NOVA ITS Architecture Maintenance and Training

Task 46 –
NOVA ITS Architecture v. 1.2 Final Report

June 2, 2004

PREPARED FOR:

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ITERIS

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1 Introduction

This report documents the work performed on Task 46, Northern Virginia Architecture Maintenance for the Virginia Department of Transportation (VDOT) in Fiscal Year 2004 (from July 1, 2003 to June 30, 2004). This report is organized as follows:

- Project Scope – Describes the work involved for Task Order 46.
- Deliverables – Describes the project deliverables for Task Order 46.
- 2004 Changes – Describes the changes that were made to the NOVA ITS Architecture during the 2004 year.
- Regional ITS Architecture Assessment – Documents how the NOVA ITS Architecture is compliant with FHWA Rule and FTA Policy on ITS Architecture and Standards Conformity.
- 2005 Activities – Recommends the activities that are necessary to update the NOVA ITS Architecture in 2005.

2 Scope and Deliverables

The Northern Virginia District ITS Architecture identifies interfaces among VDOT Systems and between VDOT systems and non-VDOT systems in the Northern Virginia District. The architecture was developed using Turbo Architecture and is based on the National ITS Architecture definition. The purpose of the NOVA ITS Architecture is to guide the planning and deployment of ITS systems within VDOT and those systems that interface with VDOT by identifying interfaces that facilitate integration across the region's transportation system.

VDOT is committed to leveraging this architecture to deploy ITS more efficiently. The NOVA ITS Architecture has been defined and documented and is available on the web at www.vdot-itsarch.com. The website includes a hyperlinked architecture enabling a user to explore the various interfaces and subsystems defined in the architecture. In addition, the documentation and Turbo Architecture database are available to be downloaded.

It is important that the architecture database and the website information be maintained as current as possible so that stakeholders wishing to use the data are leveraging the most accurate and current data available. There is also training that may be required by stakeholders to better understand and use the Turbo Architecture software in their ITS planning activities. This task order, Task Order 46, provides training on the use of Turbo Architecture and maintenance of the NOVA ITS Architecture database.
The task will consist of 3 subtasks:

2.1 Subtask 1 Website Improvement

The purpose of this subtask is to improve and maintain the NOVA ITS website to reflect the most accurate information available. This subtask will include repairing broken links as well as minor information correction. In addition, the subtask will involve the

development of an update plan that will be coordinated with VDOT to define more significant changes to be made to the site.

Deliverables of this subtask include:

- An updated website that reflects the latest changes for 2004.
- Converted the Best of ITS Award finalist video to the flash format and upload to web site.
- Included training registration onto the website.
- Changed database download method to add security feature to the website.

2.2 Subtask 2 Architecture Training

The purpose of this subtask is to develop and conduct training on the use of the NOVA ITS Architecture website and the use of Turbo Architecture in the NOVA ITS planning process. In general, the training will be conducted in 1 day. The training shall include an overview of the NOVA Architecture Website, an overview of the application of the architecture in the NOVA planning process, an overview of Turbo Architecture, and instruction on the application of Turbo Architecture and the NOVA ITS Architecture in the development of a project architecture. Students will be from the NOVA region and primarily be VDOT NOVA staff. The objective of the course will be to teach the students how to use the software tool within the NOVA planning process.
This subtask will develop and deliver a training course on the use of the NOVA ITS Architecture data.

Deliverables of this subtask include:

- Developed the training course and training manual.
- Conducted two training courses
  - 1st Course – Delivered on December 10, 2003, and attended by fourteen students. This course was nominated for a training award and was a finalist. A video clip from this training class is on the NOVA ITS Architecture website www.vdot-itsarch.com
  - 2nd Course – Delivered on May 12, 2004, and attended by twelve students.
- ITS America's 2004 Best of ITS Award entry and finalist video caption for this training program.

2.3 Subtask 3 NOVA ITS Architecture Definition Maintenance

The purpose of this subtask is to provide maintenance support of the NOVA ITS Architecture definition. As ITS deployment evolves in the region, changes need to be made to the architecture definition to keep it current. Maintenance updates occur approximately once a year. In general, VDOT collects changes from stakeholders and forwards them to the Contractor and the Contractor would verify information and make changes to the NOVA ITS architecture definition.

Deliverables of this subtask include:

- Consolidated potential changes and contacted stakeholders to verify the proposed changes to be made to the NOVA ITS Architecture database.

- NOVA ITS Architecture database version 1.2

Lastly, this project's final deliverable is this final report describing all the changes made in 2004 and planned changes for 2005.

3 2004 Changes

This section documents changes that were made to the NOVA ITS Architecture in 2004. The decisions made for the 2004 changes are based on information obtained through phone conversations with stakeholders included in NOVA ITS Architecture. The conversation topics and resulting actions taken are described below.

3.1 Roadway Sensor Data and Video Sharing Concerns

- **Trichord, Inc. Concern**
  (Talk to Omar Necko, Mobility Management Division)
  Trichord, Inc. is deploying acoustic sensors to fill in gaps of VDOT sensor coverage. However, Trichord does not send this data to VDOT. VDOT must access Trichord website to view data. It is still a one-way interface.

  NOVA ITS Architecture Change
  - Rename the element ISP Centers to Private Sector ISP Centers and allocate Trichord, Inc. to this element
  - Associate Trichord, Inc with the Regional ISPs Stakeholders
  - Show interface flow "road network conditions" from STC to Private Sector ISP Centers

- **Mobility Technology Concern**
  (Talk to Omar Necko, Mobility Management Division)
  Mobility Technologies has plans to deploy sensors to fill in gaps of VDOT sensor coverage. However, Mobility Technologies will not send this data to VDOT. VDOT will have to visit the Mobility Technologies website to view data. It is planned to be a one-way interface.

  NOVA ITS Architecture Change
  - Add Mobility Technologies to the Private Sector ISP Centers element
  - Show interface flow "road network conditions" from STC to Private Sector ISP Centers
  - Associate Mobility Technologies with the Regional ISPs Stakeholders

- **TrafficCast, Inc. Concern**
  (Talk to Omar Necko, Mobility Management Division)
  TrafficCast, Inc. plans to use traffic, incident, historical, and construction activity data to generate estimates of travel time for VDOT's use. Not sure as to when this will fully come on-line, so it will be represented as a future interface.

  NOVA ITS Architecture Change
  - Allocate TrafficCast, Inc. to the Private Sector ISP Centers element
  - Associate TrafficCast with the Regional ISPs Stakeholders
  - Show interface flow road network conditions from STC to Private Sector ISP Centers

- **Tele Atlas, Inc. Concern**
  (Talk to Omar Necko, Mobility Management Division)
  Tele Atlas, Inc. has plans to use VDOT data to sell to its customers.

  NOVA ITS Architecture Change
  - Allocate Tele Atlas, Inc. to the Private Sector ISP Centers element.
  - Show interface flow road network conditions from STC to Private Sector ISP Centers

- **TrafficLand Concern**
  (Talk to Kevin Barron, Trafficland)
  TrafficLand, Inc. displays VDOT video images on their website for the public. Their statewide plan is to expand current scope (e.g., extend coverage to the Hampton Roads area). TrafficLand, Inc. also has plans to potential display a congestion map with data coming from either VDOT or other ISPs.

  NOVA ITS Architecture Change
  - Create a new element that represents Trafficland, Inc. statewide video distribution system. The new element is called the VDOT Video Clearinghouse. The stakeholders that were assigned to this new element are VDOT and Trafficland and are associated with the stakeholder group named Video Clearinghouse Agencies.
  - Show interface flow traffic images from VDOT Video Clearinghouse to NOVA Public Safety Centers and National Warning Advisory System. The VDOT Video Clearinghouse represents Trafficland's plans to share video images of key corridors in the local jurisdictions (e.g. City of Alexandria with the Alexandria Signal Operation Center, Police, and Fire Departments; Arlington County Signal Operation Center and Emergency Communication Center; etc.) represented by the NOVA Public Safety Centers, Virginia State Police Center, and NOVA Local Signal Centers
  - Show interface flow traffic information coordination from DDOT ITMS and Maryland CHART to the VDOT Video Clearinghouse which represents DC

and Maryland plans to include their CCTV images with VDOT's video distribution system.

- Show interface flow road network conditions from VDOT NOVA STC, Adjacent VDOT STCs, and Other STCs to VDOT Video Clearinghouse representing the clearinghouse ability to share video images obtain from these STCs with first responders in the NOVA region.

3.2 Proposed Public Safety Operations Concerns

- **(Talk to Kamal Suliman VDOT NOVA Operations Director)**

After speaking with Kamal Suliman, VDOT NOVA Operation Director, it was determined that this is an issue that must wait until more information is available to determine impacts to the NOVA ITS Architecture. Kamal stated that there are talks regarding moving the VSP Division 7, Fairfax Police, Fairfax Fire, Virginia Department of Emergency Services, VDOT Northern Virginia District Office, and potentially a couple of workstations from the STC and STSS to a new regional public safety operations center.

Kamal was asked if the moves takes place, since several agencies will be co-located, will other agencies be given access to control STC field devices and vice versa? Kamal stated that it is too soon to tell. The Volpe Center is tasked to develop a concept of operations for the public safety operations center (PSOC) where he hopes the roles and responsibilities of the agencies will be addressed.

NOVA ITS Architecture Change

As of today, the STC functionality will remain the same. The development of the concept of operations document to help reflect existing interfaces should be followed to determine impacts to the NOVA ITS Architecture. Once the concept of operations document is close to being finalized, updates should be made to the NOVA ITS architecture to reflect any changes. At the time of this interview, it was thought that the concept of operations development would start in May, 2004 and would be modified until the PSOC is complete (which is approximately in 4 years).

3.3 Data Archiving Concerns

- **(Talk to Kamal Suliman VDOT NOVA Operations Director)**

Kamal Suliman stated that NOVA STC data will continue to be ftp to the Smart Travel Lab (STL) for analysis. STL has developed an Archived Data Management System (ADMS) in using Hampton Roads STC's data and will modify the system for NOVA STC's use. NOVA STC will have access to the archived ITS data collected by STL via the ADMS Virginia website. The Washington Metropolitan area is also planning for a similar system but it still stays at the concept development stage.

NOVA ITS Architecture Change
A change will not be made to the NOVA ITS Architecture because the current architecture already reflects a one-way interface from the NOVA STC sending traffic data to the STL for archiving and analysis and also to the statewide archive data system referred as the VDOT Mobility Data Store.

3.4 CAPWIN Concerns

- **(Talk to Tom Jacobs)**

Tom Jacobs stated that there have not been any events with CAPWIN that should impact NOVA ITS Architecture. Through further probing it was determined that some interconnects status levels requiring updating. Also the element name for CAPWIN needs to be renamed since the center is located in a different building than previously planned.

NOVA ITS Architecture Change

- Rename the Baltimore-Washington HIDTA to CAPWIN NOC (representing Network Operations Center)
- Change status from planned to existing for the interfaces between CAPWIN NOC and VSP and VDOT SSP

3.5 511 Concerns

- **(Talk to Scott Cowherd)**

Scott Cowherd, VDOT 511 Manager, stated that since the RFP submittals recently ended that it may be premature to start making changes to the NOVA ITS Architecture. At this point, he is not sure what the potential contractors for the 511 project submitted and what direction VDOT will go in.

Scott also mentioned that a feasibility study will evaluate the ability of having regional information (MD/DC/VA) coming into a single database for public dissemination. The results of the study will be provided in the 511 project for the DC region and Virginia and the Regional Integrated Transportation Information System (RITIS) project. This project is expected to be completed in about six months.

NOVA ITS Architecture Change
It was determined that updates to NOVA ITS Architecture should wait until this project is completed and after VDOT has selected a contractor to expand the state 511 system. The current architecture also makes reference to a Virginia Statewide ATIS Clearinghouse, Transportation Clearinghouse and Regional Transit Clearinghouse. The results of the RITIS project might recommend having a single clearinghouse; so two clearinghouses might be removed from the NOVA ITS Architecture. It is believed the Transportation

and Transit Clearinghouses may go away, but it may be premature to start moving these elements from the architecture at this time.

3.6 Transit Concerns

- **(Talk to Lora Byala and Susan Sharp)**

Lora Byala and Susan Sharp of WMATA stated they are working with the FTA in developing a report that will describe the transit ITS services planned. This report is in its preliminary stage and is not ready to be released. Lora stated that she would share the report with Amy McElwain of VDOT when it is finalized.

Lora and Susan confirmed the existing and planned WMATA transit services (e.g., AVL, paratransit, electronic fare collection, transit security). These services will be reflected in the market package selection and tailoring phase.

3.7 National Park Service Concerns

- **(Talk to Frank Corrado)**

Frank Corrado of FHWA Eastern Federal Lands Highway Division stated that the park services for the GW parkway are considering installing ITS equipment during re-construction projects. Frank also stated that since this is parkway there is a desire to remove equipment (e.g., CCTV) at the end of the projects due to aesthetics. He mentioned that any equipment on the GW will be controlled by the park services and incident information can be shared with VDOT NOVA STC and Maryland CHART. Maintenance and construction activity on the GW parkway is desired to be shared with the Maryland CHART and VDOT NOVA STC for traffic strategy purposes. Public safety is also a function of the GW park services through the park police that respond to emergencies on the parkway.

Frank would like for the GW Park Services to be extracted from the National Park Services element to reflect its uniqueness.

Frank did not feel it is necessary for his division to be called out as a separate stakeholder since the Eastern Federal Lands do not operate transportation related equipment.

NOVA ITS Architecture Change

- Add the following interconnects to the National Park Services:
  - NOVA Local Public Safety Centers
  - CAPWIN NOC
  - Maryland CHART

- Create a new element called Virginia National Park Service Center.

- Map the Virginia National Park Service Center to traffic management, emergency management, and maintenance and construction management.
- Add the following interconnects to the Virginia National Park Service Center:
    - Special Event Promoters
    - VDOT NOVA STC
    - Maryland CHART
    - NOVA Local Public Safety Centers
    - CAPWIN NOC
    - VDOT NOVA Maintenance and Construction Operations

3.8 Security Updates

Version 5.0 of the National ITS Architecture includes security information as part of its update. Security, in the context of the National ITS Architecture, is referred to protecting the surface transportation information and infrastructure. The changes that were made to the NOVA ITS Architecture related to security are reflected below. Changes in fiscal year 2005 will further expand on security updates to reflect VDOT's statewide critical infrastructure security program and DC regional Homeland transportation security. Contact person for VDOT statewide is Steve Mondul, Security Emergency Management Division Administrator and regional contact is Kamal Suliman, VDOT NOVA Operations Director.

3.8.1 Subsystems/Terminators

Three terminators from Version 5.0 of the National ITS Architecture were added to the NOVA ITS Architecture. These are:

- Alerting and Advisory Systems
    - Federal Installations
    - National Advisory Warning System
    - VDOT TEOC
- Shelter Providers
    - New Element – Shelter Centers
- Telecommunications System for Traveler Information
    - New Element – Statewide 511 Virginia

DC ITMS was renamed to DDOT ITMS which refers to the District of Columbia Department of Transportation.

3.8.2 Information Flows

Security information flows were added to the interfaces of the following elements:

- Federal Installations
- National Advisory Warning System
- VDOT TEOC

3.9 Market Packages

The previous versions of the NOVA ITS Architecture did not specify market packages, so this is a new addition. The following market packages were identified for the NOVA ITS Architecture and tailored descriptions for each are reflected in the Turbo database and website. The market packages selected include services related to maintenance, construction management, and security which were part of the version 4.0 and 5.0 National ITS Architecture Update.

Existing and Planned Market Packages Selected for NOVA

Existing Market Packages	
1.	ATMS01 Network Surveillance
2.	ATMS03 Surface Street Control
3.	ATMS04 Freeway Control
4.	ATMS05 HOV Lane Management
5.	ATMS06 Traffic Information Dissemination
6.	ATMS08 Traffic Incident Management System
7.	ATMS10 Electronic Toll Collection
8.	ATMS18 Reversible Lane Management
9.	ATMS20 Drawbridge Management
10.	APTS2 Transit Fixed-Route Operations
11.	APTS3 Demand Response Transit Operations
12.	APTS4-Transit Passenger and Fare Management
13.	APTS8 Transit Traveler Information
14.	EM01 Emergency Call-Taking and Dispatch
15.	EM04 Roadway Service Patrols
16.	EM06 Wide-Area Alert
17.	MC03 Road Weather Data Collection
18.	MC06 Winter Maintenance
19.	MC07 Roadway Maintenance and Construction
20.	ATMS01 Network Surveillance
21.	ATMS03 Surface Street Control
22.	ATMS04 Freeway Control
23.	ATMS05 HOV Lane Management
24.	ATMS06 Traffic Information Dissemination
25.	ATMS08 Traffic Incident Management System
26.	ATMS10 Electronic Toll Collection
27.	ATMS18 Reversible Lane Management
28.	ATMS20 Drawbridge Management
29.	APTS2 Transit Fixed-Route Operations
30.	APTS3 Demand Response Transit Operations
31.	APTS4-Transit Passenger and Fare Management
32.	APTS8 Transit Traveler Information

Existing Market Packages
33. EM01 Emergency Call-Taking and Dispatch
34. EM04 Roadway Service Patrols
35. EM06 Wide-Area Alert
36. MC03 Road Weather Data Collection
37. MC06 Winter Maintenance
38. MC07 Roadway Maintenance and Construction

Planned Market Packages
1. ATIS1 Broadcast Traveler Information
2. ATIS2 Interactive Traveler Information
3. ATIS9 In Vehicle Signing
4. ATMS07 Regional Traffic Control
5. ATMS09 Traffic Forecast and Demand Management
6. ATMS16 Parking Facility Management
7. ATMS17 Regional Parking Management
8. ATMS19 Speed Monitoring
9. ATMS21 Roadway Closure Management
10. AD1 ITS Data Mart
11. APTS5 Transit Security
12. CVO10 HAZMAT Management
13. EM02 Emergency Routing
14. EM05 Transportation Infrastructure Protection
15. EM07 Early Warning System
16. EM08 Disaster Response and Recovery
17. EM09 Evacuation and Reentry Management
18. EM10 Disaster Traveler Information
19. MC01 Maintenance and Construction Vehicle and Equipment Tracking
20. MC02 Maintenance and Construction Vehicle Maintenance
21. MC04 Weather Information Processing and Distribution
22. MC05 Roadway Automated Treatment
23. MC10 Maintenance and Construction Activity Coordination

4 Regional ITS Architecture Assessment

This section documents how the current NOVA ITS Architecture addresses the FHWA Rule and FTA Policy on ITS Architecture and Standards Conformity. Prior to developing the NOVA ITS Architecture, there was no specific guideline for demonstrating conformity. Conformity guidelines are now available and it is VDOT's intent to review NOVA ITS Architecture's conformity level and identify areas that need to be improved.

The table below is a checklist that represents desired elements of a regional ITS architecture, and includes the requirements of the FHWA Rule and FTA Policy on ITS Architecture and Standards Conformity. The checklist is a tool FHWA is using for assessing the completeness of and identifying improvements to regional ITS architectures. The questions are listed by main topic area with an area for a reviewer to make an assessment. The "Comments" column allows a reviewer to document any suggestions, notes, strengths, or shortcomings. This table displays what components of the rule have been addressed by the NOVA ITS Architecture.

NOVA Conformity Table

Criteria/Question	Yes/No/ Partly	Comments
1. Architecture Scope and Region Description		
a. Is the region defined geographically? Have boundaries been established such as counties, municipal boundaries, metropolitan areas, statewide, etc.?	**Yes**	A mapped was provided that displayed the counties that were included in the NOVA ITS Architecture in the scope section. Boundaries are also described in the introduction.
b. Has a timeframe for the architecture been defined? (For example, 5 or 10 years into the future, or the TIP/STIP planning period)?	**Partly**	No specific timeframe indicated.
c. Has the scope of the regional architecture been defined (i.e. the range of services, institutions, or jurisdictions)? Does the scope seem appropriate given the circumstances?	**Partly**	Not within the scope section. However, there is mention of coordinating with other architectures in other jurisdictions (e.g., Maryland statewide and DC regional).
2. Stakeholder Identification		
a. Are the stakeholders identified in	**No**	Stakeholders are provided,

Criteria/Question	Yes/No/ Partly	Comments
sufficient detail to understand who the players are and for what they are responsible? Are they identified by name, responsibility, jurisdiction, and/or typical roles and activities?		however, use Turbo 3.0 to clarify specific roles of stakeholder groups.
b. Is the range of stakeholders commensurate with the defined scope of the regional architecture?	**Yes**	
c. Does the range represent a broad cross-section of all transportation related organizations in the region?	**Yes**	
d. Is there sufficient information to assess the degree of involvement of each critical stakeholder in the architecture development process?	**Yes**	
3. System Inventory		
a. Has a system inventory been defined?	**Yes**	
b. Does it include a list of applicable regional systems along with descriptions of each system and their functionality?	**Yes**	
c. Have National ITS Architecture subsystems and terminators been correctly linked to regional systems?	**Yes**	
d. Are user-defined entities described in sufficient detail to understand their function?	**NA**	User defined entities were not used in the NOVA ITS Architecture.
4. Needs and Services		
a. Are needs and services defined and described?	**Partly**	Services are described through market packages identified for the NOVA ITS Architecture. A needs section is not provided in the document or website.
b. Are the needs and services adequately represented in the regional architecture?	**Partly**	Services are adequately represented in the NOVA ITS Architecture.
5. Operational Concept		
a. Has an architecture operational concept been described in sufficient detail for the existing systems to understand the roles and	**Partly**	Concept descriptions are provided for each flow diagram in the NOVA ITS Architecture. Also tailored

Criteria/Question	Yes/No/ Partly	Comments
responsibilities (technical, financial, human resource, mutual relationship and functional areas) of the primary stakeholders and the systems they operate in the region?		market package descriptions are used to describe operational concepts at the services level.
b. Has an architecture operational concept been described in sufficient detail for the future systems?	**No**	
6. Functional Requirements		
a. Have high-level functional requirements been identified for each regionally significant system that is included in the architecture? ("Regionally significant systems" are defined as those with interfaces that cross agency boundaries.)	**Partly**	High level functional requirements have been provided in Appendix A of the final report. The information in this table needs to be updated and changes reflected in Turbo 3.0.
b. Are the requirements categorized by stakeholders?	**Yes**	
c. Are the requirements unambiguously stated in terms of shall statements?	**No**	
d. Is the architecture output presented in a way that is understandable to a variety of audiences, including the public and decision-makers?	**Yes**	
7. Interfaces/ Information Flows		
a. Are interconnections defined to indicate what subsystems are connected together? Has this been illustrated by diagrams or tables?	**Yes**	These are reflected through diagrams and tables
b. Have information flow diagrams or tables been developed to illustrate the information flows that are exchanged between subsystems?	**Yes**	These are reflected through diagrams and tables
c. Is enough supporting information provided to understand the information exchanged?	**Yes**	
d. Does the architecture include appropriate linkages to overlapping or adjacent region architectures?	**Yes**	Linkages to the DC and Maryland regional architectures.
e. Is the connection status (existing or planned) identified for each link?	**Yes**	
f. Are there any important integration opportunities that may have been	**No**	Integration opportunities have been explored by

Criteria/Question	Yes/No/ Partly	Comments
overlooked?		conducting nine outreaching workshops with stakeholders.
8. Project Sequencing		
a. Has a plan been established by which projects would be defined and sequenced over time?	**No**	
b. Has an initial sequencing of currently defined projects been established?	**No**	
c. Does the sequencing adequately address the interdependencies among projects?	**No**	
d. Have opportunities to coordinate implementation schedules with other transportation improvements been investigated?	**No**	
9. Agreements		
a. Has a list of the agreements needed between key stakeholders in order to implement the projects that will come out of the regional ITS architecture been defined?	**No**	Consider including agreements that are required to support priority projects.
b. Can existing agreements be used?		
10. Standards Identification		
a. Are ITS standards described that are applicable to the development of projects coming out of the regional ITS architecture?	**Yes**	The NOVA ITS Architecture includes a discussion of ITS standards in the final report based on what was derived from Turbo and the center to center level.
b. Are these standards associated with specific information flows or interconnects?	**Yes**	The NOVA ITS Architecture displays associated standards on a center to center level.
c. Are there any important standards that may have been overlooked?		
11. Using the Regional ITS Architecture		
a. Is there a description for incorporating and using the regional ITS architecture in the region's planning process?	**Yes**	This is reflected in the final report and website.

Criteria/Question	Yes/No/ Partly	Comments
b. Will a regional stakeholder organization or committee monitor and manage the planning process and the architecture use? Are all important responsibilities addressed?	**Yes**	Smart Travel Manager
c. Is there a description for using the regional ITS architecture in support of project implementation?	**Yes**	
12. Maintenance Plan		
a. Is there a documented plan for maintaining the architecture? (If not, are there informal agreements for how the regional architecture will be maintained?)	**Yes**	This is described in final report.
b. Have the various reasons for updating the architecture been addressed (project updates, new requirements or initiatives, etc.)?	**Yes**	
c. Is there a plan for communicating changes in the architecture to stakeholders?	**Yes**	Final report states that the Smart Travel Manager will communicate changes to project managers.
d. Have the responsibilities of the various stakeholders or groups been well defined?	**Yes**	

5 Fiscal Year 2005 Activities

As a result of budget and time constraints, all changes necessary for updating the NOVA ITS Architecture were not accomplished in FY 04. Therefore this section documents the activities that are necessary for FY 05. The scope of the NOVA ITS Architecture and Program Plan Update for FY 05 will include the following areas:

- NOVA ITS Architecture Definition Maintenance
- Update and conduct one NOVA ITS Architecture Training Course
- Update and expansion of NOVA ITS Architecture to meet Federal Rule Compliance
- Update of the NOVA Smart Travel Program Plan to include the NOVA ITS Architecture
- Other necessary updates

These efforts are linked together with the common thread of the NOVA ITS Architecture. By the end of FY04, the NOVA ITS Architecture will be updated to the latest version of the National ITS Architecture, Version 5.0 as well as incorporating definition modifications that have been collected throughout the FY04 timeframe from stakeholders. The merging of the NOVA Smart Travel Program Plan and the NOVA ITS Architecture are logical next steps to integrating these tools for planning purposes.

5.1 NOVA ITS Architecture Definition Maintenance

This task will involve the collection of changes from stakeholders throughout the FY 05 as their systems evolve and need to be reflected accurately in the Architecture definition. The Architecture will be updated on its regular cycle at the end of the FY 05. The effort will include stakeholder outreach to gather specific information or verify Architecture content/modifications and coordination with the Metropolitan Washington Area ITS Architecture and the Maryland Statewide ITS Architecture. The output of the Architecture Maintenance task will be an updated Architecture database, updated website, and updated Architecture document. The benefits of this maintenance goes beyond the requirement in FHWA Rule 940 for architecture maintenance and addresses the availability of the most up-to-date information for stakeholders to use in the planning of ITS in the region.

5.2 NOVA ITS Architecture Training Course

This task will involve the update of the training course materials developed in FY04 to reflect modifications to the Architecture definition as well as the new Turbo Architecture Version 3.0. One course will be conducted under this task. The output of this task will be updated training course materials and PowerPoint files. The benefits of this training task is to update the existing materials to reflect the latest updates to the NOVA Architecture and the Turbo Architecture software tool which stakeholders use to access the NOVA Architecture definition and to conduct the training to educate more stakeholders on the use of the NOVA Architecture in the planning process.

5.3 NOVA ITS Architecture Compliance Update

This task will involve the update of the NOVA ITS Architecture definition and documentation to fully comply with the FHWA Architecture and Standards Rule 940. Additional tools are now available to make this a more comprehensive exercise. Primary areas of the Architecture to be refined will include functional requirements, standards, operational concepts, agreements, and project sequencing. While these areas were included in some form in the original definition of the Architecture, further refinement of the Rule requirements has better defined what is essential for meeting the requirements of the Rule which this task will address. In addition to the more technical refinements, there are more involved institutional updates to be made. Compliance with Rule 940 includes project definition within the regional architecture context. This task will include further planning stakeholder outreach to better define and implement the use of the NOVA ITS Architecture in the planning process. The outputs of this task will include Architecture

documentation, updated website, and an updated Architecture database. The benefit of updating the Architecture for compliance with the Federal Rule is to clear the way for any Federal funding regarding ITS projects by reflecting all Rule requirements in the Architecture definition.

5.4 NOVA Smart Travel Program Plan Update

This task will involve the update of the NOVA Smart Travel Program Plan dated December 1999. The update will include a comprehensive revision to this document to reflect the accomplishments of the past 5 years as well as the changes that have taken place in direction or policy. The concept of operation (COO) will be further developed and documented based on what's included in the current architecture flow description. The NOVA ITS Architecture did not exist at the time of the Program Plans development. The Architecture will be an integral reference point for the Program Plan resulting in the tight coupling of the 2 products. This effort will require significant stakeholder outreach and include project identification and phasing reflecting the implementation of the NOVA ITS Architecture and the Strategic Plans of the region. The outputs of the task will be an executive summary, program plan, and concept of operation document along with an electronic version on CD. The benefits of updating the Program Plan will be to integrate the strategic components of the plan with the functional vision of subsystems and information flows in the Architecture to better serve the stakeholders who are planning ITS in the region as well as guiding the planning activities across the region from a more centralized District point of view.

5.5 Other Necessary Updates

There are other activities that will occur in FY05 to enhance the functionality in the NOVA ITS Architecture and are listed below:

- Review of Statewide Plan to evaluate if the NOVA ITS Architecture is impacted.
- Review the RITIS project documentation to determine what impacts it may have on the Statewide 511 Virginia. After VDOT selects a contractor for the expanded 511 system, talk with Scott Cowherd to determine if any changes are necessary.
- Review ITS Transit document to evaluate if the NOVA ITS Architecture is impacted.
- Follow the activities of the Public Safety Operations Center to evaluate if the NOVA ITS Architecture is impacted.
- Meet with Frank Corrado and the national park services for the GW parkway and the park police to obtain a better understanding of their operations; identify which and what type of information is desired to be exchanged.
- Identify agencies that have plans to install or utilize security/threat sensors for ITS infrastructure (e.g., bridges, overpasses, operation centers). Also identify the agency that will control these devices. Will it be the VDOT NOVA STC and Public Safety Agency or both?

- Add future flows to from VDOT NOVA STC to STL to represent the ADMS Project.
- Determine how HOT Lanes will impact the NOVA ITS Architecture.
- Outreach with key stakeholders based on security updates made to the architecture.
- Evaluate each market package and tailor the interfaces in Turbo to reflect Northern Virginia issues and pertinent security information.
- Replace current diagrams and descriptions with market package view reflecting interfaces and tailored market package descriptions. The market packages will be used to form a basis for creating ITS projects.
- Develop an operational concept that reflects the roles of the stakeholders in the NOVA ITS Architecture.
- In Turbo 3.0 describe the timeframe for the NOVA ITS Architecture.
- Clarify roles of all stakeholders and utilize the group feature of Turbo 3.0.
- Identify project sequencing based on the projects created through market packages.
- Consider including agreements that are required to support priority projects.
- Amend project development process to include using the NOVA ITS Architecture when developing projects.
- Update training materials and rework exercise modules.