

ITEM 13 - Information

June 16, 2010

Briefing on the Washington Metropolitan Area Transportation Operations Coordination (MATOC) Program

Staff

Recommendation: Receive briefing on current MATOC operations, the recently completed benefit-cost analysis for MATOC, and the status of preparations and funding for FY2011.

Issues: None

Background: At its April 21 meeting, the Board received a briefing on current MATOC operations and the status of preparations and funding for FY 2011. The executive summary of the MATOC Benefit-Cost Analysis White Paper is attached. The full 70-page report is available at the TPB meeting web site.

National Capital Region Transportation Planning Board

777 North Capitol Street, N.E., Suite 300, Washington, D.C. 20002-4290 (202) 962-3310 Fax: (202) 962-3202 TDD: (202) 962-3213

MEMORANDUM

TO: Transportation Planning Board

FROM: Andrew J. Meese, AICP
Systems Management Planning Director

DATE: June 16, 2010

SUBJECT: Briefing on the Washington Metropolitan Area Transportation Operations Coordination (MATOC) Program

Background

The District of Columbia Department of Transportation (DDOT), the Maryland Department of Transportation (MDOT), the Virginia Department of Transportation (VDOT), and the Washington Metropolitan Area Transit Authority (WMATA), in partnership with the TPB, established the MATOC Program to conduct real-time information sharing and interagency coordinated transportation management. MATOC began operations coordination activities in 2008, led by the MATOC Facilitator with supporting staff. Michael Zezeski of the Maryland State Highway Administration, Chair of the MATOC Steering Committee, will brief the Board on MATOC status at the June 16 meeting.

Current Activities

MATOC is continuing regional coordination / monitoring / notification activities, based out of the Capital Wireless Information Net (CapWIN) offices in Greenbelt. Coverage is now five days a week. Notifications in 2010 have been on an average of about 36 regional incidents per month. The Regional Integrated Transportation Information System (RITIS) continues as the key MATOC support technology.

The MATOC Steering Committee is currently addressing three major issues: staffing; transitioning from the original federal earmark to sustained funding for FY2011 and beyond; and finalizing the benefit-cost analysis for the MATOC program. Mr. Zezeski will review the MATOC staffing status in his presentation. Recent regional transportation incidents with MATOC involvement will also be reviewed.

Transitioning from the Federal Earmark

MATOC's SAFETEA-LU earmark, secured by Congressman Jim Moran, is reaching its end. Originally scheduled for completion by June 30, 2010, the MATOC Program partners are now working to extend the eligibility of the original federal earmark to September 30, 2010, to ensure being able to take full advantage of earmark funds during the transition to sustained funding.

COG has administered the MATOC earmark, with activities undertaken by a contractor team. The University of Maryland Center for Advanced Transportation Technology has undertaken MATOC-supporting RITIS activities, and is currently a subcontractor under COG's MATOC contract. After September 30, the MATOC partners plan to have the University administer and carry out MATOC's operations activities. The University already operates the Capital Wireless Information Net (CapWIN) public safety program, whose Greenbelt, Maryland offices MATOC currently shares, as well as providing the support activities of the I-95 Corridor Coalition. The MATOC member agencies will partner with the University and its knowledgeable staff in accomplishing the goals of the program, with synergies in co-locating with the other University programs. COG/TPB will participate by means of the concomitant MATOC planning support task in the FY2011 Unified Planning Work Program (UPWP) (\$90,000, including \$30,000 carryover funds from FY2010).

Funding

The MATOC Steering Committee has estimated that a total of \$1.2 million per year is necessary to sustain the program. This includes both MATOC and supporting RITIS activities. Additional funding would provide opportunities for expanded coverage (geographically, temporally, and modally) or additional activities.

As previously reported to the TPB, the Maryland State Highway Administration has committed \$400,000 for the program for FY2011. VDOT, in a March 17, 2010 letter from Acting Commissioner Gregory A. Whirley, did not commit funding, but expressed support for the program and awaited the benefit/cost analysis results. New since the last TPB briefing on MATOC, the District of Columbia Department of Transportation has submitted an administrative modification to the regional FY2010-2015 Transportation Improvement Program (TIP) providing \$400,000 funding for MATOC.

Additional potential support is anticipated from \$100,000 from Northern Virginia CMAQ (to become available later in FY2011), and a one-time \$200,000 Federal Transit Administration FY2011 earmark secured by Congressman C.A. Ruppertsberger for "the greater coordination of the transportation and transit system[s] in the National Capital Region". As noted above, the TPB has committed \$90,000 in FY2011 UPWP funds for planning support.

The above commitments total almost \$1.2 million. This level of funding will determine staffing, hours of coverage, and enhancement activities. The University of Maryland, in coordination with the MATOC partner agencies and TPB staff, has begun developing a work program for FY2011 that will provide specificity as to the tasks and coverage that will be provided. Note that some of the funds may have restrictions on what activities are eligible (for example, the TPB's UPWP funds can be used only for planning activities), and this will have to be taken into consideration as the work program is developed.

Benefit – Cost Analysis of the MATOC Program

The MATOC Steering Committee directed the consultant team to develop benefit – cost estimates for MATOC. Funding from the original federal earmark was used to support the study, which was undertaken by MATOC subcontractor Sabra, Wang, and Associates under the guidance of the Steering Committee. The benefit-cost study report was recently completed; the executive summary of the study is enclosed in this briefing package, and the full report is available on the [TPB web site](#). The study examined how regional coordination of major traffic incidents across jurisdictional

boundaries enhances existing local incident management actions and mobility savings (e.g. time, fuel, emissions), and focused on “modified trips” – trips made at a later time, on another route, by another mode, or not made. Benefits, based upon analysis of three case studies of actual incidents, were estimated from reduced delay, fuel consumption, emissions (including greenhouse gases), and secondary incidents. The study found an overall benefit / cost ratio conservatively estimated at 10 to 1.

Outlook

The funding committed to the MATOC Program to date for FY2011 ensures that program activities will continue. The next few months will be an important transition period from the earmark initiating the program to sustained operations, and the MATOC partners are in the process of developing a FY2011 work program that will make the best use of the available funding to accomplish MATOC’s goals.

Attachment (MATOC Benefit-Cost Study)

EXECUTIVE SUMMARY

MATOC Benefit-Cost Analysis White Paper



MATOC

Metropolitan Area Transportation
Operations Coordination

June 2010



"Working together to reduce incident-related travel delays through improved coordination, cooperation, and information-sharing."

This report prepared by Sabra, Wang & Associates, Inc. under the Implementation Manager support contract with MWCOG and the guidance of the MATOC Steering Committee.

1.0 EXECUTIVE SUMMARY

The National Capital Region (NCR) is a diverse, multi-jurisdictional region, which includes travel by automobile, transit, rail, carpool, bicycle and foot. Within the NCR, there are multiple transit services, rail lines and over 300 centerline miles of interstates, parkways, tollways and HOV/HOT lanes under the jurisdiction of many DOT agencies (Federal, State, local), including the Park Service, one District, two States, 36 municipalities, 16 counties, and multiple transit agencies and toll authorities. Because of the close proximity of these governing jurisdictions, an incident that affects a transportation system in one jurisdiction (e.g., interstate highway) often will affect traffic operations and other modes of travel in adjacent jurisdictions, and the likelihood of this occurring increases with the length of time it takes to detect, mobilize and fully mitigate the incident – programs that facilitate coordination via the timely sharing of accurate incident information among NCR agencies are anticipated to reduce incident duration and be of significant benefit to the public.

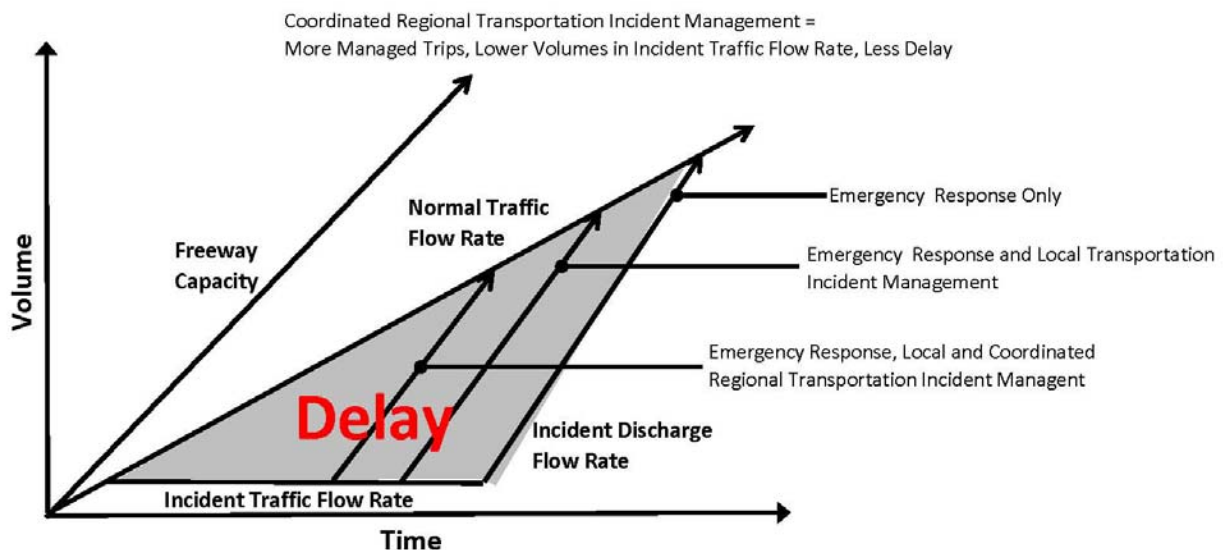
The Metropolitan Area Transportation Operations Coordination (MATOC) Program has an information-sharing mission to foster among transportation agencies a real-time situational awareness of transportation operations during regionally significant incidents that occur in the NCR. MATOC monitors, gathers and communicates accurate and timely incident and mobility information so that transportation agencies in the NCR may better coordinate their respective response activities to improve public safety (e.g., reduce secondary crashes), reduce travel delay and fuel consumption, and better inform the public, which allows individuals to make better informed travel decisions (e.g., defer or delay travel, take an alternate route or mode of travel). MATOC, however, does not usurp or override the policies or actions of other agencies, nor does it get involved in direct incident management or operational decision making, operation of service patrols, maintenance of traffic control systems, or snow removal.

Regional traffic incidents include incidents that have a significant impact on the transportation network in more than one jurisdiction; multiple minor incidents that create cascading additive impacts closely resembling that of a major incident; and severe weather that has an impact on the regional transportation network. Incidents of regional significance typically monitored by MATOC include traffic collisions, disabled vehicles, vehicle fires, hazardous materials incidents, medical emergencies, debris on roadway, road construction, weather events (e.g., thunderstorms, sleet and snow), or any combination of events that would propagate a regional transportation impact. In general, the more severe the incident, the longer its duration and impact to the traveling public.

Within the NCR, the average highway user spends 62 hours per year in congested traffic, 51% of which is non-recurring congestion caused by these traffic incidents. Interstate I-270 alone has an average of 7 incidents per day total both directions, end-to-end – 41% crashes and 59% non-crashes (e.g., disabled vehicles, police activity). On average, there are a total of 224 police-reported crashes per day on all roadways in the

NCR, and a percentage of these incidents are of such regional significance that MATOC involvement is warranted. For example, from December 1, 2009 to April 30, 2010, MATOC was involved with an average of 36 incidents per month.

It is well recognized that the coordinated sharing of incident and mobility information with potentially affected regional transportation agencies during traffic incidents has a positive effect in reducing the incident timeline in terms of detection, verification, information dissemination, response, clearance, and recovery. Programs that reduce the incident timeline and provide travelers with an earlier and regionally broader advance warning to modify their trips will reduce queue buildup, traffic delay and secondary crashes, which, in aggregate, will provide significant tangible benefits in terms of cost savings related to emissions, fuel consumption, value of time and safety. Modified trips in this context are considered trips made at a later time, on another route, by another mode, or cancelled. The following graphically illustrates this concept, where earlier incident detection and regionally broader coordination and notification by MATOC reduces the incident timeline (i.e., traffic delay and queuing) more than emergency response and local transportation incident management, which is the incremental benefit of MATOC:



This study uses traffic modeling techniques, the best available data, and engineering judgment to estimate loss of roadway capacity, vehicular queuing, travel delay, and costs (i.e., emissions, fuel consumption, value of time) associated with regionally significant traffic incidents for the purpose of quantifying benefits attributable to MATOC's real-time coordination and sharing of incident and mobility information among affected NCR transportation agencies during the incident timeline. The study uses procedures and methodologies that are commonly used and accepted in traffic engineering theory and practice, but attempts to maintain a straightforward and transparent approach. The study philosophy is to use reliable published data when available and, when assumptions are made, to be reasonable and conservative. The

following sketch-planning analysis was used in this study to quantify the benefits attributable to the implementation of MATOC:

1. Identify Representative Case Studies. The study identified the following three incidents involving MATOC that occurred on major roadway facilities in the NCR:
 - a. I-66 WB Bus Crash. On Friday, May 22, 2009 at approximately 4:45 PM, a multi-vehicle, rear-end crash (including two buses chartered for a school trip) occurred in the far left lane of WB I-66 just before the WB I-66 off-ramp to NB Nutley St. (MD 243) in Fairfax, VA. MATOC notified VDOT, Fairfax County, Maryland SHA CHART, Virginia Commuter, DDOT, and WMATA at key points during the incident timeline.
 - b. I-495 EB IL Vehicle Fire. On Thursday, September 17, 2009 at approximately 3:00 PM, a vehicle fire occurred in the far left lane of the EB I-495 Inner Loop west of MD 187 in Montgomery County, MD. MATOC notified Maryland SHA CHART and VDOT at key points during the incident timeline.
 - c. New York Avenue Shoulder Collapse. From 3:00 PM Friday, May 9 to 5:00 PM Sunday May 11, 2008, a storm sewer failure between the 1100 and 1200 blocks of New York Avenue (a major arterial link between DC 295 and I-395) caused a partial roadway collapse and the loss of the one or more travel lanes in the westbound direction into the District of Columbia, which is normally three lanes in the westbound direction. This inbound lane was closed for the entire weekend for emergency construction. MATOC coordinated the sharing of information among DDOT and Maryland SHA CHART.
2. Model Traffic Incidents. The study developed and calibrated a traffic model for each case study having MATOC involvement to reflect the actual incident timeline of events and the resulting primary queue length and duration reported by RITIS. Using each calibrated base model, the study conservatively adjusted the model's incident timeline of events (e.g., if and when DMS messages were posted) and the percent modified trips that would be expected if MATOC had not been involved – the independent variable being percentage and time of occurrence of modified trips.
3. Estimate Costs. The study estimated the costs of each incident with and, hypothetically, without MATOC in terms of emissions, fuel and value of time due to the resulting queue and traffic delay – the net benefit of MATOC for each incident being the difference in total cost of emissions, fuel and value of time (i.e., reduced emissions, fuel consumption, and wasted time).

4. Annualize Benefits. The study annualized the benefits of MATOC by conservatively estimating, based on historical data, how many incidents similar to the case studies would be expected to occur each year.
5. Determine the Benefit-to-cost Ratio. The study calculated the benefit-to-cost ratio as the ratio of the annualized benefits of MATOC to MATOC's annual operating cost.

Based on this conservative analysis, MATOC is demonstrated to have a benefit-to-cost ratio of 10:1. Note that this assessment is conservative as it does not include potential savings for reduced or eliminated secondary queues, secondary incidents or the potential delay reduction due to rubbernecking in the opposite direction. Also note that this assessment is conservative because the study does not attempt to quantify costs or benefits of the aggregate impacts of multiple simultaneous incidents being greater than the sum of their parts – an exacerbation effect.

The study concludes that MATOC has yielded positive benefits in cost savings associated with reduced traffic delay, reduced emissions and reduced fuel consumption. Although not directly evaluated in the analysis, it is also known through previous research of similar programs that MATOC indirectly improves the safety of incident responders and other motorists. At the current level of operation, it is expected that an even higher benefit-to-cost ratio would be realized with only a nominal percent increase in the occurrence of minor incidents and only a few additional major incidents in one year. Furthermore, MATOC benefits could be increased by providing supportive direct traveler information through, for example, a branded website for:

- real-time travel time information,
- trip planning,
- transit and toll information,
- notices/advisories (e.g., road closures), and
- information on additional arterials, local roadways and local transit service.

MATOC benefits can also be increased by developing standard operating procedures and action plans for recurring special events and major construction projects.