



I-95 CORRIDOR COALITION PROPOSED PROJECT IDEA

Project Title: Development and Testing of Electronic Payment Services National Interoperability Specification for Next Generation ETC Services

Project Idea Description:

This project entails developing a vehicle-to-roadside electronic payment services national interoperability specification (EPSNIS) and confirming that the specification and use thereof supports a legacy environment (clearing transactions from toll roads and merchants through a toll authority) as well as one where the payment media and customer accounts are managed by non-agency financial services companies. The goal is, through standardizing the application, to prepare for the future and provide a path to national interoperability for EPS. Once written, a Reference Implementation Test will be conducted to validate the EPSNIS standard and the model's architecture. The deliverable will be a managed-source specification maintained by the OmniAir Consortium and available to any financial services entity or electronic payment services provider who wants to participate.

Task Details: this project consists of a series of tasks conducted by the partners that can be divided into four general phases: outreach, functional requirements definition, specification development, and reference implementation testing.

Outreach: the development of the EPSNIS requires experienced input from both inside the toll industry, and peripheral to and outside of it due to the national application of the EPSNIS and the extension of the EPS paradigm outside of the familiar boundaries. Therefore, the first set of activities capture OmniAir members goals for an EPSNIS and identifies the like-minded organizations from the payments industry (i.e., NACHA, EPCGlobal, bankcard associations) who are valuable subject matter experts (SME).

Requirements: after identifying the correct stakeholders, the next set of tasks encompass collaboration with them on defining the functional requirements of an EPSNIS, refining them and then confirming them as the building block for the specification.

The Specification: this is an extensive process of specification development that begins by creating, with SMEs, a preliminary draft specification and presenting this for approval by OmniAir. Next is cooperation with organizations to extend and become compatible with related industry payment specifications that advance the development and acceptance of the OmniAir EPSNIS. Following this is another review and approval process, a second commenting process, and then a final, draft Specification.

Testing: in this phase, at the test host facility, the partners will design, test and document a Reference Implementation Test where both the technology and the payment architectures will be operated side-by-side to validate the draft EPSNIS and verify performance. Results may mean modifying the EPSNIS and another round of review and approval. Eventually, both the EPSNIS and RIT will be released for use in similar tests and eventual deployment by the EPS industry.

Partners: include the Port Authority of New York & New Jersey as the proposal Sponsor; the New York State Bridge Authority as Reference Implementation Test Host; the OmniAir Consortium serving as the program manager, and OmniAir's Electronic Payment Services Committee. The EPS Committee enjoys broad representation from all current electronic toll collection regions and protocols and consists of subject matter experts (SME) in the field of vehicle-to-roadside electronic payment services. The members of the committee have the ability to define, develop, evaluate and test the national interoperability specification and fulfill the terms of this proposal.

Background

The section below briefly describes OmniAir, the EPS Committee, the concept of 'EPS Interoperability' and the components of it. More information about OmniAir and the EPSNIS is available from OmniAir.

- *OmniAir*

The non-profit OmniAir Consortium was founded in 2003 to promote and support the national deployment of interoperable DSRC systems through the creation of the OmniAir Certification Program. By testing for DSRC standards-compliance and application protocols that together, permit True Interoperability™, the Consortium is working to ensure that all stakeholders benefit from OmniAir-certified products and enjoy a reliable and dynamic service environment.

- *The OmniAir EPS Committee*

OmniAir created an EPS Committee which is tasked with developing a National Interoperability Specification for Electronic Payment Services (EPSNIS), and a specification validation program corresponding to the development of 5.9GHz DSRC hardware sponsored by the USDOT. The EPSNIS is hardware independent however, meaning it is applicable to current-generation ETC systems which is critical and necessary to allow operators a gradual transition to the day when new hardware is available.

- *EPS Interoperability – Technical Context*

The EPSNIS initiative of OmniAir came about in the context of USDOT's 5.9GHz DSRC program. In October 2004, the FCC adopted licensing and services rules for the 5.850-5.925 GHz band for Dedicated Short-Range Communications (DSRC). '5.9GHz DSRC' is intended to provide short-to-medium range (up to 1000 meters), high data-rate, and highly secure wireless links to transfer data between vehicles traveling at highway speeds and roadside units or for communications between vehicles. The FCC intends the band to be used in Intelligent Transportation System (ITS) applications such as intersection collision avoidance, work zone warnings, traffic management, and also for electronic payments for travel, gas, fast food, parking and other transactions made from a vehicle. EPS is, in fact, considered a 'day-one' application on the vehicle's platform.

The FCC requires users of the spectrum to adhere to protocol standards (Physical and Media Access Control) that specify a radio's channel allocation, power and device identification protocols. At this time, the remaining suite of standards is being completed by the Institute of Electrical & Electronics Engineers (IEEE) and should be approved by mid-2006. These standards include security, priority and authentication requirements and add layers that allow application developers to interface to the device.

The 5.9GHz device as standardized however, includes no unique Tag ID like the toll industry knows it today and therefore no way to conduct an EPS transaction the way the industry recognizes it today. Further, IEEE does not intend to standardize the EPS application. Without a standard EPS application, the EPSNIS that OmniAir wishes to develop, the 5.9GHz device is not suitable for toll collection. OmniAir's EPS Committee was created to develop this standard payment application and the interface specifications required for complete end-to-end transaction processing interoperability. It is also designing the EPSNIS to apply to both legacy and next-generation hardware systems in order to support the transition from legacy hardware platforms.

The timing is ideal to develop an EPSNIS for another reason: the USDOT's Vehicle Infrastructure Integration program is rapidly advancing the DSRC platform, increasing the momentum to deploy it and the need to develop the corollary software standards needed to provide true interoperability.

- *EPS Interoperability Components*

There are four components of EPS interoperability. This proposal addresses the second and third:

Technical Interoperability – the standardization of the technical characteristics of both the roadside and the on-board equipment. For four separate sub-regions of interoperability (the IAG, Texas, Florida, and

California) this is heard today. For 5.9GHz DSRC, which is intended for national deployment, the standards and prototype devices are being completed. The IBTTA ETC Requirements document was produced for this aspect of the 5.9GHz platform, as a guide for how to co-deploy the technologies.

Application Interoperability – the standardization of the structure and data characteristics of the information being transacted between the service provider and the on-board unit, the service provider to the clearing entity, and that entity to the financial services and issuer community. This is commonly referred to as the ‘back-office.’

Operational Interoperability – the standardization of the procedures involved in providing EPS.

Contractual Interoperability – this is the instrument binding participants to provide service in a clear and uniform way that meets the expectations of EPS consumers and providers. This area is being addressed by the OmniAir Business Rules Committee.

- Project Principles

OmniAir is open and inclusive to any interested party, particularly I-95 Corridor Coalition Members.

OmniAir will manage the EPSNIS as a resource available to any entity that wants to use it. The EPSNIS Reference Implementation Test will address the co-operation of new and existing payment architectures. This is critical to the toll industry’s ability to transition gracefully & gradually.

Where an interface is clear and/or already defined, OmniAir will use existing standards or public domain methods and specifications. Where an interface is currently proprietary, OmniAir will develop a consensus standard specification and/or method to remove vendor IP from the interface.

The EPSNIS is a Consensus Standard. While taking somewhat longer to achieve, Consensus Standards are well known to result in the highest adherence rates because of the time and attention paid to gathering all perspectives and incorporating the requirements of a diverse, volunteer group.

A condition of OmniAir is that participants adhere to the EPS interoperability requirements defined by this project. They are being developed to support and promote national, interoperable EPS and the many benefits that come with it.

Objectives

The EPSNIS incorporates the key requirements reflecting the community’s current and long term needs and demands of next-generation payment services. The objectives of this project are:

- To identify and standardize the crucial interfaces between the major system components or devices that are linked (see OmniAir’s EPS White Paper to learn more about these interfaces);
- To adopt an open-architecture and standards-based solution for EPS;
- To create greater contestability in the procurement of back-office equipment and systems;
- To create the ability to select “best of breed” services;
- To increase the capacity to harmonize interfaces between previously diverse multiple parties;
- To ease management of the business relationships of those parties;
- To operate predictably and similarly for all payment modes and services such as parking, e-commerce, food, fuel and traditional tolling;
- To create a business environment that allows EPS providers to change business relationships quickly and without the costs associated with being locked into proprietary technologies;

The need for an EPSNIS is evident: without a common application protocol, EPS vendors could deliver payment services with unique and proprietary elements that would retard or preclude national interoperability for years to come. This would prevent the ability of a customer to roam freely between various providers of tolled services without the need of having multiple devices and accounts with different standards.

Secondly, and perhaps most important, it would preclude the right of EPS operators to freely engage and disengage in contractual relationships with tag/account/financial issuers without being effectively locked in to their services due to the proprietary nature of the product. The EPS industry would thus continue to suffer as it does today - from an inelastic market for EPS services, despite high adoption rates and consumer buy-in.

Program Relevance

One of the mainstays of the Coalition's mission and value to its members rests with information sharing. By conducting this project in partnership with the Coalition, the Coalition can continue the leadership that it established with the transit smart card Regional Interface Specification (RIS) and extend this type of platform to the roadway network. Coalition members will gain from exposure to the technological, business, and institutional issues, and have an entree to help shape the national standard.

A. Check one or more Strategic Plan strategies related to this project:

- Provide organizational and technical support among member organizations' ITS programs.
- Add value to members' ITS programs and increase customer benefits through coordination.
- Secure funding to support Coalition programs and support services.
- Influence the national ITS program in support of corridor objectives.

B. Check any relevant Program Tracks:

- | | |
|--|--|
| <input type="checkbox"/> Agency Support | <input checked="" type="checkbox"/> Intermodal |
| <input type="checkbox"/> Traveler Information | <input checked="" type="checkbox"/> Electronic Payment |
| <input type="checkbox"/> Coordinated Incident Management | <input type="checkbox"/> Coalition Support |
| <input checked="" type="checkbox"/> CVO | <input checked="" type="checkbox"/> Emerging Issues |

C. Provide a brief summary of the importance of this project to the Coalition:

The Coalition's membership reflects a microcosm of the national level, including a good representation of tolling operations that reflect different experiences, technologies and business models. By using the Coalition and its members as a sounding board and test bed for development of functional requirements and specifications, OmniAir can draw from multi-state experiences that not only cross geographic and institutional lines, but also reflect different relationships with financial institutions and varied customer expectations. In short, the Coalition provides a key venue to develop and vet functional requirements, standards and business approaches that ensure a viable EPSNIS.

This proposal is also important to the Coalition because it compliments the Coalition's funding of an earlier project – the IBTTA ETC Requirements Document (a guide for hardware installation). The EPSNIS will be employed with that to validate the work of many Coalition members in the toll industry at a point in time where they are looking to migrate to an open platform and are interested in developing a technical means and application that permits national interoperability.

Lastly, the EPSNIS will support the DSRC standards promulgated by the FCC and USDOT and because it will be applied nationally, will provide national recognition to the Corridor Coalition.

In sum, this project will provide all Coalition members with a real-world evaluation and validation of an important and valuable emerging payment method. An NIS will be created, and a new type of EPS application deployed. And under the tutelage of the Corridor, it stands to enjoy the most successful implementation possible.

Budget: \$475,600 total project cost
 \$303,200 in Coalition funds requested

Partner Contributions	
• PANYNJ – Sponsor, Contract Oversight.....	\$24,000
• NYSBA – Test Facility, Equipment & Personnel.....	\$35,000
• OmniAir EPS Committee and EPS Industry Volunteer Hours.....	\$105,000
• OmniAir – Direct Costs: Teleconference/Printing/Misc. Expenses.....	\$8,400
Total: \$172,400	

Please provide information below regarding other funding sources available/required including: agency, private, or other federal funds.

FHWA Match Requirement:

A. Check which best describes the “type” of project. (See Appendix A for details.):

Deployment and/or Integration of ITS infrastructure Components (Complete section B below), or

General Support Activity including administrative activities, training, studies, etc. (Complete section C below)

B. If a Deployment and/or Integration of ITS infrastructure Components Project, provide the following information where applicable for the required 50% “project specific” match:

Match Form:	Amount:
<input checked="" type="checkbox"/> Cash	\$8,400
<input checked="" type="checkbox"/> Equipment	\$35,000
<input checked="" type="checkbox"/> Personnel	\$129,000

Match Source:	Amount:
Public (non-federal)	\$164,000
Private	\$8,400
Other Federal Funds	

C. If a General Support Activities Project provide the following information for the required 50% “pooled” match:

What other ITS related project will be used to provide match for this project? (Describe):

What amount of match is available? \$ _____
 What are the sources of the match? \$ _____ non-federal \$ _____ other federal

Submitted by:

Name: Charles Fausti

Title: General Manager, E-ZPass, PANYNJ, and;

Name: Timothy McGuckin

Title: Executive Director, OmniAir Consortium, Inc.

Sponsor Organization: Port Authority of New York & New Jersey

Sponsor Address: One Madison Avenue, 5th Floor, New York, New York 10010

E-mail: cfausti@panynj.gov

Phone: 212-435-4800

Program Manager Organization: OmniAir Consortium, Inc.

Address: 1146 19th Street, NW Suite 800, Washington, DC 20036

E-mail: mcguckin@omniair.org

Phone: 202-756-0012

Check one: New Project (first time submitted to Coalition) Modified Project

**Please fax this form to I-95 Corridor Coalition at (703) 658-3042, -or-
Download the electronic version from the Coalition's web page (www.I95Coalition.org)
and e-mail it to I95CC@aol.com**



FINANCIAL PLAN

*FHWA Match Information Requirement
For I-95 Corridor Coalition Deployment and/or
Integration of ITS Infrastructure Components Projects
Coalition Program Year 14*

1. Name of Project: Development and Testing of Electronic Payment Services National Interoperability Specification for Next Generation ETC Services
2. Total Project Cost: \$475,600
3. Amount of Coalition Funding provided: \$303,200
4. 20% Match Required and Provided: OmniAir, NYSBA, PANYNJ
5. Details of Match Provided: See Below
- 5.A. Non-Federally Derived Funding Sources

20% Minimum Match Amount Required: \$95,120
36% Partner Match Provided: \$172,400

A minimum of 20% of the total cost of the project must be from non-Federally derived funding sources, as statutorily required, and must consist of either cash, substantial equipment or facilities contributions that are wholly utilized as an integral part of the project, or personnel services dedicated full-time to the proposed integrated deployment for a substantial period, as long as such personnel are not other wise supported with Federal funds.

Identify Non-Federal Funding Sources	Identify Types of Funds (cash, equipment or facilities, or full-time personnel services)	Identify Major: (1) Integration Activities or (2) Rural Infrastructure Deployment Supported with these funds	Specify Amount of Funding (\$)
NYSBA Test Host	Equipment/Pers	1	\$35,000
PANYNJ CO	Personnel	1	\$24,000
OmniAir	Equipment	1	\$8,400
EPS Committee and Financial SMEs	Personnel	1	\$105,000
			\$172,400

Note: Personnel identified for **36%** Match will have the following responsibilities:

1. Charlie Fausti, Director, E-ZPass Plus, PANYNJ - Contract Oversight
2. Timothy McGuckin, OmniAir – Program Manager
3. Frank Mazzella, NYSBA – Reference Implementation Test Host/Oversight
4. OmniAir EPS Committee & Fin Industry SMEs – EPSNIS Write/Test

5.B. Other Funding Sources

Remaining 30% Match Amount: _____

A minimum of 30% of the total cost of the project may come from a variety of funding sources and may include the value of Federally supported projects directly associated with the proposed integration project.

Identify Funding Source	Identify Types of Funds (cash, equipment or facilities, or personnel services)	Identify Major: (1) Integration Activities or (2) Rural Infrastructure Deployment Supporting Integration Supported with These Funds	Specify Amount of Funding (\$)

Note: Personnel identified for 30% Match will have the following responsibilities:

- A
- B
- C
- D

6. Guidelines and Acknowledgement

The FHWA Guidelines state: "The U.S. DOT and the Comptroller General of the United States have the right to access all documents pertaining to the use of Federal ITS funds and non-Federal contributions. Non-Federal partners must maintain sufficient documentation during final negotiations and during the life of the ITS Integration Component of the ITS Deployment Program to substantiate these costs. Such items as direct labor, fringe benefits, material costs, consultant costs, public involvement costs, subcontractor costs, and travel costs should be included in that documentation."

This Match information is accurate and I understand that I will be required to report on this information quarterly.

Signature: _____ **Date** _____

Print Name: Charles Fausti

Title: General Manager, E-ZPass

Agency: Port Authority of New York & New Jersey

