;
- (d) the Work shall meet all of the requirements of the Contract Documents;
- (e) the specifications and/or drawings selected or prepared for use during construction are appropriate for their intended use; and
- (f) the Project shall be fit for use for the intended function.
- (g) on an annual basis, the Contractor and MnDOT will conduct a meeting to review warranty logs and discuss warranty related issues.

21.1.2 Project Warranty Term

21.1.2.1 Original Warranty Terms

The Warranty term shall commence and end as follows:

| Intersection Locations | Warranty Commencement Date | Lighting Warranty Termination Date | RICWS Warranty Termination Date (1) |
|--|--|------------------------------------|-------------------------------------|
| Sites identified in Book 2, Section 1.3.2 | MnDOT Acceptance of turn on test at each Site. | December 1, 2014 | December 1, 2016 |
| Additional Sites installed during the 2013 Calendar year | MnDOT Acceptance of turn on test at each Site. | December 1, 2014 | December 1, 2016 |
| Additional Sites installed during the 2014 Calendar Year | MnDOT Acceptance of turn on test at each Site. | December 1, 2015 | December 1, 2016 |
| Additional Sites installed during the 2015 Calendar Year | MnDOT Acceptance of turn on test at each Site. | December 1, 2016 | December 1, 2016 |

Note (1): Subject to one-year extension per [Section 21.2](#).

21.1.2.2 Optional Warranty Extension #1

Within 60 Days of the RICWS Warranty Termination Date identified in [Section 21.1.2.1](#), MnDOT will notify the Contractor if it elects to extend the warranty on all RICWS systems an additional year to December 1, 2017. Payment for the warranty extension will be made at the price in [Exhibit L](#) (Item:

Warranty Extension #1). Payment will be made within 30 Days of MnDOT’s notification via a Unilateral Change Order per Section 13.

21.1.2.2 Optional Warranty Extension #2

If MnDOT extended the warranty per Section 21.1.2.2, MnDOT reserves the right to extend the warranty until December 1, 2018 at the price in Exhibit L (Item: Warranty Extension #2). Within 60 Days of the termination of Warranty Extension #1, MnDOT will notify the Contractor if it elects to extend the warranty until December 1, 2018. Payment for the warranty extension will be made at the price in Exhibit L (Item: Warranty Extension #2). Payment will be made within 30 Days of MnDOT’s notification via a Unilateral Change Order per Section 13.

21.1.3 Additional Warranty Threshold Requirements

The warranty work is limited to the RICWS system and lighting per the allowable threshold limits identified in the table below. MnDOT will measure and quantify the performance of each RICWS and lighting system via feedback from MnDOT District staff, MnDOT Electrical Services, local roadway authorities, and state and local law enforcement agencies. Contractor may also monitor the Site using non-destructive testing for any Warranty Work required during the Warranty period. Contractor shall provide advance notification to MnDOT of all monitoring dates and times.

The warranted work shall include all materials, equipment, and installation that fail to perform or meet the Project requirements or standards.

During the Warranty period, Contractor will not be held responsible for distresses caused by identifiable factors (e.g. items damaged by others, vandalism, or “Acts of God”) unrelated to materials and workmanship. Upon written request from Contractor and on a case-by-case basis, MnDOT will consider other factors that appear to be beyond the control of Contractor and may relieve Contractor from its Warranty obligations with respect thereto.

| ALLOWABLE THRESHOLD LIMITS AND CORRECTIVE ACTIONS | | |
|--|-------------------------|--|
| Condition Parameter | Threshold Limits | Recommended Action |
| Defect or malfunction that causes any RICWS system components to not function per the system requirements | Any Occurrence | Contractor shall determine the cause, repair or replace, and reinstall the unit. Repairs or replacements of ITS components will be accomplished in accordance with Book 2, Section 17. |
| Defect or malfunction that causes the lighting system components to not function per the system requirements | Any Occurrence | Contractor shall determine the cause of the malfunction onsite and repair or replace the unit. Repairs or replacements of ITS components will be accomplished in accordance with Book 2, Section 16. |

21.1.4 Corrective Work

MnDOT will notify Contractor of any failure of any of the Work that is Contractor’s, or any Subcontractor’s, responsibility to correct under the terms of the Warranty. Contractor shall correct any areas which exceed the warranty threshold limits established for the Project. MnDOT may require corrective actions at any time within the Warranty period.

For all corrective actions required, Contractor shall visit the site, determine the cause, and correct all warranty work within 72 hours of MnDOT's notification. If the warranty Work cannot be started then because of seasonal limitations, Contractor must so notify MnDOT and submit (for MnDOT approval) a schedule for completion of the corrective action Work.

If Contractor does not use its best efforts to proceed to effectuate that corrective action Work within the required time, MnDOT, after notice to Contractor, shall have the right to perform or have performed by third parties the necessary remedy, and the costs thereof shall be borne by Contractor. If MnDOT determines that emergency repairs are necessary for public safety, MnDOT may perform the corrective Work. Any such emergency repairs will be authorized by MnDOT's Project Manager, or his/her representative. Prior to making the emergency repairs, MnDOT will document the basis for the emergency action, and will preserve evidence, such as photographs or videotapes, of the defective condition. Emergency repairs will be coordinated with Contractor when possible. All costs associated with the emergency repairs that are covered by the Warranty Work shall be borne by Contractor.

If the warranty work requires closing any traffic lanes, the contractor shall obtain approval from MnDOT.

The Contractor shall replace any component that the Contractor has repaired or has failed more than once.

The contractor shall document in the warranty work performed in a warranty log. The log shall include the date of the corrective work, names of technicians performing the work, cause of the failure, testing performed, listing of parts repaired/replaced, and any other information related to corrective action taken. Contractor shall provide a copy of the warranty log to MnDOT within 72 hours of MnDOT's request.

21.1.5 Costs of Correction of Work

All costs of correcting Work, including additional testing of the system component, shall be deemed included in the Contract Price. Contractor shall reimburse MnDOT and pay MnDOT's expenses made necessary thereby within 30Days after Contractor's receipt of invoice therefore. Contractor shall be responsible for obtaining any required Governmental Approvals or other consents from any other Person in connection with the Warranty Work.

If a system is damaged by means beyond the Contractors control, if ordered by MnDOT, the Contractor shall make the system operational, with the repair cost paid by MnDOT in accordance with Book 1, Section 13.

21.1.6 Not used

21.1.7 Warranty Close-out

Between 30 and 90 Days prior to the RICWS Warranty termination date listed in Section 21.1.2.1, the Contractor shall conduct a turn-over test for each Site per Test Case 7 of the Test Plan (Book 2, Section 17, Exhibit 17-C). If the system does not pass this test, the Contractor shall continue to perform all necessary repairs and re-test per Test Case 7 until the system passes.

- (a) All components repaired or replaced shall meet the Contract requirements.
- (b) Repairs shall be made within 14 Days of the failed test unless otherwise agreed to by MnDOT.
- (c) No Liquidated Damage will be assessed for the test and one re-test. MnDOT will assess a monetary deduction of \$2,000/test for each subsequent re-test.

If MnDOT elects to extend the warranty per Section 21.1.2.2 and/or 21.1.2.3, Contractor shall conduct turn-over tests per each Site in accordance with the criteria listed above. These tests shall be conducted between 30 and 90 days prior to each optional warranty termination date. Liquidated damages will also be assessed per forementioned requirements of this section.

Appendix C: MnDOT RFI for Regional Mobility as a Service Platform

State Contracts

Minnesota State Board of Investment 60 Empire Drive, Suite 355-3555
St. Paul, MN 55103

minn.sbi@state.mn.us

All proposals must be received at the address listed above on or before 3:00 P.M. Central Time on June 16, 2020. NO PROPOSALS RECEIVED AFTER THAT DATE AND TIME WILL BE CONSIDERED.

Minnesota Department of Transportation (MnDOT) Office of Transit and Active Transportation (OTAT) Request for Information (RFI) for Regional Mobility as a Service Platform

1.0 Description

1.1 The Office of Transit and Active Transportation (OTAT) in support of its Greater Minnesota Shared Mobility Program is seeking information on how an interested contractor could help build all or part of a Regional Mobility as a Service Platform (MaaS).

The purpose of this RFI is to solicit feedback from technology experts and other stakeholders on the building of a Regional MaaS. OTAT is exploring piloting a Regional MaaS in partnership with select Greater Minnesota transit agencies and private shared mobility service providers as a proof of concept to build a statewide platform. The MaaS platform would allow residents and visitors to plan trips, purchase and redeem fare/tickets, and receive real time updates on trip status on public transit and private sector shared mobility providers. In addition, vehicle routing, projected and real world trip data, and ridership information generated by this platform will be used to assist local, regional, and state planners and policymakers on transit service changes and public policy changes to improve service delivery and operational efficiency.

The Regional MaaS platform will cover up to six transit agencies with varying sizes and service levels from robust, regular fixed route service to completely on-demand trip delivery. Private sector providers on the platform may include the following services: intercity and regional commuter buses, microtransit, paratransit, health and human services transportation, taxi, TNCs, carshare, and microtransit (bike and scooter share.)

Components of the MaaS platform should include:

1. consumer facing trip planner, booking, trip status and account management application;
2. management of data feeds and data transfer including GTFS, GTFS-RT, GTFS-Flex, and third party application APIs and SDKs;
3. process to assist transit agencies and private bus providers in implementing and maintaining GTFS, GTFS-RT, and GTFS-Flex feeds;
4. e-ticketing system for transit agencies and private bus providers and accompanying SDK for MaaS platform; and
5. data analysis and planning tool that will allow transit agencies, regional planners, and MnDOT to view historic ridership and trip trends by periods as short as hourly and model impact of change in service.
6. Optional component for this information request: On-demand/microtransit booking and dispatching software. All transit agencies with on-demand services in the initial Regional MaaS are expected to already have deployed dispatching software. This solution will be needed for agencies without existing software providers in a statewide MaaS build out.

OTAT is looking for solutions that incorporate recognized and developing industry standards (such as GTFS) wherever possible and support open sources of data wherever possible to allow ongoing innovation in mobility and to build MaaS features that can be used on other platforms. Solutions should be designed to be scalable to a statewide

State Contracts

deployment covering dozens of transit agencies of various sizes and service types.

1.2 THIS IS A REQUEST FOR INFORMATION (RFI) ONLY. This RFI is issued solely for information and planning purposes – it does not constitute a Request for Proposal (RFP) or a promise to issue an RFP in the future. This request for information does not commit the MnDOT OTAT to contract for any supply or service whatsoever. Further, the MnDOT OTAT is not at this time seeking proposals and will not accept unsolicited proposals. Responders are advised that the MnDOT OTAT will not pay for any information or administrative costs incurred in response to this RFI; all costs associated with responding to this RFI will be solely at the interested party's expense. Not responding to this RFI does not preclude participation in any future RFP, if any is issued. If a solicitation is released, it will be posted on the MnDOT Transit website and the Minnesota State Register. It is the responsibility of the potential offerors to monitor these sites for additional information pertaining to this requirement.

2.0 Background

2.1 Planned Production:

OTAT would work with selected vendor(s) to develop and implement a regional MaaS for a test period of at least one year after launch. With OTAT as the project lead, representatives from OTAT, participating transit agencies and private shared mobility providers, and selected vendor(s) will form a working group that will meet regularly throughout the project to ensure all participating entities have what they need and the project remains on schedule. Depending on the final project plan adopted by the working group, components of the MaaS may be developed and released in phases or all at one time. After initial release, the working group will continue to meet to address platform improvements, need for additional features, and the status of key performance indicators established at the beginning of the project.

2.2 Delivery Period:

Once project vendor(s) are selected, the goal of the project will be to deliver all components of the MaaS as outlined in Selection 1.1 in no later than 9 months. Components may be delivered separately earlier than this date.

2.3 Limitations:

Software solutions must use industry data standards (such as GTFS) instead of proprietary data standards wherever it is practical. Solutions should seek to be as open source and as interoperable as possible. Where open source is not possible, solutions should be developed to be interoperable with existing providers as part of a vendor's offering.

2.4 Security Requirements:

All solutions must protect the privacy of MaaS platform users and follow applicable state and federal privacy laws. Components of the system that pertain to financial transactions must be PCI compliant and remain so for the duration of project, including security upgrades as PCI guidelines change. With the exception of established open source data, each component of the MaaS platform must protect the data ownership rights of each transportation provider and allow the owners of this data to opt-in/opt-out of sharing data sets per agreed upon terms at the start of the pilot.

3.0 Requested Information

3.1 Category 1: Technology Solution:

1. The MaaS could address a regional platform to allow transportation users the capability to interact with various providers, as described in Section 1.1. Are all of the technology options addressed? What limitations or needs were not addressed or should be included?
2. How can proposals account for providing the data standards or data sharing access it would need to access booking, vehicle route and location information, and dispatching information for consumer facing applications?

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3. How can proposals account for protecting MaaS platform users financial and personal data in daily operational use? How can proposals address this privacy protection in data sets that are shared with local and agency planners for policy building analysis? How can proposals address the collection and analysis of data while complying with privacy laws and best practices while also conforming to state and federal freedom of information laws?
4. How can proposals account for obtaining and maintaining trip and ridership data from all the transportation service providers involved while protecting their rights to the data? How can proposals address needs for data access to be time limited based on either data sharing agreements or operational best practices? How can proposals address this collection and analysis of data sets while also conforming to state and federal freedom of information laws?
5. There is interest in making components of the MaaS platform (system data feeds, ticketing and dispatching software API and SDK, etc) as interoperable as is possible with not just the consumer facing MaaS app in this project but other platforms developed by public and private sector entities. What are the limitations and needs to allow this type of interoperability? What factors should a proposal address in the development and ongoing maintenance of such a system?
6. For public and private bus systems that have not yet implemented data standards like GTFS, how can proposals address the need for these systems to develop, deploy, and maintain data feeds using these standards to communicate with the MaaS platform?
7. How can proposals take into account cost and benefit differences between using an established, existing MaaS platform versus a custom built white label platform?
8. For data analysis and planning tools, how can proposals address the need for data standards from other components of the platform? How can proposals incorporate the need for taking massive, often complex data sets from transit and bike share feeds, on-demand trip information from dispatching software, and search and booking information from the consumer app to display meaningful information for transportation planners to understand historic trends and model future service changes?
9. For transit systems with existing dispatching software, how can proposals address the need for interoperability with the consumer facing application and data analysis software? How can proposals incorporate data standards and a desire for the use of open source data to address the need for interoperability?
10. For transit systems that do not have dispatching software for on-demand services, how can proposals address the need for implementing such services including driver and dispatcher training, system booking rules, and interoperability on the MaaS platform?
11. Deploying a Regional MaaS requires developing a technology ecosystem that allows the free flow of information across many different software systems with many different functions. How can proposals address the need to manage this ecosystem and ensure all the parts are communicating as needed? How can proposals incorporate data standards and an open source approach to interoperability and what are benefits and limitations to such an approach? How can proposals address the need to establish and maintain a high quality of data between components and ensure data such as vehicle location, service schedule, and fare price remain accurate over time?
12. Do the proposed Regional MaaS description and background sections above provide sufficient information to inform proposals? If not, what additional information would be helpful?

Category 2: Evaluation:

1. How can MnDOT OTAT evaluate proposals on the basis of:
 - a. Inclusiveness?
 - b. Product feasibility?
 - c. Expected integration of Products?
 - d. Ability to deliver desired functionality within the project timeline?
 - e. Utility and function of the solution beyond the initial project timeline and to scale to a statewide platform?

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2. What evaluation criteria are most important when considering how proposals can best achieve a regional MaaS platform?
 - a. Description of how residents and visitors can access and plan trips, purchase and redeem fare/tickets, and receive real time updates on trip status on public transit and private sector shared mobility providers
 - b. Demonstration of a realistic understanding of users and their unique needs
 - c. Demonstration of the technology needs and explaining how the team arrived at that determination of need
 - d. Determination of the potential cost and manufacturability
 - e. Thorough description of the user experience when the technology is implemented
 - f. Consideration of a range of needs and limitations, including users in a range of geographic contexts, and with and without access to a smartphone or bank account.
 - g. Other criteria

3.2 Customer reference for similar project cost

If available, the vendor should provide the contact information for customers for whom they have done a similar project awarded through competitive bidding. Vendors may reference price in their response only if this information is publicly available as part of a standard project pricing.

4.0 Responses

4.1 Interested parties are requested to respond to this RFI in written format. Responses may include answers to all of the questions in Section 3 or address any combination of information requested.

4.2 Written information regarding this request are **due no later than 11:59:59 CST, May 4, 2020**. Responses shall be limited to 10 pages and submitted via e-mail only to

Elliott McFadden,
elliott.mcfadden@state.mn.us

If a responder submits information in response to this RFI that it believes to be trade secret materials, as defined by the Minnesota Government Data Practices Act, Minnesota Statutes §13.37, the responder must:

- Clearly mark all trade secret materials in its information at the time it is submitted;
- Include a statement justifying the trade secret designation for each item; and
- Defend any action seeking release of the materials it believes to be trade secret, and indemnify and hold harmless the state, its agents and employees, from any judgments or damages awarded against the state in favor of the party requesting the materials, and any and all costs connected with that defense. This indemnification survives MnDOT's award of a contract. In submitting an informational response to this RFI, the responder agrees that this indemnification survives as long as the trade secret materials are in possession of MnDOT. MnDOT is required to keep all the basic documents related to its contracts, including responses to RFPs, for a minimum of seven years.

Please be advised that all submissions become MnDOT OTAT property and will not be returned.

4.3. Responders shall provide administrative information, and shall include the following as a minimum:

4.3.1. Name, mailing address, phone number, and e-mail of designated point of contact.

4.3.2. Business type (large business, small business, woman-owned small business, veteran-owned small business, targeted-group business owned). Responders are cautioned, however, that this is a general description only.

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5.0 Industry Discussions

Respondents are advised that MnDOT OTAT is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI. Responses to this RFI do not bind MnDOT OTAT to any further actions related to this topic. MnDOT OTAT representatives may or may not choose to meet with potential offerors. Such discussions would only be intended to get further clarification of potential capability to meet the requirements, especially any development and certification risks.

6.0 Questions

Questions regarding this RFI shall be submitted in writing by e-mail to the Elliott McFadden, elliott.mcfadden@state.mn.us. Verbal questions will NOT be accepted. Questions will be answered by posting the question, verbatim and supplying responses to the MnDOT Transit website; accordingly, questions shall NOT contain proprietary or classified information. The MnDOT OTAT does not guarantee that questions received after May 1, 2020 be answered. To access the MnDOT OTAT website, go to <http://www.dot.state.mn.us/transit.html>.

7.0 Summary

THIS IS A REQUEST FOR INFORMATION (RFI) ONLY to identify information on how an interested contractor could help build all or part of a Regional Mobility as a Service Platform (MaaS). The information provided in the RFI is subject to change and is not binding on the MnDOT OTAT. The MnDOT OTAT has not made a commitment to procure any of the items discussed, and release of this RFI should not be construed as such a commitment or as authorization to incur cost for which reimbursement would be required or sought. All submissions become MnDOT OTAT property and will not be returned.

Minnesota Department of Transportation (MnDOT) Engineering Services Division Notices Regarding Professional/Technical (P/T) Contracting

P/T Contracting Opportunities: MnDOT is now placing additional public notices for P/T contract opportunities on the MnDOT's Consultant Services website. New public notices may be added to the website on a daily basis and be available for the time period as indicated within the public notice.

Taxpayers' Transportation Accountability Act (TTAA) Notices: MnDOT is posting notices as required by the TTAA on the MnDOT Consultant Services website.

MnDOT's Prequalification Program: MnDOT maintains a Pre-Qualification Program in order to streamline the process of contracting for highway related P/T services. Program information, application requirements, application forms and contact information can be found on MnDOT's Consultant Services website. Applications may be submitted at any time for this Program.

MnDOT Consultant Services website: www.dot.state.mn.us/consult

If you have any questions regarding this notice, or are having problems viewing the information on the Consultant Services website, please call the Consultant Services Help Line at 651-366-4611, Monday – Friday, 9:00am – 4:00pm.