OPTIONS FOR STRENGTHENING REGIONAL COMMUNICATIONS AND COORDINATION IN THE TRANSPORTATION SECTOR

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1. Executive Summary

The recently revised Regional Emergency Evacuation Transportation Coordination (REETC) Annex is a vital component of the Regional Emergency Coordination Plan (RECP[SM]). As a result of the April 2003 – March 2004 development process of the revised REETC Annex, a number of key recommendations have been made:

- Carry out regional emergency management coordination efforts on a continuing basis
- Conduct a coordinated regional public education campaign on emergency preparedness
- Ensure that timely information is provided to the public during incidents
- Strengthen emergency communications and coordination in the transportation sector.

This paper addresses the fourth of those recommendations, on strengthening communications and coordination in the transportation sector. Four major options have been identified to accomplish this strengthening:

- Strengthening though technical systems and database integration
- Strengthening through procedural changes and training of existing staffs
- Strengthening through a duty rotation cycle among existing major transportation agency staffs
- Creation of a new regional transportation communications and coordination organization.

This paper describes each option, assesses how it will address the region's needs, identifies advantages and disadvantages of each approach, and gives planning estimates of potential start-up and annual operating costs. The option for creating a new regional organization appears to have the greatest potential to solve the identified needs, but also has significant cost and institutional considerations. The other options would aid regional communications strengthening with potentially lesser cost and complexity, but likely would be less effective because each provides only part of the answer.

The upcoming reauthorization of the federal transportation program is expected to offer new impetus and funding opportunities for addressing regional transportation operations and emergency preparedness issues. The need for strengthening regional communications and coordination in the transportation sector has been clearly identified. There is now a window of opportunity for action; this paper offers four options for consideration by the region's policy makers.

2. Introduction

Background

The Metropolitan Washington Council of Governments (COG) adopted the Regional Emergency Coordination Plan (RECP[SM]) on September 11, 2002. Included in the RECP[SM] was a Regional Emergency Support Function (R-ESF) #1 – Transportation chapter, as well as a Regional Emergency Evacuation Transportation Coordination (REETC) Annex. R-ESF #1 and the REETC Annex addressed regional emergency transportation issues, with the R-ESF #1 having an overall perspective, and the REETC Annex focusing particularly on events that might involve evacuation or other protective actions for the population.

An update of the REETC Annex was undertaken from April 2003 to March 2004. The revised REETC Annex incorporated a structure to address how regional emergencies often begin, unfold, and evolve, strategies to address incident evolution and periods of uncertainty in that evolution, associated protective actions planning, public warning and education strategies, and human behavioral considerations. It benefited from lessons learned in real incidents, as well as input generated by a series of scenario-based emergency transportation planning workshops held in conjunction with the Annex update process.

An important focus of the RECP[SM] and REETC Annex was regional communications and coordination utilizing the Regional Incident Communications and Coordination System (RICCS[SM]) established by the region following the September 11, 2001 attacks. The RICCS[SM] functions to support emergency notifications and interagency conferencing, utilizing text messages to recipients' pagers, cell phones, or e-mail, and conference calls among key regional decision makers and responders. Conference calls enable regional incident assessment, coordination of decisions, and crafting of common messages to the media and public.

Recommendations from the Revised REETC Annex

The key recommendations coming from the REETC Annex revision process were to:

- Carry out regional emergency management coordination efforts on a continuing basis
- Conduct a coordinated regional public education campaign on emergency preparedness
- Ensure that timely information is provided to the public during incidents

- Strengthen emergency communications and coordination in the transportation sector.

Continuing Coordination Efforts: Emergency management and law enforcement agencies were seen as central to any efforts to carry out regional emergency management coordination on a continuing basis. A main focus may be to continue scenario-based workshops, other training, exercises, or drills. Such a set of regional exercises has been proposed, led by emergency management agencies, and funded with U.S. Department of Homeland Security Urban Area Security Initiative (UASI) monies. It was recommended that exercise leaders cover some of the issues identified in the REETC Annex, notably transportation "ripple effects" of incidents (including incidents that are not per se transportation incidents). Information created during the Annex development includes definitions and supporting materials for nine further transportation-involved scenario workshops. Effective RICCS^{SM} utilization is a critical in these workshops, including a focus on who will initiate and use RICCS^{SM}, when will it be used, and what will be discussed. Also critical is how to accomplish the task of timely information sharing between transportation and emergency management, including from the incident site.

Public Outreach and Education: The second key recommendation emanating from the revised REETC Annex was to conduct a coordinated regional public education campaign on emergency preparedness. Time is short in emergencies, so pre-event education of the public is critical. The public must recognize that different emergencies may require different kinds of response on their part (e.g., sheltering-in-place for one type of hazard versus evacuating from another type). Both transportation and emergency management input is critical to public education concepts. From the transportation perspective, emphasizing avoidance of unnecessary travel is critical for management of transportation systems demands. Fortunately, such a coordinated regional public education campaign has been proposed, advised by a committee of the region's local government public information officers, and funded with UASI monies.

Timely Information During Emergencies: A third key recommendation was for the region's leadership to ensure that timely information is provided to the public during incidents. Timely, effective messages or instructions need to go out to people everywhere on what they need to know and do during the emergency. Messages must be action-oriented, credible, consistent, timely, specific and simple. This key need is supported by actions following the REETC Annex: further workshops, a public education campaign, and, the effort that is the focus of this paper, the strengthening of emergency communications and coordination in the transportation sector by examining responsibilities and functions, operations of major transportation agencies, workshop results, and experiences in recent regional incidents.

Strengthening Emergency Communications and Coordination in the Transportation Sector: This fourth key recommendation from the REETC Annex is critical because successful transportation system management during emergencies depends upon availability of systems and staff to monitor incident information, to share information among transportation and other agencies, and to assist in informing the public. This paper considers options for strengthening these capabilities.

National Capital Region Emergency Preparedness Council REETC Annex Request and Response

At its March 4, 2004 meeting, the National Capital Region Emergency Preparedness Council (EPC) endorsed the REETC Annex for distribution, and made a number of associated requests. The EPC requested the continuation of scenario-based workshops and training. The EPC supported the need for a coordinated regional public education campaign on emergency preparedness (including a component of advice for sheltering in place). It agreed that emergency management, transportation, law enforcement, and public information agencies should develop and implement procedures to ensure that the public receives timely and accurate information during incidents. It also requested that the National Capital Region Transportation Planning Board (TPB) and staff analyze alternatives for providing improved coordination and communication among transportation and other agencies during incidents.

This paper responds to the request from the EPC to the TPB by briefly examining:

- Communications responsibilities and functions within the transportation sector, including potential gaps
- The key stakeholder transportation agencies of the region and their operations
- The ways regional transportation sector communications and coordination have taken place as incidents have unfolded, both in workshops and in real events
- Descriptions, advantages, disadvantages, and potential costs of four options identified by the Emergency Transportation Work Group and staff.

3. Examination of How Transportation Communications and Coordination Occur As Incidents Unfold

Experiences During Recent Regional Incidents

One of the best ways to gain an understanding of communications and coordination needs in the transportation sector is to look at experiences in recent regional incidents, notably how and when regional communications take place as an incident unfolds. Incidents should be examined from the perspective of what is known at a given moment, especially early in the unfolding of an incident. For example, at the beginning stages of an incident, the true nature and severity are not known, even to personnel right at the incident scene, yet transportation ripple effects may already be causing problems far from the scene. It is also likely not known how long an incident will last; what seems like a limited incident can snowball to affect a wide area. Lack of communications in the early stages of incidents has been a hindrance in managing the transportation effects of those incidents.

Terrorist Attacks (September 11, 2001): The transportation sector utilized a number of longstanding communications methods, including landline phones, cellular phones with a "push-to-talk" radio feature, radios, and highway variable message signs. Though there were great and commendable efforts on the part of involved agencies, a number of transportation problems ensued that day in part because there was no established regional means of coordination among all involved public safety, traffic, and transit agencies.

"Tractor Man" (March 17-19, 2003): A lone tractor-driving protester threatened to detonate a bomb, and a public safety perimeter formed around the protester closed many regionally critical roadways in the Mall area, causing traffic snarls over three days. There were concerns expressed on whether public safety agencies considered the traffic impacts of forming such a large perimeter and the length of time taken to clear the incident. There were associated concerns expressed for a lack of communications and updates of information from knowledgeable personnel on the incident scene out to transportation agencies and the general public regionally. At this time, the RICCS^{SM} had been established and was available for communications among involved agencies, but was not used to its potential; it was stated that personnel at the scene were "too busy" to engage regional coordination and communications.

Hurricane Isabel (September 17-20, 2003): A great deal of regional coordination and communications were undertaken in advance of and during Hurricane Isabel, both within the transportation sector and among other sectors and regional decision-makers. The region collaborated on intertwining decisions on whether to close government offices, schools, and the Metro system, and when to do so, utilizing RICCS^{SM} numerous times during the week. The relatively

long advanced notice and duration of this event seemed to be critical factors in the success of the regional communications and coordination, but advanced notice does not occur in most other types of regional emergencies.

Bomb Threat Near the Stadium-Armory Metrorail Station (December 12, 2003): A perimeter established near a vehicle suspected of containing explosives closed the Metrorail Blue and Orange lines in the vicinity of the Stadium-Armory station in Washington. The closure occurred during the morning rush hour, and, at the time, the duration of the closure was unknown. No explosion occurred, and the scene was cleared within a few hours. This event, like other similar events, "snowballed" with transit congestion and effects far away from the incident site. There were concerns on delays in word on the closure reached the general public, and on what information was given to passengers already in or accessing the Metrorail system. It was again stated that personnel involved in the incident were "too busy" to use the RICCS^{SM} to engage regional coordination and communications.

Metrorail Red Line Tunnel Fire (March 18, 2004): An electrical fire in the Metrorail Red Line tunnel between the Dupont Circle and Woodley Park/Zoo/Adams Morgan stations caused a sudden and unexpected closure and stoppage of the Red Line during this day's morning rush hour. Passengers already in the system had to exit and find alternative means of transportation; many walked miles to their destinations. Concerns were expressed on the timeliness and helpfulness of communications with the public during this incident, as well as the lack of multi-agency efforts to manage the regional transportation impacts of the incident. RICCS^{SM} was used, but not to its full potential (limited text messages only late in the duration of the incident), and mostly after the incident was well underway.

REETC Annex Workshops and Discussions

In the fall of 2003, the R-ESF #1 – Emergency Transportation Work Group convened a series of three workshops, based upon emergency situations and scenarios, to examine transportation communications and coordination during emergencies, as well as related issues.

The first workshop (held October 29, 2003) involved a perimeter around a vehicle laden with explosives in the Reagan National Airport parking garage. The closure lasted through the afternoon and the evening rush hour, necessitating closure of the Metrorail Blue and Yellow Lines, the Virginia Railway Express, US 1, the George Washington Memorial Parkway and other area roadways, and the evacuation of airport facilities and nearby buildings in the Crystal City area of Arlington. This workshop raised a number of regional communications and coordination issues reflected in later workshops as well as in real events.

Information from law enforcement was identified as an issue – whether there is an effective feedback mechanism for agencies to obtain verified/official follow-up information. The question of when and how regional communications and coordination should be activated in interjurisdictional, intermodal scenarios was discussed—there seemed to be hesitancy in triggering the regional process in a situation where there was no one agency clearly in charge, and when the information known at the time had a high level of uncertainty.

The question of which agency takes the lead in transportation sector communications was discussed. The RECP[SM] states that the transportation agency in the primarily affected jurisdiction is to initiate conference calls, but that agency may also be the one busy and overburdened with response to the incident. Workshop participants recommended establishing strategies to encourage communications/notifications between non-transportation agencies and transportation agencies when transportation is affected, and to ensure that someone will be in charge of public information coordination in R-ESF #14. It was also noted that the transportation sector will need strategies to address the way that it will proceed given limited incomplete and conflicting information, such as when it is not known how long a situation will last, or even exactly what the problem is.

The second workshop (November 14, 2003) considered a two-part scenario of a regional ice storm, and, separately, a downtown apartment discovered to be laden with explosives. The workshop tested a staged or timed release of workers or evacuees. In addition to communications issues already mentioned, this workshop illustrated the critical role of knowledgeable public safety and emergency management personnel, and yet the difficulty of having these personnel participate in regional transportation communications at such a busy moment.

The third workshop (December 3, 2003) examined the scenario of a complete closure of the Metrorail system for an extended period of time. This workshop showed that with sufficient time to get the regional communications process rolling, it would occur, but there was still an issue with what happens in the critical first hours of an incident, regarding public actions, evacuation, safety, and information. Protective actions issues associated with such an emergency were discussed, such as contamination or decontamination, what facilities would have to be open or closed, and length of closure time, issues on which transportation management personnel likely are not knowledgeable. These discussions reinforced that effective coordination between the public safety and emergency management agencies with transportation agencies will be critical for the region, so that transportation agencies may be aware of critical public safety or emergency management information that will affect transportation systems and management.

Summary

Many regional incidents will be of the nature that no one agency or jurisdiction is in charge. In almost no case has an agency or staff had as its primary responsibility regional communications and coordination; it was a responsibility that falls upon all participants in addition to numerous other duties during an emergency, and has slipped behind other priorities and remained undone.

4. Review of Options for Strengthening Communications and Coordination in the Transportation Sector

During development of the revised REETC Annex, four major options were identified for strengthening regional emergency communications and coordination in the transportation sector. This section explains these options, illustrates how they may work, advantages or disadvantages of the approaches, and cost implications. The four options are not mutually exclusive; rather, they represent four levels of effort that might be undertaken as needed individually, in combination, or mixed-and-matched.

The options for strengthening regional communications and coordination in the transportation sector are summarized in Table 1, and descriptions of the four options follow.

The discussion of options has as a background the activities currently undertaken in the region regarding transportation management and operations. The appendix to this paper contains additional detail and background, including summaries of current responsibilities, means, and practices for regional communications and coordination in the transportation sector. It describes the important associated activities of transportation system monitoring and having staff with transportation expertise available for coordination and response activities. It also describes major technical, agency, and interagency activities undertaken in the region, together with descriptions of the major transportation operations centers.

Table 1. Comparison of Options for Strengthening Regional Emergency Communications and Coordination in the Transportation Sector

OPTION	ADVANTAGES	DISADVANTAGES	POTENTIAL COST	COMMENTS
Technical Systems and Database Integration	Important activity that supports all other options; no significant increase in number of personnel needed	Does not address procedures or responsibilities, only improves data availability	$10 million over a five-year period; 5-7 staff persons	Widely supported among the region's technical personnel because it will help them do their individual jobs better, but does not address the core issue of regional coordination
Procedural Changes and Training of Existing Staffs	Lowest cost among the options; begins to address procedural issues	Does not address the key issue of how personnel already busy with assigned primary duties will be able to undertake this additional responsibility; track record of this approach to date is mixed	$500,000 annually and continuing; 3-5 staff persons	All involved agencies must commit from the leadership to the technical level, and maintain this commitment in order for this to meet its potential; success would be limited because this is an additional burden on already-busy staff
Duty Rotation Cycle Among Major Transportation Agencies	Addresses the core issue of personnel being assigned the primary duty of regional coordination; no new organization or center	Cost; no cost savings versus creating a new organization; continuing coordination among several involved agencies will be necessary	$10 million start-up costs over the first three years, plus $3 million to $4 million annual operating cost; 15-20 staff persons	No apparent advantage over creating a new organization, yet vulnerable if a key agency is unable to meet its obligations
Creation of a New Regional Transportation Communications and Coordination Organization	Definitive answer to address the core issue of personnel being assigned and knowledgeable on regional coordination; accomplished task without detriment to duties of each agency's personnel	Cost and institutional complexity	$10 million start-up costs over the first three years, plus $3 million to $4 million annual operating cost; 15-20 staff persons	New York's TRANSCOM organization provides a successful model of this type of organization. Obtaining new monies for the region (e.g., a federal grant) for this will be key to success without detriment to existing programs

Option 1: Strengthening though Technical Systems and Database Integration

Description: Strengthen regional emergency communications and coordination in the transportation sector by investing in technical systems to improve computer and telecommunications connections among the region's major transportation and public safety operations centers.

Background: The region has numerous roadway management, transit operations, and public safety centers. These centers often feature telecommunications and other technological connections to the systems they manage, but often only limited connections to other agencies' centers. Particularly important is the current migration to automated systems, based upon computers and databases designed for each agency's own needs, and how different agencies' computers can talk to one another and share data. For example, if a public safety call (911) center operator logs calls into a computer-aided dispatch system, this information could be shared automatically with the computer database in a transportation operations center. Then either automatically or by personnel action, transportation personnel can become aware of the necessary information. The automated comparison or juxtaposition of this particular piece of data with other incoming data may alert transportation personnel to a condition or incident, thereby causing personnel to initiate regional coordination.

There are cost and organizational implications of this approach. Such a system would have to be built and maintained, collaboratively among all involved agencies, perhaps with one agency taking the lead. There are historical examples in the region and elsewhere, and almost all require designation of a lead agency or staff. One example is the Capital Wireless Integrated Network (CapWIN), enabling data sharing among responder vehicles at incident sites. The multi-million dollar CapWIN project necessitated use of federal transportation and law enforcement grants, creation of a board of directors, staff support obtained from the University of Maryland, contractor support, and staffing and time from participating agencies. Notably, CapWIN experienced implementation delays due to both technical and contracting issues.

Advantages: The main advantage of this approach is that information entered by an operator in one center into an agency database theoretically can be automatically shared with other agencies' databases, and thereby to other necessary personnel and centers, with little or no further time-consuming action on the part of those personnel. For example, if personnel from a highway operations center notes an accident on its system and logs this information into its agency database, this incident information might immediately be shared with other necessary agencies. Time not spent on regional communications remains free for response activities by those personnel. Technical systems can scan data,

and if thresholds are met, an alarm may be sounded, all with little or no additional human intervention.

Disadvantages: There are few technical disadvantages to this approach; systems integration would be helpful under almost any scenario. However, there are the disadvantages of cost, time, and complexity to achieve good results from such a system. A critical disadvantage is that it does not per se address the question of ensuring that personnel will take action for regional emergency transportation coordination. Other disadvantages include equipment failures and the need for a central function or responsibility, at least temporarily, to oversee and undertake the technical work tying a myriad of technical systems into one unified systems.

Cost: Cost would depend upon the amount and complexity of technical systems integration undertaken, but staff has used an estimate of $10 million over a five-year period.

Outlook: The proposal to undertake systems integration activities enjoys widespread support among technical and operations staffs of the region's transportation agencies. It is felt that this would be a cost-beneficial activity that will improve each agency's ability to do its job, and will help answer the need for regional communications. That better information will be available to all parties is vital, though this does not ensure regional coordination will take place based upon this information unless there are personnel, procedural, or organizational changes as discussed in the other three options.

Option 2: Strengthening through Procedural Changes and Training of Existing Staffs

Description: Strengthening regional emergency communications and coordination in the transportation sector by A) more training of operations center personnel and B) commitment by the leadership of the region's transportation agencies to enhance integration of regional coordination and communications, including the RECP[SM] and RICCS[SM], into their operating procedures (e.g., written into their operations manuals). Leadership of each agency would have to commit the time and effort of their staff to examine how best to integrate the regional systems. It will also be vital to undertake exercises and drills both individually and collectively to ensure integration.

Background: Currently personnel from the region's transportation agencies shoulder the burden of regional emergency notifications, information sharing, and the triggering of conference calls as necessary. A major additional source of information has been the "RICCS[SM] Host Center", a role fulfilled currently by the District of Columbia Emergency Management Agency. The official role of the RICCS[SM] Host Center is to assist authorized RICCS[SM] users in transmitting messages those users need to transmit, or to support arrangements for

conference calls if needed. However, the Host Center also occasionally sends incident notifications to transportation, public safety, and other authorized recipients on incidents that do or may affect transportation systems, reported by police or, perhaps surprisingly, heard from radio or television media outlets. This duty by Host Center personnel is among their many duties, personnel are not specialized in transportation, and therefore the Host Center cannot be seen as a definitive source of information for day-to-day transportation incident information. Regional communications and coordination, therefore, currently is as an adjunct to duties assigned by the particular agency. However, because the region has these existing, well-equipped centers with incident management personnel, opportunities can be considered for strengthening their role through enhanced training and agency operating procedures (addressing regional communications and coordination).

Each agency has policies and procedures established over many years, ranging from explicitly written rules and procedures to non-formalized practices learned and evolved in on-the-job experience. Procedures vary from agency to agency, depending upon the laws and practices under which each agency functions. The RECP[SM] and RICCS[SM,] established only after the September 11, 2001 attacks, are relatively new, limiting the time and efforts to incorporate them into the operations procedures of the region's agencies (particularly across a wide range of personnel).

Often for the region's transportation agencies, only a limited number of personnel, mostly those who have been active in the COG regional emergency planning process, have utilized RICCS[SM] and are knowledgeable about it. Other agency personnel may be either unaware of or not interested in utilizing the system. The RECP[SM] and RICCS[SM] may also benefit from a more thorough consideration of the operations procedures of various transportation agencies, but that is a challenge because of the number and complexity of those procedures, as well as possible reluctance on the part of participating agencies to share information that is internal and sensitive from a security standpoint.

In 2003, COG staff gave on-site RICCS[SM] training to member agency staffs at four of the region's major transportation operations centers, those of the District of Columbia Department of Transportation, the Maryland State Highway Administration, the Virginia Department of Transportation, and the Washington Metropolitan Area Transit Authority. COG staff remains available for additional RICCS[SM] training. However, such training can only be considered as a seed for continuing training and ongoing use by personnel within these operations centers, due to the large number of ever-changing personnel, and the need to integrate RICCS[SM] into each agency's own operating procedures.

Advantages: The main advantage of this option is that it is perhaps the lowest cost of the four identified options, though there is still a significant and continuing cost involved because there will always be staff turnover and new

procedures to address. Ease of implementation is another advantage. It is possible to undertake this activity almost entirely with existing staffs and equipment, though some additional funding for exercises or for regional support would be beneficial. Each agency can custom-tailor its approach to its needs.

Disadvantages: The main disadvantage of this approach is that it does not answer the question of how personnel primarily responsible for agency-specific duties will have time for monitoring and recognizing when an incident crosses the line into being a regional incident, and then acting "with a regional hat on" to initiate and lead regional transportation communications and coordination, over and above agency-specific duties that still need to be fulfilled.

Cost: Potential cost of this item would vary by the amount and specificity of the training and procedures development undertaken, but we have assumed an order-of-magnitude estimate of $500,000 per year regionally, on a continuing annual basis, including regional staff costs and individual agency costs.

Outlook: Training is a must if regional communications and coordination are to take place. The willingness of the leadership of the region's transportation agencies to enhance how their standard operating procedures and protocols address regional communications and coordination, including use of the RICCS^{SM}, should be considered. And even trained staff working with enhanced procedures still may not have sufficient time in many emergencies to adequately address regional communications and coordination over and above their agency-specific duties.

There have already been a number of efforts to bring stakeholders together, provide training, and discuss the need to coordinate as envisioned in the RECP^{SM}. However, a look at the experiences during emergencies since the September 11 attacks shows, despite these training and outreach efforts, the RICCS^{SM} has rarely been used to its potential. The approach also leaves a number of concerns unanswered. Compatibility of procedures across agencies is a concern (for example, one agency may send a RICCS^{SM} message for all road closures, whereas another agency may send a message only if the road closure is expected to exceed a threshold duration such as 30 minutes). There must be assurance that all necessary operations personnel in each agency receive training, and not just one or two who happen to be the ones assigned to go to regional meetings, hoping they will be the ones on duty at the time the emergency occurs. Since staff turnover is an issue, training will be a continuing challenge.

Option 3: Strengthening through a Duty Rotation Cycle Among Existing Major Transportation Agency Staffs

Description: Strengthen regional emergency communications and coordination in the transportation sector by assigning to the District of Columbia, Maryland, and Virginia Departments of Transportation, and the Washington Metropolitan Area Transit Authority, on a rotating basis, an expanded duty to be ready to trigger, broker, or undertake regional coordination communications. The duty rotation would cycle, perhaps on a period of a week or a month. These transportation Level A agencies with 24-hour operations centers would be the agencies able to shoulder this duty.

Background: Each of these four agencies undertakes actions related to communications and coordination, incident management, dispatching and notification, and information logging. Their primary duties are to undertake these activities for the systems they own and manage, and, secondarily, to share information with other agencies. Currently no single transportation agency is authorized to act on behalf of the entire region, in the way comparable to public safety agencies utilizing the incident command system at an incident site. This option addresses this by proposing to assign these agencies this duty on a rotating basis within their existing operations centers, with their own existing or expanded staffs.

Some type of governance structure, at least on a voluntary basis, may have to be developed to ensure these activities are coordinated and sustained. Each agency will have to incur or be compensated for the additional cost of doing its share of the regional coordination activity.

Advantages: The main advantage of this approach is that no new institution is necessary, and no new center would have to be built. Needs in terms of additional staff or equipment would be moderate. The four agencies may benefit from having such dual-role personnel with this kind of knowledge, available at sometimes for other, agency-specific duties. Another advantage is that this process could be developed relatively quickly, given availability and commitment of funding for this activity, potentially from federal or other sources not already utilized for agency activities.

Disadvantages: Increased staffing needs in a variety of agencies, and concerns about greatly increased task loads in the duty months, are disadvantages to this approach. A number of centers would have to be equipped so regional coordination work can be done, which may lead to some redundant investments (though redundancy may be beneficial from a security standpoint). Another concern is that all included agencies must maintain this effort. If any agency for whatever reason is unable to fulfill its portion of this duty, additional burden will be placed on the remaining agencies, or the necessary work may go undone. For this and other reasons, the potential effectives of the duty rotation concept

for regional communications and coordination may be considered unproven and uncertain.

Cost: Additional staff and equipment would be necessary to undertake this activity whether decentralized, as under this option, or centralized, as under the fourth option. Cost would be similar for both options, about $10 million for start-up costs over the first two-to-three years, and $3 million to $4 million annual operating costs, and staffing needs of about 15-20 persons.

Outlook: The duty rotation concept is noteworthy because it answers the question of personnel specifically being on duty, monitoring the region, and ready to initiate regional coordination and communication activities, not as a second priority to agency-specific duties, and not to the detriment of any agency-specific responsibilities. The institutional complexity of four agencies maintaining these activities, however, does not appear to be less than the institutional complexity of creating a new, separate organization as described in the option below, and there do not seem to be major cost advantages to the approach.

Option 4: Creation of a New Regional Transportation Communications and Coordination Organization

Description: Create a new regional organization whose specific primary duty is to monitor regional transportation system conditions and be ready to initiate and facilitate the regional communications and coordination process in the transportation sector. This organization would hire and train specialized staff who would become experts in coordinating regional transportation management, supporting and under the direction of the region's existing transportation agencies.

Background: A new regional organization could serve as the region's transportation information broker among its transportation and public safety agencies. It could be modeled after the TRANSCOM (Transportation Operations Coordination Committee) operation in the metropolitan New York-New Jersey-Connecticut Metropolitan Area, nationally recognized as an effective means to optimize regional mobility during unexpected transportation system failure. The organization's dedicated staff would be ready to trigger, broker, or undertake regional coordination communications. The organization's governance and functions would be tailored to the particular needs of the Washington region.

The separate, dedicated staff and necessary equipment of this organization might be housed at one of the existing major transportation agency operations centers in the region, rotated among those centers, or in a separately developed and dedicated center (as is the case for New York's TRANSCOM). Utilization

of an existing center may save some costs, but may have challenges regarding having sufficient space and equipment, and the ability to tailor these to the needs of the regional coordination function without infringing on the needs of the host center.

It is envisioned that such an organization would be a membership organization of its stakeholder agencies, as is TRANSCOM, with agencies such as the state and local departments of transportation, transit agencies, and state or other police agencies comprising the Board of Directors of the organization. It would be a service organization, dedicated to the needs of its member agencies.

Advantages: The main advantage of creating a new organization is that it is the most definitive answer to regional emergency communications and coordination needs, since it would be tailored exactly toward those needs. Other advantages of creation of a new organization include the development of a permanent staff with expertise on regional incidents and communications, avoidance of increased burden of existing agency staffs, and ability to tailor the staff and equipment exactly to the needs of the function.

Disadvantages: There are disadvantages to this approach. First among them is the complexity and cost of creating a new institution; there would certainly be challenges in creating a new institution. This option would be as or more costly than the options listed above. Initial costs may be higher if a new separate and dedicated facility is developed for the organization, and lower but still significant costs if a portion of an existing center is used. There also have been concerns expressed that a new organization would compete for funding against the existing agencies and operations centers. If such a new organization were started without new monies to support it, it would probably not be a net benefit to the region, since it might force other vital transportation operations programs to be cut. Also, although TRANSCOM in New York has proven its effectiveness since its 1986 inception and is widely supported and lauded by its member agencies, nationally it is a unique organizational model (coming from the large and unique level of institutional complexity of the New York metropolitan area), not proven in any other metropolitan area.

Cost: Based upon review of (New York) TRANSCOM's operations, such a new organization with fully regional, 24-hour-a-day operations might be expected to have a start-up cost of about $10 million over the first two-to-three years), an annual operating cost of about $3 million, and a permanent staff of about 15-20 persons.

Outlook: A new regional organization is perhaps the boldest option to addressing regional transportation communications and coordination needs. The Washington metropolitan area has a jurisdictional complexity similar to the New York metropolitan area, and the role of TRANSCOM there has been embraced and supported by a wide range of agencies. New additional funding

would be critical to the overall success of a new organization so as not to detract from other necessary activities of the region's transportation agencies. A new organization has strong potential for addressing the region's emergency transportation communications and coordination needs while aiding the region's transportation and public safety agencies in the performance of their individual agency duties.

5. Conclusion

The findings from the REETC Annex development process and experiences during regional incidents since the September 11 attacks demonstrate the need for regional emergency transportation communications and coordination improvements. This paper describes the background and issues related to these considerations, and lays out a number of options for strengthening regional emergency transportation communications and coordination needs. This paper does not recommend any one of the approaches; rather, it identifies and explains them so that an informed discussion on the strategies can take place. While the four approaches all have advantages, disadvantages, and varying cost implications, there is widespread agreement that something must be done to strengthen this vital function.

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APPENDIX
Responsibilities and Capabilities

This appendix examines the status of the region's transportation communications and coordination activities and responsibilities as a background to the needs and options identified in this paper.

1. Communications Responsibilities

Even after establishment of the RECP[SM] and the RICCS[SM], ensuring inter-agency coordination in major incidents has remained an issue, particularly during "non-transportation" incidents that secondarily impact transportation conditions. Recognizing that an incident has become a regional incident, especially if there is a significant level of uncertainty about the nature of the incident, remains a challenge for member agency personnel. Personnel busy with incident response have also had to shoulder the additional burden of inter-agency communications, and this has been a difficulty from a resource and time perspective. There is no designated authority or staff to shepherd regional interagency transportation communications on a unified, metropolitan-wide basis. All such communications depend upon existing agency staff to add interagency notifications and communications to their already demanding emergency duties. Options for strengthening communications capabilities within the transportation sector were identified during the course of revising the REETC Annex to address this staffing challenge:

- Further exploring potential technical improvements, particularly interagency database integration
- Improving the effectiveness of the current "voluntary" coordination through training and exercises
- Increasing the specificity of the current "voluntary" coordination, perhaps through an agency-by-agency duty rotation cycle
- Creating and funding a dedicated staff to undertake a specialized function of regional transportation information sharing. For example, metropolitan New York-New Jersey-Connecticut has such an institution, called TRANSCOM.

During the REETC revision process, stakeholders expressed a variety of support, concerns, or objections on all three of these potential approaches, with regard to effectiveness, cost, or institutional complexity. In particular, the cost and cost-effectiveness of establishing a dedicated staff in a new TRANSCOM-like institution was of great concern to many participants. Thus how best to strengthen regional transportation communications and coordination remains to be addressed, and is the topic of this paper.

2. Means of Interagency Communications

The R-ESF #1 – Transportation chapter of the RECP lists means of communications that may be used by the region's transportation agencies. Most commonly used are unilateral messaging on matters that may have specific interest to individual members, by text messages, e-mail messages, telephone calls, voice messages, and some cellular telephones' "push-to-talk" feature. Communications may be individual-to-individual, or may be routed through one or more of the agencies' operations centers. The RICCS^{SM} includes features enabling stakeholders' transmission of text messages; many jurisdiction specific radios and other systems are also utilized.

In instances when personnel from many agencies need to confer, often for reasons of collaboration on decision-making, conference calling may be used. The RICCS^{SM} includes features enabling conference calls to be quickly convened. When a representative of one of the transportation agencies (usually one of the major agencies defined as "Level A" agencies in R-ESF #1) wants to initiate a conference call in response to an incident or emergency, the initiator agency will first notify the other agencies through the RICCS^{SM} of the need to convene a conference call. This notification can occur by telephone, cellular phone, digital radio, cellular telephone, pager, e-mail, or other means if necessary. This also established a process whereby critical communications between R-ESF #1 member organizations can take place even if the telephone and cellular systems are experiencing overloads.

3. Transportation Systems Surveillance

A critical role for the transportation sector is the need for transportation systems conditions to be monitored. Traffic flow and transit operating conditions are clearly important aspects, but others may include whether debris blocks a roadway, structural safety of a bridge (such as after flooding), or whether public safety responders have closed a facility (but may not have had a chance to notify others of the blockage).

Transportation system conditions are monitored in a variety of ways. Agencies have cameras at key locations, but there is far from universal coverage of the system. Equipment such as in-pavement detectors provides additional data on traffic flow. In emergency situations, live observations by personnel in the field, bus and train drivers, observation aircraft, and the radio and television media will be important, including at or near the incident site.

4. Expertise of Personnel

Raw information is of limited value without the expertise and ability of personnel to understand the implications of and act upon the information if need be. One of the critical issues observed in the workshops held and in actual regional incidents is the ability to recognize that one of any number of small incidents that happen every day has crossed a threshold to be a regional incident; knowledgeable staff have the ability to make such recognitions. Once a regional incident has begun, knowledgeable personnel can:

- Help keep track of aspects of the incident or its ripple effects
- Know to contact personnel or entities that may need to be notified
- Help coordinate actions or responses, including coordination of managing of transportation ripple effects, determination that an incident has ended, and recovery.

This can be further illustrated by examples:

- An incident in the parking lot of the Pentagon would be widely understood to have military and public safety implications, but personnel with transportation-specific knowledge may immediate recognize the big transportation management impact to the major bus-rail transfer center adjacent to the Pentagon. This means it will be critical for getting word in a timely fashion to transit management personnel and customers that utilize that transfer center.

- A downtown Washington incident may cause traffic tie-ups that look like they will back up into Arlington. Knowledgeable personnel may recognize that Arlington needs to be notified as soon as possible, among other reasons so they may adjust their nearby traffic signal timing to assist in traffic management in the area.

- An incident on the Metrorail system may have quickly developing impacts on suburban bus systems that serve Metrorail stations. Knowing who needs to be notified and quickly doing so would be a benefit of having knowledgeable staff ready.

The above examples are based upon actual events that have happened. If the impact is to a functional area not in the responsibility of the managing agency, often the notification has not occurred in a timely fashion. These examples help show the difficulty facing personnel with an assigned primary responsibility in an incident to anticipate and send notifications concerning all potential side and ripple effects of that incident.

5. Technical Systems and Databases

Enhanced technical systems can help facilitate proper information flow with less human intervention or interpretation. A typical example that has been used in operations centers around the country is an automated computer analysis in an incoming stream of data (for example, from in-pavement traffic detectors), with an alarm sounded notifying operations personnel if certain criteria are met (such as detection of stopped traffic on a freeway).

Many public safety and transportation operations centers log incidents or actions of their agencies into computer databases. Operations personnel must manually input (type) this information into the computer. Once operators have entered this information into an agency's database, theoretically it could be harvested in an automated fashion to be shared with other transportation or public safety operations centers or personnel. The development of Internet technical protocols in recent years enables such data sharing. Even camera images are readily shared on the Internet or Internet-like private computer networks.

Key projects have been undertaken in recent years to improve technical systems design and integration. Examples include the Maryland State Highway Administration CHART System, which provides a software platform for sharing of State Highway data, and the Virginia Department of Transportation Northern Virginia Intelligent Transportation Systems Architecture, which addresses the design and format of how data may be shared. Much of the work identified in these projects, however, remains because of the numerous agencies, sites, and databases involved. These systems address necessary regional emergency coordination situations, such as cases where the incident is not detected by automated equipment, or the nature of the incident is uncertain (particularly true for quickly unfolding non-transportation public safety emergencies) and timely appropriate information cannot be entered into the database. These systems also still depend upon the expertise, ability, and timely action of operations center personnel to enter relevant information into a computer.

Systems integration is promising and potentially quite cost-effective. The idea has been strongly supported by technical staffs of the region's transportation agencies. It likely would be beneficial under almost any envisioned scenario to improve regional transportation communications and coordination.

6. Transportation Operations Centers

The region is served by transportation operations centers, operated by the District of Columbia, Maryland, and Virginia Departments of Transportation, the Washington Metropolitan Area Transit Authority, and several local departments of transportation and transit agencies in the area. These centers

often feature telecommunications and other technological connections to the systems they manage. They have staffs, communications, and database capabilities. They act as focal points of the agency's operations activities, and a point of contact as needed to other agencies, either fellow transportation agencies in different areas, or different functional agencies (such as public safety agencies) within their area. They may ramp up in times of emergency, and serve as transportation emergency operations centers.

Centers typically feature radio and other telecommunications equipment, video feeds and displays from cameras at key locations on the transportation system, computers and database systems, and, critically, dedicated operations staffs overseeing the relevant transportation system, ready to act if a situation arises. Actions may include posting or sharing of information on variable message signs, Web sites, out to fellow agencies, or out to media outlets such as commercial broadcast radio traffic reporters; dispatch of relevant transportation field personnel to an incident site, or marshaling of transportation resources needed for a particular incident (e.g., tow trucks, dump trucks, traffic signal maintenance crews, utility repair crews, etc.); control of roadway system management technologies (e.g. retiming of traffic signals, ramp meters, control of high-occupancy vehicle facilities); or coordination of roadway and bus operations.

Major centers include:

- District of Columbia Integrated Transportation Management System (ITMS) and Center: The District's transportation management center was newly opened in 2003, and is located in the Reeves Center Building. A supporting system of interconnected traffic signals, cameras, and other equipment is in the process of being installed. The creation of the ITMS has greatly increased the ability of the District to coordinate its transportation management with other agencies and jurisdictions.

- Maryland Department of Transportation CHART Statewide Operations Center (SOC): MDOT's State Highway Administration operates this center, designed and built in the 1990s, in Hanover, Maryland, near BWI Airport. The CHART SOC is interconnected with satellite Transportation Operations Centers co-located in State Police barracks in Annapolis, Baltimore, College Park, and Rockville. The SOC and TOCs have the ability to view and control dozens of cameras, receive data feeds from traffic detection equipment control variable message signs, dispatch State Highway Administration personnel to incident scenes, communicate with fellow agencies, and to serve as "war room" for statewide transportation management during an extended incident, such as occurred during Hurricane Isabel.

- Virginia Department of Transportation Smart Traffic Center (STC): VDOT runs this operations center in Arlington near the Pentagon. The STC can view and control VDOT cameras, receives data feeds from traffic detection equipment, dispatch VDOT personnel to incident scenes, and communicate with fellow agencies. The STC also has abilities to communicate with and change the timing of hundreds of Northern Virginia traffic signals under VDOT control. Additionally, the STC manages the system of Northern Virginia high-occupancy vehicle (HOV) facilities, include signs and gates.

- Washington Metropolitan Area Transit Authority Operations Center: This downtown Washington center is the hub of all WMATA communications, dispatching, and surveillance of WMATA's buses and trains. An important aspect of WMATA is that it also has a police force, so that transportation management and public safety activities are contained within one agency.

- Local jurisdiction centers including the Montgomery County Advanced Transportation Management System in Gaithersburg and the Prince George's County TRIPS Center in Largo.

7. Regional Interagency Operations Coordination Activities

A critical consideration regarding the region's well-equipped transportation operations centers is that they are, by definition, dedicated to the system they own and operate, within their own jurisdiction. Regionwide, interagency, intermodal activities typically are secondary to the primary activity of managing within each agency's jurisdiction. Nevertheless, these agencies and personnel have recognized the need for coordination, and a number of coordination activities have taken place in recent years.

- Regional Transit Operators Emergency Working Group: Convened by WMATA since 9/11, this group brings together transit operations personnel from around the region to discuss procedures for transit coordination in emergencies, and was influential in development of the R-ESF #1 and the REETC Annex of the RECP[SM].

- National Capital Region Transportation Planning Board (TPB) Activities: The TPB, as the federally-designated metropolitan planning organization (MPO) for the Washington region, has since 1997 convened the Management, Operations, and Intelligent Transportation Systems (MOITS) Policy and Technical Task Forces. The MOITS Task Forces and numerous technical subcommittees have created forums for discussion, collaboration, and coordination on topics such as traffic signals, regional ITS architecture, traveler information, and transportation incident management. MOITS participants also were active in the ad hoc R-ESF #1 – Emergency

Transportation Work Group that supported development of the REETC Annex.

- Maryland Suburban Regional Operations Coordination Committee (ROCC): this partnership of the Maryland SHA, the Montgomery County Department of Public Works and Transportation, and the Prince George's County Department of Public Works and Transportation, began in the 1990s to collaborate on the coordination of traffic management and roadway incident management on the roadways controlled by those three agencies. Activities include regular meetings, technical systems development, and integration of systems among the three agencies.

- Annual Regional Transportation Incident Management Conference: Since 2001, the major transportation agencies of the region have convened this conference, taking place in annually in November, to discuss important related topics and to encourage familiarity among the rank and file of the region's operations personnel.