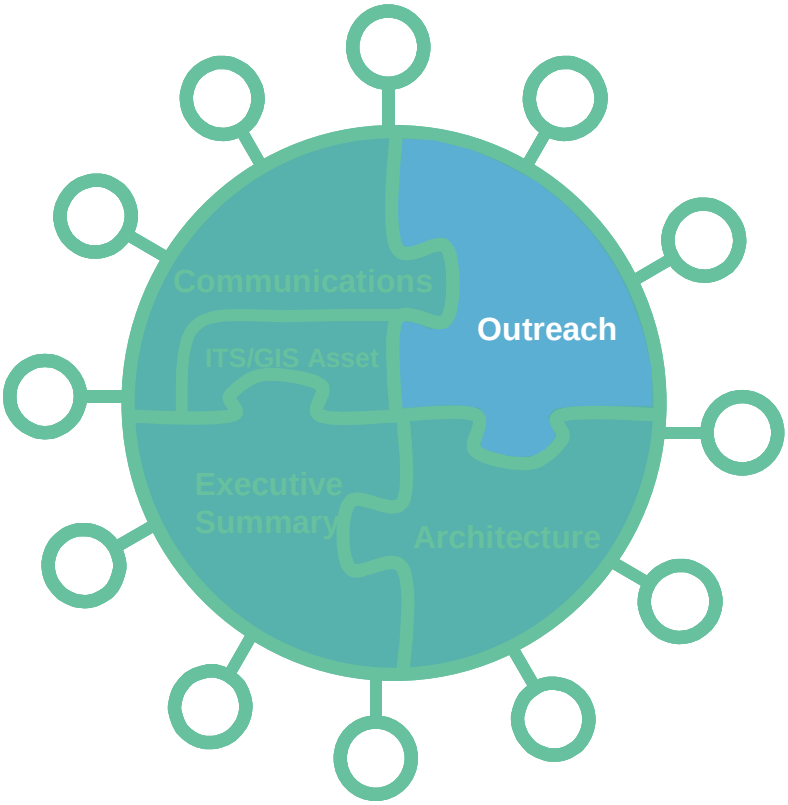
VDOT NOVA – Centric ITS Architecture

OUTREACH REPORT



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1 PROJECT OVERVIEW

As a part of the ongoing efforts to improve the quality of transportation throughout Northern Virginia (NOVA), the Virginia Department of Transportation (VDOT) has adopted the Northern Virginia Smart Travel Program, utilizing ITS to achieve program goals. Intelligent Transportation Systems (ITS) play a vital role in improving transportation operations and providing information to travelers. ITS is used in conjunction with various other conventional engineering programs and techniques that are already in place. Being systems, these ITS solutions should not be deployed in isolation, and will require regional integration for the benefit of the transportation customer.

As shown on the Figure 1 below, Northern Virginia is strategically situated within the National Capital Region, in immediate proximity to Maryland and the District of Columbia.

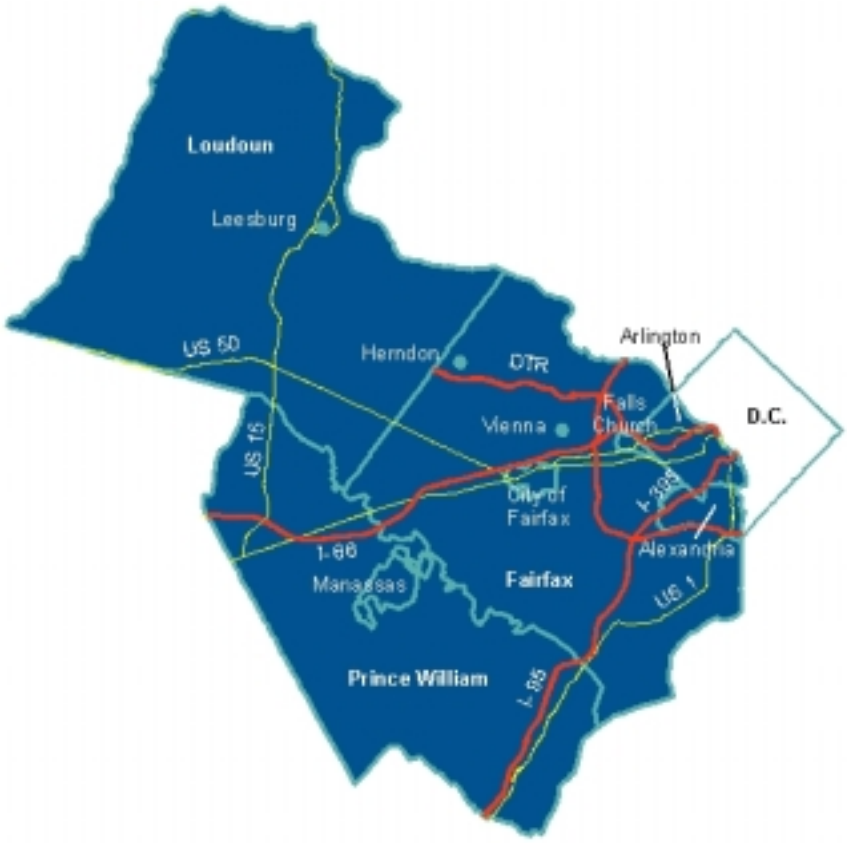

Figure 1 – Northern Virginia District and National Capital Region

VDOT's Northern Virginia District strives to have regional coordination and communication between the different systems deployed by NOVA District and other transportation operating agencies in the region. These integrated systems help to mitigate the recurring congestion problems, thereby improving the quality of the transportation system and improving the efficiency of transportation operations. VDOT's Northern Virginia District is leading this effort in order to help better coordinate ITS integration between stakeholders and VDOT NOVA

operations. This effort is called the VDOT NOVA-Centric ITS Architecture. "NOVA-Centric" means where information flows and interconnects are mapped to and from NOVA and stakeholders, but not between stakeholders. This effort is NOVA-Centric because the Metropolitan Washington Area Regional ITS Architecture already includes NOVA agencies, and therefore there is no reason to duplicate the work of describing linkages outside NOVA District. In addition, because VDOT NOVA District is one point of connection in every linkage described, it is easier to both implement and track progress of the VDOT NOVA-Centric ITS Architecture.

A previously completed ITS Early Deployment Plan (EDP), led by VDOT NOVA District, defined ITS needs within the NOVA District, and a resulting Program Plan defined specifically what actions and projects should be undertaken. The VDOT NOVA-Centric ITS Architecture builds on these to define inter-relationships among stakeholders, as well as with ITS programs and activities throughout Virginia and in Maryland and the District of Columbia.

Since an EDP and Program Plan were already in place, the NOVA ITS Team was able to craft a Strawman Architecture, and then present it to stakeholders within an outreach program. The Strawman was presented to stakeholders in order to validate the NOVA ITS Team's understanding of communications/coordination needs, and to elicit consensus among the stakeholders in support of the Architecture.

The VDOT NOVA ITS Architecture includes development of both an Architecture and Communications Plan. As a key element in undertaking this effort, the Northern Virginia District initiated an Outreach effort that was vital to constructing, validating, and establishing support of the Architecture. The objective of the Outreach effort was to involve stakeholders in order to make the Architecture itself as thorough, useful and meaningful as possible, while eliciting this involvement in a streamlined fashion that emphasized quality of input rather than quantity of meetings.

The Outreach effort included assembling a group of stakeholders representing the many and varied interests that have some stake in the Architecture. Rather than simply providing a series of workshops to present an overview of the Architecture, stakeholders placed in smaller groups by function, to add focus to the Outreach effort. Input was sought from these stakeholders to validate the VDOT NOVA ITS Architecture, as it pertained to each agency or stakeholder group. In addition to this, stakeholder input on existing and/or planned communications infrastructure (including leased services) was sought, although much of the outreach and data collection specific to telecommunications issues was completed under a separate Communications Plan task.

Before mapping information flows within the Architecture, stakeholders were asked to define the required connections between themselves and VDOT. Input and feedback from stakeholders was sought, via examples and scenarios, to help identify information that should be shared between stakeholders and VDOT, within the context of a VDOT NOVA-Centric Architecture. Stakeholder guidance was sought to better develop a regional approach for the integration of technology applications to the transportation system, with the understanding that information sharing among agencies must be truly need-based.

The Northern Virginia District undertook this outreach effort with the understanding that stakeholder input and validation would help make the ITS Architecture a more valuable tool to help improve mobility for the Northern Virginia region, to help improve operation for all concerned with providing mobility options, and as a decision-making tool for planning ITS

projects and investing in regional infrastructure. The stakeholders' and VDOT's involvement in this Outreach effort indicate their commitment to working toward the implementation of the ITS Architecture. The report that follows details the process, proceedings, lessons learned, and results of this Outreach effort.

Further detail on elements of Architecture development is available in the NOVA ITS Architecture Executive Summary, the Final Architecture Report, and the NOVA ITS Architecture Communications Plan. Additional information about the NOVA ITS Architecture Project, including all related tasks and project reports can be found online at the following web address: http://www.VDOT-ITSArch.com.

2 PLANNING FOR AN EFFECTIVE OUTREACH PROGRAM

The Outreach element of the NOVA ITS Architecture is a unique effort designed to critique and validate the needs identification, systems inventory, planning of user services, and associated activities that occur at the outset of a regional architecture development effort. The specific purpose of this Outreach effort was to validate the NOVA ITS Team's understanding as expressed through the Strawman Architecture, and to refine the Strawman into a realistic, comprehensive and implementable architecture that garners stakeholder buy-in and support.

Figure 2 describes the Architecture Development Process and the role of Outreach in that process. The process began with collection and review of existing documentation, followed by development of the Strawman Architecture. The Strawman was then presented to stakeholders for comment, validation, and consensus. Stakeholder input from the Outreach effort was used to refine the Architecture and produce a finalized product that captures all interconnects and information flows. The Architecture remains as a "living" product that can grow and respond to Northern Virginia's dynamic transportation system.

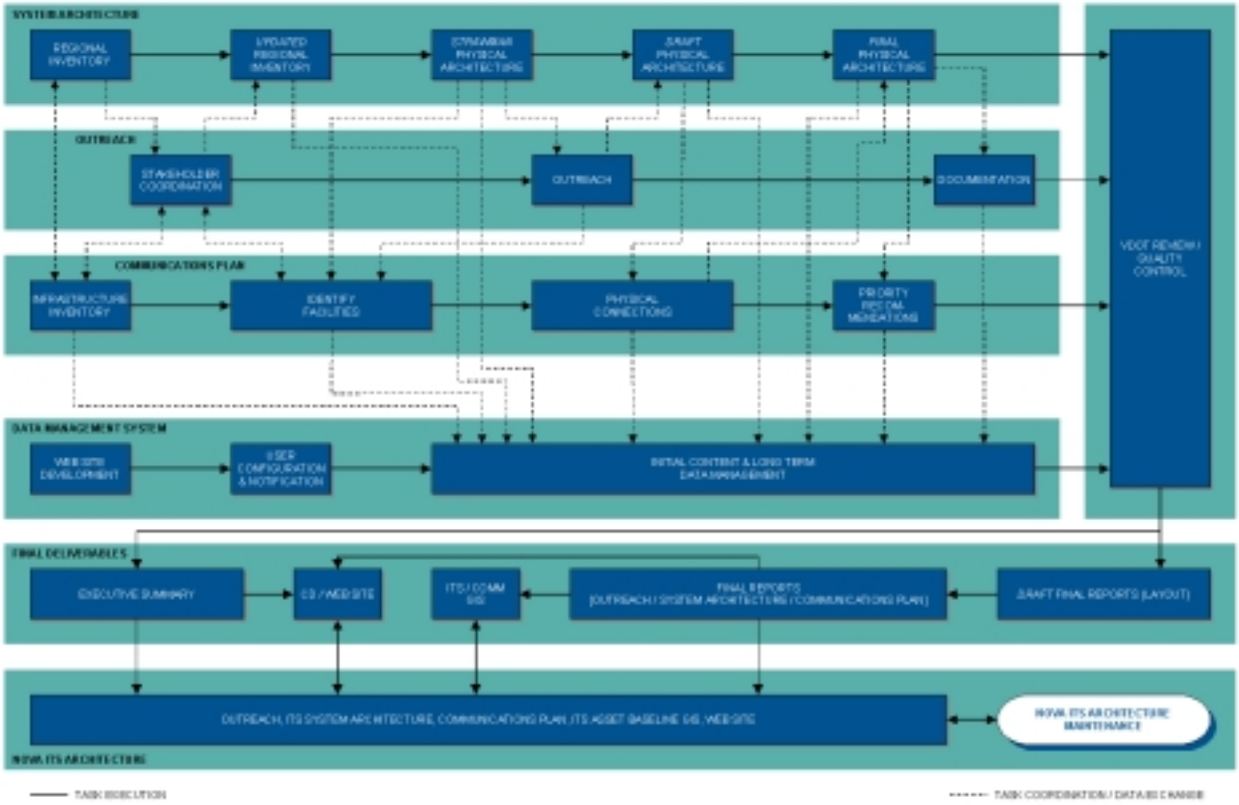

Figure 2 – ITS Architecture Development Process

The scope of the Outreach effort called for the NOVA ITS Team to identify and categorize stakeholders, plan and conduct a series of Outreach meetings to obtain stakeholder input and validation, follow up with stakeholders as necessary after these meetings, to consolidate and

utilize stakeholder input as a basis for modifying the Strawman Architecture, and finally to confirm with stakeholders the validity of the revised Architecture.

The strategy for the Outreach effort was to: coordinate with Maryland and D.C Regional Architecture efforts for consistency in communicating with stakeholders; create VDOT champions; arrange meetings in specific areas/functions to involve stakeholders; conduct post-meeting follow up, and; send confirmation letters to establish acceptance/endorsement. The Outreach strategy is graphically represented in Figure 3, below:

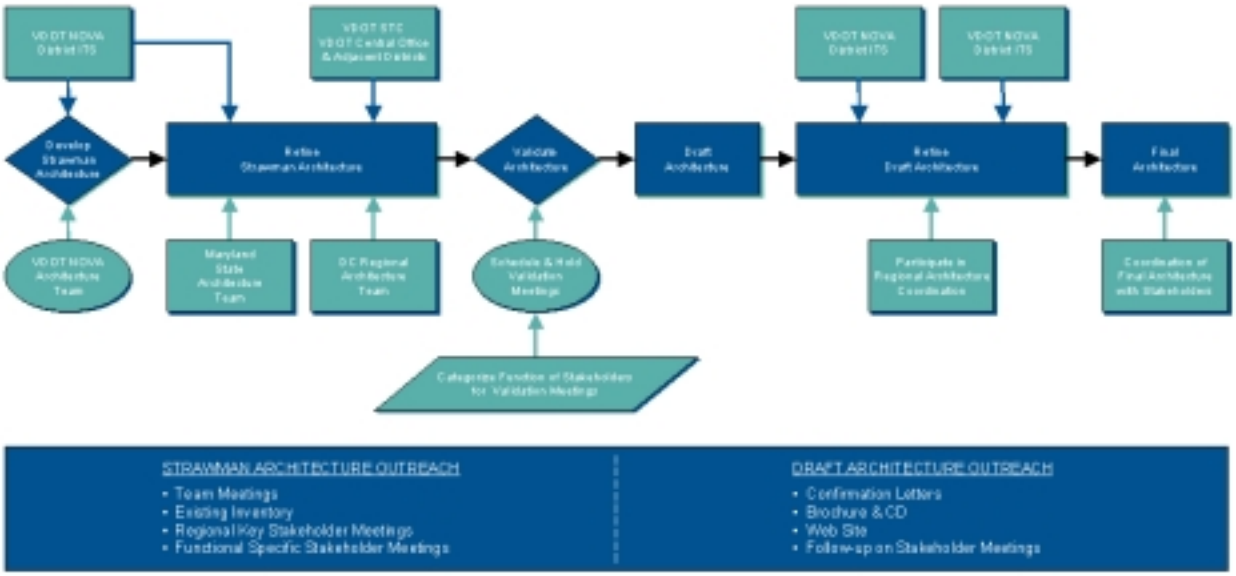

Figure 3 – Outreach Process

In May, 2001, a NOVA ITS Team comprised of staff from ARINC, PB Farradyne and Iteris began working with the VDOT Northern Virginia District to plan and implement an Outreach program in support of the ITS Architecture. At a meeting on May 8, VDOT District staff and the NOVA ITS Team agreed on a process and approach for moving forward with outreach efforts. The process began with identification of stakeholder groups, and then of organizational stakeholders within each group. Points of contact were identified for each stakeholder organization. This process created stakeholder "champions" to help generate input needed for completion of the final Architecture.

An ITS Strawman Architecture was developed for the purpose of eliciting stakeholder input and iteratively producing a final architecture that responded to stakeholder concerns, incorporated stakeholder vision, and engendered stakeholder support and consensus. A series of 11 meetings were planned and executed in May and June, to address specific areas of system function and stakeholder interest within the Strawman Architecture. This approach led to more focused discussions and more productive and meaningful results.

2.1 TRI-ARCHITECTURE COORDINATION

Both prior to the Outreach effort, and as a follow up element after the stakeholder meetings, the development of the VDOT NOVA ITS Architecture was closely coordinated with the on-going Maryland Statewide and Metropolitan Washington Area ITS Architecture initiatives (of which some of the NOVA ITS Architecture information flows are a subset). All three Architecture efforts used a common tool: the ITS Turbo Architecture, developed by FHWA as to provide automated assistance in developing a Regional Architecture. Accordingly, the precedent was set for identifying common stakeholders and common naming conventions, as a means to achieving consistency among the three Architectures.

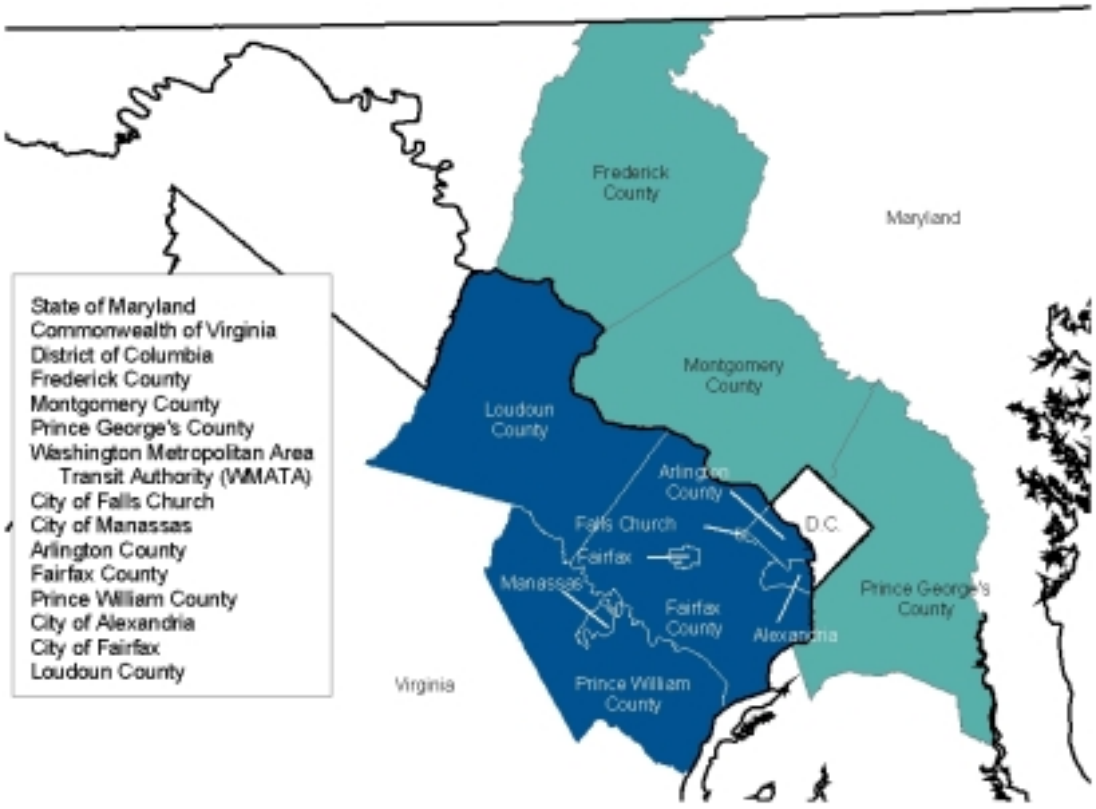

Figure 4 – Coverage of Architecture Efforts in National Capital Region

The Maryland Statewide ITS Architecture identifies interconnects and architecture flows between freeway, arterial, toll administration and transit management centers, information service providers, public safety centers, commercial vehicle operations (CVO) systems, and archived data, emission and parking management systems between state, county and local agencies in Maryland. The Washington Metropolitan Area ITS Architecture covers jurisdictions who are members of the Metropolitan Washington Council of Governments (MWCOG), and examines the regional ITS application interface alternatives and recommends specific actions that could facilitate electronic exchange on National ITS Architecture data elements among MWCOG member ITS agencies. By way of comparison, the VDOT NOVA ITS Architecture is a VDOT-centric architecture, and as such, identifies interconnects and architecture flows between VDOT NOVA District and local jurisdictions within the Northern Virginia District, regional

agencies in the Washington Metropolitan Area, and other VDOT entities within the State. It also supports users of those systems.

Each Architecture group met to achieve consensus and agreement on the following issues:

- Coordination
- Common Stakeholders
- Common Naming Conventions
- Common Interconnects
- Validation

This was achieved via actions and decisions during the following meetings:

- November 8, 2000 – Agreed to coordinate the development of the architectures and developed a framework for doing so.

- December 13, 2000 – Agreed to common stakeholders and naming conventions for use in the Turbo Architecture software package. Stakeholder and naming conventions continued to be closely coordinated during the development and updates of all three architectures.

- April 6, 2001 – Reviewed and coordinated common interconnects among the various stakeholders included in all three architectures.

- May / June, 2001 – Coordinated targeted validation meetings with local public safety, transit, and traffic management operators, and regional electronic fare payment providers.

The result of these meetings is a coordinated and complementary effort among the groups pursuing all three Regional Architectures. With common nomenclature, conventions and processes, the end products of each effort will be more meaningful, more easily understood by stakeholders, and more "user friendly". By defining common interconnects, a first step has been taken to achieve some level of compatibility in design and eventual deployment, which may result in a level of interoperability across the regions.

2.2 REACHING OUT TO STAKEHOLDERS

In order to reach out to stakeholders, identification of stakeholder categories, and individual stakeholders within categories, was an important initial step in the Outreach effort.

2.2.1 IDENTIFY AND CATEGORIZE STAKEHOLDERS

The following categories of stakeholders were identified:

- Incident and Emergency Management
- Traffic Operations
- Transit
- Planning
- VDOT Central Office and other VDOT Districts
- Electronic Payment

The table that follows details the organizations that were represented among each stakeholder group. In some cases organizations were represented by more than one individual. A complete list of all individuals participating as stakeholders, with contact information, is attached as Appendix A.

Table 1 – NOVA Stakeholders

Category	Stakeholder
Incident and Emergency Management	• VDOT NOVA Safety Service Patrol • VDOT NOVA Maintenance Special Operations • Virginia State Police • Arlington County Police and Fire • Fairfax County Police and Fire • Prince William County Police and Fire • Loudoun County Fire and Rescue • Prince William County Office of Public Safety • Arlington County Emergency Communications Center • City of Alexandria Police and Fire • Fairfax City Police and Fire • Falls Church Police and Fire • Herndon Police • Vienna Police • Leesburg Police • Manassas Police
Traffic Operations	• VDOT NOVA Smart Traffic Center • VDOT NOVA Smart Traffic Signal System • VDOT Dulles Toll Road • Dulles Greenway • City of Falls Church Signal System • City of Fairfax Signal System • City of Alexandria Signal System • Arlington County Traffic Engineering • City of Manassas Signal System • City of Manassas Park Signal System • Town of Herndon Signal System • Town of Leesburg Signal System • Town of Vienna Signal System • District of Columbia Department of Public Works • Maryland SHA CHART Program • District of Columbia Traffic Management Center • Maryland Transportation Authority • National Park Services
Transit	• Virginia Department of Rail and Public Transit • Virginia Railway Express • Rail Operations – CSX and Norfolk Southern

Table 1 – NOVA Stakeholders

Category	Stakeholder
	• Washington Metropolitan Area Transportation Authority • Potomac and Rappahannock Transportation Commission • Omni Ride – Prince William County • Arlington Regional Transit – Arlington County • Virginia Railway Express • City-University-Energy Saver Bus – Fairfax City • DASH Bus Service – Alexandria City • LCTA and Express Bus – Loudoun County • Fairfax Connector – Fairfax County • Fairfax County FASTRAN Services • Falls Church Bus • Springfield (TAGS Metro Springfield Circulator) • Maryland Mass Transit Administration
Planning	• VDOT NOVA Geographic Information System • VDOT NOVA Sections: Transportation Planning, Location & Design, Land Development, Traffic Engineering, Environmental, NOVA Residencies • Metropolitan Washington Council of Governments • Tri-Regional Architectures • Northern Virginia Transportation Commission • Fairfax County – Planning • Prince William County – Planning • Loudoun County – Planning • Arlington County – Planning • City of Alexandria – Planning • City of Falls Church – Planning • City of Fairfax – Planning • City of Manassas – Planning • City of Manassas Park – Planning • Town of Herndon – Planning • Town of Leesburg – Planning • Town of Vienna – Planning • VDOT Data Management Division • VDOT Traffic Engineering Division – Mobility Data Store • Smart Travel Lab - UVA • Universities – George Mason and Virginia Tech Falls Church • Federal Highway Administration Regional Resource Center

Table 1 – NOVA Stakeholders

Category	Stakeholder
Internal VDOT NOVA Groups	• VDOT NOVA Transportation Communication Center • VDOT NOVA Technical Construction • VDOT NOVA Snow Operations • VDOT NOVA Equipment and Facilities • VDOT NOVA Infrastructure Management • VDOT NOVA Maintenance Construction • VDOT NOVA Public Affairs
VDOT Central Office and Other VDOT Districts	• VDOT ITS Division • VDOT Maintenance – ICAS • VDOT Richmond District STC • VDOT Hampton Roads STC • VDOT Fredericksburg District ITS • VDOT Culpeper District ITS • VDOT Lynchburg District ITS • VDOT Staunton District STC • VDOT Salem District ITS • VDOT Bristol District ITS • VDOT Maintenance – TEOC • FHWA
Electronic Payment	• VDOT Dulles Toll Road/Smart Tag • Dulles Greenway • Maryland MTAG Electronic Toll Collection System • VDOT Fiscal Division – Smart Tag Center • I-95 Corridor Coalition – EZ Pass • Metropolitan Washington Council of Governments • Metropolitan Washington Airport Authority • Virginia Railway Express • Washington Metropolitan Area Transportation Authority • Local transit services (see Transit)

2.2.2 PLANNING A STRUCTURED OUTREACH PROGRAM

A series of meetings with project stakeholders were held, including a pre-meeting with VDOT NOVA senior staff. The purpose of the pre-meeting was to elicit senior staff's support in "championing" the Outreach effort. A meeting was then held with staff from the VDOT NOVA Smart Traffic Center, to apprise them of the upcoming stakeholder meetings and to gather initial input from STC staff that serve as the current hub of much of the ongoing exchange of information. The meetings were typically scheduled for two to three hours. Preparation for all stakeholder meetings is fully addressed in Sections 2.2 through 3.2 of this document. The following table summarizes the meeting schedule, venue and focus area for the Outreach effort:

Table 2 – Outreach Meetings

Date	Focus Area	Venue	Purpose
May 8, 2001	VDOT NOVA Pre-meeting	VDOT NOVA District Office, Chantilly, VA	Educate participants about NOVA ITS Architecture and create champions.
May 8 & 10, 2001	VDOT STC	VDOT Smart Traffic Center, Arlington, VA	Obtain input from STC staff on interconnects and information flows between STC and other stakeholder agencies.
May 11, 2001	Incident and Emergency Management Groups	VDOT Smart Traffic Center, Arlington, VA	Obtain input from incident and emergency response teams representing several stakeholder agencies.
May 21 & 23, 2001	Traffic Operations Groups	VDOT Smart Traffic Center, Arlington, VA	Obtain input from various stakeholders within Northern Virginia involved in traffic operations.
May 30, 2001	Transit Groups	NVTC, Arlington, VA	Obtain input from transit operators representing various agencies and jurisdictions.
June 12, 2001	Internal VDOT NOVA Groups	VDOT NOVA District Office, Chantilly, VA	Obtain input from internal NOVA District units and elicit their support of Architecture process.
June 13, 2001	Planning Groups	MWCOG, Washington, D.C.	Obtain input from entities involved in envisioning and planning for transportation system improvements and archiving transportation data.
June 14, 2001	VDOT Central Office and adjacent District Personnel	VDOT Staunton District Office	Obtain input from stakeholders within VDOT performing traffic operations outside NOVA District.
June 21, 2001	Electronic Payment Groups	MWCOG, Washington, D.C.	Obtain input from stakeholders in and around Northern Virginia offering transportation and related services on a cost per use basis.

Table 2 – Outreach Meetings

Date	Focus Area	Venue	Purpose
October 5, 2001	VDOT STC Post 9-11 Follow-up	VDOT Smart Traffic Center, Arlington, VA	To follow up with STC staff regarding changes in operations after the 9-11 attack.
October 11, 2001	Transit Groups Post 9-11 Follow-up	NVTC, Arlington, VA	Participated in the transit group meeting called by transit agencies. To follow up with transit stakeholders regarding changes in operations after the 9-11 attack.

2.3 TEAM COORDINATION

In addition to the meetings with stakeholders, the NOVA ITS Team met regularly to plan upcoming meetings, review results of prior meetings, and to coordinate and report on the status of all work related to this Outreach effort. The NOVA ITS Team consisted of representatives from PB Farradyne, Iteris, ARINC and the VDOT project leader.

During these meetings strategy and consensus was developed for each stakeholder strawman architecture, and synergies were established between Outreach, System Architecture and the Communications Plan.

The NOVA ITS Team collectively developed the briefing for each stakeholder group, tailoring the discussion and presentation materials to address concern unique to each group. This was critical to getting stakeholders interested and involved.

The NOVA ITS Team also met with representatives from ITS Architecture development efforts in Maryland and the District of Columbia, to coordinate the VDOT NOVA-Centric ITS Architecture with those efforts.

2.4 OUTREACH PREPARATION – HANDOUTS AND PRESENTATIONS

Detailed presentation materials and a complete package of handouts were prepared in advance of each Outreach meeting. The material content was consistent throughout each meeting, but was tailored to fit the needs and interests of each group of stakeholders. For each meeting, the NOVA ITS Team:

- Created an agenda
- Created a handout package
- Created presentation slides that would introduce the project to the stakeholders, educate and prepare stakeholders for validating the Architecture
- Created presentation and handout materials that would help in facilitating the validation discussion among stakeholders on the Strawman Architecture.

3 VERIFY THE STRAWMAN ARCHITECTURE

After determining who the stakeholders were, categorizing them, and planning for a structured series of meetings, the NOVA ITS Team began the heart of the Outreach effort: verifying the Strawman Architecture through stakeholder outreach. Specifically, this portion of the Outreach effort was designed to:

- Seek support and champions among VDOT senior staff
- Conduct outreach meetings to validate the Strawman Architecture
- Consolidate Information from stakeholders
- Use this information as input for modifying the VDOT NOVA Architecture and the Washington Metropolitan Regional Architecture

Detailed minutes for each of these meetings, presentation materials and attendee lists are included in the "VDOT NOVA ITS Architecture Compendium of Outreach Materials" which is available through VDOT. Presented below is an overview of the series of meetings. The meetings are described individually in greater detail in section 3.2.4.

3.1 SEEK SUPPORT AND CHAMPIONS AMONG VDOT SENIOR STAFF

A pre-meeting between the NOVA ITS Team and VDOT staff was held on May 8, 2001 at the VDOT NOVA District Office in Chantilly, Virginia. The purpose of this meeting was to provide background to VDOT staff on the VDOT NOVA ITS Architecture project, to preview the upcoming series of meetings with stakeholders, to conduct a "dry run" of the materials to be presented to stakeholders, to elicit VDOT staff feedback on those materials and the planned Outreach effort, and to elicit support of VDOT management for the involvement of their staff, as appropriate.

Invited to this pre-meeting were senior members of VDOT and it's functional sub-groups in Northern Virginia, including the VDOT ITS Administrator and senior staff from the VDOT NOVA Smart Traffic Center (STC), the VDOT NOVA Smart Traffic Signal System (STSS), as well as other planning, engineering and operations groups. Among the invitees were individuals representing each of the planned focus areas of the upcoming stakeholder meetings. These individuals were encouraged to become "champions" for the Architecture as they attended the stakeholder meetings.

The VDOT group provided valuable input and critique that was used to inform and enhance the outreach materials and approach used in subsequent stakeholder meetings. Among issues raised by VDOT staff at the pre-meeting were: the need for the Architecture to take into account evolving communications technology; the need to deal sensitively with privacy issues; and the need to determine whether individual agencies or a central clearing center should be responsible for ensuring data integrity.

Overall there was strong consensus that the Architecture would be an effective tool for promoting inter-operability and regional coordination and integration, and that it would be important to develop a Communications Plan to facilitate implementation of the Architecture.

Using this pre-meeting as a strong foundation, the NOVA ITS Team continued moving ahead with plans already underway for the stakeholder meetings. Invitations to specific meetings were distributed to the identified stakeholders well in advance of each meeting, and the NOVA ITS Team worked to ensure good attendance by sending emails and placing phone calls and making contacts to remind participants of the upcoming meetings.

3.2 EDUCATING AND INVOLVING STAKEHOLDERS

After the pre-meeting with VDOT, stakeholder meetings focused on specific areas of operational and functional interest were held throughout May and June 2001. A listing of the dates, venues and focus areas for these meetings is included in preceding section 2.1.2.

One purpose of each of these meetings was to obtain input from stakeholders in a specific focus area on the various interconnects and information flows between stakeholder organizations with respect to that focus area. Another purpose of each meeting was to inform the stakeholders that additional information would be solicited (as follow up) regarding existing and/or planned communications infrastructure. The NOVA ITS Team also provided an overview of the scope of the project, established that the Architecture was VDOT NOVA-centric, presented the strawman Architecture (developed from previously documented information and general understanding of stakeholder operations), then engaged the stakeholders regarding each proposed interconnect and information flow.

The meetings were divided into two parts: the first part focused on introducing the project and educating stakeholders about the Architecture; the second part focused on validating the Architecture interconnects and data flows. The meetings were typically very well attended, with the majority of those invited attending. Detailed minutes, attendance lists and materials are available in the hard copy project records available from VDOT. Following is an overview of the material presented at each meeting.

3.2.1 OUTREACH MATERIALS

Each meeting followed a similar structure and used consistent, but tailored, presentation materials to stimulate discussion. The first part of the meeting utilized a project flier and presentation materials to introduce the project and the Architecture. The second part utilized handouts and presentation materials including:

- Strawman Architecture detailing VDOT NOVA-centric ITS Architecture with emphasis on interconnects and data flows related to the focus area of each meeting.
- Summary tables of information exchanged related to each meeting's focus area
- Stakeholder inventory
- Information flow definition table

Attendance Documentation – It was important to document attendance so that points of contact could be identified, and stakeholder participants could be contacted again for any necessary follow up and verification. Sign-in sheets were filled out at each meeting. The sheets listed those stakeholders invited to each meeting, noting stakeholder category and contact information for the individual expected to attend. Attendees simply checked a box to indicate their presence. In addition, space was provided for other attendees, who were asked to

provide similar information. Copies of all meeting sign-in sheets are available in the hard copy project records available from VDOT.

Project Flier – A one-page flyer was developed to provide an overview of the Outreach and validation efforts. This flyer contained a description of the VDOT NOVA ITS Architecture project; a discussion of the context in which the project was being undertaken, including benefit expected to be derived from the Architecture; and a solicitation of stakeholder input and support, including a description of why the input was important and how it would be used. The flyer was distributed to stakeholders at each meeting and was made available in quantity for distribution "second hand" to other interested parties. The flyer was designed to engender an understanding of the NOVA ITS Architecture effort among a broad range of audiences. Accordingly, it concisely described the project while avoiding technical jargon and unnecessary detail. The flyer also served as a reference for those unable to attend stakeholder meetings, and a bridge to future follow-up with those stakeholders.


VALIDATION
of the
VDOT NOVA ITS Architecture
NOVA ITS Architecture
The Project
Context
Your Input
Smart Travel FAQ Sheet

Figure 5 – Outreach Flier and FAQ Sheet

Handouts – t each meeting, attendees were given a copy of the meeting agenda, as well as a full version of all presentations. The handouts were used as working materials for the stakeholders to refer to in validating those elements of the VDOT NOVA ITS Architecture that related to their areas of responsibility. Copies of all meeting handouts are available in the hard copy project records available from VDOT. The handouts included:

- Summary tables of information exchange related to that meeting's focus area.
- An overview of the VDOT NOVA ITS Architecture Outreach effort.

- Materials that detail the VDOT NOVA ITS Architecture with emphasis on interconnects and data flows related to that meeting's focus area.
- Overview of the structure of the Communications Plan, it's purpose, and related data needs in order to complete the analysis.

3.2.2 EDUCATING STAKEHOLDERS

The VDOT project leader opened each meeting by welcoming participants and leading group introductions, then briefed the attendees on the purpose and background of developing the VDOT NOVA ITS Architecture, and described the importance of that particular meeting's focus area in the Architecture and in shaping the future of transportation in the region. The participation of VDOT's project leader gave credence to the value of stakeholder input, and to the entire NOVA ITS Team as they worked with the stakeholders. Stakeholder participants were told how the meeting would progress and how their input would be used. This helped them frame their response to the Strawman Architecture, as well as understand the larger picture of regional coordination and improved operations that their participation was helping to bring about. Stakeholders were apprised of the potential opportunities created by the Architecture, and also of the constraints deriving from the Architecture's VDOT NOVA-centric nature.

The NOVA ITS Team then presented the strategies devised to reach out to the stakeholders in the regions, which the Architecture encompasses. The presentation described how stakeholder groups had been determined and how individual stakeholders were identified within each group. Stakeholders were invited to participate in all meetings related to functional areas that they were involved with. The presentation detailed the stakeholder outreach effort and described how each particular meeting fit within the entire scheme, as presented in Figure 6.

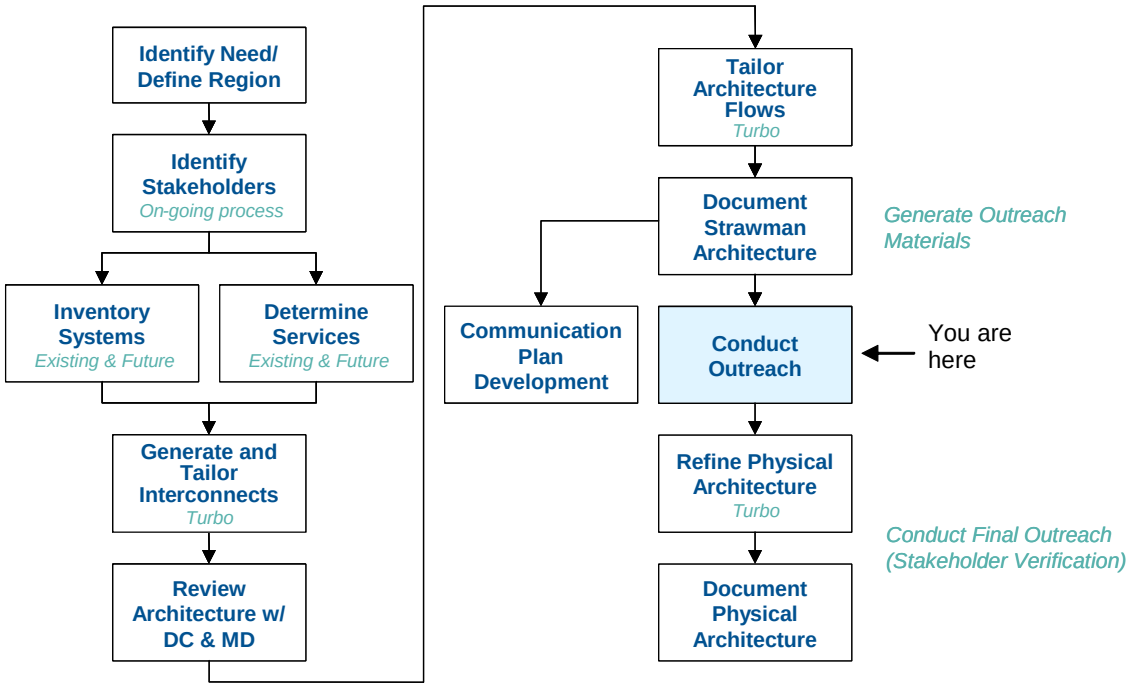

Figure 6 – Where Stakeholders Fit in the Architecture Process

The NOVA ITS Team then presented the VDOT NOVA ITS Strawman Architecture. Stakeholders were provided an overview of the Architecture development process (Figure 2). Stakeholders were introduced to the Architecture, given an overview of the information they were about to receive in the second part of the meeting, and told what they were expected to verify.

Stakeholders were shown how the Outreach activities contributed to the overall architecture development by gathering needed stakeholder input. Stakeholders were briefed on how the Architecture attempts to describe interconnects and data flows, shown examples of Inventory Lists and a project-customized detailing the logical architecture of the many transportation information and management systems in Northern Virginia. The NOVA ITS Team showed examples of different levels of "Interconnect Diagrams" that the group would be asked to critique and verify.

At the time of the stakeholder meetings, it was premature to collect information specific to communications infrastructure, but communications needs were addressed. The stakeholders reviewed communications elements of the Strawman Architecture, as input to eventual development of a Communications Plan. This feedback was used to account for existing and planned communications infrastructure in the Architecture; to match information flows to stakeholder requirements, and to project bandwidth requirements (see "VDOT NOVA ITS Architecture Communications Plan" for details).

3.2.3 INVOLVING STAKEHOLDERS

After the NOVA ITS Team briefed meeting participants as noted above, stakeholders were led through a detailed review of the Strawman Architecture for the purpose of verifying interconnects and information flows. The review process was facilitated by Iteris the VDOT project leaders, who provided real-world examples to explain the Architecture flows. Stakeholders were therefore not simply reviewing technical diagrams, but were also validating real-world scenarios.

Specifically, each stakeholder group reviewed the following items:

- NOVA System Inventory (Figure 7)
- Interconnect Diagrams/Tables for focus area (i.e.: traffic operations, transit, etc.)
- Information Flow Diagrams for focus area
- Information Flow Definition Tables

They were asked to review the overall architecture, with emphasis on interconnections with VDOT NOVA and information flows within NOVA systems, such as the STC, and with other systems, particularly those related to their focus area; and to suggest modifications, deletions or additions as appropriate. In each meeting and with regard to each focus area, a significant amount of important input was received.

Name	Description	Status	Name	Stakeholder/Owner
Adjacent VDOT STCs	Richmond STC Fredricksburg STC Culpepper STC Staunton STC	Planned	Other TM	VDOT Districts
Baltimore-Washington HIDTA	High Intensity Drug Trafficing Area	Planned	Emergency Management	CAPWIN
		Planned	Emergency Vehicle Subsystem	
CVO Safety Unit	Virginia State Police Fairfax County Police	Planned	Commercial Vehicle Check	Virginia State Police
DC DPW Center		Existing	Other Traffic Management	District of Columbia
DC Public Safety Centers		Existing	Other EM	District of Columbia Public Safety
Federal Installations	GAO Military	Existing	Emergency Management	Federal Agencies
Greenway Center		Existing	Toll Collection	Dulles Greenway
		Existing	Toll Administration	
IEN		Existing	Other TM	I-95 Corridor Coalition
IMMP/ICAS	Integrated Maintenance Management Program/Asset Management	Existing	Construction and Maintenance	VDOT Maintenance Division
ISP Centers	Partners in Motion EyeCast.com (HighwayNet.com) VF (Vision Factor)	Existing	Information Service Provider	Regional ISPs
Maryland (MTAG) Electronic		Existing	Toll Administration	Maryland
Maryland Arterial TMCs	MDSHA OOTS Montgomery County TMC Prince George's County TRIP Center	Existing	Other TM	Maryland Arterial Management Agencies

Figure 7 – Snap Shot of the NOVA System Inventory

3.2.4 MEETING HIGHLIGHTS

While each meeting followed the format detailed above, each also had it's own unique flow, discussion focus, and stakeholder interaction. Detailed meeting minutes can be found in Appendix B. Following are important highlights from each meeting:

VDOT Pre-meeting – There was consensus among attendees that ITS benefits Northern Virginia, and therefore the VDOT NOVA Architecture, as a means to enhancing the region's ITS, is a worthwhile undertaking. The VDOT ITS Administrator made an impassioned plea for "integrated systems" as a focal point of both the Architecture effort and resulting deployment efforts. A key concern among the group was the perception of ITS as a public infringement on the privacy of the citizenry. The consensus was that ITS benefits need to be highlighted, and the actual use of ITS as a non-intrusive operations and management tool be communicated. There was a sense that significant use could be made of data archived through ITS.

VDOT Smart Traffic Center (STC) – STC staff were concerned about the level of integration required to make the interconnects and data flows proposed in the Strawman Architecture a practical reality. However, STC staff actively participated in two meetings with the NOVA ITS Team and were able to validate all existing interconnects and provide suggestions regarding removing/adding future interconnects.

Incident and Emergency Management Groups – Stakeholders representing police and fire departments were especially interested and cooperative. They identified Event Management and Response to Non-Recurring Incidents as key concerns. They also expressed their chagrin at the lack of communication between themselves and Federal enforcement agencies (FBI, CIA, etc.) with a significant local presence, and their skepticism that this would ever be rectified. The group also suggested that "Command Post" be added to the Architecture and identified as a stakeholder.

Traffic Operations Groups – Stakeholders from the NOVA Smart Traffic Signal System were very interested and cooperative, but expressed concerns about why discretely operating ITS elements in Northern Virginia were not already more integrated. Stakeholders from the Dulles Greenway provided a unique private-sector perspective, emphasizing their need for, and willingness to participate in, information exchange as a function of business opportunity and requirements. Stakeholders from the Dulles Greenway and Dulles Toll Road agreed that traffic management and operations along both roadways was properly the responsibility of the Smart Traffic Center. Another unique perspective was brought by stakeholders from the National Park Service, who focused on the potential benefits of ITS to the environment as a key selling point of the VDOT NOVA Architecture.

Transit Groups – This meeting was extremely well-attended, as reflected in the meeting notes, with stakeholders from both small municipal and large, county-wide and regional transit systems present. A shared concern among this group was why VDOT could not serve as an information broker for transit information. The group stressed the need for an information clearinghouse to provide transit information, integrated with traffic information.

Internal VDOT Groups – This meeting highlighted just how many and varied are the groups within VDOT that have some interest and stake in the NOVA ITS Architecture. Discussions made it clear that ITS has been, and continues to be, planned, designed and implemented in decentralized fashion throughout VDOT. While the stakeholders involved did see a value to coordination and cooperation, there was no inclination toward further centralization of ITS activities.

Planning Groups – The focus of this meeting was on obtaining and utilizing data that is truly meaningful from the planner's perspective. This group was concerned that controlling and sharing data had become a "turf" issue, creating difficulty in the exchange of data across departments and agencies. The group discussed both centralized and decentralized models of data flow, with the consensus that control of data should reside at the agency/division level, with only selected provision for data sharing.

VDOT Central Office and Adjacent Districts Personnel – The tone of this meeting was cooperative, yet it was clear that VDOT Districts in the western part of the state had not interest in Architecture interconnects with NOVA District. Stakeholders from the Fredericksburg District did express interest. No clear vision was communicated from the VDOT Central Office. The apparent sense was that the NOVA District should pursue develop of the VDOT NOVA Architecture as an activity unto itself. However, there was a consensus that each District's STC would have more active cooperation and integration functions with its adjacent STC and would communicate with non-adjacent Districts' STC via TEOC.

Electronic Payment Groups – Stakeholders in this group focused their discussions on the market research for eventual integration with E-ZPass, and on linkages between transit

operations and toll/fare collection. It was noted that the ITS National Architecture does not address Electronic Payment Systems. This group did not provide any clear-cut direction or guidance for the NOVA ITS Architecture. However, this group did stress the importance to understand the customers' need before government and private industry invest in cross-mode electronic payment integration.

3.3 POST-MEETING FOLLOW-UP AND HOMEWORK

The stakeholder meetings were designed, in part, to provide the impetus for further discussion and stakeholder involvement outside the structure of the formal meeting. Accordingly, in some cases, the in-meeting discussion led to further discussions among the stakeholders themselves and between stakeholders and the NOVA ITS Team. In some cases information was exchanged via e-mail exchanges, in other cases conversations were held via telephone. Stakeholders made some inquiries to the project team, and considerable effort was required to follow up with stakeholders, answer questions, and to initiate calls to stakeholders resolve open discussion items.

In some cases also, the stakeholders were asked to continue their work of validation and documentation of communications elements after the meeting, and to return their input to the project team. The level of success with which this request was met is indicative of the strong stakeholder buy-in and willingness to participate in the process. One lesson learned from the process is that, even though Outreach activities and meetings were well orchestrated, the strong participation of stakeholders meant that not everything could be accomplished in a single meeting. In an Outreach effort such as this, allotting time and resources for follow up is critical, as is the willingness of stakeholders to continue to participate as the process moves forward.

4 CAPTURE STAKEHOLDER INPUT

The project team was careful to document the stakeholder meetings, with emphasis on recording attendance, presentation materials, notes and minutes, and stakeholder input to the Strawman Architecture validation process.

4.1 MINUTES

The NOVA ITS Team recorded detailed minutes of each meeting, so that nothing of importance would be lost or missed. It is often difficult during a meeting to sift through all this is said and presented in order to capture important elements while weeding out unimportant elements. It is also possible that conflicting comments might arise in various meetings. Therefore the NOVA ITS Team's approach was to capture "everything" for later distillation, and as an aid in identifying and addressing any conflicts. The Team found that this approach enhanced the output of the meetings, and yielded important pieces of information that might otherwise have been missed.

A final memorandum recapping the proceedings and discussion at each meeting was prepared by PB Farradyne. The minutes recorded attendees, the purpose of the meeting, an outline of all presentation topics, and all stakeholder input and comments. Meeting handouts were also noted in the minutes. Minutes were reviewed by the entire NOVA ITS Architecture Team prior to being finalized. All meeting minutes are included in Appendix B.

4.2 CONSOLIDATE STAKEHOLDER INPUT

After each Outreach meeting, all information and elements related to that meeting were consolidated. All e-mails and information taken from phone calls prior to the meeting, meeting materials and minutes, and follow up actions, were recorded in written form and distributed among the NOVA ITS Team. Detailed minutes of each meeting were prepared. A debriefing meeting among the Team was then conducted to determine how to apply stakeholder input from the Outreach meeting to the Architecture. Consolidated information was shared with the Washington Metropolitan Regional Architecture and the Maryland Statewide Architecture. Modifications made to the VDOT NOVA Architecture were also shared.

4.3 MAINTAINING STAKEHOLDER INVOLVEMENT

An e-mail list of all stakeholders was created, as a tool to keep stakeholders informed as the project progressed. Maintaining contact with stakeholders after the Outreach meetings continued the open dialogue and information exchange established during the meetings. Fostering this ongoing dialogue is an important element of any Outreach effort. After each meeting, a summary report was communicated to stakeholders via e-mail. In addition, updates on the status of the ongoing Outreach effort were periodically communicated to stakeholders, and any comments received were noted and acted upon. A copy of the stakeholder list from which e-mail addresses were drawn is attached as an Appendix A.

4.4 CONFIRMING STAKEHOLDER INPUT

Creating an open and inviting process to elicit stakeholder input, and ensuring that all stakeholders were given ample opportunity to participate, were of paramount importance. The more fully the broad set of stakeholders participated, the more validity the process and it's output held.

In order to promote full participation, the NOVA ITS Team was careful to invite all stakeholders, to make certain that they were aware of scheduled meetings, to confirm their ability to attend, and to record their attendance. The Outreach process was intended to inform stakeholders, elicit their involvement, encourage their participation, and capture their input. The validation process was intended to make sure the NOVA ITS Team accurately and effectively managed the Outreach effort and captured stakeholder input. The end result of the Outreach effort and validation process was considerable valuable input to the Architecture, and a general consensus among stakeholders that the Architecture was "on the right track".

Letters of Confirmation (Appendix C) were sent to all attendees, recognizing their participation in the meeting and providing meeting results and responses to stakeholder input. Stakeholders were provided with the relevant Architecture flow diagrams and the flow definition table. Letters and relevant Architecture aspects were also sent to all non-attendees informing them of project status.

Rather than seeking formal Memorandums of Understanding from particular stakeholders, the Letters of Confirmation offer stakeholders the opportunity to further correct or comment on the process and architecture. This kept the input process alive and did not place stakeholders in a position of having to formally accept, or reject, an Architecture that was still a "work in progress". The NOVA ITS Team assumed that stakeholders in receipt of confirmation letters, who did not provide further response or input to any of the material documented, are in agreement with the process and results. This assumption is based on the ample opportunity for involvement afforded to stakeholders, and the importance of the Architecture effort as characterized to stakeholders by the NOVA ITS Team.

Throughout the remaining course of VDOT NOVA Architecture development, there will continue to be some limited follow-up outreach to stakeholders. All comments and input already received, or any that will be received by the NOVA ITS Team in the future, will be fully documented by the NOVA ITS Team as part of the VDOT NOVA ITS Architecture.

4.5 STAKEHOLDER COMMENTS

Comments, as grouped below, were received from the following stakeholders:

Confirmation of Architecture –

- Maryland State Highway Administration
- Fairfax County Department of Transportation
- Prince William County Public Safety (police and fire/rescue)
- Maryland Transportation Authority
- Metropolitan Washington Airport Authority
- NOVA Smart Traffic Center
- Arlington County

- Washington Metropolitan Area Transportation Authority
- National Parks Service

Kudos –

- FHWA Regional Resource Center
- VDOT Maintenance Division
- NOVA Smart Traffic Center
- Arlington County

Further Input and Inquiries –

- VDOT NOVA Transportation Planning Section
- VDOT Maintenance Division
- VDOT Data Management Division
- VDOT GIS Program
- VDOT NOVA Permitting Section
- Arlington County
- Washington Metropolitan Area Transportation Authority
- VDOT Traffic Engineering Division

In each case where stakeholders made inquiries, a member of the NOVA ITS Team responded promptly to answer questions.

5 POST SEPTEMBER 11, 2001 FOLLOW-UP

On September 11, 2001 a terrorist attack on the Pentagon impacted the Northern Virginia transportation system. Operation of the system and it's control facilities and infrastructure during this event shed additional light on needed interconnects and information flows. This event brought into motion a series of actions and responses involving VDOT staff and facilities, and highlighted both the effectiveness of existing interconnects, and the need for additional interconnects. The event suggested ways in which the VDOT NOVA Architecture might need to be changed.

Figure 8 – VDOT NOVA Smart Traffic Center

To discuss this, a follow up meeting with VDOT staff of the NOVA Smart Traffic Center (STC) occurred after, and as a result of, the September 11, 2001 terrorist attack. During the follow-up meeting, the role of the STC and the resulting inter-agency coordination and emergency transportation management measures implemented were recapped. The performance of the STC during a time of crisis highlighted its vital role for both transportation management and public safety. Based on a review of events, important lessons were learned that can be applied to the VDOT NOVA Architecture (see Appendix D for details).

As a result, the NOVA Smart Traffic Center is considering acquiring teleconferencing equipment to facilitate emergency communications, and is looking at improving communications links with the VDOT Transportation Emergency Operations Center (TEOC) in Richmond. The STC also recognized the need to be able to control the system from a remote laptop through dial-in or from remote access through an adjacent STC. This follow-up meeting minutes can be found in Appendix B.

Although not part of the scheduled Outreach meetings, a meeting of traffic and transit operations groups was held on mid-October, to further discuss inter-agency communications issues and changes that can be made to the NOVA ITS Architecture. Minutes of this meeting are included in Appendix B.

6 SUMMARY AND LESSONS LEARNED

The stakeholder outreach effort was successful in both creating “champions” for the VDOT NOVA ITS Architecture within specific focus areas, as well as in eliciting valuable stakeholder input and feedback to the Architecture itself. The Strawman Architecture” was enhanced and improved as a result of this feedback, and the overall approach and product of the Architecture effort was validated by the stakeholders.

Important lessons learned include:

Identify Stakeholders and Organize by Functions – The NOVA ITS Team determined that it would be more efficient to work with stakeholders in groups with similar interests, focus, and areas of operational responsibility. Since individual stakeholders within each group had similar concerns and “spoke the same language”, it was easier to both focus meeting materials and content, and to keep discussions during the meeting on subject. Stakeholders also seemed more at ease interacting with peers who had common interests and concerns.

Identify Meeting Facilitator (Agency Champion) – The NOVA ITS Team recognized early on that a respected and viable “champion” would lend significant credence to the Outreach process. Accordingly, VDOT’s project representative assumed a central role in leading each meeting. This demonstrated the commitment of VDOT to the process, assured stakeholders that this was a worthwhile use of their time and that their input would be valuable, and energized stakeholders to work alongside the region’s primary provider of transportation services.

Maintain Stakeholder Interest – The NOVA ITS Team discovered that details such as data flows within the system architecture must be developed to some level of customization for each stakeholder group, prior to presentation for validation. While the purpose of the validation exercise was in part to enhance and further define data flows, it was apparent that presenting stakeholder groups with a “generic” architecture suggested that a certain amount of “homework” remained to be done, and caused them to lose interest. An effective approach was to use "scenarios" to explain certain information flows when, based on the flow name alone, it was otherwise unclear. This technique allowed stakeholders to more closely associate the system architecture to their own operations and helped to maintain an increased level of interest during the outreach meetings.

Listen Intently to Stakeholders – Stakeholders are the experts in their field of interest or responsibility. They know best what works in the real world. If stakeholders say that an element of the Architecture is either not necessary, or is missing, the Architecture must flexibly adapt to that input. Stakeholders will not flexibly adapt their practices and procedures just because an Architecture says they should.

Maintain Project Team Coordination – Preparation before the meeting allowed the team to be coordinated and present as “one voice”. Debriefing after the meeting captured elements that might not have made it into written notes and spurred creative thinking while issues were still fresh in minds.

Focus the Discussions for Each Stakeholder Group – Stakeholders who felt they were being shown a generic set of materials, not tailored to their concerns, needs and responsibilities, tended to lose interest.

Be Willing to Change the Architecture – It should not be assumed that stakeholders understand that the Architecture Team will act in accordance with their input. By proactively expressing this willingness, stakeholders were assured that their input was valued, and that the exercise was a worthwhile use of their time. Offering stakeholders a Strawman Architecture to critique is also a better methodology for gathering stakeholder requirements than "starting from scratch".

Coordinate with Adjacent Architecture Efforts – In a region that is in close proximity to other major metropolitan areas, or where major political and jurisdictional boundaries are present within the geographic scope of the Architecture, it is essential to coordinate with other Architecture efforts in those areas. By agreeing on common conventions and developing a shared understanding of practices and procedures among stakeholders, the value and usefulness of all Architectures is enhanced.

Focus on the Region – Federal approved processes, tools and documentation related to Architecture development provide an excellent guide for developing a customized Regional Architecture. However, the needs and requirements of the specific region must be paramount in crafting the Regional Architecture end product. Guidelines cannot anticipate or plan for every issue, concern, need that arises regionally. The Architecture team must be committed to developing an Architecture that works for the region, even if it steps outside existing guidelines.

Keep Good Record – Meticulous record-keeping is essential to the integrity of the process.

Follow-up and Confirm with Stakeholders – Substantial follow up after stakeholder meetings is required and should be planned for. Confirming with stakeholders their participation in the process is good measure of effectiveness.

Commit to the Iterative Process – Development, enhancement and validation of an Architecture is an iterative process that may continue until the final Architecture is delivered.

This Outreach effort positioned the project team to move forward with next steps of refining and documenting the physical architecture and communications plan. Final Architecture reports will be distributed via CD and at the following Web site: www. VDOT-ITSArch.com. This Web site will be kept up-to-date with the "living" Architecture, and will include a hyperlinked Architecture allowing the user to traverse the various levels of the Architecture information. It will contain a list of stakeholders, the systems they are responsible for, the interconnections among the various subsystems in the Architecture and the information exchanges across each interconnection. The user will be able to select a subsystem and get information about who owns/operates it, what other subsystems it is connected to and what information is exchanged with those subsystems. In addition, the interfaces between subsystems will be linked to the communications plan information that illustrates what communications infrastructure is available, planned or needed to accommodate that interface. The continuous outreach effort would become part of normal cooperative business between VDOT NOVA and its stakeholders. The results would be reflected in the "living" Architecture through the project's web site.

APPENDIX A – STAKEHOLDER CONTACT LIST

Table A1 – Stakeholder Contact List

Meeting	Invited	Attended	Name	Prefix	Last Name	Organization1	Organization2	Phone	Street	City_State_ZIP	Email Address
Pre-May 8	X	X	JR Robinson	Mr.	Robinson	VDOT	ITS Administrator	804-786-6677	1401 E. Broad St.	Richmond, VA 23219	robinson_jr@vdot.state.va.us
Pre-May 8	X	X	Jimmy Chu	Mr.	Chu	VDOT	NOVA Smart Traffic Center	703 383-2621	1426 Columbia Pike	Arlington, VA 22204	chu_tf@vdot.state.va.us
Pre-May 8	X	X	Mark Hagan	Mr.	Hagan	VDOT	NOVA STSS	703 383-2872 Cell-703-975-0101	4762 West Ox Rd.	Fairfax, VA 22030	hagan_md@vdot.state.va.us
Pre-May 8	X	X	Bill Costis	Mr.	Costis	VDOT	Dulles Toll Road	703 383-2697	P.O. Box 9430	McLean, VA 22102	costis_ww@vdot.state.va.us
Pre-May 8	X	X	Robin Allen	Ms.	Allen	VDOT	NOVA TCC	703 383-2001	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	allen_rm@vdot.state.va.us
Pre-May 8	X	X	David Evans	Mr.	Evans	VDOT	NOVA Technical Construction	703 383-2739	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	evans_dr@vdot.state.va.us
Pre-May 8	X		Gaby Hakim	Mr.	Hakim	VDOT	NOVA Snow Operations	703 383-2427	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	hakim_gy@vdot.state.va.us
Pre-May 8	X		Renee Hamilton	Ms.	Hamilton	VDOT	NOVA Snow Operations	703-383-2434	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	hamilton_rn@vdot.state.va.us
Pre-May 8	X	X	Bill Harrell	Mr.	Harrell	VDOT	NOVA Traffic Engineering	703 383-2391	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	harrell_wp@vdot.state.va.us
Pre-May 8	X		Bob McDonald	Mr.	McDonald	VDOT	NOVA Planning	703-383-2226	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	mcdonald_rh@vdot.state.va.us
Pre-May 8	X	X	Cina Dabestani	Mr.	Dabestani	VDOT	NOVA Planning	703-383-2215	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	dabestani_cs@vdot.state.va.us
Pre-May 8		X	Shazack Ali	Mr.	Ali	VDOT	NOVA GIS	703-383-2251	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	ali_s@vdot.state.va.us
A-May 8	X	X	Matt Miller	Mr.	Miller	VDOT	NOVA Smart Traffic Center	703 217-0629	1426 Columbia Pike	Arlington, VA 22204	miller_gm@vdot.state.va.us
A-May 8	X	X	Marilynn Taylor	Ms.	Taylor	VDOT	NOVA Smart Traffic Center	703 383-2638	1426 Columbia Pike	Arlington, VA 22204	taylor_ma@vdot.state.va.us
A-May 8	X		Carlene McWhirt	Ms.	McWhirt	VDOT	NOVA Smart Traffic Center	703 383-2615 703-383-2645 (PM)	1426 Columbia Pike	Arlington, VA 22204	mcwhirt_cm@vdot.state.va.us

Table A1 – Stakeholder Contact List

Meeting	Invited	Attended	Name	Prefix	Last Name	Organization1	Organization2	Phone	Street	City_State_ZIP	Email Address
A-May 8	X	X	Gottfried Kofi	Mr.	Kofi	VDOT	NOVA Smart Traffic Center	703 383-2600	1426 Columbia Pike	Arlington, VA 22204	kofi_ga@vdot.state.va.us
A-May 8	X	X	Marlowe Dixon	Mr.	Dixon	VDOT	NOVA Smart Traffic Center	703 383-2601	1426 Columbia Pike	Arlington, VA 22204	dixon_mk@vdot.state.va.us
A-May 8	X	X	Vijay Lahar	Mr.	Lahar	VDOT	NOVA Smart Traffic Center	703 383-2605	1426 Columbia Pike	Arlington, VA 22204	lahar_vk@vdot.state.va.us
B-May 11	X	X	Terry Murray	LT	Murray	Arlington County	Police	703 228-4149	1425 No. Courthouse Road	Arlington, VA 22201	tmurra@co.arlington.va.us
B-May 11	X		Bert Peacher	LT	Peacher	City of Fairfax	Police and Fire	703 385-7914	3730 Old Lee Highway	Fairfax, VA 22030-1800	bpeacher@ci.fairfax.va.us
B-May 11	X	X	William Knost	Mr.	Knost	Fairfax County	Police	703 280-0558	4100 Chain Bridge Road	Fairfax, VA 22030	wknost@co.fairfax.va.us
B-May 11	X		H.M. Chapman	Mr.	Chapman	Virginia State Police		800-752-4510 703 323-4503	P.O. Box 10900	Fairfax Station, VA 22039-0900	
B-May 11	X	X	Alfred Miller	CAPT	Miller	Prince William County	Police	703 792-7146	1 County Complex Court	Prince William, Virginia 22192	amiller@pwcgov.org
B-May 11	X	X	Pete Todd	Mr.	Todd	VDOT	NOVA Maintenance Safety Service Patrol	703 383-2611	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	todd_pn@vdot.state.va.us
B-May 11	X		Cindi Ward	Ms.	Ward	VDOT	Maintenance Division	804 692-0390	1401 E. Broad St.	Richmond, VA 23219	ward_cl@vdot.state.va.us
B-May 11	X	X	John White	Mr.	White	Arlington County	Fire	703 228-7618	2100 Clarendon Blvd. Suite 4000	Arlington, VA 22201	jwhite@co.arlington.va.us
B-May 11	X		David Cooper	LT	Cooper	Prince William County	Fire	703 792-6813	1 County Complex Court	Prince William, Virginia 22192	dcooper@pwcgov.org
B-May 11	X	X	Gerald Jaskulski	CAPT	Jaskulski	Fairfax County	Fire	703 280-0634	4100 Chain Bridge Road	Fairfax, VA 22030	gjasku@co.fairfax.va.us
B-May 11	X	X	Gregory Mcintosh	Mr.	Mcintosh	Fairfax County	Fire		4100 Chain Bridge Road	Fairfax, VA 22030	gmcin1@co.fairfax.va.us
B-May 11	X		Eddie Reyes	LT	Reyes	City of Alexandria	Police	703 838-3806 703 838-4444	2003 Mill Road	Alexandria, VA 22314	Eddie.Reyes@ci.alexandria.va.us
B-May 11		X	John Maddox	Mr.	Maddox	Prince William County	Office of Public Safety	703-792-7975	3 County Complex Court	Prince William, Virginia 22192	jmaddox@pwcgov.org
B-May 11		X	Craig Allen	Mr.	Allen	Arlington County	ECC	703-228-4082	1400 N. Uhle St., 5th Floor	Arlington, VA 22201	callen@co.arlington.va.us
B-May 11		X	Jack Dusek	Mr.	Dusek	Arlington County	ECC	703-558-2222	1400 N. Uhle St., 5th Floor	Arlington, VA 22201	jackdusek@erols.com

Table A1 – Stakeholder Contact List

Meeting	Invited	Attended	Name	Prefix	Last Name	Organization1	Organization2	Phone	Street	City_State_ZIP	Email Address
C-May 21	X		Maurice Keys	Mr.	Keys	District of Columbia	Department of Public Works	202 673-0495	2000 14th Street, NW	Washington, DC 20009	maurice.keys@dc.gov
C-May 21	X		Steve Clinger	Mr.	Clinger	FHWA	Regional Resource Center	410 962-0095	10 S. Howard Street, Suite 4000	Baltimore, MD 21201-2819	stephen.clinger@fhwa.dot.gov
C-May 21	X	X	Moe Wadda	Mr.	Wadda	City of Falls Church		703 248-5287	300 Park Avenue	Falls Church, VA 22046	mwadda@ci.falls-church.va.us
C-May 21	X	X	Alex Verzosa	Mr.	Verzosa	City of Fairfax	CUE	703 385-7889 703 385-0954	Falls Church, VA 22046	Fairfax, Virginia 22030	averzosa@ci.fairfax.va.us
C-May 21	X	X	Kathy Asmussen	Ms.	Asmussen	VDOT	NOVA STSS	703-383-2779 703-383-2875	4762 West Ox Rd.	Fairfax, VA 22030	asmussen_ka@vdot.state.va.us
C-May 21	X		Terry Bellamy	Mr.	Bellamy	Arlington County		703 228-3720	2100 Clarendon Blvd, Suite 717	Arlington, VA 22201	Tbella@co.arlington.va.us
C-May 21	X	X	Andre Conerly	Mr.	Conerly	Arlington County		703-228-3727	2100 Clarendon Blvd, Suite 717	Arlington, VA 22201	aconer@co.arlington.va.us
C-May 21	X		Mike Zezeski	Mr.	Zezeski	Maryland CHART		410 787-5859	7491 Connelley Drive	Hanover, MD 21076	mzezeski@sha.state.md.us
C-May 21	X		Robin Clausen	Ms.	Clausen	Maryland CHART		410-582-5605	7491 Connelley Drive	Hanover, MD 21076	rclausen@sha.state.md.us
C-May 21	X	X	Egua Igbinosun	Mr.	Igbinosun	Maryland CHART		410-787-5873	7491 Connelley Drive	Hanover, MD 21076	eigbinosun@sha.state.md.us
C-May 21		X	Shawn Jones	Mr.	Jones	VDOT	NOVA STSS	703-383-2351	4762 West Ox Rd.	Fairfax, VA 22030	jones_se@vdot.state.va.us
C-May 23	X	X	Tom Sines	Mr.	Sines	Dulles Greenway		1-888-707-8870 x226	45240 Business Court, Suite 100	Sterling, VA 20166	tsines@dullesgreenway.com
C-May 23	X	X	Juan Carrazco	Mr.	Carrazco	City of Alexandria			301 King Street	Alexandria, VA 22314	Juan.Carrazco@ci.alexandria.va.us
C-May 23	X		Lou DeLorme	Mr.	DeLorme	National Park Service		202-565-1254	1849 C Street, NW, Rm 7312	Washington, DC 20240	lou_delorme@nps.gov
C-May 23	X		Bob Souza	Mr.	Souza	Town of Herndon		703-435-6860	P.O. Box 427	Herndon, Virginia 20172	bob.souza@town.herndon.va.us
C-May 23	X		Michael Bomgardner	Mr.	Bomgardner	Town of Vienna		703-255-6387	127 Center Street S.	Vienna, VA 22180-5799	ce@ci.vienna.va.us
C-May 23	X		Bob Garbacz	Mr.	Garbacz	City of Alexandria		703-838-4747	3200 Colvin St.	Alexandria, VA 22314	bob.garbacz@ci.alexandria.va.us
C-May 23	X		Kamal Hamud	Mr.	Hamud	District of Columbia	Department of Public Works Traffic Management Center	202-671-1493	2000 14th Street, NW	Washington, DC 20009	Khamud@wam.umd.edu, khamud@dpw.dcgov.org
C-May 23		X	Kirk Nelson	Mr.	Nelson	National Park Service		703-243-7649	1100 Ohio Drive, SW	Washington, DC 20242	kirk_nelson@nps.gov

Table A1 – Stakeholder Contact List

Meeting	Invited	Attended	Name	Prefix	Last Name	Organization1	Organization2	Phone	Street	City_State_ZIP	Email Address
D-May 30	X	X	Will Raine	Mr.	Raine	WMATA		202 962-2409	600 Fifth Street NW	Washington D.C., 20001	wraine@wmata.com
D-May 30	X		Eric Marx	Mr.	Marx	PRTC/OmniRide		703 580-6117	14700 Potomac Mills Road	Woodbridge, VA 22192	emarx@omniride.com
D-May 30		X	Bill Leisen	Mr.	Leisen	PRTC/OmniRide		703 580-6116	14700 Potomac Mills Road	Woodbridge, VA 22192	bleisen@omniride.com
D-May 30	X		James Hamre	Mr.	Hamre	Arlington County	ART	703 228-3698	2100 Clarendon Blvd, Suite 717	Arlington, VA 22201	jhamre@co.arlington.va.us
D-May 30	X		Eric Smith	Mr.	Smith	Arlington County	ART		2100 Clarendon Blvd, Suite 717	Arlington, VA 22201	esmith@co.arlington.va.us
D-May 30	X	X	Howard Shock	Mr.	Shock	VRE		703-642-3808 703 684-1001	1500 King Street, Suite 202	Alexandria, Virginia 22314	hshock@vre.org
D-May 30	X	X	Corey Hill	Mr.	Hill	VDRPT		804 786-4443	1313 East Main Street, suite 300	Richmond, VA 23218-0590	chill@drptstate.va.us
D-May 30	X	X	Al Himes	Mr.	Himes	City of Alexandria	DASH	703-370-3274 x613	116 South Quaker Lane	Alexandria, VA 22314	al.himes@ci.alexandria.va.us
D-May 30	X		Terrie Laycock	Ms.	Laycock	Loudoun County	County Administration	703 777-0200	1 Harrison Street, S.E	Leesburg, VA 20175	tlaycock@co.loudoun.va.us
D-May 30	X	X	Rick Taube	Mr.	Taube	NVTC		703-524-3322	4350 North Fairfax Dr. Suite 720	Arlington, VA 22203	rick@nvtdc.org
D-May 30		X	Jim Carrell	Mr.	Carrell	Fairfax County		703-324-1175	12000 Government Center Pkwy	Fairfax VA 22035	jim.carrell@co.fairfax.va.us
D-May 30	X	X	Steven Yaffe	Mr.	Yaffe	Fairfax County	FASTRAN	703-324-7075	12011 Government Center Parkway, Suite 1040	Fairfax, VA 22035	Steven.Yaffe@co.fairfax.va.us
D-May 30	X		James N. Stoneback	Mr.	Stoneback	Fairfax County	DIT/Radio Services Branch	703-324-3380	12000 Government Center Pkwy	Fairfax VA 22035	james.stoneback@co.fairfax.va.us
D-May 30	X	X	Steve Shergold	Mr.	Shergold	VDOT	Central Office ITS Division		1401 E. Broad St.	Richmond, VA 23219	shergold_s@vdot.state.va.us
D-May 30	X	X	Daniel Worke	Mr.	Worke	Arlington County			2100 Clarendon Blvd, Suite 717	Arlington, VA 22201	dworke@co.arlington.va.us
D-May 30	X	X	Andy Szakos	Mr.	Szakos	Fairfax County	Dept. of Transportation	703 324-1194	12055 Government Center Parkway, Suite 1034	Fairfax, VA 22035-5511	andy.szakos@co.fairfax.va.us
D-May 30		X	Sharmila Samarasinghe	Ms.	Samarasinghe	NVTC		703-524-3322	4350 North Fairfax Dr. Suite 720	Arlington, VA 22203	sharmila@nvtdc.org
E-June 13	X	X	Andy Meese	Mr.	Meese	MWCOG		202 962-3789	777 North Capitol Street, NE, Suite 300	Washington, DC 20002-4239	ameese@mwcog.org
E-June 13	X	X	Doug Hansen	Mr.	Hansen	Fairfax County		703 324-1178	12000 Government Center Pkwy	Fairfax VA 22035	Doug.Hansen@co.fairfax.va.us

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Meeting	Invited	Attended	Name	Prefix	Last Name	Organization1	Organization2	Phone	Street	City_State_ZIP	Email Address
E-June 13	X	X	Hari Sripathi	Mr.	Sripathi	VDOT	NOVA Traffic Engineering		Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	sripathi_hk@vdot.state.va.us
E-June 13	X	X	George Phillips	Mr.	Phillips	Loudoun County		703-777-0122	1 Harrison Street, S.E	Leesburg, VA 20175	gphillip@co.loudoun.va.us
E-June 13		X	Matt Grimes	Mr.	Grimes	Smart Travel Lab			Thornton Hall Room D-112	Charlottesville, VA 22904-4246	mcg7d@virginia.edu
E-June 13	X	X	Glen McLaughlin	Mr.	McLaughlin	Maryland CHART		410-787-5884	7491 Connelley Drive	Hanover, MD 21076	gmclaughlin@sha.state.md.us
E-June 13		X	Ed Countryman	Mr.	Countryman	Maryland CHART		410-787-5872	7491 Connelley Drive	Hanover, MD 21076	ecountryman@sha.state.md.us
E-June 13		X	Mike Farrell	Mr.	Farrell	MWCOG		202-962-3760	777 North Capitol Street, NE, Suite 300	Washington, DC 20002-4239	mfarrell@mwcog.org
E-June 13	X		Stephen Read	Mr.	Read	VDOT	NOVA Planning	703-383-2216	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	read_sw@vdot.state.va.us
E-June 13	X		Dan Widner	Mr.	Widner	VDOT	Data Management Division	804 786-6762	1401 E. Broad St.	Richmond, VA 23219	widner_dk@vdot.state.va.us
E-June 13	X		Richard Jones	Mr.	Jones	VDOT	Data Management Division	804 786-9574	1401 E. Broad St.	Richmond, VA 23219	jones_rh@vdot.state.va.us
E-June 13	X		Brian Smith	Mr.	Smith	Smart Travel Lab		804 243-8406	Thornton Hall Room D-112	Charlottesville, VA 22904-4246	bls2z@virginia.edu
E-June 13	X		Cathy McGhee	Ms.	McGhee	Smart Travel Lab		804-293-1973	Thornton Hall Room D-112	Charlottesville, VA 22904-4246	mcgheecc@vdot.state.va.us
E-June 13	X		Wilhelm DerMinassian	Mr.	DerMinassian	District of Columbia	DPW, Traffic Signal Operations Branch	202-671-1490	2000 14th Street, NW	Washington, DC 20009	wil_der@dpw.dcgov.org
E-June 13	X		Noreen Hazelton	Ms.	Hazelton	I-95 Corridor Coalition		978 532-8485 617 973-8214	38 Boulder Brook Drive	Peabody, MA 01960	i95nhaze@aol.com
E-June 13	X		Larry Caldwell	Mr.	Caldwell	VDOT	Traffic Engineering	804-786-7779	1401 E. Broad St.	Richmond, VA 23219	caldwell_lc@vdot.state.va.us
F-June 12	X	X	Tom Phillips	Mr.	Phillips	VDOT	NOVA GIS	703 383-2221	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	phillips_th@vdot.state.va.us
F-June 12	X	X	Jim Gray	Mr.	Gray	VDOT	NOVA Maintenance – Infrastructure Section - Fairfax	703 383-2761	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	gray_jr@vdot.state.va.us

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F-June 12	X	X	Patrick Stark	Mr.	Stark	VDOT	NOVA Maintenance – Infrastructure Section - Fairfax	703 383-2745	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	stark_pr@vdot.state.va.us
F-June 12	X	X	Albert Rollins	Mr.	Rollins	VDOT	NOVA Maintenance Section - Interstate	703 737-2034	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	rollins_am@vdot.state.va.us
F-June 12	X	X	Bill Campenni	Mr.	Campenni			703 437-3555	1104 Iron Ridge Court	Herndon, VA 20170	Campenni@erols.com
F-June 12	X	X	Ken Haubrock	Mr.	Haubrock	VDOT	Info Technology-ICAS	804 371-2903	1401 E. Broad St.	Richmond, VA 23219	haubrock_ka@vdot.state.va.us
F-June 12	X	X	Jane Peregoy	Ms.	Peregoy	VDOT		703 383-2739	3565 Chain Bridge Rd.	Fairfax, VA 22030	peregoy_j@vdot.state.va.us
F-June 12	X		Tommy Atkins	Mr.	Atkins	VDOT	NOVA Equipment & Facilities	703 366-1975	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	atkins_tw@vdot.state.va.us
F-June 12	X		Floyd Canard	Mr.	Canard	VDOT	NOVA Maintenance Section - Interstate	703 366-1961	Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	canard_fr@vdot.state.va.us
F-June 12	X		Ande Johnson	Mr.	Johnson	VDOT	Maintenance - ICAS	804 786-5252	1401 E. Broad St.	Richmond, VA 23219	johnson_la@vdot.state.va.us
F-June 12	X		Dorothy Purvis	Ms.	Purvis	VDOT	Permit		Avion Lakeside I 14685 Avion Parkway	Chantilly, Virginia 20151-1104	purvis_da@vdot.state.va.us
F-June 12	X		Joan Morris	Ms.	Morris	VDOT	Public Affairs		1401 East Broad Street	Richmond, Virginia 23219	morris_jm@vdot.state.va.us
F-June 14	X		Robert Slocum	Mr.	Slocum	VDOT	Staunton District	540 332-7720	P.O. Box 2249 Commerce Road	Staunton, Virginia 24402-2249	slocum_rj@vdot.state.va.us
F-June 14	X	X	Mark Irving	Mr.	Irving	VDOT	Fredericksburg		87 Deacon Road	Fredericksburg, Virginia 22405	irving_md@vdot.state.va.us
F-June 14	X		Regina Franklin	Ms.	Franklin	VDOT	Fredericksburg	540-899-4138	87 Deacon Road	Fredericksburg, Virginia 22405	franklin_rm@vdot.state.va.us
F-June 14	X		Jeff Hores	Mr.	Hores	VDOT	Culpepper	540 829-7611	1601 Orange Road	Culpeper, Virginia 22701	hores_js@vdot.state.va.us
F-June 14	X		Tammy Thomas	Ms.	Thomas	VDOT	TEOC	804 692-0460	800 E. Leigh St., Suite 315B	Richmond, VA 23219	thomas_tk@vdot.state.va.us

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Meeting	Invited	Attended	Name	Prefix	Last Name	Organization1	Organization2	Phone	Street	City_State_ZIP	Email Address
14			Thomas						315B		
F-June 14	X	X	Sue Maddox-Toth	Ms.	Maddox-Toth	VDOT	TEOC	804 692-0180	800 E. Leigh St., Suite 315B	Richmond, VA 23219	maddox_toth@vdot.state.va.us
F-June 14	X		Stephany Hanshaw	Ms.	Hanshaw	VDOT	Hampton Roads	757-424-9907	1700 North Main Street	Suffolk, Virginia 23434	hanshaw_sw@vdot.state.va.us
F-June 14	X	X	Rob Alexander	Mr.	Alexander	VDOT	Richmond STC	804 796-4533	2201 W. Hundred Rd.	Chester, VA 23831	alexander_rw@vdot.state.va.us
F-June 14	X		Chris McDonald	Mr.	McDonald	VDOT	Salem District	540 387-5393	P.O. Box 3071 731 Harrison Ave.	Salem, Virginia 24153	mcdonald_cd@vdot.state.va.us
F-June 14	X		Ronnie Hubble	Mr.	Hubble	VDOT	Bristol District	540 669-9912 x212	P.O. Box 1768 870 Bonham Road	Bristol, Virginia 24203	hubble@vdot.state.va.us
F-June 14	X		Tim Smith	Mr.	Smith	VDOT	Lynchburg Distric	804-856-8140	P.O. Box 11649 4219 Campbell Avenue	Lynchburg, Virginia 24506	smith_tr@vdot.state.va.us
F-June 14		X	Tim L. Martin	Mr.	Martin	VDOT	Salem District	540-378-5060	P.O. Box 3071 731 Harrison Ave.	Salem, Virginia 24153	martin_tl@vdot.state.va.us
F-June 14		X	Mshadoni Smith	Ms.	Smith	FHWA	Division Offices	804-775-3346	P O Box 10249	Richmond, VA 23240-0249	mshadoni.smith@fhwa.dot.gov
F-June 14	X	X	Tom Jennings	Mr.	Jennings	FHWA	Division Offices	804 775-3357	P O Box 10249	Richmond, VA 23240-0249	Tom.Jennings@fhwa.dot.gov
F-June 14		X	Pat Harrison	Mr.	Harrison	Quality Consultants Group		703-836-4732	303 East Glendale Avenue #2	Alexandria, Va 22301	qualcongroup@prodigy.net
H-June 21	X		Greg Garback	Mr.	Garback	WMATA		202-962-1358	600 Fifth Street NW	Washington D.C., 20001	ggarback@wmata.com
H-June 21	X	X	Craig Maxey	Mr.	Maxey	WMATA		202-962-1526	600 Fifth Street NW	Washington D.C., 20001	cmaxey@wmata.com
H-June 21	X	X	Mike Hackett	Mr.	Hackett	MWAA		703 417-8164	1 Aviation Circle	Washington, DC 20001	hackettm@mwaa.com
H-June 21	X	X	Miriam Daughtry	Ms.	Daughtry	VDOT	Fiscal Division	804 786-2758	1401 E. Broad St.	Richmond, VA 23219	daughtry_mh@vdot.state.va.us
H-June 21	X	X	Liliane Ramadan	Ms.	Ramadan	VDOT	Smart Tag	703-708-9344	11301 Sunset Hills Rd., Suite A3	Reston, VA 20190	lramadan@smart-tag.com
H-June 21	X	X	Al Karoly	Mr.	Karoly	I-95 Corridor Coalition		518-457-7438	87 Rolling Brook Drive	Clifton Park, NY 12065-2231	alkaroly@alkaroly.com

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H-June 21	X	X	Chellie Cameron	Ms.	Cameron	Washington Flyer Bus and Taxi	703-572-2904	Washington Dulles International Airport P.O. Box 17045	Washington, DC 20041	rochelle.cameron@mwaa.com	
H-June 21	X	X	Ian Newberg	Mr.	Newberg	Cubic		703-802-2100	3800 Concord Parkway, Suite 1500	Chantilly, VA 20151	ian.newberg@cubic.com
H-June 21	X		Vernon Hartsock	Mr.	Hartsock	MDOT	Mass Transit Administration	410-767-3318	6 St. Paul St.	Baltimore, MD 21202	vhartsock@mdot.state.md.us
H-June 21	X		Keith Duerling	Mr.	Duerling	Maryland Transportation Authority	410-288-8400	300 Authority Drive	Baltimore, MD 21222-2200	kduerling@mdtransportationauthority.com	
H-June 21	X		Roxane Y. Mukai	Ms.	Mukai	MD Transportation Authority	410-288-8484	300 Authority Dr.	Baltimore, MD 21222	rmukai@mdtransportationauthority.com	
H-June 21	X		Alfie Steele	Mr.	Steele	Montgomery Co.	Ride On	240-777-5845	101 Monroe Street, 5th floor	Rockville, Maryland 20850	steele@co.mo.md.us
H-June 21	X		Howard Benn	Mr.	Benn	Montgomery Co.	Ride On	240-777-5800	101 Monroe Street, 5th floor	Rockville, Maryland 20850	benn@co.mo.md.us
H-June 21	X		Rick Gegenheimer	Mr.	Gegenheimer	MarkIV	Vice-President Operations	732-494-7720	212 Durham Ave., Building 4, Suite 101	Metchen, NJ 08840-1740	rgegenheimer@att.net
H-June 21		X	Jeremy Siviter	Mr.	Siviter	Castle Rock Consultants	Smart Tag	703-771-4680	17 Royal Street, SW	Leesburg, Virginia 20175	siviter@crc-corp.com
H-June 21		X	Ram Kandarpa	Mr.	Kandarpa	Castle Rock Consultants	Smart Tag	703-771-1046	17 Royal Street, SW	Leesburg, Virginia 20175	kandarpa@crc-corp.com
H-June 21	X		Amrita Mishra	Ms.	Mishra	MDOT	Mass Transit Administration	410-767-3324	6 St. Paul St., 7th Floor	Baltimore, MD 21202	amishra@mdot.state.md.us

APPENDIX B – OUTREACH MEETING MINUTES

VDOT NOVA ITS Architecture Outreach
Pre-meeting

Date/Time: May 8, 2001 – 9:00 AM to 11:00 AM

Location: VDOT NOVA District Office - Chantilly, VA

Attendees: Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Bill Costis, VDOT DTR
Bill Harrell, VDOT NOVA Traffic Engineering
Cina Debastani, VDOT NOVA Transportation Planning
Cliff Heise, Iteris
Dave Evans, VDOT NOVA Technical Construction
Fred Cwik, ARINC
J.R. Robinson, VDOT ITS Division
Katherine Asmussen, VDOT NOVA Smart Traffic Signal System
Mark Hagan, VDOT NOVA Smart Traffic Signal System
Martha Morecock, Iteris
Mike Harris, PB Farradyne
Robin Allen, VDOT NOVA Transportation Communication Center
Shazack Ali, VDOT NOVA GIS

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to educate the participants on what is ITS and how NOVA region is going forward with various ITS initiatives through the development of an ITS Architecture. The goal is to create champions out of the participants that will volunteer to lead and assist the outreach efforts involving various stakeholders that play a role in the ITS operations in the NOVA region.

MEETING SUMMARY

1. Meeting commenced with a welcome note by Amy Tang and introduction of the participants. She briefed on the purpose and background of developing the NOVA ITS Architecture and described how the participants of the meeting are going to play a vital role in the outreach efforts.

2. JR Robinson followed up with his views on how ITS benefits the region as a whole and helps VDOT to better serve the community by saving time and lives. JR mentioned that ITS efforts in Northern Virginia are well appreciated for being the first of its kind throughout the state. He insisted upon the participation of these champions to make these outreach efforts a successful one.

3. Mike Harris presented the strategies devised to reach out for the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under several functional areas of ITS such as incident management and emergency response, traffic operations etc. Through a series of meetings, one for each group, scheduled over the months of May and June, the VDOT NOVA ITS Architecture team will obtain the input from these agencies to validate several aspects of this NOVA ITS architecture and communication plan.

4. Cliff Heise presented the context of the ITS Architecture that is to be discussed and debated during the series of outreach meetings with stakeholders that is slated for the next few months. The presentation included model slides detailing interconnects and flows associated with a regional stakeholder agency thus aiding a clear understanding of the architecture.

5. JR pointed out that most of the stakeholders including VDOT have systems in place that are often manually controlled and individualized to suit the needs. When such small, discrete systems are interconnected to form a regional network, it becomes highly difficult to maintain and operate such networks manually.

    - It is extremely hard to keep track of every single incident and respond to them appropriately. That is why such larger integrated networks should be automated as described in the architecture, making it very effective during time sensitive operations such as emergency response. Thus architecture serves as a valuable planning tool that helps in easing the work overload on humans to a greater extent.

6. Other beneficial examples were also pointed out by the participants such as parking availability information on Metro Park and Ride lots being displayed along the highways assists the traveler in making decisions, avoiding the time delay resulting from driving into the parking lots and checking to see if there is any space available.

7. The Communication plan followed the presentation of the Architecture. Fred explained the development of the communication plan and how it follows the footsteps of the physical architecture that lays the groundwork for integration of discrete systems to form a large network operation. He clearly stated that the Physical architecture determines who wants to talk with whom in the region and exchange what kind of information (voice, data or video) and the communication plan details how can this information be exchanged between these agencies.

8. Concerns were raised by the participants on the volatility of existing networks due to the deployment of new technologies that often change the way we communicate with each other. But it is well understood that any communication architecture is usually designed to suit the developments over a period of 5, 10 or 20 years. The more we update our systems, the more demanding it gets and hence the systems go obsolete within a shorter period of time. But as technology matures with time, it becomes more easy and flexible and more adaptive to the environment thus making it more easier to plug-in to the existing architecture.

9. The ITS Architecture serves as a valuable planning tool by determining the need for archiving data from a system and storing it. This data can be used for planning purposes and improvement of operations.

- In the VDOT NOVA ITS Architecture, the archived data can be retrieved from Smart Travel Lab than just being allowed access to the raw data from individual agencies.

- Data Archiving - The data collected from various stakeholders in the region are collected, “cleaned-up” and stored at a clearing center. This central processing and storage of data eliminates the need for each agency (involved in the architecture) to spend time and money in collecting, processing and storing the data. The architecture implies on two major checks for data exchange and storage between agencies - Are we connected? If so, what are we exchanging?

OTHER ITEMS

The architecture team will be closely working with the participants of this meeting and help them in being the champions of the various stakeholder meetings scheduled for discussion on the architecture. The participants are encouraged to review the material presented to them and provide their input to the team at their convenience through e-mails.

NEXT MEETINGS SCHEDULED

A series of meetings are scheduled during May and June 2001. The Architecture will be presented to the various stakeholders in the region and will be refined further to address the comments obtained from these agencies. The first of the series is the meeting with personnel from Smart Traffic Center, one of the single largest transportation operations entities in Northern Virginia, scheduled for May 8, 2001 @ 1:00 PM.

ATTACHMENTS

The following handouts were given to the meeting participants:

- Agenda
- Copy of slide presentation
- List of stakeholders

VDOT NOVA ITS Architecture Outreach
Meeting A – Smart Traffic Center

Date/Time: May 8, 2001 – 1:00 PM to 4:00 PM
May 10, 2001 – 7:00 AM to 10:10 AM

Location: VDOT NOVA STC @ Arlington, VA

Attendees: Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Charles Neil, Iteris
Cliff Heise, Iteris
Fred Cwik, ARINC
Gottfried Kofi, VDOT NOVA STC
Jimmy Chu, VDOT NOVA STC
Marilynn Taylor, VDOT NOVA STC
Marlowe Dixon, VDOT NOVA STC
Matt Miller, VDOT NOVA STC
Mike Harris, PB Farradyne
O'Neil Brooke, VDOT NOVA STC
Vijay Lahar, VDOT NOVA STC

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from STC staff on the various interconnects and associated flows between STC and other regional stakeholder agencies. The goal is to verify and validate the draft Strawman architecture interconnects and flows pertaining to STC with input from the staff, and modify the architecture to reflect the changes suggested.

MEETING SUMMARY

1. Meeting commenced with a welcome note by Amy Tang and introduction of the participants. She briefed on the purpose and background of developing the NOVA ITS Architecture and described how the STC will play a major role in shaping the future of transportation infrastructure in Northern Virginia. Amy explained the importance of STC staff's input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of the center's operations to improve the quality of transportation operations in the region.

2. Mike Harris presented the strategies devised to reach out for the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under several functional areas of ITS such as incident management and emergency response, traffic operations etc. Through a series of meetings, one for each group, scheduled over the months of May and June, the VDOT NOVA ITS Architecture team will obtain the input from these agencies to validate several aspects of this NOVA ITS architecture and communication plan. He indicated to the STC staff that it is the first meeting of the series

and hence it becomes a very important benchmark to gauge the level of interest in other stakeholders meetings based on the input obtained from this meeting.

3. Cliff Heise and Charles Neil followed Mike Harris with their presentation of NOVA ITS Architecture, exclusively focused on interconnects and flows between STC and other stakeholders in the region that form a part of this Architecture. The presentation encompassed a complete overview of the Architecture interconnects and an introduction to a huge volume of flows associated with interconnects between the STC and stakeholders. Due to the very high volume of flows in the NOVA Architecture, the team reached a consensus to work closely with STC staff on yet another group meeting and in individual, one-on-one sessions if needed. Homework assignments on "flows" will be supplied once the staff have a complete understanding of the Architectures, both physical and communication, and will be assisted to complete the assignments upon request. The following are the changes suggested by the STC staff on ITS Architecture interconnects pertaining to STC:

    - Archived Data – STC will be exchanging data with Smart Travel Lab for archiving. The reason cited for STC NOT archiving data on its own is because data archiving needs a lot of manpower to download the data and might mandate the purchase of huge data storage systems adding up to the annual maintenance and operations cost. Questions were raised if the Smart Travel Lab will be feeding the Data Warehouse planned for the region. The team agreed that at least some archived data, can be near time and not have to be real-time, should be kept in-house for internal purposes.

    - In future, STC will be heavily involved with emergency response.

    - Maintenance activities on equipment such as cameras and detectors will be performed by VDOT. STC collects the information on incidents and proceeds further to dispatch.

    - STC is planning to be on the CAPWIN network in the near future.

    - DC DPW is currently linked through DC Emergency center and the data exchanged is purely voice. It is preferred to exist in the architecture.

    - STC talks to DC Public Safety through Communication Center located in DC. Communication during off-time hours is through a different telephone number that is considered poor in quality of service.

    - Federal Installations – Traffic control during special events is usually coordinated with STC. Especially, FBI seems very interested in the assets of the STC center in such occasions. They get the video feed through the media channel but have no control over the field equipment (cameras in specific).

    - IMMP – As its is firmly believed that all rural construction operations will be coordinated through this program, Jimmy Chu finds a need for this interconnect to be present in the architecture.

    - ISP – STC is currently connected with ISPs in the region exchanging voice and data.

    - CHART- Currently connected.

- MD State Police – Currently connected through CHART. MD State Police will need to connect with STC if they need someone from VDOT or VSP.
- Media Centers – Both TV and Radio are connected to STC currently. In future, STC will look into obtaining the video and voice feeds from Aerial cameras mounted on helicopters belonging to these media agencies.
- MWCOG - Currently MWCOG reports to STC for some traffic counts in particular locations. Also the fax communication between MWCOC and STC on OZONE ALERT presently exists.
- Metro Washington Airports Authority – Connect to STC.
- NAWS – A direct communication link currently exists between STC and NAWS.
- NOVA Local Public Safety Centers – Direct communication link exists with STC.
- NOVA Local Signal Centers – STC provides courtesy notification to the local signal agencies. City of Fairfax coordinates with STC regarding incident management on I-66.
- Rail Operations – STC staff find no need for inclusion of this Interconnection between STC and Rail Operations (Norfolk Southern & Freight) in the region.
- Other Parking Management – Such as WMATA, VDOT NOVA Parking – Needed in the Architecture.
- VRE – Direct communication is in place.
- VDOT Data Warehouse – Needed in the Architecture.
- VDOT NOVA Construction – Needed in the Architecture.
- Dulles Toll Road (DTR) – Needed in the architecture. Dulles toll road has its own operations center but STC has two cameras on DTR that are solely owned and operated by STC. The possibilities of connecting STC and DTR using the existing Fiber optic cable in place should be explored in the near future.
- GIS – Needed in the Architecture.
- VDOT Parking Management – Need in the Architecture.
- VDOT NOVA Residencies – Needed in the Architecture.
- VDOT NOVA Safety Service Patrol – Need in the Architecture.
- VDOT NOVA TCC – Needed in the Architecture.
- STC Field Equipment – Needed in the Architecture.

- VDOT Snow Operations – Needed in the Architecture
- VDOT Truck Overheight/Overweight Detection Systems – Needed in the Architecture.
- VDOT TEOC – Needed in the Architecture.
- Virginia State Police Center – Needed in the Architecture
- VA Statewide ATIS – Needed in the Architecture.
- Truck Weigh Stations – Needed in the Architecture.
- Include VA Power and Bell Atlantic into the Architecture as STC continues to stay in communication for its operational necessities.
- Include VDOT Public Affairs Office into the existing architecture.
- Contractors working on the systems – It is agreed overall that contractors are more of an internal issue than external and does not mandate any communication link with STC as like in other regional stakeholders. The Architecture team assured that it would check into the possibility of inclusion of contractors into the existing architecture if needed.

4. In addition to the above discussion about the ITS System Architecture, Fred Cwik presented an overview of the Communications Plan and the development process. He also established the relationship between the Plan and the ITS System Architecture.

OTHER ITEMS

1. STC staff will be provided with homework assignments on determining the flows needed to be present in the architecture and upon request for completion of the assignment will be assisted. A second round meeting with STC staff is scheduled for Thursday, May 10, 2001 to assist the staff in finalizing the flows associated with STC interconnects.

2. The communication architecture will be finalized upon the completion of the task assignment on identifying the required flows.

NEXT MEETINGS SCHEDULED

1. The second meeting with personnel from Smart Traffic Center is scheduled for the May 10, 2001 @ 7:30 AM.

2. One-on-one meetings will be arranged, if required, for completion of the task assignment on identifying flows associated with the interconnects of the existing architecture.

ATTACHMENTS

The following handouts were given to the meeting participants:

- Agenda
- Copy of slide presentation

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

The following are the comments on the minutes made during the "Stakeholder Outreach Debrief & Strawman Architecture Update" meeting held on July 18, 2001.

- Add the planned flow for toll "suspend/lifting toll collection" between DTR and STC.
- Create a terminator "event promoter" to address the special events in NOVA region.
- Discussed linking FEMA and "Map To Weather" terminator to capture weather related issues such as thunder storms, tornado warnings, etc.
- STC does not maintain signals or dispatch personnel to handle the signal related problems. STC and City of Fairfax coordinate with each other for signals via existing connections. STC provides courtesy notification to Local Signal Agencies when a problem is reported to them.

VDOT NOVA ITS Architecture Outreach
Meeting B – Incident and Emergency Management

Date/Time: May 11, 2001 – 9:00 AM to 11:00 AM

Location: VDOT NOVA STC @ Arlington, VA

Attendees: Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Capt. Alfred Miller, Prince William County Police
Capt. Gerald Jaskulski, Fairfax County Fire
Capt. Gregory McIntosh, Fairfax County Fire
CD Tyler, PB Farradyne
Chief. John White, Arlington County Fire
Cliff Heise, Iteris
Craig Allen, Arlington County ECC
Fred Cwik, ARINC
Jack Dusek, Arlington County ECC
Jeff Arch, PB Farradyne
John Maddox, Prince William County - Office of Public Safety Communication
Lt. Terry Murray, Arlington County Police
Mike Harris, PB Farradyne
Pete Todd, VDOT NOVA Safety Service Patrol
William Knost, Fairfax County Police

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from Incident and Emergency Response teams representing several stakeholder agencies in Northern Virginia. Meeting participants provided their input on the draft strawman ITS architecture interconnects and flows pertaining to public safety operations such as fire, vehicle accidents, etc. in the NOVA region. The goal is to verify and validate the draft Strawman architecture interconnects and flows with input from the staff, and modify the architecture to reflect the changes suggested.

MEETING SUMMARY

1. Meeting commenced with a welcome note by Amy Tang and introduction of the participants. She briefed on the purpose and background of developing the NOVA ITS Architecture and described the importance of Incident and emergency response in shaping the future of transportation operations in the region. Amy explained the value of stakeholder input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of their agency's operations to improve the quality of transportation operations in the region.

2. Mike Harris presented the strategies devised to reach out for the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under several functional areas of ITS such as incident management and emergency response, traffic operations etc. Through a series of meetings, one for each group, scheduled over the months of May and June, the VDOT NOVA ITS Architecture team will obtain the input from these agencies to validate several aspects of this NOVA ITS architecture and communication plan. He also indicated that the meeting with NOVA incident and emergency response units is a part of a series of meetings and hence it becomes a very important benchmark to gauge the level of interest in other similar stakeholder meetings based on the input obtained from this meeting.

3. Cliff Heise followed Mike Harris with their presentation of NOVA ITS Architecture, exclusively focused on interconnects and flows between NOVA STC and Virginia State Police that form a part of this Architecture. The following are the changes suggested by the Public Safety officials on ITS Architecture interconnects pertaining to STC:

    - Arlington County Police and Fire is currently providing assistance to all 911 and fire emergencies in the Falls Church area.
    - Remove “Arlington County Sheriff’s Office” from the existing list of NOVA Local Public Safety Centers.
    - Similarly, eliminate “Loudoun Sheriff”
    - Prince William County Police and Fire are co-located in the same facility.
    - Fire emergencies in City of Fairfax are currently handled by Fairfax County Fire.
    - VDOT NOVA Safety Service Patrol is also connected to Virginia State Police.
    - There is no direct communication between NOVA Residencies and NOVA Safety Service Patrol. Since NOVA Residencies operations are coordinated through STC, this connection shall be removed from the Architecture.
    - Include “#77” into the existing architecture. Pete Todd (VDOT) pointed out that 70 – 75% of the calls at State Police are made through this number. This issue will be addressed through interconnect between NOVA Safety Service Patrol and Virginia State Police.
    - There is no direct communication between SSP and VDOT Local Public Safety Centers. All emergency response activities are coordinated through a unified command post at the scene of the accident. Hence, all the associated flows between NOVA Safety Service Patrol and NOVA Local Public Safety Centers can be bundled under one single flow named “Unified Command”. Incident Command information is a face-to-face communication that happens at the Unified Command post.
    - Include Virginia State Emergency Operations Center (EOC) along with the existing interconnects for Virginia State Police. Operations of this center are similar to that of Federal Emergency Management Agency (FEMA) during emergencies.

- Currently there are no signal priority systems in place in Northern Virginia except for the pilot test projects on Columbia Pike in Arlington County and on Route 1 in Fairfax County. Signal pre-emption systems are being used at a few intersections in Fairfax, Prince William, and Loudoun Counties.

- Remove the interface between NOVA TCC and NOVA Local Public Safety Centers.

- For the communication plan, the title of CAPWIN centered interconnects should be changed to Communication Interface Projects (CIP's). Several regional communication projects such as CAPWIN, APCO Project # 36, 800 Trunk Radio System, and Scanners are grouped under this category. For CAPWIN, City of Alexandria is the pilot location.

- Add NOVA Local Public Safety to CIP's. Secret Service (Federal Installations) will form a part of CAPWIN operations.

4. Fred Cwik presented the framework of Communication Architecture that will overlay the Physical Architecture. He detailed the process flow of the communication architecture development and described how the input from the stakeholders in the region determines the way the communications take place in the future between these entities. He will follow up with the individual agencies once the communication plan is finalized and he will obtain their feedback.

5. Jeff Arch (PB Farradyne), attending the meeting and was invited to brief the participants on how the Metropolitan Washington DC Regional ITS Architecture is being developed in compliance with the NOVA ITS Architecture and Maryland Statewide Architecture. A handout containing the draft strawman architecture developed for the DC region was distributed to aid in understanding of the process.

OTHER ITEMS

The participants of the meeting discussed emergency response operations issues and came up with some thoughts to provide a better understanding and operations of the emergency response. They are:

- Implications of the incident information procurement process – City of Fairfax was initially interested in integrating with STC but it was not feasible to provide a direct link and therefore up being a stand alone system which made it impossible to proceed further with the integration initiative.

- Notification of Clearance of the information – This is a very important part of the response operations. In most cases, incident would be cleared on time, but failure to follow through with a notification on Response Status leads to the loss of credibility of information delivered in the future. Attention should be paid to this issue.

- Checklist for Incident Clearance - A checklist similar to the one used for Incident Response can be prepared to deal with notification of Incident Clearance. Lot of agencies around the nation notifies the dispatch crew with the update on the incident status.

- Location Identification – A vital element for coordination and responding to an incident. The quicker and absolute identification of location of the incident, better will be the incident response. With wireless communications, the volume of incident reporting has gone up but at the same time the quality of information has gone down hill. Incident verification can also be obtained through a camera in certain locations.

NEXT MEETING SCHEDULED

None.

ATTACHMENTS

The following handouts were given to the meeting participants:

- Agenda
- Copy of slide presentation

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

The following are the comments made during the "Stakeholder Outreach Debrief & Strawman Architecture Update" meeting held on July 18, 2001:

- Update minutes to reflect that the Arlington County Sheriff isn't included in the list of public safety (but does exist). Same applies to the Loudoun County Sheriff.
- #77 calls go to State Police located in basement of STC. This is an existing link that doesn't need to be specially addressed in the System Architecture.
- "EOC" is treated as "TEOC."
- Include in the final report a write-up on the "Unified Command" post. System Architecture would include interconnect between SSP and "Unified Command" - include traffic management (after incident) as future capability.
- Remove existing link between "VDOT NOVA District / VDOT NOVA Safety & Service Patrol" and VDOT / VDOT NOVA Dulles Toll Road." This link is how things are done today - but will not be in the future.
- CapWIN - Keep as "CapWIN" in System Architecture as a subsystem. CIP's are within CapWIN. Do not change to CIP. CapWIN aspects are to be addressed in Communications Plan.
- System Architecture - Tailor flows for minor incidents and remove tracking. Keep "Unified Command" for large incidents.

VDOT NOVA ITS Architecture Outreach
Meeting C1 - Traffic Operations I

Date/Time: May 21, 2001 – 9:00 AM to 11:00 AM

Location: VDOT NOVA STC @ Arlington, VA

Attendees: Alex Verzosa, City of Fairfax
Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Andre Connerly, Arlington County
Cliff Heise, Iteris
Fred Cwik, ARINC
Katherine Asmussen, VDOT NOVA STSS
Mark Hagan, VDOT NOVA STSS
Mike Harris, PB Farradyne
Moe Wadda, City of Falls Church
Shawn Jones, VDOT NOVA STSS

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from various stakeholder agencies performing Traffic Operations in and around Northern Virginia. The meeting participants provided their input on the draft strawman ITS architecture interconnects and flows pertaining to traffic operational entities such as VDOT NOVA Smart Traffic Signal Systems, in the NOVA region. The goal is to verify and validate the draft Strawman architecture interconnects and flows with input from the participants, and modify the architecture to reflect the changes suggested.

MEETING SUMMARY

1. The meeting commenced with a welcome note by Amy Tang and introduction of the participants. She described the purpose and background of developing the NOVA ITS Architecture and the importance of traffic operations in shaping the transportation future in the region. Amy explained the value of stakeholder input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of their agency's operations to improve the quality of transportation operations in the entire region.

2. Mike Harris presented the strategies devised to reach out to the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under several functional areas of ITS such as incident management and emergency response, traffic operations, etc. Through a series of meetings, one for each group, scheduled over the months of May and June, the VDOT NOVA ITS Architecture Team will obtain the input from these agencies to validate several aspects of this NOVA ITS architecture and communication plan. He also indicated that the meeting with traffic operations is a part of a series of meetings and hence it becomes a very important benchmark to gauge the level of interest in other similar stakeholder meetings based on the input obtained from this meeting.

3. Cliff Heise followed Mike Harris with his presentation of the NOVA ITS Architecture, focused primarily on interconnects and information flows between STSS and the other VDOT NOVA systems. Fred Cwik presented the Outline for the communication plan that will be derived from the final architecture to meet the needs of information exchange between the stakeholder agencies.

4. The meeting concluded with a note of thanks by Amy Tang to all the participants for providing their input in perfecting this architecture and reminded them about the possibility of future homework assignments once the communication plan is developed.

DISCUSSIONS

The following are the changes suggested by the traffic operations stakeholders in the region on ITS Architecture interconnects:

- Fairfax, Loudoun, and Prince William Counties should be removed from the existing list of Local Signal Agencies because VDOT NOVA STSS operates signals in these Counties.

- TEOC located in Richmond is presently communicating with NOVA STSS.

- The towns of Herndon and Vienna should be included in the architecture as they are expanding their infrastructure capabilities. Herndon has issued an RFP for the installation of a multi-million dollar signal system for the town.

- VDOT NOVA STSS will interact with both, operations center and field vehicles, with regard to emergency response.

- Questions were raised on how to include some of the regional traffic generators such as Redskins Park, George Madison University (GMU), and National Park Service. It was agreed to include the following entities to the existing STSS interconnect network: GMU, Redskins Park, shopping malls, and Federal Installations such as National Park Service, military bases on Rt. 1 and Ft. Belvoir, and CIA. (During the July 18, 2001 meeting it was suggested to Include “Special Event Promoter” terminator to address regional traffic generators, e.g., Redskins Park, GMU, etc.).

- VDOT NOVA STSS and VDOT NOVA STC will be an integrated entity in the future (assumed to happen in a period of 5-10 years).

- The following are the corrections made on STSS to STSS Field Equipment:

    - Change the flow status for “Roadway Information System Status” from “existing” to “planned.”
    - Change the flow status for “HRI Status” from “existing” to “planned.”
    - Remove the flow named “environmental conditions” that exchanges information from STSS field equipment to STSS center.
    - Remove the flow named “Intersection Blockage Notification” that exchanges information from STSS field equipment to STSS center.

  - STSS is planning to install video cameras that will provide video images to STC in the future.

- Suggestion on flows between STSS and NOVA Local Signal Centers:

  - Arlington got funding from the state to install 25 cameras and they will be exchanging video information with STC to manage the arterial traffic.
  - STSS will coordinate with local traffic agencies on arterial corridors level.
  - Coordination at the boundary level is permitted but not the control of the local signal systems.
  - Include “Red Light Running” flow between NOVA Public Safety and STSS. Regarding the red light running violations, it was cited that complaints were lodged on the amber time insufficiency in some of the local signals as it caused an increase in the number of citations when it was lowered below a certain time limit.
  - City of Fairfax got complaints from the Bus drivers as they were having difficulty in crossing wider intersections where the Amber times are shorter. So they have no other options but to speed through such intersections or slam the brakes and come to a screeching halt causing discomfort to the riders.
  - These red-light violation surveillance provides useful information such as speed data.
  - Integrate traffic control coordination and traffic information coordination.
  - Coordination of signal systems during special events was suggested at the meeting.

- NOVA STSS and Smart Travel Lab

  - Almost all flows shown in this flow diagram presently exist in contrast to what are represented as planned flows.

- NOVA STSS will have some interface with Dulles Toll Road due to the impact of ramps that pour into the arterials controlled by STSS.

- Add interconnect between DC Signal Systems & NOVA STSS.

- Suggestions on STSS and NOVA Snow Operations:

  - Some communication currently exists for controlling the left turn movements. This is a mere incident management strategy than anything else.
  - Revise the existing flow diagram and update if any changes were made.

- Suggestions on NOVA STSS & Metro Washington Airport Authority (MWAA)

  - “Traffic Information Coordination” flow should be removed (confirmed during the debrief meeting held on July 18, 2001).

- Suggestions on NOVA STSS & Virginia State Police (VSP)

  - Revise the flow diagram to reflect the changes to be made - Remove all other flows except for Incident information Request, Emergency Traffic Control Request, Emergency Traffic Control Response and Incident Information. Also add Special Event information as an additional flow.

- Suggestions on NOVA STSS & Virginia Statewide ATIS interface
  - Add "Transit Information" flow to Statewide ATIS interconnect.
- Suggestions on NOVA STSS & NOVA Local Public Safety interface
  - Need a connection between the mobile units and dispatch center.
- Suggestions on NOVA STSS & Virginia Railway Express (VRE) interface
  - This interface should be completely removed (confirm with VRE during a meeting with them).
- Suggestions on STSS & Rail Operations interface
  - Remove the flow named "Railroad Schedules."
- Suggestions on NOVA Local Signal Centers & NOVA STC interface
  - Remove all the flows shown in the diagram except for "Traffic Information Coordination" in both directions.

OTHER ITEMS

The participants of the meeting actively indulged in the discussions on traffic operations and came up with some thoughts to provide a better understanding and operations of the emergency response. There are as follows:

- Coordination between NOVA STSS and utilities such as power should be addressed in the architecture. This gains importance due to a large number of construction and maintenance activities in the region where the electric power supply often fails, causing interruptions to the regular operations of the signal systems.
- Coordinate with Mark Hagan to obtain the contacts for the Town of Herndon and Vienna to invite them to participate in the next meeting of the Traffic Operations series. Also invite City of Alexandria (Bob Garback) to participate in the next meeting.

NEXT MEETING SCHEDULED

May 23, 2001 – Traffic Operations Part II.

ATTACHMENTS

The following handouts were given to the meeting participants:

- Agenda.
- Copy of slide presentation.

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

The following are the comments made during the "Stakeholder Outreach Debrief &Strawman Architecture Update" meeting held on July 18, 2001:

- Change "ECC" to "TEOC."
- System Architecture - Include "Event Promoter" to address regional traffic generators (e.g., Redskins' Park, GMU, etc.).
- System Architecture – Include Dulles Smithsonian Extension as future stakeholder.
- STSS is planning to do some experimenting with video images in the near future.
- Arlington got funding from the state to install 25 cameras and they will be exchanging video information with STC to manage the arterial traffic.
- Coordination at the boundary level is permitted but not the control of the local signal system.
- System Architecture - relationship to red light running? Include "Red Light Running" flow between "NOVA Public Safety" and "STSS." Fairfax has data and STSS has link to Fairfax. Include in final report write-up.
- System Architecture - Confirmed to remove "Traffic Information Coordination" flow between "NOVA STSS" and "WMAA."
- Signal priority for BRT service will need to be addressed.
- DTR and NOVA Construction ops. - Construction activities are posted on the Internet for public access.
- National Park Service and STC - For the Final Report, it is recognized that the Park Service is open to the same model as CHART for the BW Parkway.

VDOT NOVA ITS Architecture Outreach
Meeting C2 - Traffic Operations II

Date/Time: May 23, 2001 – 9:00 AM to 11:00 AM

Location: VDOT NOVA STC @ Arlington, VA

Attendees: Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Bill Costis, VDOT Dulles Toll Road
Cliff Heise, Iteris
Egua Igbinosun, MDSHA – CHART
Fred Cwik, ARINC
Juan Carrazco, City of Alexandria
Kirk Nelson, National Park Service
Matt Miller, VDOT NOVA STC
Mike Harris, PB Farradyne
Patrick Chuang, ARINC
Shawn Jones, VDOT NOVA STSS
Tom Sines, Dulles Greenway

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from various stakeholder agencies performing Traffic Operations in and around Northern Virginia. The meeting convened as Part II of the Traffic Operations series. The participants provided their input on the draft Strawman ITS architecture interconnects and flows pertaining to traffic operational entities such as VDOT NOVA Smart Traffic Signal Systems, in the NOVA region. The goal is to verify and validate the draft Strawman architecture interconnects and flows with input from the participants, and modify the architecture to reflect the changes suggested.

MEETING SUMMARY

1. The meeting commenced with a welcome note by Amy Tang and introduction of the participants. She described the purpose and background of developing the NOVA ITS Architecture and the importance of traffic operations in shaping the transportation future in the region. Amy explained the value of stakeholder input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of their agency's operations to improve the quality of transportation operations in the entire region.

2. Mike Harris presented the strategies devised to reach out to the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under several functional areas of ITS such as incident management and emergency response, traffic operations, etc. Through a series of meetings, one for each group, scheduled over the months of May and June, the VDOT NOVA ITS Architecture Team will obtain the input from these agencies to validate several aspects of this NOVA ITS architecture and

communication plan. He also indicated that the meeting with traffic units is part of a series of meetings.

3. Cliff Heise followed Mike Harris with his presentation of the NOVA ITS Architecture, focused primarily on interconnects and information flows between STSS and the other VDOT NOVA systems. Fred Cwik presented the Outline for the communication plan that will be derived from the final architecture to meet the needs of information exchange between the stakeholder agencies.

4. The meeting concluded with a note of thanks by Amy Tang to all the participants for providing their input in perfecting this architecture and reminded them about the possibility of future homework assignments once the communication plan is developed.

DISCUSSIONS

The following are the changes suggested by the traffic operations stakeholders in the region on ITS Architecture interconnects:

Inventory Listings & Interconnects

- Traffic Signals in Fairfax, Prince William and Loudoun Counties are operated by NOVA STSS.
- Dulles Toll Road (DTR) does not have adequate resources to handle emergency management; therefore this has to be handled through STC.
- Dulles Greenway operates its own emergency management operation with their troopers and emergency management teams. Dulles Greenway will be doing Toll and Emergency Management
- DTR does toll collection only.
- Greenway has a contingent police force; therefore add a connection to Greenway and State Police. Greenway places phone calls to DTR when its systems get backed up.

Flows

- Suggestion on flows between STSS and NOVA Local Signal Centers:
    - It was agreed at the previous meeting that traffic information coordination and traffic control coordination will remain in the flow diagram. Remaining flows, such as incident response, will be removed.
    - Alexandria discussed the President's Motorcade issues with Secret Service and said that they don't seem to buy in the need for prior notice to the traffic agency.
    - DTR intersections are controlled by signal systems. Tyson's Corner area traffic circulation affects DTR toll operations. But there is not a necessity now to provide cameras to feed STSS.
    - Signal priority for BRT service will need to be addressed. Each of the toll plazas will have an exclusive BRT lane for faster access to this BRT service.

- Suggestions on DTR & NOVA STC interface:

    - Primary flows that will exist in this interface are “traffic control information” and “traffic control coordination.” STC will be providing the information to DTR but will own and operate the ITS field equipment. Traffic flow information will be fed back to STC in return through the Traffic Information Coordination Flow.

- Suggestion on DTR & NOVA Safety Service Patrol Interface:

    - Currently there is just voice communication between these two agencies. They communicate through radio once when the incident is cleared. Most of the time, it involves customer service issues, such as flat tires.
    - Safety Service Patrol – There is another parallel program called the “State Police Motorist Assistance Program” where DTR will call State Police when the Safety Service Patrol is not available. They rarely advise regarding the incident status once when the scene is cleared.

- Over-width load is a real problem. Problems are at the toll plazas. State police becomes a party to handle the violation of such regulations in which case it is an automatic entitlement for citation. Often the lost drivers of these over-sized vehicles are encountered on DTR.

- Other Interfaces that are suggested for a change:

    - DTR & Virginia State Police - Incident Information and HAZMAT information related flow are the only existing flows between these two agencies.
    - DTR and NOVA Construction Operations - DTR notifies Jane Peregoy regarding the construction activities through e-mail, which in return are disseminated to various agency personnel through e-mail. Weekly summaries of the construction activities are posted on the Internet for public access. Add one more link between DTR and VDOT Maintenance.
    - National Park Service and STC – National Park Service (NPS) is very concerned about the erosion of natural looks with the installation of the “roadside equipment” to collect/monitor their roadways. It is very difficult to get the approval from the NPS to install any of these technology-oriented items on their roadways. CHART has forged an agreement on B-W Parkway to install the loop detectors for collecting volume data after prolonged negotiations. NPS is open to future possible application of the same model with NOVA STC.
    - The Park Service has just started an ITS program.
    - The Park Service has some speed-warning systems and road temperature detectors on Parkways.
    - The Park Police will attend incidents happening on Parkways; therefore include Park Police as a part of the description for National Park Service (Park Police are a separate entity and are a part of CAPWIN).
    - Changes to the flows between NPS and STC – Only “traffic information coordination” will be present, which balloons to address all other flows.

- Suggestions on Greenway & STC interface

    - Delete the flow “toll data request”. STC obtains two types of data from Greenway Center. Loop data and Probe Data. So add the flow “Loop Data” from Greenway to STC.

ATTACHEMENTS

The following handouts were given to the meeting participants:

- Agenda
- Copy of slide presentation

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

The following are the comments made during the “Stakeholder Outreach Debrief & Strawman Architecture Update” meeting Held on July 18, 2001:

- Signal priority for BRT service will need to be addressed.
- DTR and NOVA Construction Operations - Construction activities are posted on the Internet for public access.
- National Park Service and STC - For the Final Report, it is recognized that the Park Service is open to the same model as CHART for the BW Parkway.

VDOT NOVA ITS Architecture Outreach
Meeting D - Transit

Date/Time: May 30, 2001 - 1:00 PM

Location: Northern Virginia Transportation Commission (NVTC) @ Arlington, VA

Attendees:
Al Himes, City of Alexandria DASH
Alex Verzosa, City of Fairfax CUE
Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Andy Szakos, Fairfax Connector
Bill Leisen, PRTC
Cliff Heise, Iteris
Corey Hill, VDRPT
Daniel Worke, Arlington County Engineering
Eric Smith, Arlington County Transit
Fred Cwik, ARINC
Jim Carrell, Fairfax County
Mike Harris, PB Farradyne
Rick Taube, NVTC
Steve Shergold, VDOT Central Office ITS Division
Steven Yaffe, Fairfax County FASTRAN
Will Raine, WMATA

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from various stakeholder agencies performing transit operations in and around Northern Virginia. The meeting participants provided their input on the draft strawman ITS architecture interconnects and flows pertaining to transit operational entities such as Washington Metro Area Transit Authority (WMATA), City of Alexandria (DASH), City of Fairfax (CUE) in the NOVA region. The goal is to verify and validate the draft Strawman architecture interconnects and flows with input from the participants, and modify the architecture to reflect the changes suggested.

MEETING SUMMARY

1. Meeting commenced with a welcome note by Amy Tang and introduction of the participants. She briefed on the purpose and background of developing the NOVA ITS Architecture and described the importance of transit in shaping the transportation future in the region. Amy explained the value of stakeholder input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of their agency's operations to improve the quality of transportation operations in the entire region.

2. Mike Harris presented the strategies devised to reach out for the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under

several functional areas of ITS such as incident management and emergency response, traffic operations etc. Through a series of meetings, one for each group, scheduled over the months of May and June, the VDOT NOVA ITS Architecture team will obtain the input from these agencies to validate several aspects of this NOVA ITS architecture and communication plan. He also indicated that the meeting with transit stakeholders is part of a series of meetings and hence it becomes a very important benchmark to gauge the level of interest in other similar stakeholder meetings based on the input obtained from this meeting.

3. Cliff Heise followed Mike Harris with their presentation of NOVA ITS Architecture, focused on interconnects and flows between NOVA local transit providers and NOVA STSS that form a part of this Architecture. Fred Cwik presented the outline for the communication plan that will be derived from the final architecture to meet the needs of information exchange between the stakeholder agencies.

4. The meeting concluded with a note of thanks by Amy Tang to all the participants for providing their input in perfecting this architecture and reminded them about the possibility of future homework assignments once the communication plan is developed.

DISCUSSIONS

Inventory Listings

- Transit agencies listed in the inventory matrix under NOVA Local Transit Centers needs to be expanded to include the following agencies that provide paratransit services (see Table B1 for the list of NOVA Transit operators):
    - Falls Church Bus –Transit service provided through 4 new hybrid elec. buses – METRO will operate this service and it will not reveal the data to anyone until the owners permit, which are NVTC and City of Falls Church.
- Dulles Flyer should be added to the existing list of Transit Providers.
- Question was raised with regard to inclusion of private transportation providers such as Employers in the region and Hotels, etc that are operating shuttles to prime points in the regional transportation network. The currently existing agency - Regional Fare Payment Consortium - is not looking to add these private operators.
- Questions were raised on how Transit Management is defined in the architecture.
- AMTRAK should be added under Passenger Rail. The functions are similar to that of VRE.
- Non-VDOT Park and Ride lots can be captured under Other Parking Management. It is suggested that any commuter transit Park and Ride lot should be provided with parking availability information.
- Add ”Archive Data” function to VDOT NOVA Parking Management along with Parking Management.

Table B1 – NOVA Transit Operators

BUS TRANSIT		PARA-TRANSIT	OTHER TRASIT
Local Bus Service	Metrobus	WMATA Metro Access	Virginia Railway Express (VRE)
	Fairfax Connector	Fastran - Fairfax County	
	Arlington ART	Arlington STAR	
	Alexandria DASH	Alexandria DOT	
	City of Fairfax CUE	City Wheels (City of Fairfax)	
	Loudoun Transport Association	Fare Wheels (City of Falls Church)	
	PRTC Omnilink		
	Springfield - TAGS METRO & Springfield Circulator		
	Falls Church Bus		
Commuter Bus Service	Loudoun County Commuter Service		
	PRTC OmniRide		

Overview of Architecture Interconnects and Flows

Interconnects

- NOVA Local Transit Centers
    - Add Electronic Clearing House (VRE & regional Electronic Clearing House)
    - Add Amtrak to VRE Center
    - Link VRE center to Regional Electronic Clearinghouse
    - The link between Regional Clearinghouse and NOVA Local Transit Centers doesn't need to be on this Architecture. Instead it should be covered through DC regional Architecture.
- NVTC
    - Add Local Transit and VRE. Link Local Transit to Data Warehouse. Change the name of MWCOG's data archiving system as "RIDES" (Regional ITS Data Exchange System).

Flows

- Suggestions on NVTC & STC interface.
    - Add Parking Info. flow. Also add video exchange.

- Suggestions on NOVA Local Transit & STSS interface.
    - Transit Demand Management Response will be done through DC Architecture. This is handled through MWCOG's "CODE RED" program (Ozone alert). But later it was agreed to leave these flows unaltered at this point in time.
- It is suggested that the existing interconnect between NOVA Local Transit Centers and regional electronic clearinghouse be removed.
- DC Architecture will address the inter-agency coordination between the NOVA transit agencies.
- DC architecture should reflect a proposed Regional Service Center (a future operation) that will capture all the regional transit information and facilitate and exchange between them.
- It is suggested to add the new Information Clearinghouse (planned) to connect All Local NOVA Transit agencies to STC and possibly the Regional Transit Electronic Clearinghouse through WMATA and/or NVTC.
- Suggestions on VRE & STSS interface
    - Remove Railroad Advisories and Railroad Schedules
- Suggestions on NVTC & Smart Travel Lab (STL)
    - NVTC will perform data archiving pertaining to transit, with data types similar to that of collected by STL. The STL is not interested in an archive data link from NVTC. The STL only desires a one-way flow from STL to NVTC.

<u>Miscellaneous Items</u>

Some of the miscellaneous discussions that were a part of the Architecture review are summarized as follows:

- Data Warehouse (Mobility Data Store) will replace the Lab as the data archival function in future.
- Check with STL if they need any kind of transit information back from NVTC such as ridership. This will be done during the June 12 meeting with STL staff and follow-up calls and emails.
- Connection between VDOT snow operations and NOVA Local Transit (make it a two way link).
- Connection between VDOT Construction and Nova Local Transit Centers.

- Since there are a lot of efforts taking place simultaneously in the NOVA region on transit issues, the participants insisted that these agencies should coordinate with each other to make things possible.

- Concerns such as the impact of VDOT Architecture on inter agency relationships between non-VDOT agencies were debated. It is made clear to the participants that the NOVA ITS Architecture imposes no limitations on the existing agency relationships between Non-VDOT agencies.

The following is a conceptualized schematic that provides a glimpse of the current transit fare payment system vs. the one planned for the future.

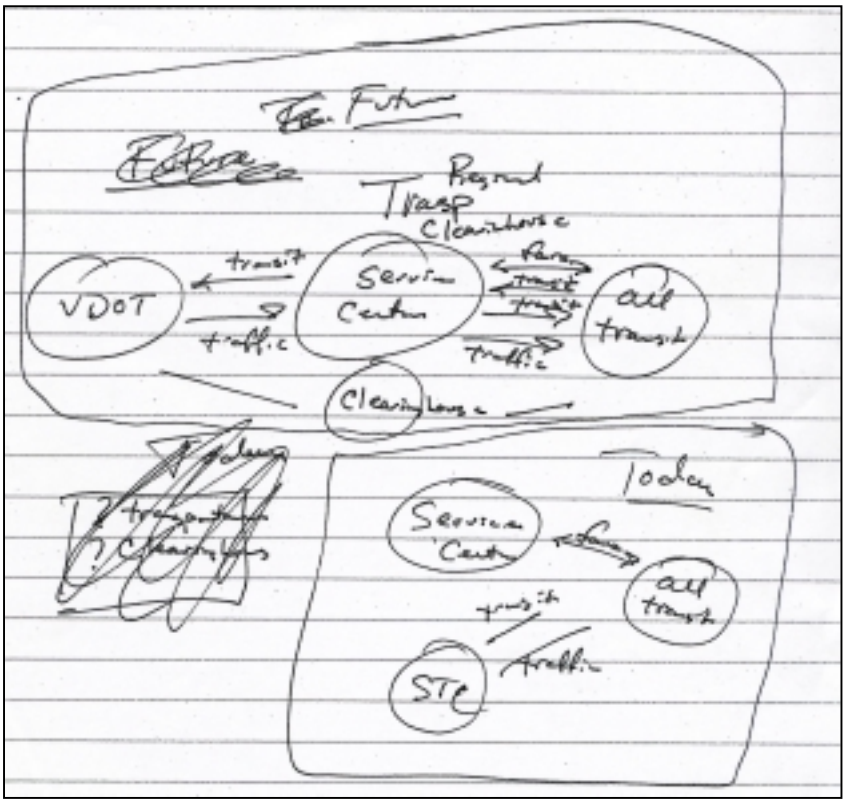


Figure B1 – Current NOVA Transit Fare Payment System vs. Planned System

ATTACHEMENTS

The following handouts were given to the meeting participants:

- Agenda
- Copy of slide presentation

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

The following are the comments made during the "Stakeholder Outreach Debrief & Strawman Architecture Update" meeting Held on July 18, 2001:

- Paratransit services - City of Fairfax - CUE
- Need to use the new name for the Washington Metro Data Clearinghouse – RIDES (Regional ITS Data Exchange System)
- NVTC would like video capability. [Note - ARINC (Fred) to confirm during Communications Plan outreach process.]
- NVTC would like archive data from MWCOG and VDOT (Mobility Data Store).

VDOT NOVA ITS Architecture Outreach
Meeting E - Internal VDOT NOVA

Date/Time: June 12, 2001 – 1:30 PM to 4:30 PM

Location: VDOT NOVA District Office @ Chantilly, VA

Attendees: Albert Rollins, VDOT NOVA Maintenance
Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Bill Campenni, Consultant – VDOT NOVA AVL Snow Operations
Cliff Heise, Iteris
David Evans, VDOT NOVA Technical Construction
Fred Cwik, ARINC
Jane Peregoy, VDOT NOVA Construction
Jim Gray, VDOT NOVA Infrastructure Management
Ken Haubrock, VDOT Info. Technology – ICAS
Mike Harris, PB Farradyne
Patrick Stark, VDOT NOVA Infrastructure Management
Tom Phillips, VDOT NOVA GIS

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from various stakeholder agencies within VDOT performing various operations within NOVA District. The meeting participants provided their input on the draft strawman ITS architecture interconnects and flows pertaining to their area of operations such as VDOT NOVA GIS, ICAS, NOVA Maintenance, etc in the NOVA region. The goal is to verify and validate the draft Strawman architecture interconnects and flows with input from the participants, and modify the architecture to reflect the changes suggested.

MEETING SUMMARY

1. Meeting commenced with a welcome note by Amy Tang and introduction of the participants. She briefed on the purpose and background of developing the NOVA ITS Architecture and described the importance of internal coordination between these various VDOT agencies in shaping the transportation future of the region. Amy explained the value of stakeholder input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of their operations to improve the quality of transportation operations in the entire region.

2. Mike Harris presented the strategies devised to reach out for the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under several functional areas of ITS such as incident management and emergency response, traffic operations etc. Through a series of meetings, one for each group, scheduled over the months of May and June, the VDOT NOVA ITS Architecture team will obtain the input from

these agencies to validate several aspects of this NOVA ITS architecture and communication plan.

3. Cliff Heise followed Mike Harris with their presentation of NOVA ITS Architecture, focused on interconnects and flows between NOVA Snow Operation and NOVA STC that form a part of this Architecture. Fred Cwik presented the Outline for the communication plan that will be derived from the final architecture to meet the needs of information exchange between the stakeholder agencies.

4. The meeting concluded with a note of thanks by Amy Tang to all the participants for providing their input in perfecting this architecture and reminded them about the possibility of future homework assignments once when the communication plan is developed.

DISCUSSIONS

The following are the summary of changes suggested by the VDOT NOVA District stakeholders:

Inventory Table

- Change the IMMP/ICAS status listing from Existing to Planned.

- Though Richmond STC currently exists, other STCs in the state are non-operational. So in general all STCs are not operational. Think about how to handle this variation in the status of operation (Existing/Planned).

- NOVA Snow Operations – Presently there is a system called “Electronic Snow Reporting System”. This is developed in the past year. There are two types of snowplow operations that form a part of this Snow reporting system. First one is with AVL and the other one is through the website.

- Parking Management – Check who is managing this, STC or ICAS.

Interconnects

- VDOT NOVA GIS

    - Change all “Map Update Flows” to “GIS Database Information”. The information provided through the GIS Database are: Fiber Optic Duct locations, Accident locations, Providing speed information on county road segments, are the type of This is much more than Map Update. Its also deals with Database and Information exchange with multiple agencies
    - Add interconnects for the following agencies: ISP, Local Planning Agencies, Traffic Engineering, Permits and STSS.

- VDOT Construction Ops

    - Add interconnects to the following agencies: MD Agencies, Richmond STC, Permits (in Richmond), Virginia State Police and Private Contractors.
    - Every Friday, Jane Peregoy provides a synthesized e-mail to 250+ people regarding the closure and construction information, etc.

  - Major construction activities need Police Protection and this done only by Jane Peregoy (coordination and control of some sites during constructions).
  - Permits Offices in Richmond gets the e-mails too. They issue the permits depending on the availability of the lanes for the mobility of wide loads.
  - The information sources for these construction activities are STSS, Construction, Permits, Maintenance, Bridge and this information received is compiled and sent out.
  - The "Hot Spots" are identified by STC and will be supplied to GIS for posting on the web.

- IMMP/ICAS
  - The interconnect to STC should be changed to planned

- VDOT Snow Operations
  - Remove the Interconnect Snow Operations to VDOT NOVA Residencies.

Flows

- Suggestions on IMMP to GIS interface – "Map Update Information" flow should be added along with all other flows similar to those that are specified in the STC to IMMP interface.

- Suggestions on IMMP to STC interface
  - Add a new flow called "Inventory Condition & Assessment Data"
  - Add a new flow "Data Update" from VDOT NOVA STC to IMMP.
  - The following flows need to be removed:
    - Closure Coordination
    - Work Zone Status
    - Archive Status
  - Use IMMP instead of IMMP/ICAS as the official naming convention throughout the document as it covers all 5 aspects of operation such as ICAS, IMMS, BMS, VOIS, etc.

- Suggestions on Construction Ops to STC interface– Flows will have to be revised after obtaining the List of agencies that receive the e-mail.

- Suggestions on Snow Operations to NOVA STC interface– Modify the naming for the flow "Current network conditions" to "Current Transportation Network Conditions".

- Suggestions on Snow Operations to NOVA STSS interface – Delete the following flows: Emergency Dispatch Response, Current Network Conditions and Suggested Route.

- Suggestions on Snow Operations to Safety Service Patrol – Delete the following flows: Incident Report, Incident Status and Suggested Route.

- Suggestion on Snow Operations to Snow Plows interface – Add the following flows:

  - Incident Information – from “VDOT NOVA Show Plow Vehicles” to “VDOT NOVA Snow Operations”.
  - Incident Response – From VDOT NOVA Snow Operations to VDOT NOVA Snow Plow Vehicles

- Suggestions on Snow Operations to TEOC interface– Remove the following flows: Emergency Dispatch Response, Emergency Dispatch Requests and Suggested Route. The only remaining flow will be Emergency Vehicle Tracking Data (inputs on road conditions).

- Suggestions on Snow Operations to Data Warehouse interface – Rename the flow “Emergency Archive Data” as “Snow Ops Archive Data”.

- Suggestions on Construction Ops. To STC interface – The only flows that will remain in the architecture for this particular interconnect will be “Work Zone Status” and “Closure Coordination”

- Suggestions on GIS to STC – Add the flow “ Closure Data” from NOVA STC to NOVA GIS.

- Suggestions on Snow Ops. To TCC interface

  - Electronic Snow Reporting – is the name used for all statewide GIS Snow reporting operations. Manassas, Fairfax, Leesburg, and Interstate (includes Arlington primaries and some secondaries). All these snow centers report to TCC.
  - Too much work load for STC and that’s why its responsibilities got pushed to TCC for evening hours of operation.

Miscellaneous

- Dr. Bernie Hill (Chief Information Officer, VDOT) has suggested a system called “Synergy”, where all the databases of Non-VDOT entities lying outside the VDOT jurisdictions will be integrated at one point and will be disseminated to all the VDOT employees to serve as a one-stop-shop for all their data needs. This system is VDOT Exclusive and doesn’t include any non-VDOT entities.

- The Fairfax GIS Pilot program is not complete yet. Some time during this summer the data will be ready.

- ICAS - How this can be incorporated into the Communication GIS tool. Once when the required data is provided (Maintenance), Comm. GIS tool will be developed to completion and will be handed over to the GIS folks who will operate and maintain the system in the future.

- ICAS will be developing a GIS system to track doing all the Statewide Maintenance activities and STC will be a part of the whole operation. Marlowe Dixon is the point of contact for Patrick at STC.

- Tom Phillips will dictate attributes for this GIS tool. Tom developed a model that shows what asset attributes needs to be linked to what other attributes.

- Question was raised to understand how deep the architecture would steer the development of future transportation systems in NOVA region. It is explained that the current architecture is more technology independent but it will provide the framework for communication to establish what data should be exchanged. The communication plan will detail how the data will be exchanged, with respect to technology currently being used.

- A brief description of IMMP/ICAS was provided to the participants from the VDOT personnel. It was stated that ICAS is nothing but an inventory of all the existing system components and equipments. All of the agencies in VDOT have the custom software loaded in their office and will update the ICAS system with any change or modification of the assets in the field done by their own personnel.

- A maintenance and inventory management Subsystem is available in the STC's operations software. VOIS, Bridge Management System (bridge and sound barriers and overhead signs, etc are all managed through this software), Integrated Maintenance Management System (the actual business system – Driver of the data).

- The participants were briefed that there are 80 vehicles equipped with AVL facilities out of 800 vehicles in the fleet. This is a pilot program managed from Merrifield and is presently faced with institutional issues.

Action Items

- Obtain a copy of the weekly e-mail distribution list from Jane Peregoy.

- Amy will provide a list of entities that interact with NOVA GIS. Traffic Engineering will have to be included.

ATTACHMENTS

The following handouts were given to the meeting participants:

- Agenda.
- Copy of slide presentation.

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

The following are the comments made during the "Stakeholder Outreach Debrief & Strawman Architecture Update" meeting Held on July 18, 2001:

- None.

VDOT NOVA ITS Architecture Outreach
Meeting F - Planning

Date/Time: June 13, 2001 – 1:00 PM to 3:00 PM

Location: Metropolitan Washington Council of Governments (MWCOG) Building, Washington D.C.

Attendees: Alex Verzosa, City of Fairfax
Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Andy Meese, MWCOG
Cina Debastani, VDOT NOVA Transportation Planning
Cliff Heise, Iteris
Doug Hansen, Fairfax County
Ed Countryman, MDSHA CHART
George Phillips, Loudoun County
Glen McLaughlin, MDSHA CHART
Hari Sripathi, VDOT NOVA Traffic Engineering
Matt Grimes, Smart Travel Lab
Michael Farrell, MWCOG
Mike Harris, PB Farradyne
Moe Wadda, City of Falls Church

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from various stakeholder agencies in and around Northern Virginia involved in Planning. The meeting participants provided their input on the draft strawman ITS architecture interconnects and flows pertaining to planning (transportation and other related aspects such as data archiving) such as Metro Washington Council of Governments (MWCOG), VDOT NOVA Planning, etc in the NOVA region. The goal is to verify and validate the draft Strawman architecture interconnects and flows with input from the participants, and modify the architecture to reflect the changes suggested.

MEETING SUMMARY

1. Meeting commenced with a welcome note by Amy Tang and introduction of the participants. She briefed on the purpose and background of developing the NOVA ITS Architecture. Amy explained the value of stakeholder input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of their agency's operations to improve the quality of transportation operations in the entire region.

2. Mike Harris presented the strategies devised to reach out for the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under several functional areas of ITS such as incident management and emergency response, traffic operations etc. Through a series of meetings, one for each group, scheduled over the

months of May and June, the VDOT NOVA ITS Architecture team will obtain the input from these agencies to validate several aspects of this NOVA ITS architecture and communication plan.

3. Cliff Heise followed Mike Harris with a presentation of NOVA ITS Architecture, exclusively focused on interconnects and flows between VDOT Data Warehouse and NOVA STC that form a part of this Architecture. Fred Cwik presented the Outline for the communication plan that will be derived from the final architecture to meet the needs of information exchange between the stakeholder agencies.

4. The meeting concluded with a note of thanks by Amy Tang to all the participants for providing their input in perfecting this architecture and reminded them about the possibility of future homework assignments in the development of the communication plan.

DISCUSSIONS

Inventory Listings

- NOVA Signal Centers – Remove Fairfax, Loudoun, and Prince William County.
- George Phillips will provide detailed information on Loudoun Transit Agencies.
- It is revealed that a GIS database is being created exclusively for VDOT Traffic Engineering. This project is in its basic stages (preliminary groundwork has been done). Some 2500 databases will be linked to this web based interactive GIS system that provides access to information such as traffic volumes.
- Participants inquired if there is something in VA that is similar to that of MD Emergency Management Association (MD EMA). TEOC located in Richmond, VA performs similar operations. This issue should be addressed in the DC Architecture.
- Fairfax County FASTRAN – Planning division does a lot of data collection such as traffic counts. VDOT NOVA Traffic Engineering will use this data for their future needs.
- VDOT Central Office Planning is going for a decentralization of all the regional planning activities. For example, VDOT NOVA Planning is joining hands with Fredericksburg and Culpepper to do the regional planning coordination.
- Add a NOVA Local Planning Centers - a New Architecture Element. That will constitute all the agencies listed under NOVA Local Signal Centers including Loudoun, Prince William and Fairfax County.
- Agencies such as Fairfax County Park Service have their own planning program. Include these local planning agencies into the Architecture.

Interconnects – Summary of Changes

- Smart Travel Lab (STL)

- A new architecture element, Location Design and Land Development (LD&LD), gets the data from VDOT Traffic Engineering and also NOVA Planning.
- Add an interconnect to Traffic Engineering for this new entity.
- Also suggested is that this entity should be connected to the Smart Travel Lab as well to VDOT Data Warehouse (later changed to Mobility Data Store).
- VDOT Central Office is creating a statewide Mobility Data Store in Richmond. Add an interconnect for VDOT Traffic Engineering Division.
- Ideas were proposed for connecting NOVA Local Planning with Smart Travel Lab.
- Explore the possibility of linking MWCOG Data Warehouse to STL.

- MWCOG

    - STSS is not linked to this element in the architecture. This information will be provided through STL. STC will be providing ozone alerts to MWCOG.
    - Add a new interconnect linking NOVA GIS and MWCOG GIS.
    - Add an interface connecting VDOT Snow Operations & MWCOG.

- VDOT Data Warehouse

    - Add the same Interconnects seen in STL (refer comments seen under STL). [Note: This entity has been renamed as VDOT Mobility Data Store during the "Stakeholder Outreach Debrief & Strawman Architecture Update" meeting held on July 18, 2001@ ARINC.]

- NOVA Traffic Engineering

    - The following schematic (Figure B2), provided by the NOVA Traffic Engineering representative, provides an insight of various entities that were desired to be linked to VDOT NOVA Traffic Engineering:

- VDOT NOVA Planning

    - Add traffic engineering, GIS, Land Development, Environmental Division.
    - Add an interface connecting VDOT NOVA Snow Operations & Local Schools for providing real time snow information.
    - Fairfax County is looking to integrate the local school traffic operation systems such as flashing lights, so that they all can be controlled from one single point. A series of cameras and associated systems are programmed to retime the 25mph zone signals.
    - VDOT NOVA GIS, L&D, LD, Traffic Engineering and Planning and Environmental (environmental impact data resulting from Traffic) – all of these should be interfaced with NOVA STSS.
    - STSS to NOVA GIS for signal timing plans.

NOVA TRAFFIC ENGINEERING

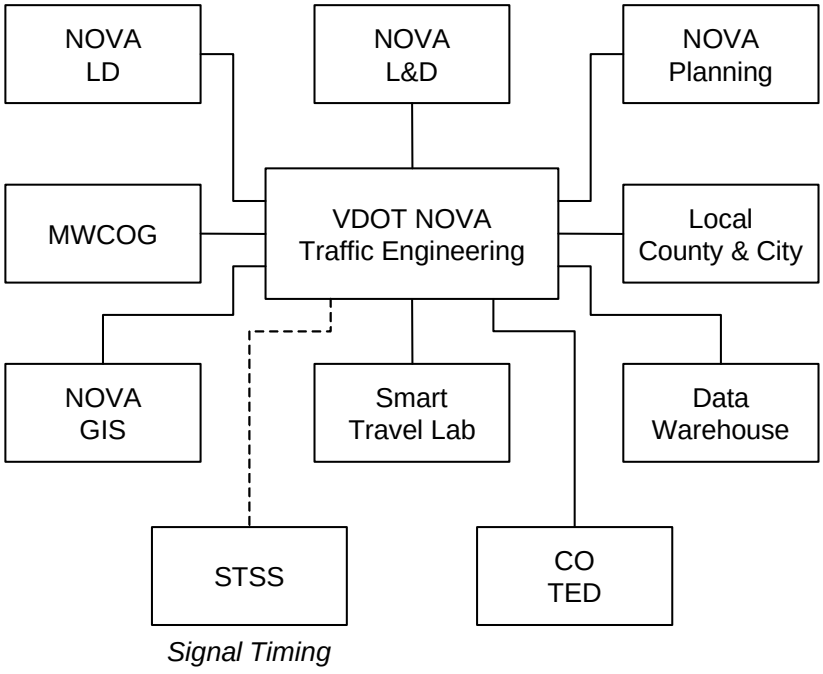


Figure B2 – NOVA Traffic Engineering

Flows – Summary of Changes

- MWCOG Flows
    - MWCOG to VDOT Data Warehouse – Flows between these two agencies will be similar to those existing between MWCOG and STL.
    - MWCOG to VDOT NOVA Planning - Flows between these two agencies will be similar to those existing between MWCOG and STL.
    - A special request flow (Data for MWCOG) should be added from NOVA STC to MWCOG. Also it is recommended to add the user-defined flow between STC and MWCOG.
    - MWCOG to NOVA Traffic Engineering - Flows between these two agencies will be similar to those existing between MWCOG and STL. Add GIS and Snow Operations.

- Data Warehouse Flows
    - VDOT Data Warehouse to NOVA STSS - Flows between these two agencies will be similar to those existing between STSS and STL.
    - VDOT Data Warehouse to NOVA Traffic Engineering - Flows between these two agencies will be similar to those existing between NOVA Traffic Engineering and STL.

  - VDOT Data Warehouse to NVTC – Flows between these two agencies will be similar to those existing between NVTC and STL.
  - VDOT Data Warehouse to Research and Data Collection Centers (RDCC) - Flows between these two agencies will be similar to those existing between RDCC and STL.
  - VDOT Data Warehouse to NOVA GIS - Flows between these two agencies will be similar to those existing between NOVA GIS and STL.
  - VDOT Data Warehouse to NOVA Planning - Flows between these two agencies will be similar to those existing between NOVA Planning and STL.

- Smart Travel Lab Flows

  - Smart Travel Lab to NOVA GIS - Change the name of the flows with the reflection from Map Updates to Map Database.
  - STL to Planning – Both of these agencies will archive completely.
  - STL to STC – Remove “traffic information” and “request for traffic information” flows.
  - STL to Traffic Engineering – Complete archiving – same as in MWCOG & STL interface.

- Miscellaneous

  - Add a subsystem called Central Office.
  - Combine all NOVA Planning L&D, LD, Traffic Engineering, & Environmental in one subsystem.

ATTACHEMENTS

The following handouts were given to the meeting participants:

- Agenda.
- Copy of slide presentation.

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

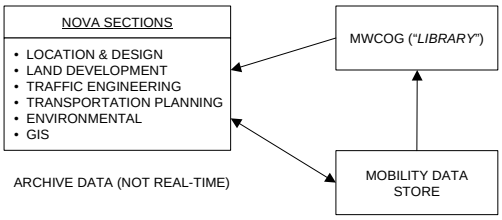
The following corrections and comments were made during the “Stakeholder Outreach Debrief & Strawman Architecture Update” meeting held on July 18, 2001:

- The VDOT Mobility Data Store will be the central location for data storage (for both ITS and non-ITS data).

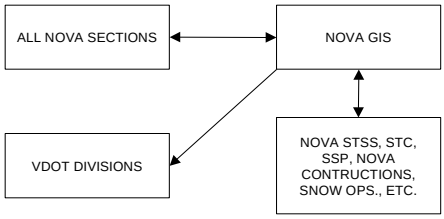
- The "NOVA Internal Sections" constitutes of the following Sections that are co-located in the VDOT NOVA District office (reference - Planning Group):

  - Location & Design (L&D)
  - Land Development
  - Traffic Engineering
  - Transportation Planning
  - Environmental

- But the VDOT Divisions slightly different than Sections (no Land Development):
  - IT
  - ITS
  - L&D
  - Traffic Engineering
  - Transportation Planning
  - Environmental
  - DMV
- Mobility Data Store – This will serve as the data provider to MWCOG clearinghouse (see figure below). The primary data exchange will be archive data, not real-time.



- System Architecture - All NOVA Sections and VDOT Divisions establish 2-way flows with NOVA GIS (see figure below).



- System Architecture - Modify "Map Update" flow to be "GIS Database" flow.
- System Architecture - it is confirmed to add NOVA Local Planning Centers.

VDOT NOVA ITS Architecture Outreach
Meeting G – VDOT Central Office and Adjacent Districts Meeting

Date/Time: June 14, 2001 – 2:00 PM to 3:30 PM

Location: VDOT Staunton District Office @ Staunton, VA

Attendees: Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Cliff Heise, Iteris
Fred Cwik, ARINC
J. R. Robinson, VDOT ITS Division
Kevin Barron, VDOT ITS Division
Mark Irving, VDOT Fredericksburg STC
Mike Harris, PB Farradyne
Mshadoni Smith, FHWA
Pat Harrison, Quality Consultant Group
Pat McGowan, PB Farradyne
Rob Alexander, VDOT Richmond STC
Sue Maddox-Toth, VDOT TEOC
Tim Martin, VDOT Salem District
Tom Jennings, FHWA

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from various stakeholder agencies within VDOT performing various operations outside VDOT's NOVA District. The meeting participants provided their input on the draft strawman ITS architecture interconnects and flows pertaining to their operations that are of interest and needs addressed in the NOVA ITS Architecture. The goal is to verify and validate the draft Strawman architecture interconnects and flows with input from the participants, and modify the architecture to reflect the changes suggested.

MEETING SUMMARY

1. Meeting commenced with a welcome note by Amy Tang and introduction of the participants. She briefed on the purpose and background of developing the NOVA ITS Architecture and described the importance of internal coordination between these various VDOT agencies in shaping the transportation future of the region. Amy explained the value of stakeholder input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of their agency's operations to improve the quality of transportation operations in the entire region.

2. Mike Harris presented the strategies devised to reach out for the stakeholders in the region that constitute this architecture. Various stakeholders in the region were grouped under several functional areas of ITS such as incident management and emergency response, traffic operations etc. Through a series of meetings, one for each group, scheduled over the

months of May and June, the VDOT NOVA ITS Architecture team will obtain the input from these agencies to validate several aspects of this NOVA ITS architecture and communication plan.

3. Cliff Heise followed Mike Harris with their presentation of NOVA ITS Architecture, focused on interconnects and flows between VDOT TEOC and NOVA STC that form a part of this Architecture. Fred Cwik presented the Outline for the communication plan that will be derived from the final architecture to meet the needs of information exchange between the stakeholder agencies.

4. The meeting concluded with a note of thanks by Amy Tang to all the participants for providing their input in perfecting this architecture and reminded them about the possibility of future homework assignments once when the communication plan is developed.

DISCUSSIONS

The following are the summary of changes suggested by the VDOT District stakeholders:

Interconnects

- TEOC and adjacent STCs.
    - Add VA Emergency Management.

Flows

- Suggestions on VDOT TEOC to Adjacent VDOT STCs –
    - Traffic information coordination includes “Web Video”. This will be included in the future.
    - Video Packaging for PDAs and Cell Phones is also being considered for future.
    - After hours incidents – Staunton and other STCs should coordinate with STC when it becomes fully operational. This being the planning stage, we should consider the possibility of including the equipment control for NOVA STC owned by the adjacent STCs on 95 and 66. Add “Traffic Control Coordination” flow that will capture all these after hours operations.
- Suggestions on Adjacent STCs to NOVA STCs interface –
    - Add “Traffic Control” flow. This will be included as a TBD (To Be Determined) item.
    - Similarly, add “Limited Equipment Control” on a TBD basis.
- Suggestions on TEOC to NOVA STC interface –
    - Add HAZMAT flow in both directions.
- Suggestions on TEOC to NOVA Residencies interface –

- Remove this entire interface.

- Suggestions on TEOC to NOVA Snow Operations –
  - Remove the flows “Suggested Route” and “Emergency Traffic Control Response”

- Suggestion on TEOC to TCC interface –
  - Remove this entire interface

- Suggestions on TEOC to Virginia State Police -
  - Remove this interface for now as it’s more of a statewide issue than NOVA specific.

Miscellaneous

Question was raised on how the NOVA team is relating this project to the statewide fiber optic network project that is currently carried out.

ATTACHEMENTS

The following handouts were given to the meeting participants:

- Agenda.
- Copy of slide presentation.

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

The following are the comments made during the “Stakeholder Outreach Debrief & Strawman Architecture Update” meeting Held on July 18, 2001:

- None.

VDOT NOVA ITS Architecture Outreach
Meeting H - Electronic Fare Payment

Date/Time: June 21, 2001 – 1:00 PM

Location: Metropolitan Washington Council of Governments (MWCOG), Wash., D.C

Attendees:
Al Karoly, I-95 Corridor Coalition
Alex Verzosa, City of Fairfax
Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Andrew Meese, MWCOG
Chellie Cameron, MWAA
Cliff Heise, Iteris
Corey Hill, VDRPT
Craig Maxey, WMATA
Fred Cwik, ARINC
Jeff Arch, PB Farradyne
Jeremy Siviter, Castle Rock Consultants/Smart Tag
Liliane Ramadan, Castle Rock Consultants/Smart Tag
Michael Farrell, MWCOG
Mike Hackett, MWAA
Mike Harris, PB Farradyne
Miriam Daughtry, VDOT Fiscal Division/Smart Tag
Ram Kandarpa, Castle Rock Consultants/Smart Tag
Sharmila Samarasinghe, NVTC
Tom Sines, Dulles Greenway

Prepared By: Ananda Palanisamy, PB Farradyne

PURPOSE OF MEETING

The purpose of the meeting was to obtain input from various stakeholder agencies in and around Northern Virginia that are offering a wide variety of transportation and related services on cost per use basis. The meeting participants provided their input on the draft strawman ITS architecture interconnects and flows pertaining to regional electronic fare payment (toll collection and other related aspects such as parking) for several regional agencies such as Metropolitan Washington Council of Governments (MWCOG), Dulles Toll Road, and Metropolitan Washington Airports Authority, etc. in the NOVA region. The goal is to verify and validate the draft Strawman architecture interconnects and flows with input from the participants, and modify the architecture to reflect the changes suggested. In tandem, the meeting reinstated a regional interest in integrating the various fare payment mechanisms for different agencies that are currently in existence and fuse them to a unified, and sophisticated system.

MEETING SUMMARY

1. Meeting commenced with a welcome note by Amy Tang and introduction of the participants. She briefed on the purpose and background of developing the NOVA ITS Architecture and

described the importance of regional electronic fare payment operations in shaping the transportation future in the region with the revenues generated by various agencies that are offering transportation and other related services. Amy explained the value of stakeholder input on the interconnects and flows of NOVA ITS Architecture and how it helps in determining the future capabilities of their agency's operations to improve the quality of transportation operations in the entire region. She also explained how the Metropolitan Washington DC Regional Architecture would be addressing various aspects of regional electronic fare payment issues.

2. Corey Hill from VDRPT provided a glimpse of various electronic fare payment initiatives in the Washington Metropolitan region and explained how it is falling in line with integration of various electronic toll activities in carried out entire North East corridor under the EZ PASS system. The vision stated the establishment of a "Regional core transit payments system" that will be interacting with various entities performing transit and related operations such as toll, taxi services, parking, and paratransit, etc.

   He stated that the goal is to provide a single, multi-region interoperable transportation smart card. This can be achieved through the introduction of a "Fusion Tag" that will have multiple protocols embedded in one single tag, facilitating the elimination of any inconvenience for the users who are currently carrying multiple cards which are very exclusive for each system in the region.

3. Andy Meese (MWCOG) provided an insight on how the Washington Metropolitan Regional ITS Architecture addresses the Electronic Payment issues. He briefed on the nature and types of various subsystems and their functions that are included into the Regional ITS Architecture that is developed in tandem with the NOVA ITS Architecture.

4. Amy Tang explained about the project objectives for the development of a NOVA–centric ITS Architecture and how it is poised for a phased progress. The various major milestones/ major tasks involved in this phased progress are:

   - Architecture
   - Outreach/Validation
   - Communication Plan.

5. Cliff Heise followed with a presentation of NOVA ITS Architecture, exclusively focused on interconnects and flows between various toll & transit agency stakeholders in the region that form a part of this Architecture.

DISCUSSIONS

1. Miriam Dougherty (VDOT Smart Tag Program) briefed on the status of VDOT's Smart Tag program and what they are planning to do in the future as a part of the operation expansion. The participants were informed that Richmond Airport is now ready to integrate Mark 4 transponder Electronic Fare Collection system in their parking and public transit vehicles.

2. MWAA is going for a New Revenue Control Systems. Few parking revenue models in various airports around the region are cited for the best performance and the reduction in the price of these electronic fare collection products such as tags and transponders and

processing systems has been a big boost for the increasing popularity of these devices with the customers.

3. Concerns were raised on the interoperability of various electronic toll tags existing in the region. The most prominent questions asked were “Did MD replace their tags for EZ PASS compatibility?” and “Does MD’s MTAG work with Smart Tag”. Participants were explained that interoperability issues are under currently scrutiny and yet to be resolved. Though the interoperability of these various tags is not happening at this point in time it will eventually be achieved in the near future. There are a number of clearinghouses around the North East and it should not be a problem to deal with this issue of toll transactions through these clearing agencies.

4. Discussions were focused on the identification of travel patterns amongst the toll tag users.

5. Questions were raised on the need for the regional integration of the various toll and fare collection systems. One of the participants asked whether there has been a formal market research done towards reading the customer interest in implementing such an integrated system? MWAA representatives stated that their agency did an intercept survey and their customers seem to be interested in using more products of this kind that facilitates an easy and convenient access to the facilities and services offered.

6. Participants raised a question on the existence of any programs/discussions in the region to integrate the regional transit agencies. It was conveyed that Greg Garback (WMATA) will be the best person to talk to regarding this issue. Also stated was the fact that FTA had put out an RFP for coordinating transit fare payment operations in the region a while ago. While asked if VDOT is ready to coordinate with the regional transit clearinghouses, Miriam Dougherty said she is certainly open to this idea.

7. It is stated that there is going to be coordination between all the transit systems in the region in the future when all transit agencies implement a unified, single card system embedded with multiple protocols that will work in any mode of transit operating in the region. On the highway toll collection side, we already have things in place for integration (EZPASS & MTAG). Distinctly, the Dulles Corridor BRT commuters will have a new dimension to their transportation problems as the customers will have to use the Airport parking, Highway toll, and Transit operation. This facilitates the need for a unified system that serves the customer with all their needs under one single mode of payment.

8. Discussions on further directions to carry forward this regional integration initiative lead the participants to the question “What is the next step”. Since the entire group of participants have agreed and showed consensus on the idea of potentially pursuing the integration of parking, toll and transit payment systems. It is felt that a detailed market research should be carried out to substantiate the need customer input for the development of such a system. The project team is to contact Joan Morrison (VDOT) for details regarding the market research on Smart Tag program carried out a while ago. It is realized overall amongst the participants that doing some market research similar to that of VDOT’s Smart Tag program will provide a clear idea of what the customer demand is.

9. The most prominent part of discussion was the political perspective of this regional electronic fare payment issue– Who is going to operate this Regional Clearinghouse?

Architecture Review – Interconnects and Flows

- It is suggested to change “Regional Toll Electronic Clearinghouse” to “Other Toll Electronic Clearinghouse”.
- The interconnect between Smart Tag Center and Virginia Toll Facility Centers should be changed from “planned” to “existing”.
- Add “Other Facility” to Smart Tag Center to address issues such as Parking and Retail (Pay-On-Foot)
- Remove the flow “Toll Instructions” existing in Smart Tag Center & Dulles Toll Road interface diagram and add a flow that describes the exchange of data pertaining to the toll transaction (good tag/bad tag data) from Smart Tag Center to VDOT NOVA Dulles Toll Road. Dulles Greenways yet to decide how they will do the transaction. Preferably, they will be interacting through “Other Toll Electronic Clearinghouse”.
- Remove the flow “Toll Instructions” existing in Greenway Center & Smart Tag Center interface diagram and add a flow that describes the exchange of data pertaining to the toll transaction (good tag/bad tag data) from Smart Tag Center to Greenway Center
- Remove the flow “Toll Instructions” existing in Virginia Toll Facility Center & Smart Tag Center interface diagram.

Miscellaneous

- National ITS Architecture doesn’t seem to have much of the depth in the EPS area. Snow operations is a good example on how the non-existent data in VDOT architecture.
- The following Figure B3 is the schematic representation of the existing and proposed (future) systems for regional fare payment.

ATTACHMENTS

The following handouts were given to the meeting participants:

- Agenda
- Copy of slide presentation

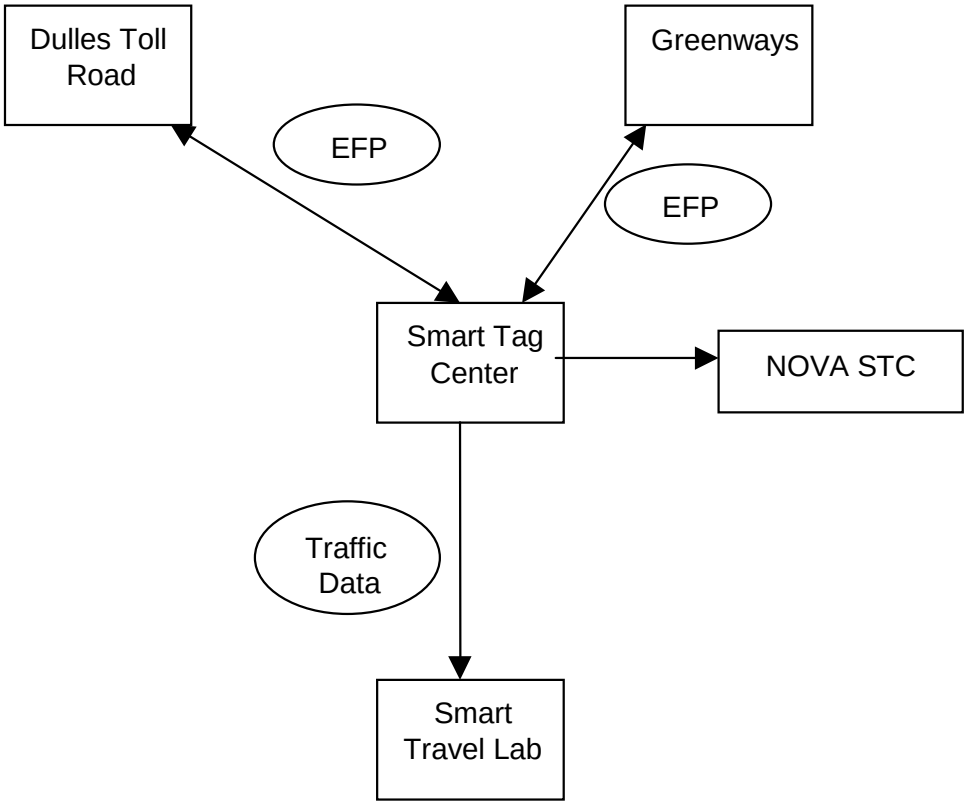


Figure B3 – Existing and Proposed Regional Electronic Payment System

Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)

The following are the comments made during the "Stakeholder Debrief Outreach & Strawman Architecture Update" meeting held on July 18, 2001:

- Discussion about block diagram. Addressed as future (TBD). Changes to be reflected in the final draft architecture.
- Final report - describe the vision for toll (market research; E-ZPass interest; no movement; if demand is there, more involvement).

VDOT NOVA ITS Architecture Team Meeting
Stakeholder Outreach Debrief & Strawman Architecture Update

Date/Time: July 18, 2001 – 10:00 AM – 3:30 PM

Location: ARINC, Inc. Annapolis, MD

Attendees: Amy Tang, VDOT NOVA ITS
Ananda Palanisamy, PB Farradyne
Charles Neal, Iteris
Cliff Heise, Iteris
Fred Cwik, ARINC
Mike Harris, PB Farradyne

Prepared By: Fred Cwik, ARINC

PURPOSE OF MEETING

The purpose of the meeting was to debrief the outreach meetings and consolidate the changes needed to be made to the Strawman Architecture.

MEETING SUMMARY

The NOVA ITS Architecture Team used the Outreach Meetings materials that include each outreach meeting's agenda, sign-in sheet, handouts, strawman architecture slides that were presented to the particular meeting, and draft meeting minutes as the basis for the discussion. All the materials are organized in a binder with the following index system:

- Tab 1 – Pre-Meeting
- Tab 2 – Meeting A: Smart Traffic Center
- Tab 3 – Meeting B: Incident and Emergency Response
- Tab 4 – Meeting C1 & C2: Traffif Operations
- Tab 5 – Meeting D: Transit
- Tab 6 – Meeting F: Planning
- Tab 7 – Meeting E: Internal VDOT NOVA & Meeting G: VDOT Central Office and Adjacent Districts
- Tab 8 – Meeting H: Electronic Fare Payment

The following notes have been incorporated into each outreach meeting summary shown in the box of "Comments on Meeting Summary by NOVA ITS Architecture Team (July 18, 2001)":

1. Tab 2, Slide 16

    - "VA Commercial Vehicle Management" added to field equipment.

2. Discussion of Data Archive and relationship to STL at UVA.

3. Data Warehouse / Mobility Data Store - differences noted by Cliff.

4. GIS different than archive? VDOT (Amy) to consider.

5. Mobility Data Store - central location for data storage. ITS and non-ITS data.

6. "NOVA Internal Sections" - combined (ref: Tab 6, Planning Group):

    - Location & Design (L&D)
    - Land Development
    - Traffic Engineering
    - Transportation Planning
    - Environmental

7. VDOT Divisions slightly different than Sections (no Land Development):

    - IT
    - ITS
    - L&D
    - Traffic Engineering
    - Transportation Planning
    - Environmental
    - DMV

8. Mobility Data Store - provider to MWCOG clearinghouse (see figure below). Archive data, not real-time.

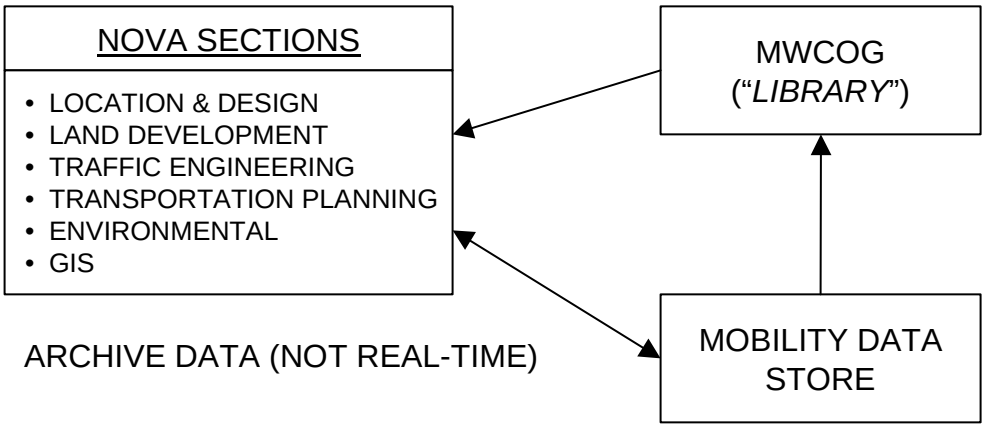


Figure B4 – Mobility Data Store

9. Tab 3, Summary Page 2 of 4

    - "EOC" is actually "TEOC."

10. Tab 2, Page 33 (slide)

    - Planned link added for toll (confirm with Cliff's notes).

11. Tab 2, Page 53

- Discussion about FEMA and "Map to Weather" terminator to capture flow.

12. Tab 3, Slide 14

- Remove existing link between "VDOT NOVA District / VDOT NOVA Safety & Service Patrol" and VDOT / VDOT NOVA Dulles Toll Road." This link is how things are done today - but will not be in the future.

13. Tab 5, Page 4 of 4

- NVTC is more of a clearinghouse than real-time. Stakeholder name is TBD ("Information Clearinghouse").

14. Tab 5, Page 4 of 4

- Discussion about Clearinghouse relationship to ISP (PIM). Document stakeholder requirement for Information Clearinghouse. Issue not resolved & needs to be addressed. Treated as TBD within architecture. Can show interconnect between ISP and PIM as existing.

- Final Report - Need to recognize larger demand than is currently supported - need Information Clearinghouse.

15. Tab 8, Page 4 of 4

- Discussion about block diagram. Addressed as future (TBD). See Amy's notes / diagram. Final decision - Cliff's recommendation.

- Final report - describe the vision for toll (market research; E-ZPass interest; no movement; if demand is there, more involvement). Basically, document the discussions during the meeting.

- System Architecture - refer to Cliff's notes.

16. Tab 2, Page 2 of 4

- STC doesn't maintain signals, no dispatching. STC and Fairfax coordination for signals via existing connection. STC provides courtesy notification.

17. Tab 3, Page 2 of 4

- Update memo to reflect that the Arlington County Sheriff isn't included in the list of public safety (but does exist). Same applies to the Loudon County Sheriff.

- #77 calls go to State Police located in basement of STC. This is an existing link that doesn't need to be specially addressed in the System Architecture.

- "EOC" is treated as "TEOC."

- Include in the final report a write-up on the "Unified Command" post. System Architecture to include interconnect between SSP and "Unified Command" - include traffic management (after incident) as future capability.

18. Tab 3, Page 3 of 4

- CapWIN - Keep as "CapWIN" in System Architecture. CIP's are within CapWIN. Do not change to CIP. CapWIN aspects are to be addressed in Communications Plan.

19. Tab 3, Slide 21

- System Architecture - Tailor flows for minor incidents and remove tracking. Keep "Unified Command" for large incidents.

20. Tab 4, Page 2 of 4 (part 1)

- Change "ECC" to "TEOC.'

- System Architecture - Include "Event Promoter" to address regional traffic generators (e.g., Redskins' Park, GMU, etc.).

- System Architecture - Include Smithsonian Extension as future stakeholder.

- STSS is planning to do some experimenting with video images in the *near* future. [Note - Fred to confirm (w/ Mark Hagan) the scope of this and number of CCTV cameras.]

21. Tab 4, Page 3 of 4 (Part 1)

- Arlington got funding from the state to install 25 cameras and they will be exchanging video information with ~~STSS~~ STC to manage the ~~highway~~ *arterial* traffic.

- Coordination at the boundary level is permitted but not the ~~complete takeover~~ *control* of the local signal system.

- System Architecture - relationship to red light running? Include "Red Light Running" flow between "NOVA Public Safety" and "STSS." Fairfax has data and STSS has link to Fairfax. Include in final report write-up.

- System Architecture - Confirmed to remove "Traffic Information Coordination" flow between "NOVA STSS" and "WMAA."

22. Tab 4, Page 2 of 4 (Part 2)

- Signal ~~pre-emption~~ *priority* for BRT service will need to be addressed.

23. Tab 4, Page 3 of 4 (Part 2)

- Safety Service Patrol - … when the Safety ~~service~~ *Service* Patrol is not available.

- DDTR and NOVA Construction ops. - … construction activities are posted on the ~~internet~~ *Internet* for public access. [Note - VDOT (Amy) to follow up with Dorothy Purdis.]

- National Park Service and STC - For the Final Report, it is recognized that the Park Service is open to the same model as CHART for the BW Parkway.

24. Tab 5, Page 2 of 2 (5) [Note - memo should be updated to reflect "Page *x* of 5."]

- Paratransit services - City of Fairfax - ~~Tax~~ *CUE*

- [Note - PBF (Andy) to confirm entire list.]

25. Tab 5, Page 3 of 3 (5)

- Emergency Management - the special requirements are recognized as being handled by NAWA system.

- Need to use the new name for the Washington Metro Data Clearinghouse.

26. Tab 5, Page 4 of 4 (5)

- Wait until the NVTC is confirmed with video requirements. [Note - ARINC (Fred) to confirm during Communications Plan outreach process.]

- The STL is not interested in an archive data link from the NVTC. The STL only desires a one-way flow from the STL to the NVTC.

27. Tab 6

- System Architecture - All NOVA Sections / Other and VDOT Divisions establish 2-way flows with NOVA GIS (see figure below).

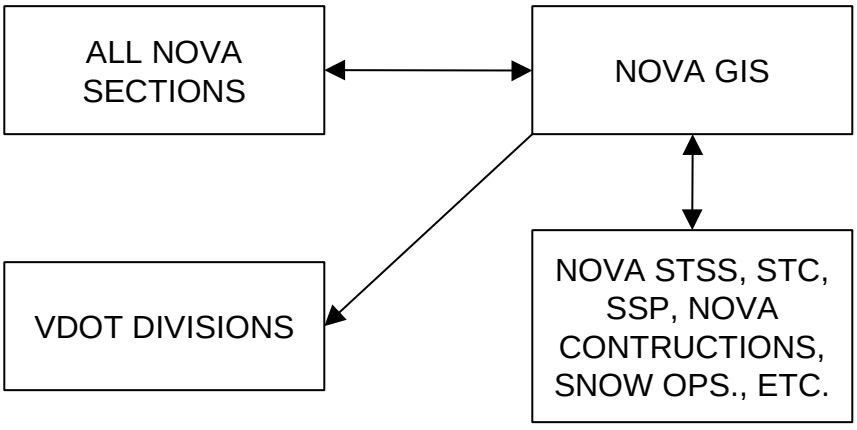


Figure B5 – VDOT NOVA Sections and NOVA GIS

- System Architecture - Modify "Map Update" flow to be "GIS Database" flow.

28. Tab 6, Page 2 of 4

- System Architecture - it is confirmed to add NOVA Local Planning Centers.

29. Tab 7, Page 3 of 4

- There was a discussion about the Snow Ops web page posting. [Note - this was a general discussion item that requires no action.]

30. NOVA GIS

- Explore relationship between NOVA GIS and MS Outlook.
- Potentially additional information available from NOVA GIS.
- Concept of putting GIS on NOVA Server.
- Develop a paper trail from Master List to modified list (specific to NOVA ITS Architecture project).

31. Final Deliverables (5 in total)

- Remove project brochures from list.
- (1) Executive Summary - Target high-level audience. To be written by ARINC.
- (2) Project Report - Approximately 50 pages. Discuss project team, experience, and PM aspects (focus and process). Identify key positive points and issues found in the process. Discuss process for System Architecture (mapping of functions), Outreach (final stakeholder list), and Communications Plan (philosophy & approach). Discuss lessons learned (e.g., System Architecture to Outreach, One Sheet of Music). Discuss the project deliverables and reference other reports. To be written by ARINC.
- (3) System Architecture - to be written by Iteris.
- (4) Outreach Report - to be written by PBF.
- (5) Communications Plan - to be written by ARINC.
- Develop consistent document formatting (font, text size, headers, footers, etc.) for all deliverables. ARINC to review ISO QMS procedures.

32. Project / System Architecture Web Page

- Recognized that web page is better method for maintaining the system architecture (as opposed to published CD-ROMs).
- Consider an interactive search feature as part of the web site.

- Iteris to develop proposed scope and cost.

33. Outreach

- The Outreach meetings are complete. However, follow-up outreach efforts are still required.

- Need to develop two letters (written from the perspective of and from VDOT) - one for the attendees and one for the non-attendees. The letters should discuss that we have gone through the outreach process - thanking those who participated (and seeking confirmation) and presenting those who did not the opportunity to provide feedback. Draft cover letters to be developed by PBF and shared with VDOT (Amy) for review.

- Iteris to update the Interconnects and Information Flows (w/ table). Due: August 31, 2001. Follow-up outreach package to include updated System Architecture materials.

- Follow-up Outreach packages to be distributed first week in September, 2001.

- Will need to follow-up with non-attendees with phone calls to ensure they received the follow-up packages and answering any questions they may have.

34. Configuration Management

- Need to baseline into CM the System Architecture files going into the Outreach process. Iteris to forward files to ARINC.

- Will also need to put into CM the updated (from outreach effort) system architecture files.

35. Communications Plan

- Publish detailed Communications Plan outline (August 3, 2001)
- Distribute initial draft of System Architecture-independent sections of plan (August 31, 2001)

- Distribute GIS Database layers and attributes (August 9, 2001). Also, support VDOT ITSCC meeting as required.

- Publish initial GIS database with stakeholder input (August 17, 2001).

- Provide Internet-based GIS demonstration (August 24, 2001). [Note - subject to modification.]

36. Other Business

- ITS 2002 - Develop three briefings for submission to the program (drafts due August 24, 2001).
    - Project experience / process / regional cooperation (PBF, ARINC).

  - o VDOT's Vision for using the System Architecture (VDOT).
  - o Deployment - Planning Architecture projects, Communications Plan (Iteris, ARINC).

- Consider additional project-related briefing on the GIS for ITS using NOVA as the example (ARINC).

- System Architecture Workshop - Consider role in workshop preceding ITS 2002.

SUMMARY OF ACTION ITEMS:

- Outreach Package Summary (see above for additional items, especially, System Architecture updates):

  - o VDOT to consider relationship of GIS to data archiving. Due: TBD.
  - o ARINC to confirm with VDOT NOVA STSS (Mark Hagan) the scope of CCTV system (i.e., number of cameras). Due: TBD.
  - o VDOT to follow up with Dorothy Purdis. Due: TBD.
  - o PBF to confirm contents of entire transit / paratransit list. Due: TBD.
  - o ARINC to confirm video requirements with NVTC during Comm Plan development process. Due: TBD.

- Final Deliverables

  - o ARINC to review ISO QMS procedures for consistent document formatting for all project final deliverables (reports). Distribute guidelines to team. Due: TBD.

- Project / System Architecture Web Site

  - o Iteris to develop proposed scope and cost. Due: TBD.

- System Architecture

  - o Update Interconnects and Information Flows and develop summary table to support follow-up outreach efforts. Due: August 31, 2001.

- Outreach

  - o Develop draft follow-up outreach cover letters for VDOT review. Due: TBD.
  - o Distribute follow-up Outreach packages. Due September 3-8, 2001.

- Communications Plan

  - o Publish detailed Communications Plan outline. Due: August 3, 2001.
  - o Distribute initial draft of System Architecture-independent sections of plan. Due: August 31, 2001.
  - o Distribute GIS Database layers and attributes. Also, support VDOT ITSCC meeting as required. Due: August 9, 2001.

- Publish initial GIS database with stakeholder input. Due: August 17, 2001.
- Provide Internet-based GIS demonstration. Due: August 24, 2001. [Note - subject to modification.]

- ITS 2002

  - Develop draft presentations for internal team review (see above for listing and responsible). Due: August 17, 2001.
  - Submit draft presentations to ITS America. Due: August 24, 2001.

VDOT NOVA ITS Architecture Outreach
Post 9-11 Follow-up Meeting – Smart Traffic Center

Date/Time: October 5, 2001 – 9:00 AM - noon

Location: VDOT NOVA STC @ Arlington, VA

Attendees: Cliff Heise, Iteris
Charles Neil, Iteris
Fred Cwik, ARINC
Jimmy Chu, VDOT NOVA STC
Kathy Asmussen, VDOT NOVA STSS
Marilynn Taylor, VDOT NOVA STC
Mark Hagan, VDOT NOVA STSS
Matt Miller, VDOT NOVA STC
O'Neil Brooke, VDOT NOVA STC
Shawn Jones, VDOT NOVA STSS

Prepared By: Cliff Heise, Iteris

PURPOSE OF MEETING

The purpose of the meeting was to discuss with VDOT NOVA STC and STSS staff regarding changes to the NOVA Architecture resulting from the September 11, 2001 events.

MEETING SUMMARY

1. Add STC remote control from Adjacent STC and off-site control by STC management much like the STSS is handled.

2. Reflect remote control capability in STSS.

3. Add camera feed dedication for agency requesting specific camera view (possibly non-transportation); Blank camera feed to public.

4. Develop and add information exchange for STC/STSS from/to Federal agencies and other organizations that are making decisions impacting the transportation system; VDOT needs to be in the decision process for transportation related decisions.

5. Re-evaluate the VOIS system (TEOC) regarding the architecture; reliability of system is suspect; need text message exchange capability across VDOT and other agencies.

6. Satellite communications needed for reliable communication (not necessarily an architecture issue but could affect the communications plan)

Comments on Meeting Summary by NOVA ITS Architecture Team

- Some of these issues are more institutional than architectural. The team will reflect them in the architecture so that the institutional issues can be worked out.

Post 9-11 Follow-up Meeting – Northern Virginia Transit Operators Emergency Coordination, Communication and Security

Date/Time: October 16, 2001 – 12:00 Noon – 3:00 PM

Location: Northern Virginia Transportation Commission (NVTC) @ Arlington, VA

Attendees:
Al Himes, City of Alexandria DASH
Alex Verzosa, City of Fairfax
Andy Szakos, Fairfax Connector
Betsy Massie, City of Alexandria
Cliff Heise, Iteris
Corey Hill, VDRPT
Don Chism, VRE
Eric Marx, PRTC
Eric Smith, Arlington County Transit
Julie Bourbon, NVTC
Kamal Suliman, VDOT NOVA STC
Rick Clawson, VDRPT
Rick Taube, NVTC
Robbie Werth, Diamond Transportation
Sandy Modell, City of Alexandria Transit
Tamara Ashby, NVTC
Tanya Husick, VDRPT
Todd Kell, VDOT ITS Division
Valerie Pardo, VDOT NOVA Planning

Prepared By: Cliff Heise, Iteris

PURPOSE OF MEETING

This meeting was called by NVTC and the transit stakeholders. The NOVA ITS Architecture team joined the meeting to capture possible changes to the NOVA Architecture resulting from the September 11, 2001 events. For a copy of the official meeting minutes, please contact NVTC.

MEETING SUMMARY

1. Nextel gave a pitch about their system with direct connect/messaging.

    - The group discussed Internet messaging and email. The radio and cell communication systems are separate.

    - There was interest in conference calling, sending broadcast email, updating website content from phone/remote location.

    - Group calls can be made via the direct connect radio but the group list must be preset and can not be dynamically generated.

- Direct connect is about 4 times the capacity of cellular.

2. Kamal Suliman discussed the STC activities on the 11th.

   - Preset plans were put in place and coordinated with surrounding traffic operations in Arlington County and City of Fairfax.
   - Arlington County was major responder.
   - MWCOG conference call took place in the afternoon that day.
   - Lifted HOV for 12th because schools were closed and there were limited DC activities.
   - Lifting of HOV included notification of METRO and media.
   - Need to decide on what criteria is for lifting HOV.
   - NOVA incident management team manual handed out.
   - There was some conflict between STC and the transit group concerning incident management coordination. Apparently, the transit inputs to the incident management manual in the last update were not included.

3. The biggest problem of the day was getting information from other sites, transit, and STC, etc.

4. Todd Kell of VDOT ITS Division and project manager of Partners in Motion, reported on the availability of a web-based application through SmartTraveler.

   - This web application has existed as part of the SmartTraveler contract to provide this service/capability.
   - Most of the transit participants were unaware of this system.

5. The group discussed financial reimbursement for transit agencies from the Federals for their costs on the 11th.

Comments on Meeting Summary by NOVA ITS Architecture Team

- Most issues are more institutional and about communication than architectural. The team will address the Nextel/cellular communication capability/capacity and intranet/internet capacity among agencies.
- The big issues are communications (voice/data), common facility to exchange data, and standard operating procedures.

- Communications was discussed a lot but also just finding a place to find or place information for or from their system. Although transit stakeholders didn't seem to be aware of the web application, the architecture concerning the link with SmartTraveler has been included in the Washington regional architecture and is outside of NOVA architecture scope.

- The transit stakeholders have yet to have a big picture in resolving the issue of sharing information among themselves and highway agencies. With more focus and some structure in the approach, the NOVA ITS Architecture Team is encouraged by the willingness of this group to use the internet as a data exchange facility for this type of activity. But issues such as server bandwidth/capacity, potential internet failure due to overload of the demand on web server should be seriously considered for such a sharing application.

- The Nextel solution provides a great option for improving communications if everyone has a Nextel phone. But the direct connect feature is not designed for group conference call and is limited for that purpose. Concern is that the Nextel has a relatively low penetration and therefore the system did not go down on the 11th, but this can be changed.

- The transit group would need to start working on standard response/operating procedures; future changes would be reflected in the architecture.

APPENDIX C – OUTREACH CONFIRMATION LETTERS

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
14685 AVION PARKWAY
CHANTILLY, VA 20151-1104
(703) 383-VDOT (8368)

CHARLES D. NOTTINGHAM
ACTING COMMISSIONER

THOMAS F. FARLEY
DISTRICT ADMINISTRATOR

September 6, 2001

«Organization1» «Organization2»
«Street»
«City_State_ZIP
Attn: «Name»

RE: Virginia Department of Transportation (VDOT) Northern Virginia ITS Architecture

Dear «Prefix» «Last_Name»:

The final draft copy of VDOT's Northern Virginia (NOVA) ITS Architecture is enclosed for your review and comment. I would like to thank you for your participation in the VDOT NOVA ITS stakeholder workshops and ask that you please provide any additional comments on the ITS Architecture tome by September 30, 2001.

Comments may be provided by email to <AmyTang@vdot.state.va.us> or by regular mail to my attention at:
VDOT Northern Virginia District
14685 Avion Parkway
Chantilly, Virginia 20151-1104

All comments received by the end of September will be incorporated into the final version of the VDOT NOVA ITS Architecture. A copy of the final architecture will be available in late 2001.

Thank you again. Your involvement is appreciated.

Sincerely,

Amy Tang
Smart Travel Program Manager
VDOT Northern Virginia District

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
14685 AVION PARKWAY
CHANTILLY, VA 20151-1104
(703) 383-VDOT (8368)

CHARLES D. NOTTINGHAM
ACTING COMMISSIONER

THOMAS F. FARLEY
DISTRICT ADMINISTRATOR

September 6, 2001

«Organization1» «Organization2»
«Street»
«City_State_ZIP
Attn: «Name»

RE: Virginia Department of Transportation (VDOT) Northern Virginia ITS Architecture

Dear «Prefix» «Last_Name»:

The final draft copy of VDOT's Northern Virginia (NOVA) ITS Architecture is enclosed. During our outreach period in June 2001, we were sorry we missed your participation. We look forward to your assistance in finalizing the VDOT NOVA ITS Architecture. I ask that you please review the enclosed report and provide your comments tome by September 30, 2001.

Comments may be provided by email to <AmyTang@vdot.state.va.us> or by regular mail to my attention at:
VDOT Northern Virginia District
14685 Avion Parkway
Chantilly, Virginia 20151-1104

All comments received by the end of September will be incorporated into the final version of the VDOT NOVA ITS Architecture. A copy of the final architecture will be available in late 2001.

Thank you again. Your involvement is appreciated.

Amy Tang
Smart Travel Program Manager
VDOT Northern Virginia District

APPENDIX D – STC ACTIONS ON 9-11, 2001 (SOURCE: NOVA STC)

VDOT NOVA STC ACTIONS ON 9-11

Following, in chronological order, from VDOT NOVA STC is a bulleted summary of events and actions that took place at the Smart Traffic Center (STC) on September 11, 2001, also suggestions to make the future responses more efficient.

INITIALLY –

- Notification of incident at NY Towers. (Through news media)
- Plane flies directly over STC and hit Pentagon. (eyewitness & emergency scanner)
- Secured the STC facility (closed gates to keep citizens and news media out of facility so VDOT could mobilize its forces and act on planning strategies).
- Began monitoring traffic movements in and around the immediate DC area (Cameras, Computer Systems) and news (Radio, TV).
- Maintenance Groups and SSP personnel were instructed to return to area headquarters (Planning and Instructions).

IMMEDIATE VDOT RESPONSE –

- Notification through emergency scanners and news media that DC and Federal agencies had enacted a state of emergency and the Pentagon was being evacuated (STC began intense monitoring of traffic flow out of DC and surrounding areas for implementation of incident plans).
- Coordinated HOV gates openings with State Police (maximum traffic flow out of city).
- Programmed VMS signs (traveler information to public).
- SSP incident supervisors organized and mobilized crews and proceeded to accident scene.
- STSS contacted Arlington County signal department and City of Fairfax signal department to coordinate placement of signals into the p.m. plans (out going traffic) and execute special-event incident management plans to facilitate vehicle traffic movement down major corridors.
- Because of news reports that other threatening planes were still in the air and heading towards DC. STSS moved control of signal systems computers and communications to back up system located at VDOT's Camp 30 facility in Fairfax (security reason).

MOBILIZATION –

- Unified Command Vehicle Mobilized – Initially set up at ramp 8B directly across and in front of the Pentagon, then relocated vehicle next to STC facility due to smoke and emergency vehicle traffic (VDOT has permanent operational seat in vehicle).

- Operational contacts for coordination made with Unified Command Vehicle, STC facility, State Police, Fairfax County Police, Arlington County, Fairfax City, TEOC (Richmond), and Maryland DOT.

- Maintenance and SSP sections mobilized crash cushions, light towers, traffic cones, manpower, and other related equipment and coordinated with STC and Unified Command Vehicle for placement.

- Other VDOT Districts (Culpeper & Fredericksburg) were contacted for available equipment and responded.

MONITORING, INFORMATIONAL PROCESS AND CONTINUED MOBILIZATION –

- Communication process established for information updates to and from TEOC (Richmond), NOVA district, Fairfax County police, Virginia State Police and NOVA maintenance areas.

- VDOT coordinated with and assisted United State Military from Naval Annex (Navy, Army) in setting up information command center in secured VDOT Columbia Pike (STC) facility. Secured for their access to phones, e-mail, news broadcasts, CCTV cameras, writing material, white boards, conference rooms and offices. Columbia Pikes Maintenance area headquarters facility was used as a temporary daycare center for children of military personnel.

- Work shifts were established for around the clock operations.

- Conference call was established between area agencies including the Council of Governments discussing and planning openings and closings for roads, public and private facilities and other relevant business decisions.

SITUATIONAL IMPROVEMENTS/LESSONS LEARNED -

- Within a minute of plane hitting the Pentagon all Cellular phones, and some two-way radio communications, and pagers were periodically interrupted for approximately 3 hours (Caused by circuit overloads, and military blackout). On that basis, <u>for external communications</u> VDOT will need to rely on the use of more specialized leased two-way and satellite type communication devices.

- District's teleconferencing equipment was brought to the STC; this proved to be an essential and useful tool. We need to have appropriate teleconferencing equipment exclusively dedicated for this sensitive traffic operation center.

- STC evacuation procedure and active personnel verification guidelines and policy need to be established. (i.e. what if STC had been damaged, where should personnel go for instructions, relocation and who should personnel notify to establish list of the non-injured).

- TEOC guidelines and procedures. This past week's activities demonstrated the need to review, tighten and make developmental improvements on procedures for communications between TEOC (Richmond) and all districts.

- Within the framework of managing incidents and emergencies of this magnitude and nature, we need interoperability guidelines for contact and interaction with the military.

- The existing STC facility is old, does not have adequate space, and is not adaptable for the existing and future traffic volume, congestion and high customer expectations. To realistically meet these demands a new facility is needed, and the necessary funding for design and construction should be allocated. A centralized unified district emergency command facility, (information and command center) would encompass all VDOT sections (district – wide involved in incident management), police, fire and rescue, COG and others.

- Aerial visual (helicopter type) link. Ability to see large area of district for traffic flow analysis. During emergencies visual verification of traffic flow and patterns to confirm proper incident management signal plans are adequate for the emergency. Also send STC video feed to command centers across state using communication lines. This would give these facilities instant visual informational feeds. This communications could also be used to feed local news broadcasts to these facilities about district specific emergencies.

- Establish protocol for providing and obtaining additional resources (equipment, signs, light towers, or manpower) from within NOVA and from neighboring VDOT Districts. The protocol should include guidelines for maintaining communication with crews on route and after they arrive to the incident scene.