Program Plan
Development of Regional Capabilities to Improve Transportation System Management

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Background

During the past few years, significant procedural and communications improvements have been made in the area of transportation incident and emergency response. Transportation agency personnel have established strong working relationships that facilitate coordination of the transportation sector's response to incidents. However, with current operational procedures it is an added challenge for individuals who are participating directly in the response to incidents to provide real-time regional information about the status of the transportation system. The best incident management requires real-time receipt of information, predefined action plans, and quick information dissemination to providers and the public. The following considerations affect the timely exchange and dissemination of real time information:

- Coordination at the incident scene is the responsibility of individuals with many other important responsibilities.
- Currently, the media must contact multiple agencies to develop a comprehensive picture of regional transportation status.
- It has been a challenge for response personnel from individual agencies to convene and create coordinated regionwide, multi-agency operations plans. This may be accomplished in a more timely fashion if a regional program with experienced operations personnel, able and assigned to take a regionwide perspective, is assigned the responsibility for ensuring that such plans are developed.
- For existing regional communications systems to operate effectively, clear responsibilities, procedures, and protocols must exist for initiating and following up on inter-agency communications, and this could be facilitated by a program with a regional perspective.

There is a need for enhancements that expedite the region's capability to coordinate regional response to transportation incidents. This project plan describes the approach that can potentially fulfill this need.

This plan is based on a grant application submitted to the Government of the District of Columbia in connection with the 2005 Homeland Security Initiative under Emergency Support Function R-ESF-1 titled "Development of Regional Capabilities to Support Transportation System Management and Operational Support in Response to Terrorism Emergencies". A grant was subsequently awarded in response to this application, which included the stipulation that the project satisfy the following objectives:

1) "Development of a detailed workplan and scope of services for continued design and implementation of the RITIS (Regional Interoperable Transportation Information System) data exchange information system
2) "Planning the use of the integrated UASI communications "tracks", both wireline and wireless, as the electronic backbone of the RITIS regional data exchanges"

As described in the following workplan, these objectives will be achieved through a combination of planning and implementation of a prototype information exchange capability. The end product of this effort will be the availability of a RITIS prototype, and the comprehensive evaluation of the feasibility and effectiveness of a regional transportation information exchange capability.

The Concept

The basis for this work is the implementation of a regional information exchange capability. The scope of activities included in its development includes:

- Information Backbone – A transportation information backbone (RITIS) will be developed that focuses on regional incidents, but will also include general information regarding the overall status of the transportation system. This system will focus on the use of the integrated electronic communications paths, both wireline and wireless, as the electronic backbone of the RITIS regional transportation data exchanges as described in the Grant award.
- Live Transportation Information Exchange Among Agencies – The project will use available wireline and wireless backbones for exchange of information regarding the status of the transportation system regionally on an everyday basis, with particular emphasis on information related to incidents. Project staff will receive and disseminate all available data regarding the status of transportation modes and major routes in the region using RITIS as the primary information backbone. In addition, project staff will establish and schedule communications among all involved parties in the transportation sector.
- Public Information – The RITIS system and supporting operational staff will make transportation information available directly to the public through the Internet and potential future 511 telephone systems to ensure transportation status information is coordinated, timely, and thorough.
- Planning – The project will provide the needed planning for the use of the integrated UASI communication tracks through the development of concepts of operations required to define transportation sector procedures and responsibilities for coordination and communication during major incidents. These planning activities will include supporting the coordination of transportation sector preparation activities prior to incidents, as well as post-incident analysis to support future regional emergency preparation, with the objective of continuous improvement in regional coordination through modifications to standard operating procedures, training and exercises.

The successful completion of these activities will represent a critical step toward enhanced incident management for the transportation system in the Metropolitan Washington region.

Project Description

This concept has been used as the basis for the development of a project approach that is responsive to the objectives of the Grant Award. This approach is based on the development of an information backbone, along with a planning and prototyping activity that is intended to serve as a "proof of concept" for the coordination of regional transportation incidents. The project approach includes the following tasks:

Task 1 – Preparation
During this task, the initial project organization will be created, additional staff will be hired and trained, and the needed equipment and software will be acquired.

Two categories of additional staff will be required; technical staff and operations staff. The technical staff will be responsible for RITIS development, enhancement and support. The operations staff will include personnel required to support five days per week, 16 hours (two shifts) per day operation. Staffing details are provided in the Staffing section of this plan.

Equipment requirements include workstations with associated networking equipment, telecommunications equipment and office equipment. This equipment will also be acquired during Task 1.

Training will be provided for the operations personnel, which includes provision of information required to familiarize them with the region, the transportation organizations within the region, and existing procedures for transportation system status acquisition and dissemination. The training will also include visits and meetings with supporting organizations including but not limited to DDOT, MDSHA, VDOT and WMATA. It will include visits to PSAP (911) centers, as well as "ride-alongs" on service patrol vehicles. One week of training is planned for all new employees. Operations staff will also be instructed on procedures to be used for entry of incident data into RITIS. This training will emphasize the interpretation and entry of arterial incident data into the RITIS system, which will be necessary until more automated interfaces can be developed.

Task 2 – Information Backbone
During this task, the RITIS system will be enhanced to include additional information sources including Montgomery County and WMATA. (Note that information from the state DOT's and Prince Georges County will be interfaced with RITIS prior to the initiation of this task.) Interfaces with the Montgomery County system will include procedures for manually processing information received and entry into the RITIS database.

A website will be developed to permit transportation officials, emergency management officials and the public to rapidly evaluate the status of the transportation system, including availability and level of service on major routes throughout the region.

Task 3 – Live Information Interchanges Among Agencies

A significant challenge of the information dissemination process is the provision of accurate, timely and comprehensive information to the intended recipients, without overwhelming them with irrelevant messages. Two approaches are possible: push systems in which information is provided automatically to recipients without requiring any action on their part, and pull systems in which the recipient must request information when interested. Dissemination of incident information among agencies requires a push-type approach, which must be tailored to meet the needs of the recipient. In recognition of this need, the following steps will be performed during this task:

- Review and begin updating existing phone and pager lists
- Review, update and develop user profiles to define information needs of recipients
- Define the range of possible transportation incident scenarios (both pre-planned and no-notice) and develop contact lists for each scenario
- Define notification protocols for the incident scenarios – i.e. what information is transmitted, what terminology is used to inform the individual being contacted
- Define follow-up and close-out protocols for the incident scenarios including recommended communications intervals and scheduling steps.
- Define process for preparation and review of regional incident after action reports (with emphasis on regional transportation coordination)
- Execute the plans and procedures developed during the remainder of the project period.

Task 4 – Public Information

The information collected through the RITIS process will be invaluable to the customers of the transportation system – travelers in the metropolitan Washington, DC region. During this task, access will be provided to the RITIS information through a website to be developed during Task 2, and through on-site workstations. Acquisition of workstations and communications required to support access to the RITIS information will be the responsibility of the recipient. During this task, project staff will work with media outlets that are potential providers of transportation system information, to determine whether they can provide such information automatically or through telephone contact for use by the RITIS system. Informal contacts have already been made, that have verified both the interest and capabilities of these outlets.

Task 5 – Planning

There is a need for ongoing planning to ensure coordinated, informed response to incidents that affect the performance of the region's transportation system. The following planning activities will be included in this project:

- Review and begin updating existing SOPs for applicability to regional incidents
- Review and begin updating existing training for regional incidents

- Review and coordinate identification of critical transportation infrastructure with regional impacts
- Prepare and begin implementing Operations Outreach Awareness Plan
- Develop detailed regional incident concept of operations
- Develop regional incident response performance measures of effectiveness for transportation

Task 6 – Implement 2-Shift Operation
This task defines the ongoing operation activity required to provide data entry to the RITIS system, facilitate communication, and perform the needed ongoing planning activities. This will be a five day per week, 2-shift (16 hours per day) operation. Hiring and training of operations staff is performed during task 1. During this task, the following activities will be performed as an ongoing activity to be continued through the end of the project.

- Monitor – recognize need for regional coordination
- Initiate and coordinate communications
- Ensure that regional SOPs are followed
- "One-stop-shop" for providing status of transportation system during regional incident (hotline for senior managers and key members of media)
- Operate and maintain RITIS database
- Establish access to sources of information related to transportation status through real-time linkages with existing systems and execution of agreements with private sector organizations currently collecting similar data. (Note: real-time connection has already been established with CHART, and initial agreements has already been reached with WTOP for provision of such data).
- Provide "help-desk" support for agreed upon regional applications (initially CapWIN and RITIS).
- As time is available, perform planning functions of task 5

Evaluation Strategy

The nature of this work as a prototype, as well as the requirements of the Grant Application process, emphasize the importance of evaluating the effectiveness of this regional transportation coordination project. The evaluation will include quantitative assessments of each measure, wherever possible. As indicated in the first section, the evaluation measures identified for management of the project include:

- Staff size
- Percent of staff trained
- Number of completed R-ESF#! Worksheets

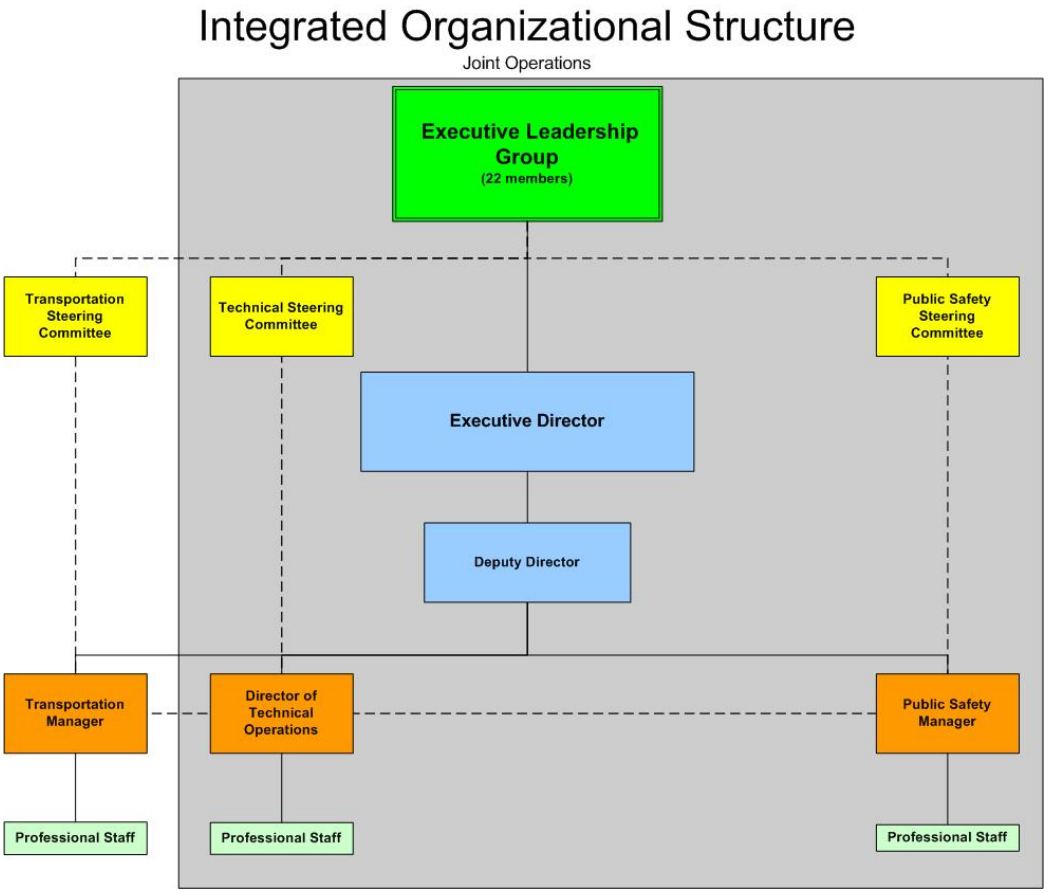
- Percent of agencies in the region whose SOPs have been reviewed for regional operations, and modified to reflect regional response requirements
- Satisfactory completion and evaluation of two exercises
- Completion of the RITIS prototype
- Satisfaction of agency personnel with coordination support as evaluated through questionnaire surveys

With the exception of the agency personnel satisfaction, the measures identified for evaluation are "output" measures rather than "outcome" measures, and the latter are generally preferred. Outcomes describing the CapCom effectiveness will be developed as part of the evaluation of exercises conducted for coordinated transportation system response.

Organization

The proposal, on which this work was based, indicated that the project would be the responsibility of the University of Maryland's Center for Advanced Transportation Technology (CATT). The CapWIN organization which is one element of the CATT will be assigned responsibility for this work. The CapWIN Program has been recognized by regional transportation authorities as currently having the fundamental governance structure, staff and other elements required for implementing a regional information resource such as the one in this project. The experience of other regions, has demonstrated that effective information sharing cannot occur unless all of these agencies are involved including both first responders and transportation agencies. The use of the CapWIN governance structure satisfies this need.

The proposed organization shown in the figure below has been approved by the Transportation Planning Board, as well as the CapWIN executive leadership group. The use of a single executive leadership group to oversee the activities of both CapWIN and this project ensures the efficient use of scarce management time, and representation by all parties responsible for response to incidents is assured. Similarly, steering committees staffed by public sector individuals with operational experience are established to provide detailed guidance in their respective areas. This relationship is reflected in the following organizational chart:



Transportation group

The organization shown in the figure is modular, in the sense that the project staff (as represented by the transportation steering committee and transportation manager) are separate identifiable entities, while at the same time reporting to a unified Executive leadership Group. In this way, it will be possible to avoid co-mingling of funding, and ensure accountability to their respective public agency counterparts.

The transportation group will include all project staff required to support the planning and operations activities described above. This group will be configured to support the two shift operation described above. It will include supervisory personnel for each shift, as well as one incident management specialist who will oversee the group's planning activities.

Technical Operations Group

The Technical Operations group in the figure is responsible for providing technical support for CapWIN, and (to the extent required) this project. This group will be responsible for the RITIS development and maintenance.

A limited number of CapWIN resources will be used to supplement the RITIS activities in the areas of software quality assurance (QA), configuration management, and

documentation. The existing CapWIN resources will also be used to provide management oversight, to ensure that software development, testing and documentation procedures are rigorously applied during the RITIS development process.

Staffing

Staffing resources include both the operations and system/software development staff required to implement the plan described above. Management and operational staffing positions are defined in Table 1.

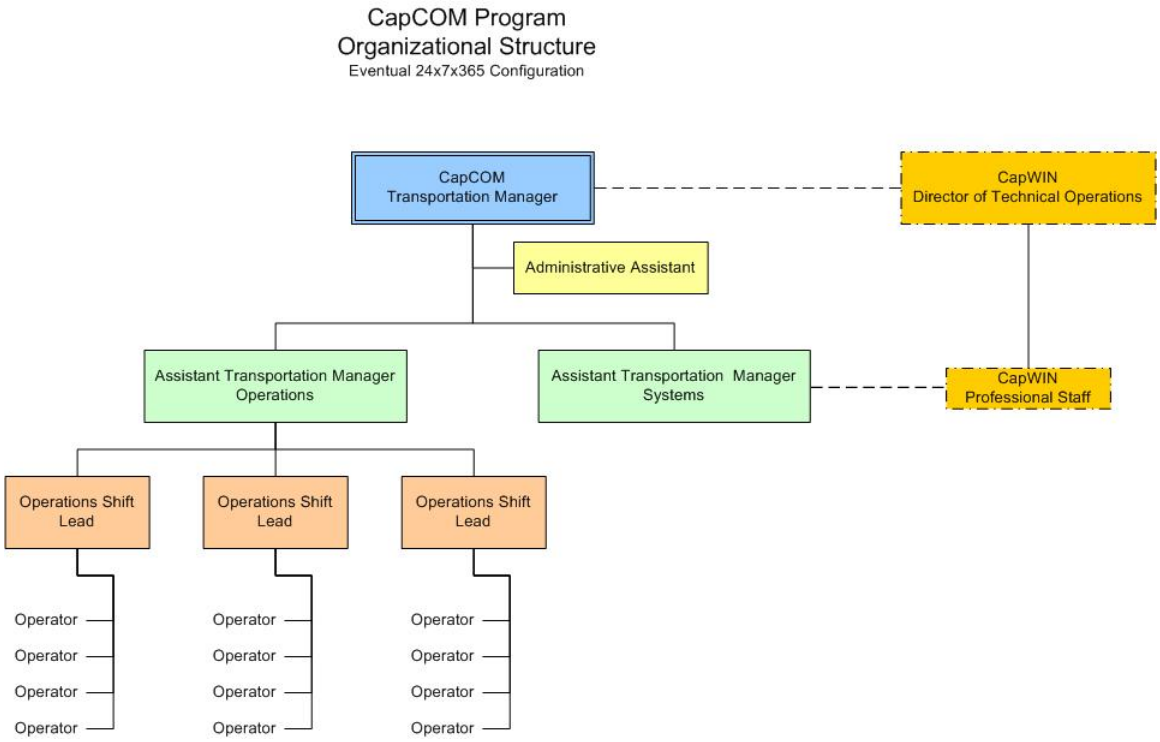


Table 1. Project Staffing

Position	General Functions & Responsibilities*
Transportation Manager	Provides overall administrative direction of CapCom.
Assistant Transportation Manager – Operations	Manages all activities of the CapCom Operations Center for delivery of 16x5x52 service and leads planning activities
Administrative Assistant	Administrative support for CapCom personnel.
Operations Shift Lead (2 positions)	Provides supervisory duties and responsibilities for one of three (3) Operator Teams. Also functions as a

Position	General Functions & Responsibilities*
	Lead Operator and works rotating shifts with the team.
Operator (8 positions)	Provides basic Operator duties and responsibilities as required. Works rotating shifts to ensure 16x5x52 delivery of service.
Technical support and software development (1 position)	Responsible for RITIS interfaces with other systems. RITIS support and maintenance provided under existing RITIS development contracts.
Field Coordination (15% time)	Interfaces with public agencies and the media. Identifies requirements, prepares memoranda of understanding, oversees technical issues associated with interconnections and training

* Complete duties and responsibilities are detailed in each position's job description included in the Appendices.

Direction of the overall program, coordination with outside organizations, interfaces with the executive leadership group and coordination of operations with technical development will be performed by existing CATT staff.

New employees hired to fulfill requirements for the CapCom program will be employed as Faculty Research Assistants (FRA) through the University of Maryland. An FRA is defined as:

> "The appointee should be capable of assisting in research under the direction of the head of a research project and should have ability and training adequate to the carrying out of the particular techniques required, the assembling of data, and the use and care of any specialized apparatus. A baccalaureate degree shall be the minimum requirement."

The only exception to this applies to the proposed Administrative Assistant. This position will be a non-exempt UMD employee subject to a different hiring process than an FRA.

Schedule

The project schedule is based on a one-year overall project duration, with an estimated start date of August 1, 2005. The project includes a preparatory phase, during which the

work of Task 1 and preliminary activities of other tasks will be performed. The preparatory phase will be followed by an operations phase, during which the remaining work will be performed. The project schedule is provided in Table 2.

Table 2. Schedule

Task	Subtask	Start Date	End Date
1. Preparation	1.1 Staffing	8/1/05	11/1/05
	1.2 Equipment acquisition	9/1/05	11/1/05
	1.3 Training	10/1/05	11/1/05
2. Information Backbone	2.1 Montgomery County interface	9/1/05	2/1/06
	2.2 WMATA interface	10/1/05	3/1/06
	2.3 Website	9/1/05	12/1/05
3. Live Information Exchange Among Agencies	3.1 Contact lists and profiles	10/1/05	2/1/06
	3.2 Communications procedures and protocols	11/1/05	1/1/06
	3.3 Ongoing information exchange	1/1/06	8/1/06
4. Public Information	4.1 Identification of partners (media and ISPs)	10/1/05	12/1/05
	4.2 Testing of information dissemination process	12/1/05	1/1/06
	4.3 Interfaces for acquisition of media-supplied information	11/1/05	1/1/06
5. Planning	5.1 Review and updating of local procedures	12/1/05	2/1/06
	5.2 Regional SOPs including performance measures	2/1/06	5/1/06
	5.3 Training	5/1/06	6/1/06
6. 2-Shift Operation	N/A	1/1/06	8/1/06

Project Budget

The total available funding for this project is $1 million. This funding is adequate to meet the project objectives, and execute the tasks that have been defined in this plan. This budget is a modified version of the budget submitted with the UASI Grant Application, adjusted to reflect the available funding. A summary of the revised project costs is provided in Table 3. An explanation of these costs is provided below.

Table 3. Project Cost Summary

Budget Category	Amount
A. Personnel	$ 381,600.83
B. Fringe Benefits	$ 106,848.23
C. Travel	$ 4,889.00
D. Equipment	$ 286,100.00
E. Supplies	$ 5,450.00
F. Consultants/Contracts	$ 27,300.00
G. Other	$ 900.00
Total Direct Costs	**$ 813,088.07**
H. Indirect Costs	$ 190,599.22
TOTAL PROJECT COSTS	**$ 1,003,687.29**

Personnel

The personnel included in the project budget are shown in Table 1. Existing personnel from the CATT are identified here. The percentages in this list represent the percent time commitment made by those who are assigned to the project on a full-time basis.

- **Director, CATT**: Provides overall strategic direction for the project. (5%)
- **Director, CATT Laboratory**: Provides technical integration and transportation database access support. (25%)
- **Program Manager, CATT**: Provides start-up project management for the project as well as ongoing transportation management domain expertise, coordination with CapWIN and the Executive Leadership Group. (25%)
- **Training and Multi-media Manager, CapWIN Program**: Provides training on use of computer software for field responders and system administrators. (10%)

Fringe Benefits

The standard fringe rate for the University of Maryland is 28% and is calculated as follows:

Employers FICA	7.65%
Retirement	7.25%
Tuition Remission	0.06%
Health Benefits	12.98%
Unemployment Insurance	0.06%
Total	**28.00%**

As the University of Maryland is a State institution, employees of the University must abide by the State fringe structure. Should you have any questions regarding this fringe rate, please contact Ms. Wendy Montgomery in the University's Office of Research Administration and Advancement at (301) 405-6279.

Travel

All travel will be in accordance with University of Maryland travel policies. This cost item provides travel funds for project staff to attend Transportation Steering Committee Meetings, Technical Committee meetings, Public Safety Steering Committee meetings, MWCOG meetings, Executive Leadership Group meetings, etc.

Additional travel costs are budgeted to attend one ITS America meeting, a national/regional homeland security conference and one unspecified conference.

Equipment

- **Existing Network Expansion**: Includes the addition of racks, LAN hardware such as servers, routers, etc. to support the project. To the maximum extent possible, spare capacity of existing IT infrastructure built for CapWIN will be leveraged to support for the project. It also includes funding to increase the capacity of the telecommunications infrastructure (network room "communication closet" to handle additional circuits for connecting to regional transportation management centers).

- **IT Equipment**: Internal IT equipment is needed to conduct daily operations. Essential items include hardware; software; and a fax and small copier. Major copying jobs can be performed using existing equipment. In addition, other related support equipment such as video projectors, scanners, digital whiteboards, and digital cameras will NOT be required as these already exist and will be shared with the CapWIN Program. Also included in this section are funds for Integration. This includes funding for additional, hardware, software, and integration that will be required to connect to existing regional transportation management centers including:
  - Maryland Statewide Operations Center (which includes DDOT inputs);
  - Northern Virginia Smart Traffic Center;
  - WMATA Operations Center
  - Montgomery County TMC

Supplies
Office supplies will be purchased via existing vendor contracts established through the University of Maryland. Training manuals and reference materials will be developed and produced to support CapWIN operational requirements.

Consultants/Contracts
This funding is required to support T-1 circuits to connect to existing traffic management centers and includes the addition of Nextel phones for center personnel to be added to an existing contract. .

Other Costs
These costs include registration fees and memberships related to relevant organizations and conferences.

Indirect Costs
Indirect costs have been computed as defined by the University's C***olleges and Universities Rate Agreement.***