Surface Transportation Program (STP) Public Transportation Set-Aside Proposal

Submitted by: Regional Transportation Program, Inc.

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Part I – General Information and Requirements for All Proposals

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Proposal: RTP proposes to acquire 36 integrated mobile data computer/automatic vehicle locator modules (MDC/AVL) and supporting technology components.

Description of the Project:

RTP seeks STP funds for the purpose of acquiring and installing 36 integrated mobile data computer/automatic vehicle locator modules (MDC/AVL) on its fleet of buses and vans, which operate across Cumberland County. Integrated MDC/AVL modules are small, on-board computer terminals that mount in vehicles and communicate directly with a transit system's central computer via a wireless communications network. MDC/AVL modules are ITS technology components that have been deployed in transit systems around the country. This technology facilitates communication of real-time data input, trip performance, and vehicle diagnostics through interactive wireless connections with transit agency's central computer and in-house dispatching systems. This technology will provide RTP with increased capacity in areas of service delivery, data management, and customer service. The MDC/AVL technology is built on a platform that is expandable and able to integrate with other transit agency technology which is consistent with regional ITS architecture goals. The implementation of this technology will serve to benefit both RTP's system needs and can be optimized to serve future regionally integrated mobility management goals.

A. Problem Statement:

RTP currently utilizes a basic 2-way radio system for communication between the mobility agents (formerly called "dispatchers") and drivers, augmented by individual cell phones. RTP has deployed AVL on all vehicles in its fleet, but currently does not have the IT capacity to use this technology to their fullest advantage. An additional barrier has been capacity constraints of RTP's current scheduling and routing software.

During peak times of the day, there is a high volume of customer calls and number of trips being delivered. This creates considerable demands on RTP's Mobility Management Team. Mobility Agents and Navigators must answer customer phone calls, provide information about the system to new riders, book and schedule current and future trips, and provide real-time dispatch and communication to all vehicles and drivers on the road. The high volumes of 2-way radio and phone communications affect length of customer phones calls and hold times, and impacts the quality of real-time dispatching decisions and on time trip performance. All current Mobility Navigator – driver communication occurs over one conventional, 2-way radio frequency, with auxiliary cell phones being used to provide additional coverage when radio traffic is heavy. The frequency band is also shared by the drivers as they speak with one another. The high volume of information transmitted and the frequent need to repeat messages can be both frustrating and time-consuming for drivers and dispatchers. Information that needs to be shared about trips and riders are also a matter of privacy, and while RTP protects rider confidentiality to the highest degree possible, the ability to transmit this information through MDC/AVL modules will greatly enhance our ability to ensure the very highest level of privacy and safety for our riders and our system.

A secondary, but associated problem with RTP's current operating system, is the amount of time and work involved with manually processing trip data, and the increased room for error with this type of data reporting. Drivers use paper manifests and they must write each and every change to trips and schedules during the course of transportation delivery. These manifest are returned daily to data entry staff who must then verify information drivers have written on their manifests, make corrections, and add additional data into the system to accurately reflect trip performance. Room for human error is great in such a manually intensive system with paper manifests passing through at least three, and as many as five, sets of hands from start to finish. The implementation of MCD/AVL will not only make communication easier and faster, it will also remediate potential for error and reduce the amount of paper involved in the process, and improve excessive workloads that staff are currently experiencing, allowing them to focus more directly on rider and partner agency needs. This will improve the overall customer experience, at the same time that it makes the system more efficient, which will in turn increase the capacity to deliver more service to meet growing demand.

MCD/AVL modules will:

- Provide mobility agents with adequate time to make better dispatching decisions than the current system permits;
- Speed up effective communications between dispatchers and drivers, and reduce the error rate in communicating between them;
- Offer a higher level of customer service to callers requesting information on booking trips;
- Accommodate the transportation needs of passengers in a timelier manner;
- Generate more accurate and informative reports using trip execution times and mileages;
- Supports other advanced technology for possible future deployment, such as Magnetic Card Readers.
- Provide a platform that meets ITS architecture goals and has regional ITS integration capability, including future integration with MaineDOT's MODES Traveler Information System
- Provide these improvements at an acceptable cost.

2. Internal Study:

To support the need for MDC/AVL modules and the move to interactive wireless data communication utilizing RTP conducted the following internal study:

- Evaluation of current RTP operations from three perspectives: mobility management, drivers, and data entry staff;

- Evaluation of potential changes in operations from implementation of MDC/AVL modules and integrated scheduling software from the same three perspectives;

- Researched IT applications with a variety of vendors, reviewed steps necessary to upgrade current system to accommodate integrated MDC/AVL technology, and additional wireless connectivity requirements and components to support MDC/AVL technology.

- Researched and analyzed cost/ benefit of a variety of technology platforms with expandable, build-on capabilities to support regional integrated ITS goals.

- Analyzed the operational benefits of MDC/AVL technology, including cost/benefit analysis to RTP operations and data management.

3. Major Findings:

- Currently, the mobility management team as a group spends an average of 49 minutes per hour on the phone or radio.

- With MDC/AVL modules operating in an integrated technology environment RTP estimates at least a 50% reduction (24.5 minutes per hour).

- Currently, data entry staff manually enter all passenger information and trip data, into a relational database, which is both time consuming and prone to error.

- With integrated MDC/AVL modules, trip performance data would be automatically transmitted between on-board vehicle computers and the in-house mobility management computer systems. This will result in increased service efficiency, reduction in manual data processing errors, and improved customer service.

- With integrated MDC/AVL information transfer will occur automatically, eliminating additional the additional attempts that are now required to communicate this data between mobility management staff and drivers.

- Currently, drivers have to manually record trip data on paper manifests during the course service delivery. Due to the nature and variety of the mobility services that RTP provides, this manual system of results in incomplete or inaccurate trip stop and start times, dwell time and mileage being recorded. This inaccurate data has to be corrected by data entry staff, resulting in additional steps and additional man hours required to accurately record trip information.

- Integrated MDC/AVL modules will automatically provide time and mileage stamps, allowing RTP to more closely and efficiently monitor trip performance. These expanded and real-time data reporting capabilities will provide a more comprehensive management reporting tool than RTP presently has.

- MDC/AVL modules will offer mobility management staff the capability to more accurately track the real –time movement of vehicles, resulting in increased efficiencies when adding and dispatching additional trips.

- Implementing MDC/AVL technology will require RTP to upgrade its present software system to an expandable, advanced scheduling and route mapping software application. The existing scheduling software does not support current operating needs, and is not capable of supporting fully functional MDC/AVL technology.

- RTP has identified funding to replace existing scheduling software and has begun to research options, interview IT vendors, and collect and analyze information on software options, costs, and benefits.

- Digital Dispatch Systems (DDS) and Mentor Engineering (the two leading companies in MDC/AVL technologies) both offer MDC/AVL modules that would meet RTP's identified needs. Each company presently has an MDC/AVL technical relationship with the major transportation scheduling/dispatch software vendors in the industry.

B. **Proposed Scope of Work:**

1. **Identify additional MDC/AVL vendors and review available components and system requirements**

2. **Create RFP and bid process**

3. **Select MDC/AVL vendor**

4. **Create project management schedule with selected vendor**

5. **Configure wireless configurations**

6. **Install on-board MDCs**

7. **Conduct staff training**

8. **Implement system**

C. **Cost Estimate and basis for amount:**

BUDGET ESTIMATE

1. **Cost Estimate (Note: These cost estimates were provided by an industry leading ITS vendor)**

A. Software Requirements

MDC/AVL Module Data System	$54,000

B. In – Vehicle Equipment

36 Mobile Data Computers	$103,341
Additional hardware	$8,734
Shipping	$412
Subtotal	**$166,487**

2. **Professional Services**

A. Project Management	$7,040
B. Wireless Configuration and Training	$30,113
C. 36 Vehicle Installations	$17,929
D. Travel Estimate	$5,544
E. Maintenance and Technical Support	$17,500
Subtotal	**$78,126**

TOTAL PROJECT COSTS : $244,613

STP Funds @ 80% = $195,690

RTP Funds @ 20% = $48,923

Part II – Scoring Criteria (maximum of 100 points)

1. This project is consistent with priority recommendations from the PACTS Transit Coordination Study

Implementation of MDC/AVL technology will enhance transit capacity and increase ridership by increasing efficiency in RTP's service:

Regional Transportation Program, Inc is the transportation agency in Cumberland County designated by DHHS and MDOT to coordinate human services transportation. .It also operates as a mass transit service available to the general public. In FY09, RTP provided 303,603 trips to over 5,000 residents of Cumberland County. While these numbers are significant, what is not identified are the number of trips that have to be turned away due to the capacity constraints of the system.

Increases in trips and a growing demand for mobility services throughout the PACTS area and the entire Cumberland County region that RTP serves are straining the system. One of the biggest system constraints identified over the past year are an inadequate IT system and increasing difficulty with communications, including longer hold times on the phone, and problems with dispatch-to-driver radio and phone interaction. While MDC/AVL technology will not remediate every issue, it will certainly give RTP the tools required to make communication and data exchange more seamless and subsequently increase both transportation productivity and customer service levels.

When fully optimized, this technology can be utilized to provide a platform for increased regional connectivity and transfers between systems by providing a gateway for regional transit service information.

RTP has identified an ITS priority of acquiring systems that are fully expandable and that may provide a platform for future regional integration. The investment in this ITS project serves the operational needs of RTP today, and provides a buildable platform for regionally integrated ITS architecture approaches to the mobility management needs of the future.

2. This project will benefit the PACTS region and has regional significance.

Implementation of MDC/AVL technology will increase RTP's productivity and deliver more service with the same number of drivers and vehicles. Increasing service and providing more rides to more people in the region is a primary benefit to the PACTS region and will increase transit ridership.

As mentioned previously, implementation of MDC/AVL technology has the potential to facilitate greater regional ITS integration. RTP's acquisition of advanced transit technology is an investment that will increase RTP's transit capacity, and more importantly, from a regional perspective this is an investment in an advanced ITS

platform that has the functionality to provide point of access information for riders that will increase inter-modal connectivity and facilitate enhanced regional mobility management for riders and better data management for transit providers.

3. This project will improve existing transit capacity by improving existing facilities and services.

Implementation of MDC/AVL technology will enhance transit capacity and improve services. These details are covered in Scoring Criteria number 2.

4. This project addresses State and Federal mandates and does not conflict with any municipalities comprehensive plans.

The application of Intelligent Transportation Systems (ITS) appears in several state and local transportation plans. In the *Destination Tomorrow* transportation plan, (Pages 5-9) *Component 6 – Travel Demand Management and Intelligent Transportation System*, the plan states: "Intelligent Transportation System measures (ITS) apply technology to make the transportation system more efficient and to provide traveler information to transportation system users."
Goal VI - Regional Focus –Objective 2, Strategy 80 (Page 5-31) cites data collection as important to monitor transportation system performance and plan implementation.

The MDOT/OPT state strategic passenger transportation plan, *Explore Maine,* includes the application of ITS technology, principally the use of "smart cards." RTP vehicles equipped with MDT/AVL built in "smart card" technology would place us in a position to be one partner in the Multi-modal Electronic Payments System Feasibility Study sponsored jointly by MDOT and the US DOT/Volpe National Transportation Systems Center. The Executive Summary of this study was prepared in March, 2002. Recently, the project began with a review of the communication systems now in place for RTP, Metro, South Portland Bus System and CBITD.

The first ITS planning effort in Portland began when GPCOG established a *Greater Portland ITS Early Deployment Plan in 1997*. Projects and related applications were prioritized based on their likely respective contributions to regional goals adopted by the Advisory Committee, and the *Early Deployment Plan* was completed in March 1998.

Excerpts from the plan related to this project are:

ITS technologies are being deployed to disseminate traveler information, improve traffic flow, optimize transit system performance, and in a myriad of other transportation applications.

ITS technology can also improve transit operating efficiency through automated vehicle location (AVL) "smart card" electronic fare payment, and computer assisted trip planning and dispatching.

The final plan stated "the highest priority for deployment of ITS public transit applications before the year 2003 was given to **automated vehicle location for Greater Portland transit fleets, "smart cards" for electronic fare payment**, and the development of a network of electronic passenger information kiosks linked to the World Wide Web."

Over the past several years there has been an increased focus on ITS solutions around the country. According to the USDOT, implementation of a wireless mobile data system has been shown to:

Decrease operating expenses by 4%- 7% per vehicle mile
Increase shared passenger rides by 6% -9%
Decrease cost per passenger by over 2% per trip
Achieve a 10% increase in timesaving by using on-board navigation assistance
Increase fleet productivity by 7%-11%
Create over a 9% improvement in on-time performance
Improve driver and passenger safety
Improve response to real-time schedules and "will calls".
Facilitate intermodal connections.

This project is consistent with and supports the following goals and objectives related to the **Eight Guiding Policies of the Destination Tomorrow plan**

Goal 1: Economic Development: People and goods need to move easily within and through the region. One key component of the transportation system necessary to facilitate this movement is passenger transportation.

In Chapter 5, page 12:Objective 2: To provide landside access to air, sea, and rail stations accounting for the needs of passengers, expedited freight, goods movement, and other demand.

Strategy 5. Seamless Transfers. (Chapter 5, p. 12)

The MDT/AVL technologies will provide RTP the capability to interface its passengers with other transportation services. For example, a visiting ADA wheelchair passenger arriving in Portland by AMTRAK needs to be picked up at the Portland Transportation Center. The passenger has to be taken to CBITD to catch the ferry to Peaks Island. The RTP dispatcher, using an MDT/AVL system, would be able to locate the vehicle nearest to the passenger and transmit the necessary information to the driver via the MDT/AVL. The dispatcher using the MDT/AVL system then monitors the trip to ensure that the passenger arrives in time to catch the ferry to the island.

Goal II: Mobility, Safety and Accessibility: To improve the movement of goods and the mobility, accessibility and safety of people throughout the region.

In Chapter 5, page 17:Objective 6: To provide transportation alternatives for those with special needs – elderly, young, disabled low-income and others.

The utilization of MDC/AVL technology will greatly improve RTP's service capacity and increase service to the already mission-targeted populations of the elderly, young, people with disabilities, and people with low-income.

Strategy 33. ADA Para-Transit: Maintain ADA Para-transit system to complement the fixed route bus transit services

Equipped with an MDC/AVL system RTP will not only be able to maintain the current system, but will also be able to expand it if new fixed route services required it to do so. (Serving the new Falmouth Flyer route is a good example). The MDC/AVL will bring increased efficiencies and higher productivity (more trips and more passengers per vehicle revenue hour) at the same as it lower costs. MDC/AVL will provide a tool for RTP's Mobility Management Team to use in executing more shared rides, thus enhancing the use of the vehicle and expanding the numbers of new riders and trips.

Goal III: Energy Conservation: To conserve and efficiently use nonrenewable resources See Scoring Criteria number 5 below

Goal IV: Land Use: To support land use plans and development patterns that promote efficient transportation services and systems. See Scoring Criteria Number 6 below.

Goal V: Environmental Quality Chapter 5, Page 26: Protect and improve the quality of life and the human and natural environment including natural and cultural resources, air quality and water quality. See Scoring Criteria 5 below

Goal VI: Regional Focus: To reflect a regional approach to transportation and land use founded on effective communication and management of regional resources.

Objective 2: To monitor transportation system performance and plan implementation on a region-wide basis. Strategy 80. Data Collection

Accurate data is critical for the planning and management of any transportation service or system. An MDT/AVL system is many times more capable of collecting, sorting, and transmitting data from a vehicle than having to rely on drivers' data at the end of the day which then has to be manually processed. A system can be established where data transmitted directly from the vehicle to computer storage without the involvement of any data entry personnel. Because it is in a digital format, the data can be manipulated for any purpose – planning, billing, assessing transportation provider performance in terms of on-time arrivals and departures, vehicle performance, productivity (numbers of trips per

revenue hour, number of passenger miles, etc.), efficient deployment of vehicles and many more measurements.

5. This project will reduce air pollution and conserve energy.

It is difficult to precisely measure the air pollution reduction and energy conservation benefits of this project. Due to the nature of demand-response transportation, issues with rider "No Shows" and "Cancellations" are problematic and common in the demand-response and paratransit business. When riders are not at the place they are supposed to be, not only are the costs to send the vehicle to do the trip non-recoverable, additional fuel is consumed and subsequent air pollutants are emitted. MDC/AVL technology will make it possible to notify a driver quickly when a rider calls to cancel a trip. The vehicle can then be diverted to the next nearest passenger pick up, thus minimizing both the financial and environmental impacts of a cancellation.

An additional area where MDC/AVL technology can have positive environmental benefits is in the reduction of "dwell" time. Drivers often wait too long for a rider to come to the vehicle. This "dwell" time can be reduced, with subsequent reduction idling time by improving communication with the driver regarding the trip. MDC/AVL technology provides the driver with trip information more quickly and releases him/her to move on to the next stop.

6. This project enhances service between activity centers

RTP currently delivers service between a variety of activity centers, including housing facilities, residential group homes, social service agencies, places of employment, and commercial destinations such as grocery stores. The implementation of MDC/AVL technology will increase RTP's ability to provide more transportation, enhancing connections for more people to a potentially greater number of destinations.

The Destination Tomorrow transportation plan supports several State Planning Office's Smart Growth Principles. **(See page 5-21, number 6., last bullet).** Among them is: To provide choice in the mode of transportation and to ensure that transportation options are integrated and consistent with land use objectives.

While not currently providing these services, RTP as a regional transportation provider could in the future offer to design and implement transportation services that meet the needs of housing developers and the intended purpose of their development. For example, in housing development projects geared toward specific demographics, i.e. the elderly, people with low-income, etc. a small circulator system could be established to meet people's mobility needs. An MDC/AVL system would be used to increase the efficiency of such a system through tracking its progress as the day goes by, controlling its adherence to a predetermined route that might change at different times in the day to meet rider demand, assigning and controlling additional vehicle at peak times, and communicating through an MDC for faster and more accurate messaging.

7. This project does not primarily include or involve more than RTP in its formulation or submission of this proposal. As mentioned previously, RTP has prioritized regional needs in addition to agency needs in formulating the scope of its ITS needs. Integration and expandability are two factors that will be considered when choosing scheduling and dispatching software and ITS components such as the MDC/AVL modules proposed here. This technology will have a profound impact on other transit providers when implemented and fully operationalized. (Please refer to number 8 below)

8. This project will benefit several different alternative modes of travel. The MDC/AVL will provide a key piece of technology for RTP to more effectively bring riders, including many of its ADA passengers to key intermodal stops located within the cities of Portland, South Portland and Westbrook. Passengers will be able to transfer to a bus, train, or ferry for a portion of a planned trip within the ADA service area. For example, an eligible person might want to travel from his/her home in Falmouth to the Maine Mall. (ADA is applicable here as long as the Metro Falmouth Flyer provides service in this community). RTP could provide the first leg of the trip to the Metro Pulse, where the passenger transfers to a Metro bus going to the Maine Mall and the final leg of the trip is completed on a fixed route system.

The mandate to RTP, as the Complementary Paratransit Provider, is to place ADA riders on appropriate fixed route service where possible. Fixed route is a more efficient mode than demand-response service. If an ADA client can ride a fixed route, but cannot get to it, then RTP must provide a ride from the point of origin to the nearest appropriate fixed route stop. This practice has had only limited use, as the technology to do so in terms of coordination of rider requirements and a fixed route schedule, has not been affordable for RTP to acquire, and there has not been ITS application in place to facilitate this.

RTP is currently planning to replace the current scheduling and dispatching software with a multi-platform software application with advanced capabilities that include single point of access intermodal trip planning capability. Transit providers throughout the region are already using AVL technology, and that will play an important role in maximizing the regional benefits of this project. Having a computer-based ability to make these connections and to access information wirelessly and in real-time will set the stage for greater efficiencies that will benefit riders, other transportation providers, and the taxpayers who support these services.

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February 1, 2010

RTP Board of Directors

Regularly Scheduled Board Meeting

Authorization to Apply for STP (set-aside) Funds

A quorum of board members being present, on a motion from Will Vernick and a 2nd by Randy Caswell, the board unanimously approved RTP's proposal for FY12/13 STP (set-aside) funds to acquire Mobile Data Computer modules and related technology components.

Authorized by:

Michael Goldman, President
RTP, Inc. Board of Directors

Date: Feb. 12, 2010