ENTERPRISE

ENTERPRISE Program
FY 2010 Work Plan

Project Ideas Approved December 2009

Prepared for the

ENTERPRISE Pooled Fund Study

Prepared by

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March 3, 2011

Program Overview

The ENTERPRISE Program represents a forum for collaborative Intelligent Transportation Systems (ITS) research, development, and deployment ventures reflecting the interests of governmental entities and industrial groups. This forum also facilitates the sharing of technological and institutional experiences gained from individual ITS projects conceived and initiated by each participating entity. The intent is to use a pooled program as a mechanism to support jointly-sponsored ITS projects of shared interest. These projects form this annual ENTERPRISE work plan. The scope of the ENTERPRISE Program promotes North American ITS development, reflecting the active involvement of U.S. and Canadian member agencies. ENTERPRISE also seeks to take advantage of technologies being developed outside North America. ENTERPRISE's European member is the Dutch Ministry of Transport, Rijkswaterstaat.

ENTERPRISE has approved a number of work plans since its inception in 1991 and completed nearly 50 projects. Each project has followed the vision of ENTERPRISE which defines the program's global view of highway travel. ENTERPISE aims to be consistent with the vision of higher bodies, such as ITS America and ITS Canada, concerning the development and use of ITS technologies and the benefits that this will bring. ENTERPRISE envisions a highway system in which advanced technologies continue to support the safe, efficient, convenient, and socially and environmentally sound movement of people and goods. Complete details on previous work plans and individuals projects are available through the program website at: http://enterprise.prog.org/.

Financial Status

ENTERPRISE North American members contribute $30,000 or more annually to the pooled fund and are reimbursed for program travel. Non North America members contribute $25,000 or more per year to the program and are not reimbursed by ENTERPRISE for program travel expenses. In FY 2010 (October 1, 2009 through September 30, 2010), 12 member agencies contributed financially to the projects included in this work plan.

Projects

During 2009 member agencies submitted project ideas for this FY 2010 Work Plan. The initial project ideas were reviewed by the ENTERPRISE Executive Board and a selected number of projects were approved for development of full project proposals to describe the project ideas in additional detail. The project proposals were then reviewed and voted on by the board and finally approved at the December 2009 Executive Board meetings as projects for the FY 2010 Work Plan. Complete details on the project selection process can be found in the ENTERPRISE Management Plan which is posted on program website: http://enterprise.prog.org/.

The following table summarizes the voting results and estimated project costs to complete the five approved projects.

Table 1: FY 2010 Work Plan Funding Plan

Expense	Estimated Costs	
2010 Projects		
Project 1: Developing Consistency in ITS Safety Solutions – Intersection Warning Systems	$ 135,000	
Project 2: Impacts of Travel Information on the Overall Network	$ 40,000	
Project 3: Next Generation Traffic Data and Incident Detection from Video	$ 325,000*	
Project 4: Crashworthiness and Protection of ITS Field Devices	$ 45,000	
Project 5: Warrants for ITS Devices Phase 3	$ 20,000	
Program Administration Support	$ 5,188**	
Transition Period Operating Costs	$120,000***	
Revenue		**Estimated Revenue**
Member Annual Contributions to Michigan DOT Pooled Fund		$259,990
Member Annual Contributions to Iowa DOT Pooled Fund		$120,000***
Project Specific Contributions from Members		
Project 1 – FHWA		$50,000****
Project 3 – Ontario		$125,000
Project 3 – Transport Canada		$125,000
Project 5 – Ontario		$20,000
Total (Revenue vs. Expenses)	**$690,188**	**$699,990**

**The ENTERPRISE Pooled Fund approved contribution to Project 3 is $75,000. If the estimated revenue for Project 3 is not identified, the project will be scaled back.*
*** Program Administration Support of $5,188 covered 1 month of support.*
**** During the 15 month transition period of the Pooled Fund from Iowa to Michigan, $120,000 of funds were sent to Iowa DOT ($30,000 from: VA, WA, IA, AZ) to cover expenses for the four group meetings and any program wrap up costs. The remainder of unused funds (still to be finalized) will be rolled in to the 2011 Work Plan.*
*****Amount to be finalized.*

The states will be directly involved with finalizing contractor cost estimates, scopes of work and schedules for each of the projects to ensure concurrence with the final mix of projects contracted for this work plan.

Additional project details for the approved projects are included on the following pages.

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2010 Work Plan

2010 Project #1: Developing Consistency in ITS Safety Solutions – Intersection Warning Systems

Project Background, Summary, and Objectives:

Intersection crashes account for many fatal and serious crashes in the United States. Many Strategic Highway Safety Plans provide for:

- Improving the Design and Operation of Highway Intersections

Some of these plans contain elements to use ITS applications to aid in addressing these activities. To facilitate deployment it is desirable to keep the cost of these applications as low as practical. These low-cost ITS safety solution systems include intersection warning systems and intersection collision avoidance systems.

It is envisioned that the MUTCD will provide a standard for the design and operation of the sign displays for these low cost ITS safety solution systems.

The objective of this project is to develop a consensus between agencies for an accelerated uniform deployment of low cost ITS safety solution projects. This consensus will be developed by facilitating two workshops.

Scope of Work with Task Descriptions:

Task 1 – Documenting the Safety Needs for Intersection Collision Warning Systems

Task 1 will synthesize the results of safety studies that document risk factors that contribute to the need for intersection warning systems. In addition, Task 1 is expected to facilitate one or more webinars with representatives from states that have deployed warning systems to document the risk factors and decisions that led to the deployments.

Task 1 will serve two key roles in the project:

- It will assemble critical information to be shared during the in-person workshops to ensure that discussions about the intersection warning systems are 'grounded' in the safety needs that have been identified by those states that have deployed systems; and

- It will assemble the logic that will eventually help to build 'Warrants' to help others state, county and local agencies determine if and where intersection collision warning systems are appropriate for deployment.

Task 2 - Develop a matrix of system types

Efforts in Task 2 will build upon the 'safety needs' documented in Task 1, and assemble a matrix of different approaches to intersection collision warning systems. The contractor will develop a comprehensive listing of low-cost safety solutions systems that have been deployed. This listing shall include, at a minimum:

- Agency and individual contact for system(s) deployed;
- Type of system (e.g. 'Who' does the system alert (mainline or cross street)? Where does the system alert drivers (upstream or at the intersection)? What message does the system display?);
- Technical approaches used for each type of system.

The consolidated information will be gathered as a matrix describing the various systems, and recommend the system types to be included in the workshops described in Task 3 and Task 4. These system types include, but are not limited to: intersection warning systems, intersection collision avoidance systems, etc.

The matrix shall include at a minimum:

- Theory of operation of each system type;
- Any deployment warrants or guidelines that have been developed;
- Any reports or documented traffic performance or crash data information;
- Any available standards for the operation of the system;
- Standards for all signs/displays used; and
- Relation of these systems to the National ITS architecture.

One or more webinars are anticipated during Task 1. The intent of the webinars is to accomplish as much briefing and background information sharing in order to allow for very effective and efficient use of the time during the Workshops.

Task 3 – Hold Workshop #1 and Workshop #2

Workshop #1: Problems and Issues

Hold a facilitated workshop with the appropriate stakeholders identified to be critical to a discussion about advancing requirements for intersection warning systems. The goals of this workshop are to:

- Share knowledge and educate each other on the needs driving the warning systems;
- Agree to a comprehensive list of 'types' of systems to be discussed in the workshops;
- Identify problems, issues, successes with deployments
- Review the agenda for the second workshop and identify action items for each workshop attendee to perform in preparation for the second workshop (e.g. gathering input and feedback from their respective state based on their needs and experiences)

Workshop #2: Solutions

Hold a facilitated workshop with attendees from Workshop #1 three months after Workshop #1. The goals of this workshop are to:

- Establish a process to facilitate inclusion of the systems identified into the federal Manual on Uniform Traffic Control Devices (MUTCD);
- Establish a process to facilitate development of application warrants for the systems; and
- Establish appropriate measures of effectiveness and data needs for each system type to facilitate direct comparison of systems regardless of jurisdiction.

Subtasks for the workshops include at least:

1. Recommend time and location of each workshop.
2. Recommend participants of the workshop, including the agencies and individuals identified in Task 1 (ENTERPRISE board members, traffic, safety, and ITS engineers, local agencies, etc.) and other groups or individuals that would aid in achieving the workshop goals. These may include groups/agencies such as FHWA, ITE, AASHTO, etc.
3. Pay travel related expenses for workshop participants.
4. Recommend process used for the workshop to insure that consensus is reached to achieve the workshop goals.
5. Hold the workshops including scheduling, securing facilities, inviting all participants, hosting the workshops, etc.
6. Complete and publish the proceedings from each workshop including the plan to achieve stated goals.

Task 4 – Recommend Application Guidelines for each System Type

This task includes the review of existing guidelines collected during task 1 and task 2 development of a composite set of guidelines that include theory of operation; deployment warrants, design guidelines; maintenance and operations guidelines or procedures and any documented traffic performance or crash reduction results. These guidelines should also include recommendations for design details for the signs and/or displays. The interim and final report will be developed during this task.

The intent is that the deliverable of Task 4 will be a document that all attendees of the workshops have reached consensus on, and agree with. It is also the intent that the deliverable will serve as a formal recommendation / suggestion for inclusion in the MUTCD (pending discussion of the state representatives at the workshop).

Project Schedule at the Task Level:

Task 1 – 2 months
Task 2 – 1 month
Task 3 – 6 months
Task 4 – 2 months

Project Deliverables:

A complete listing of agencies and the low-cost safety solutions systems that have been deployed developed under Task 1 along with the matrix developed under Task 2.

Hold the consensus building workshops detailed in Task 3. Proceedings of the workshop including the plan to achieve the workshop goals.

Interim and Final Report that lists existing deployments of low cost ITS safety solution systems. This report shall include at a minimum:

- System type (intersection warning, etc.);
- Theory of operation of each system;
- Any deployment warrants or guidelines that have been developed or are being used by the agency;
- Any documented traffic performance or crash reduction results and analysis;
- Detailed design standards for the signs and/or displays used;
- Maintenance and operations guidelines or procedures
- Detailed design standards for control equipment and operational guidelines for each system;
- Details on installation (ease of deployment), maintenance (durability), and costs of the systems;
- Recommendations for which system(s) appear to be most effective.
- Draft language for revisions to the MUTCD based on findings for the standard designs for signs and displays.

Project Cost Detailed at the Task Level:

Task 1 - $20,000
Task 2 - $15,000
Task 3 - $30,000
Task 4 - $20,000

Relationship to Similar Activities and Projects If Known:

States where it is known to have ITS safety solutions installed include: Maine, Pennsylvania, North Carolina, Michigan, Kansas, Missouri, Wisconsin and Minnesota.

FHWA, Office of Safety has a contract with SAIC to develop a business plan for the design and deployment of Intersection Safety Systems. The consultant has many of the details needed to complete this project.

Project Participants (Agencies):

Minnesota DOT, Illinois DOT, Iowa DOT, Idaho Transportation Department, Michigan DOT and Kansas DOT

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2010 Work Plan

2010 Project #2:
Impacts of Travel Information on the Overall Network

Project Background, Summary, and Objectives:

A variety of methods and tools are used to inform travelers about conditions on the roadway. Many ENTERPRISE member states now display travel time messages on DMS signs, describe traffic flow conditions on Internet map displays, and alert travelers to crashes, delays or other events using a combination of phone, web, and en-route tools.

The extent of this impact is not clearly understood. While the public response to these disseminations has been very positive, there remains little solid evidence about the travel pattern changes caused by these messages or the impacts on other routes in the network.

In Minnesota, for example, anecdotal evidence gained from observing CCTV cameras along Northbound Hwy 77 during peak morning periods indicates that in situations where the freeway slows significantly, it appears that less travelers are diverting off Hwy 77 (on to I-35E) when they view the travel time report. This suggests that without travel time information travelers tend to overestimate delays when they see traffic congestion and often divert to other routes. However, by viewing reports of the travel times, travelers may be more inclined to choose to stay the course on their current path.

Therefore, this project will address the challenge that the ITS industry lacks a solid understanding of the impacts travel information has on driver behavior. Based upon the ENTERPRISE Travel Time Best Practices project, in nearly every state deployed, the travel time reports have received very positive feedback, and perhaps the value lies in informing travelers of conditions ahead, regardless of whether they divert. However, if the reports are causing trip diversions, or more specifically if travel time reports exceeding certain thresholds are causing diversions, then understanding this (and the likely impacts on main-line traffic and alternate routes) will be critical to managing traffic.

The benefit of addressing this problem, and understanding the relationship between travel information dissemination and the travelers' diversion habits, is that ENTERPRISE states will better be able to manage the transportation network if they understand the impacts that the information dissemination will have on travel patterns. This may include adjusting ramp meter rates or parallel arterial signal timings whenever considerable diversions are expected.

The objective of the project is to understand the impacts of travel Information dissemination on the overall operations of an urban transportation network. For example, posting a travel time that reflects 'normal' driving conditions may not cause much deviation. However, posting a travel time that reflects 15 minutes of delay may cause a high percentage of vehicles to exit and divert their route. Once the network impacts of traveler information are understood, traffic management can be performed. For example, an agency posting a travel time message that reflects a 15 minute delay could then anticipate the volume of traffic expected to exit at the next off-ramp, and adjust the signal timings on parallel arterials to accommodate the change in network behavior.

Scope of Work with Task Descriptions:

Task 1: Develop Data Collection Plan

Efforts in Task 1 will work with participating ENTERPRISE member states to develop a detailed data collection plan. The intent of this plan will be to define the specific activities to be performed and the detailed data to be collected. The goal will be to collect as much data as is practicable with the limited project funds. The data collection plan will describe the procedures and processes to be followed to collect the data (both in real-time and through retrospective analyses of archived data).

With the limited funds of the project, there will not be extensive field collection of new data, but rather the project will rely upon archived data (for DMS displays) within member states or collect data from observing travel information dissemination on the (for Internet or phone systems). The number of member states participating will be based upon the interests of member states (they may opt to participate in providing data or participate and not provide data). In general, the states providing data would ideally have some data in the form of archives of travel information dissemination (e.g. what messages were displayed on DMS signs, what messages were disseminated over phone or Internet) or the ability to observe these disseminations in real-time, and archives of traffic volumes on mainline and ramps downstream of events. In some cases, data for events could be collected during this project to supplement any archived data, or to capture behaviors in states without data archived.

Once a draft Data Collection Plan is developed, the project team will meet to discuss the data collection plan, both in regards to the feasibility of performing all the activities in the plan, as well as in regards to whether execution of the plan will result in the necessary data being collected.

Task 2: Data Collection and Processing

Efforts in Task 2 will perform the data collection and processing necessary to assemble the information that will be analyzed in later tasks. The data collection (to be detailed in the data collection plan) is expected to consist of gathering data already archived in the ITS systems (for example both Minnesota and Washington have indicated they have archives of the travel information and traffic volume data), and through observations of data displayed on Internet or phone systems. Traffic volume data will

typically come from archives of traffic counters (e.g. there is no budget for field data collection). Two key 'types' of data will be collected:

- Travel information messages – will be collected to allow the research to document what messages were disseminated to travelers, using what mechanisms, and at what times; and
- Traffic count data – will be collected for key sensor stations surrounding the incident/event or DMS location (in the case of DMS displays) in order to understand the traffic flows and diversions. Again, traffic data would come from archived data sets and not collected through field observations in this project.

The activities in this task will mostly involve liaisons with ENTERPRISE member agencies to regularly transfer the data described above, or observations of data on the Internet. The intent is not to duplicate efforts already performed by agencies to gather and store the data, but simply to transfer the data so it may be used by the project, and assemble and label the data for use throughout the project.

Task 3: Data Analysis and Conclusions

Efforts in Task 3 will involve detailed analysis of many aspects of the data. The intent of Task 3 is to determine if patterns of travel behavior changes can be detected when travel information is performed. In order to complete this task, the project will approach the analysis from two distinct perspectives, defined as follows:

Perspective #1: Analysis of Overall patterns of Change

For Approach #1, the data from all routes examines will be analyzed with a comprehensive view. The intent will be to reach a decision about the general traveler behavior changes when travel information is disseminated. For example, this analysis will look at all messages posted (i.e. all travel time messages at all locations), and all volumes to determine if patterns are evident that diversions result from travel time messages.

The results of Approach #1 to the data analysis will help ENTERPRISE members understand the overall behavior change influenced by travel information dissemination.

Perspective #2: Analysis of Location Specific Patterns of Change

For Approach #2, each individual route/segment for which data is collected will be analyzed to determine if there are specific response patterns that differ according to the locations. For this analysis, individual segments will be examined independently, and characteristics such as alternate routes, other options and distances to destinations will be considered.

The results of Approach #2 in the data analysis will be to help ENTERPRISE members understand two distinct concepts:

- The driver behavior influences that travel information has on specific routes (e.g. 'do travel time messages on Route AA cause travelers to migrate to alternate routes?'); and

- The contributing factors for routes where driver behavior is influenced by travel information messages (e.g. 'What are the diversion patterns for routes where the destination are is more than 10 miles away and there is a limited access road as an alternative?')

Project Schedule at the Task Level:

Task	Months from Notice to Proceed											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Data Collection Plan												
2. Data Collection and Processing												
3. Data Analysis and Conclusions												

Project Deliverables:

Task	Deliverables
1. Data Collection Plan	- Draft Data Collection Plan - Final Data Collection Plan
2. Data Collection and Processing	- Data sets assembled into comparative spreadsheets - Monthly updates of data collection progress
3. Data Analysis and Conclusions	- Data Analysis and Preliminary Results - Final Report of Study Findings

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Project Cost Detailed at the Task Level:

Task	Costs
1. Data Collection Plan	$5,000
2. Data Collection and Processing	$25,000
3. Data Analysis and Conclusions	$10,000

Relationship to Similar Activities and Projects If Known:

This project is a logical next step to the ENTERPRISE Travel Time Dissemination Best Practices project completed in 2007-2008.

This project could provide insight to the ENTERPRISE Warrants Project, by better understanding the impacts of Travel Information devices (e.g. DMS) that are covered by the ITS Warrants.

Project Participants (Agencies):

WSDOT will serve as the project lead, with close involvement from Rijkswaterstaat.

Other ENTERPRISE members who wish to participate may contribute data (to be analyzed), or may participate in the data analysis (whether or not they contribute data).

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2010 Work Plan

2010 Project #3:
Next Generation Traffic Data and Incident Detection from Video

Project Objective:

Site I. To explore potential advantages of 3-D vector-based object recognition in capture of traffic data and incident detection.

Site II. To explore potential advantages of 3-D vector-based object recognition in capture to validate the MTO Roadway Animal Detection System (RADS). Portable matrix message signs in advance of area and flashing warning signs would be triggered once wildlife is detected. Incorporate radar based traffic detection and measurement. The development of all these apparatuses and applications would envelope a strong tool kit for wildlife detection.

Strategy/Tasks:

1. Within 4 weeks of the start of the project, to develop a detailed work plan identifying deliverables including sub-components (such as object type, weather, learning software). To identify schedule for progress reports.
2. Develop 3-D vector-based tracking software
3. Install cameras at site(s)
4. Install radar based RTMS G4 at strategic roadside areas along test bed to develop vehicle detection and measurement.
5. Identify performance measures for both sites.
6. Develop demos of finished work with user-friendly interface
7. Maintain record of incident detection
8. Develop final report and presentations

Desired Deliverables/Outcomes (more comprehensive plan to be developed by contractor):

Site 1

Install cameras a) at the existing Highway 400 SIPC site OR other convenient location (such as suburban mall around contractor's offices) and demonstrate capabilities and advantages to 3-D vector-based object recognition and tracking.

Site 2

Install cameras at location of RADS – Highway 11, South-bound, near Watson Road Weigh Station and demonstrate capabilities of the technology to reduce false alarms. This is a known area where wildlife regularly crosses the highway.

Status of Similar Activities If Known:

No instances of application in traffic and incident management context.
No instances of application for wildlife detection

Estimated Duration/Schedule:

3 weeks for literature scan
8 months to develop vector-based systems
4 months testing
3 weeks for report

Estimated Cost:

Site 1:

1. Literature scan	$ 10,000
2. Software	$ 70,000
3. Hardware	$ 30,000
3. Server Collocation, License and traffic fee (11 months)	$ 25,000
4. Wireless Internet Communication (11 months)	$ 10,000
5. Maintenance	$ 5,000
Total Site 1:	**$150,000**

Site 2: (if only one site add $70,000 for software to this proposal)

1. Software	$ 30,000
2. Hardware	$ 50,000
3. Satellite Internet Communication and Traffic (11 months)	$ 20,000
4. Server Collocation, License and traffic fee (11 months)	$ 10,000
5. Maintenance, out of town traffic expenses	$ 10,000
Total Site 2:	**$120,000**

Warrants for Vehicle Detection	$ 20,000
Warrants for Animal Detection	$ 20,000
Travel for Project Representatives:	$ 15,000
Total Project Cost	**$ 325,000**

ENTERPRISE Members or Other Agencies Who May Participate or Have Interest:

Michigan representative and the Federal Highway Administration representative

Others TBD

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2010 Work Plan

2010 Project #4:
Crashworthiness and Protection of ITS Field Devices

Project Background, Summary, and Objectives:

Many ITS deployments include signs and other traffic control device displays that require locating them and other ITS components within the clear zone. The MUTCD requires these traffic control devices to be crashworthy.

The objective of this project is to determine if there are appropriate crashworthy supports for ITS Field Devices (signs, detectors, solar panels, control cabinets, etc.), that meet federal MUTCD and AASHTO standards and guidelines for crashworthy roadside appurtenances. This includes roadside appurtenances that have been successfully crash tested in accordance with a national standard such as the National Cooperative Highway Research Program Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features" or the Manual for Assisting Safety Hardware.

It is also desirable to determine if additional crashworthy supports are required to meet the needs of ITS deployments.

Scope of Work with Task Descriptions:

Task 1 - Search FHWA website, State DOT standards, and equipment manufacturers documents for ITS device supports that have been successfully crash tested and determine if these have been accepted by the FHWA.

Task 2 - Determine if these existing crashworthy support structures meet the needs for ITS deployments. To accomplish this, needs such as including solar panels, control equipment, sign displays, etc. for typical ITS deployments will have to be developed. Determination of needs shall include the ability of the structure to withstand common wind loads and to support the additional weight of the ITS equipment. Consideration should also be given to the cost and ease of installation and maintenance of these supports.

Task 3 - Recommend a course of action to establish support standards for deployment of ITS field devices, including the development of crashworthy supports or guidance for the protection or shielding of these devices if necessary.

Project Schedule at the Task Level:

Task 1 – 4 months
Task 2 – 2 months
Task 3 – 2 months

Project Deliverables:

Provide a report on current standards of crashworthy supports and appurtenances that were discovered in Task 1. This report shall include whether or not these supports meet all of the needs for ITS deployments that were discovered in Task 2. The report shall also include complete recommendations on design standards for future ITS field device support development.

Project Cost Detailed at the Task Level:

Task 1 - $20,000
Task 2 – $5,000
Task 3 -$20,000 (includes final report)

Relationship to Similar Activities and Projects If Known:

Currently existing sign supports are being modified or protected by guardrail for experimental ITS deployments.

Project Participants (Agencies):

Minnesota DOT and Kansas DOT

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2010 Project #5:
Warrants for ITS Devices – Phase 3

Project Background, Summary, and Objectives:

The ENTERPRISE Pooled Fund Study in 2009 developed initial warrants for four Intelligent Transportation System (ITS) devices to assist agencies in the decision process of deploying technology devices as well as to validate the location of deployed devices. The second phase of the project was completed in 2010 and focused on developing warrants for an additional five devices.

An operational outcome of the first phase of the project was a project website. Visitors to the project website may execute the warrants by 'pointing and clicking' to answer the warrant questions. Website users will immediately receive the results of the warrant questions (either informed that the deployment in question is 'warranted', is 'not warranted', or is 'partially warranted'). Users may request to view the criteria and decision factors that led to the warrant conclusions.

The objective of this project is to satisfy the members agreed approach to continue the Warrants development when appropriate by developing a warrant for Autonomous Monitoring Stations. ENTERPRISE has completed two phases of an Autonomous Monitoring Station project. The ENTERPRISE program envisions that as projects move forward that creation of warrants are considered in order to continue to enhance the ENTERPRISE program efforts.

Scope of Work with Task Descriptions:

Task 1 – Develop an ITS Warrant for the Autonomous Monitoring Stations. The warranted will be drafted, tested, and feedback from users of the Autonomous Monitoring Stations (and ENTERPRISE representatives) will provide feedback.

Task 2 – Update Warrants Website to include Autonomous Monitoring Stations warrant.

Project Schedule at the Task Level:

Task 1 – 3 months
Task 2 – 1 month

Project Deliverables:

Updated ITS Warrants Final Report to include Autonomous Monitoring Stations
Updated ITS Warrants Website

Project Cost Detailed at the Task Level:

Task 1 - $15,000
Task 2 - $5,000

Relationship to Similar Activities and Projects If Known:

ENTERPRISE completed development of 9 ITS Device warrants in 2009 and 2010.

Project Participants (Agencies):

ENTERPRISE Members

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