NYSDOT A10: ATDM – Task 3 Revised Scenarios

The table below shows seven scenario frameworks, and associated large, medium and small examples for each when applicable (in some cases, small or large may not apply). Each scenario describes the hypothetical situation, provides context for real-world examples, and includes a table of strategies that apply. The scenarios are intended to reflect a variety of travel situations and problems on a corridor-level. The strategies are categorized first by whether they apply to large, medium or small metro areas, and then by the estimated cost range.

Scenario Framework	Examples: Large, Medium and Small Metropolitan Areas
1. Complex, urban congested corridor	• **Large:** Cross Bronx Expressway, Long Island Expressway, and I-684 Corridor with Parallel Metro-North Rail Line • **Medium:** I-490 corridor in Rochester and I-81 corridor in Syracuse • **Small:** not applicable (generally, no recurring congestion or complex freeway systems)
2. Urban arterial network	• **Large:** NYC's five boroughs • **Medium:** CBDs in Syracuse, Rochester, Buffalo and Albany • **Small:** not applicable (generally, not urban)
3. Bottlenecks and crossings *(bridges, tunnels and border crossings)*	• **Large:** Queens-Midtown Tunnel, Lincoln Tunnel and Holland Tunnel • **Medium:** US-Canada Border Crossing • **Small:** not applicable (generally, no recurring bottlenecks, unless captured by examples below for seasonal tourism, and special events)
4. Seasonal, recurring off-peak congestion	• **Large:** Although there are instances of seasonal influxes of traffic in large areas, this type of congestion is typically more appropriately characterized under complex urban congested corridors (#1) or special events (#7) • **Medium:** I-87 Expressway in Albany during seasonal tourism • **Small:** Finger Lakes area during summer tourism season, Lake Placid area during ski season, and Lake George during summer tourism
5. Major emergencies and weather	• **Large:** Hurricane Sandy evacuations in Downstate metro area • **Medium:** Winter storm preparations in upstate NY • **Small:** Hurricane Irene flooding
6. Construction	• **Large:** Tappan Zee Bridge construction or K Bridge construction • **Medium:** I-787 construction in downtown Albany, or Twin Bridges in Albany • **Small:** Prospect Mountain Bridge construction, or small urban area CBD undergoing construction or repaving; also route 17 conversion to I-86
7. Special events	• **Large:** UN Assembly, POTUS, major sporting event (NYC Marathon, Super Bowl) • **Medium:** Buffalo Bills Football Game or Syracuse NYS Fair • **Small:** Festivals and special events in Finger Lakes region (such as wine festivals)

Scenario 1: Complex, Urban Congested Corridor

About

There are many examples of highways that experience regular, recurring congestion, particularly throughout New York's downstate regions. Some freeways that are consistently congested also have special use lanes, such as high-occupancy vehicle (HOV) lanes or bus lanes. These types of freeways present opportunities to encourage ridesharing or express transit and strategies such as pricing that can alleviate congestion.

Examples

- **LARGE**: In large urban areas, there are often consistently congested freeways – with special use lanes that also experience recurring congestion – which are worsened by incidents and emergencies, attributed in part to congestion and construction. The heavily congested **Long Island Expressway** (LIE) covers both suburban and urban areas and includes an HOV lane and bus lanes prior to the Queens Midtown Tunnel, and ramp metering. In Nassau and Suffolk counties, the LIE is an eight lane expressway with HOV lanes. Other examples include the **Cross Bronx Expressway** and the **I-684** corridor with parallel Metro-North Rail line.

- **MEDIUM:** Even in medium-sized areas, such as Albany, Rochester, Syracuse and Buffalo, heavily used corridors can experience recurring congestion. **I-490** in Rochester is a heavily-used corridor, which also serves as an alternate route for the New York State Thruway. Regular congestion combined with weaving maneuvers required at the I-490/I-390 interchange switchover (sometimes referred to locally as a "can of worms") results in a high number of accidents. Other examples include the **I-81** corridor in Syracuse.

- **SMALL:** Not applicable. Generally, there is no recurring congestion or complex freeway systems in small or rural areas.

Developing an ATDM Approach: Strategies to Consider for a Complex, Urban Congested Corridor

ATDM strategies can be used to alleviate congestion on complex, urban corridors. This will require a well conceived, comprehensive concept of operations because there are various entities and agencies involved that will need to coordinate on protocols and operating procedures. Almost all ATDM strategies could apply to urban congested corridors. The selection of specific strategies for a given corridor is determined by site-specific characteristics, including: existing and forecasted conditions, the exact nature of congestion, and travel options available.

Strategy Type	ATDM Strategy	Cost Estimate	Medium Metro Area	Large Metro Area
Demand	**Predictive Traveler Information** *Information on future travel times can influence mode, route and time of travel*	$	X	X
Traffic	**Adaptive Ramp Metering** *Ramp meters adaptive to real-time conditions to address changing congestion*	$	X	X
Parking	**Dynamic Overflow Transit Parking** *In critical corridors, the provision of on-demand, extra parking near stations*	$	X	X
Parking	**Dynamic Parking Reservation** *Guaranteed parking can avoid searching for parking in or near congested areas*	$	X	X
Demand	**Dynamic Fare Reduction** *In key congested corridors, transit fares can be reduced in response to congested conditions*	$	X	X
Demand	**Dynamic Ridesharing** *Social networking allows for new applications to match riders and allow for gamification*	$	X	X
Traffic	**Adaptive Signal Control** *Integrating traffic flow management with parallel highways as with ICM*	$$	X	X
Demand	**On-Demand Transit** *Technology can allow for efficient operation of on-demand, flexible transit service*	$$	X	X
Traffic	**Real-time Travel Information** *Comparative travel time information on car, transit, bicycle, and parking options*	$$	X	X
Traffic	**Queue Warning** *The full implementation of ATM would manage traffic before congestion*	$$	X	X
Traffic	**Variable Speed Limits** *Speed limits can be lowered in certain congested corridors based on anticipated conditions*	$$	X	X
Traffic	**Speed Harmonization**	$$	X	X
Traffic	**Transit Signal Priority** *Provides faster, more reliable transit travel times on key parallel arterials*	$$	X	X

Strategy Type	ATDM Strategy	Cost Estimate	Medium Metro Area	Large Metro Area
Demand	**Dynamic HOV or Managed Lanes** *Conditions and requirements for use of managed lanes can vary with congestion*	$$	X	X
Demand	**Dynamic Pricing** *Pricing may be the ultimate tool to manage congestion, if political barriers can be overcome*	$$	X	X
Demand	**Dynamic Routing** *Active re-routing or real-time display of route options if alternative routes exist*	$$	X	X
Demand	**Dynamic Transit Capacity Assignment** *In regions with adequate transit service, dynamic assignment to marshal responsive transit to address congested corridors by offering high-quality alternatives*	$$	X	X
Parking	**Dynamic Wayfinding** *Travelers notified of peripheral parking options away from congested locations*	$$	X	X
Traffic	**Dynamic Shoulder Lane and Lane Use Control (Hard Shoulder Running)** *Adds extra capacity where and when needed if speeds slowed and areas of refuse offered*	$$$	X	X
Traffic	**Dynamic Speed Limits** *By dynamically managing speeds, traffic can be slowed before reaching gridlock conditions*	$$$	X	X
Demand	**Transfer Connection Protection** *To make transit more reliable in congested corridors, real-time transfer protection*	$		X
Parking	**Dynamic Priced Parking** *Parking pricing tied to demand might reduce traffic in areas adjacent to congested highways*	$$		X
Traffic	**Dynamic Merge or Junction Control** *Managing lanes and access for two facilities with different peaking characteristics*	$$		X
Traffic	**Dynamic Lane Reversal** *Certain directional peaking conditions may warrant use adaptive use of lanes*	$$		X

Scenario 2: Urban Arterial Network

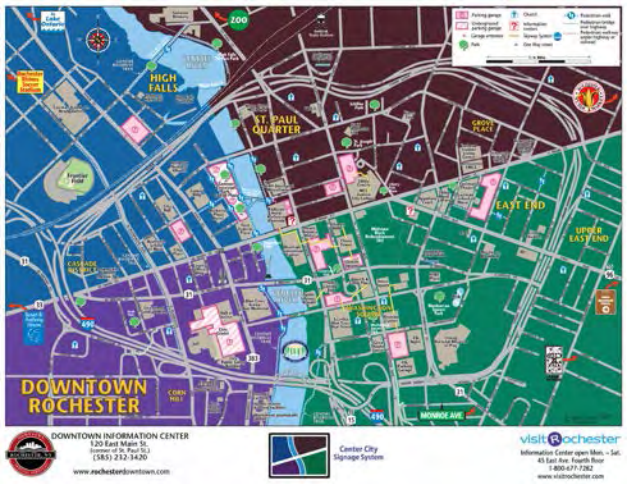
About

An urban arterial network, especially those experiencing recurring congestion during peak morning and evening rushes, can be amplified by incidents and planned or unplanned closures. ATDM can help to alleviate congestion, through strategies such active traffic management, parking management, and transit enhancement. The strategies used will depend on the congestion conditions and the infrastructure and services available.

Examples

- **LARGE**: **New York City's five boroughs** have a complex network of expressways, freeways and arterials that link the local street network to Northern New Jersey, the Hudson Valley, Long Island and Connecticut. Recurring congestion is commonplace on much of the network, during both peak and off-peak times. The arterial network includes such streets as Park Avenue and Broadway in Manhattan, Northern Blvd in Queens, and Atlantic Avenue in Brooklyn. With such an extensive system, there has to be coordination across roads and signals to keep traffic moving smoothly. NYCDOT's Midtown in Motion is an example of a real-time traffic management system that is in place to help reduce congestion in potential choke points around the city.

- **MEDIUM:** Medium sized cities like Rochester usually are designed in a loop or beltway to connect the city and the suburbs through arterials and freeways. The Rochester Outer Loop runs through the suburbs outside the city (including Greece, Brighton and Irondequoit), while the Inner Loop is more concentrated around the central business district. There are three major highways in the city: I-390, I-490, and I-590, along with an extensive system of expressways and freeways that connect the city to the Thruway (I-90). Some major arterials that move traffic between the local streets, the city and the freeways include Route 31 (Monroe Avenue and W Broad Street), Route 33 (Main Street), and Lake Avenue. This network of arterials, as in any city, can be congested throughout the day, not just during the peak period. Rochester has an extensive traffic signal control system for much of its network, and so presents a good opportunity for ATDM strategies to manage congestion and improve reliability in a dynamic way.



- **SMALL:** Generally not applicable. Usually there are no urban arterial networks in small and rural areas.

Developing an ATDM Approach: Strategies to Consider for an Urban Arterial Network

ATDM strategies can be used to alleviate congestion in urban arterial networks. This will require a well conceived, comprehensive concept of operations because there are various entities and agencies involved that will need to agree to the different protocols and operating procedures.

Strategy Type	ATDM Strategy	Cost Estimate	Medium Metro Area	Large Metro Area
Parking	**Dynamic Parking Reservation** *Can reduce parking search time affecting arterial network*	$	X	X
Demand	**Dynamic Ridesharing** *Many trips shared with these apps are non-work trips using arterials*	$	X	X
Demand	**Dynamic Transit Capacity Assignment** *Transit service can be added or reduced in response to conditions on arterials*	$	X	X
Traffic	**Transit Signal Priority** *Could effectively increase transit travel time reliability in the face of changing conditions*	$$	X	X
Traffic	**Real-time Traveler Information** *City of Bellevue, WA shows real-time LOS at major intersections*	$$	X	X
Demand	**Dynamic Fare Reduction** *Fares can be reduced on routes serving major arterials during period of severe congestion, especially if coupled with signal priority*	$$	X	X
Traffic	**Adaptive Signal Control** *Allows for better response to changing and network-wide conditions*	$$	X	X
Demand	**Transfer Connection Protection** *Integrating transit operations with real-time traffic monitoring can help to assure connections are protected for critical transfers*	$$	X	X
Parking	**Dynamic Wayfinding** *Real-time information on location and supply of available parking*	$$	X	X
Traffic	**Dynamic Lane Control** *Adaptive left-turn lanes and controls*	$		X
Demand	**On-Demand Transit** *While often used in low density areas, "jitney" services can offer response alternative for some*	$		X
Traffic	**Dynamic Lane Reversal** *Dynamic control avoids loss of directional capacity when needed*	$$		X
Parking	**Dynamic Priced Parking** *Assures parking supply better matched to demand, thus reducing parking search time*	$$		X

Scenario 3: Bottlenecks and Crossings (Bridges, Tunnels and Border Crossings)

About

Bridges, tunnels and border crossings are facilities that can exacerbate traffic delays on already congested routes or create chokepoints and bottlenecks on otherwise uncongested routes. The strategies used will depend on the congestion conditions and the infrastructure and services available. While this scenario focuses on points or bottlenecks, the issues should be looked at as part of a corridor or network.

Examples

- **LARGE**: The **Queens-Midtown Tunnel,** which is a major access point into the city, is where the often congested Long Island Expressway (I-495) terminates. Over 20+ express bus routes use this entrance into the city each weekday morning. The route through the QMT is already congested, but any accidents or incidents can create major chokepoints and delay travelers even more. Even during off-peak and weekends, one tube of the tunnel is often closed for construction resulting in reduced capacity and delays. Alternative routings include the Queensborough and Williamsburg Bridges as well as ferry service across the East River. The Lincoln Tunnel and Holland Tunnel face similar issues.

- **MEDIUM:** International border areas can create significant bottlenecks due to security checkpoints and the large volume of day-to-day traffic. Delays can create problems that have larger economic impacts related to the movement of goods. Border crossings, such as the **US-Canada Border** in Region 5, can benefit from dynamic travel management so that delays do not adversely affect traffic flow for the movement of people and goods. There are three bridges that serve as routes to cross the US-Canada border in the Buffalo region, and the Peace Bridge has the highest concentration of traffic. Much of the traffic in Region 5 is concentrated near this international border, and congestion occurs regularly at the Peace Bridge.

- **SMALL:** Not applicable. Generally, there are no recurring bottlenecks in small or rural areas. For those that do occur, the situations are better captured within “Special Events” or “Seasonal, Off-Peak” scenarios.

Developing an ATDM Approach: Strategies to Consider for Bottlenecks and Crossings

ATDM strategies can be to alleviate recurring chokepoints and bottlenecks near borders, bridges, and tunnels. This will require a well conceived, comprehensive concept of operations because there are various entities and agencies involved that will need to agree to the different protocols and operating procedures.

Strategy Type	ATDM Strategy	Cost Estimate	Medium Metro Area	Large Metro Area
Demand	**Dynamic Ridesharing** *Mobile apps can be designed to encourage shared rides*	$	X	X
Demand	**Predictive Traveler Information** *Use archived data to predict future travel times and recommend departure times, routes and modes.*	$	X	X
Traffic	**Real-time Travel Information** *Dynamic information on changing conditions and modal and route options*	$$	X	X
Traffic	**Queue Warning** *Dynamic information on back-ups before and at approaches*	$$	X	X
Demand	**Dynamic Routing** *Where adequate parallel routes exist (e.g. multiple bridge crossings), dynamic routing and travel time info can reduce congestion*	$$	X	X
Traffic	**Adaptive Signal Control** *Means to manage traffic feeing into approach*	$$	X	X
Traffic	**Dynamic Shoulder Lane and Lane Use Control (Hard Shoulder Running)** *Can address problems at bottlenecks if adequate shoulder exists; not as applicable to bridges/tunnels*	$$$	X	X
Traffic	**Speed Harmonization** *Traffic slowed before encountering congestion to reduce "accordion" effect*	$$$	X	X
Demand	**Dynamic HOV or Managed Lanes** *Can increase person and vehicle throughput at bottlenecks*	$$$	X	X
Traffic	**Dynamic Lane Reversal** *Reversal or contra-flow lanes on bridges or in tunnels if directional peaking occurs*	$$$	X	X
Traffic	**Adaptive Ramp Metering** *Dynamic flow control to meet demand onto congested segments*	$$		X
Traffic	**Dynamic Merge or Junction Control** *Effective for bottlenecks and approaches if traffic patterns conducive*	$$		X
Demand	**Dynamic Pricing** *Pricing already common on bridges and tunnels; occupancy and time of day discounts can be applied*	$$		X

Scenario 4: Seasonal, Recurring Off-peak Congestion

About

Some facilities, though generally meeting capacity needs, may experience seasonal or periodic congestion due to temporary influxes of additional traffic. Seasonal tourism is a primary cause of periodic, recurring congestion.

Examples

- **LARGE**: There are instances in large metropolitan areas in New York where seasonal influxes of traffic cause additional congestion. A few examples include the influx of summer traffic along **Route 27** in the Hamptons (Long Island), the **New England Thruway,** and the **Southern State Parkway.** NYCDOT also has a holiday traffic management plan that goes into effect to better manage the increase in trips. However, typically, this type of congestion is more appropriately characterized as regularly recurring. See the *Complex, Urban Congested Corridor* and *Special Events* scenarios for ATDM strategies to alleviate congestion in these areas.

- **MEDIUM:** Seasonal tourism generates periodic congestion on **I-87** in Albany. The interstate, which runs from the Bronx north to the Canadian border, is a six-lane freeway through Albany. The freeway corridor has the capacity to handle local traffic for much of the year. However, the area experiences a spike in tourism in the summer; there are several tourist attractions in Albany and nearby Saratoga, and the route also serves as a throughway to the Adirondacks. During this period, I-87 experiences congestion, which may be exacerbated by special events, construction, or traffic incidents.

- **SMALL:** Tourism destinations are also found in small towns and rural areas. An example of this is Lake Placid, a small village nestled in the Adirondacks. Lake Placid is not located on any interstate highway; it is served by **New York State Routes 73, 86 and 9N** and **County Roads 21, 31 and 35**. In the winter, Lake Placid attracts skiers and other winter sports enthusiasts. This seasonal tourism causes congestion on local routes – some of which are just two lanes – and can be worsened by winter weather. Other examples include roads in the **Finger Lakes** and **Lake George areas** during the summer.

Developing an ATDM Approach: Strategies to Consider for Seasonal, Recurring, Off-Peak Congestion

ATDM strategies can be used to alleviate seasonal, recurring off-peak congestion. These strategies require a well-conceived, comprehensive concept of operations because there are various entities and agencies involved that will need to agree to the different protocols and operating procedures. The most aggressive (and expensive) strategies likely do not apply to this scenario as seasonal congestion may not warrant deployment of these measures. Likewise, seasonal traffic congestion may be less of an issue in the New York City region – which experiences persistent and severe congestion at most times – and may be addressed through many of the same strategies applied for consistently congested corridors and special events. Finally, many transit, TDM and parking strategies may not apply as the nature of the congestion is based on through trips.

Strategy Type	ATDM Strategy	Cost Estimate	Small or Rural Area	Medium Metro Area
Traffic	**Queue Warning** *Temporary VMS devices can warn motorists of upcoming and unexpected back-ups*	$	X	X
Demand	**Dynamic Ridesharing** *Real-time ridesharing apps could increase occupancy of seasonal trips*	$	X	X
Traffic	**Adaptive Signal Control** *Managing congestion on parallel arterials that feed into major routes*	$$	X	X
Demand	**Dynamic Routing** *If parallel routes are available, VMS signs and traveler info can redirect motorists*	S		X
Traffic	**Adaptive Ramp Metering** *If meters are already in place, adaptive operations can quickly respond to conditions.*	$		X
Traffic	**Dynamic Merge or Junction Control** *If the situation warrants, merging volumes onto congestion facilities might be managed*	$$		X
Traffic	**Dynamic Shoulder Lane and Lane Use Control (Hard Shoulder Running)** *This has been used successfully in Massachusetts for Cape Cod bound traffic*	$$		X

Scenario 5: Major Emergencies and Weather Conditions

About

Major emergencies, including weather events that cause road closures and damage to infrastructure, national security threats or incidents, and other similar fully or relatively unexpected events, can cause significant disruptions to traffic flow in areas of the state. ATDM strategies can reduce the likelihood of further chaos after or during emergency conditions by keeping motorists informed about effective travel methods and roadway conditions.

Examples

- **LARGE**: In October 2012, **Hurricane Sandy** hit the New York City metropolitan area, prompting evacuations of low-lying areas and vulnerable populations (hospitals, nursing homes, etc.) and causing flooding and widespread damage to the region's transit and highways. Prior to the storm, officials urged the public to use the 511NY website and hotline for emergency alerts and up-to-date information on road and transit conditions. Afterwards, storm damage affected approximately 10 million commuters for several weeks. 511 was utilized to provide real time travel information and ridematching assistance to help workers navigate the temporarily impaired transportation system.

- **MEDIUM:** Many of the medium and small towns upstate that are in close proximity to Lake Ontario experience **storms throughout the winter months**. Syracuse, NY, located approximately 40 miles south of Lake Ontario and situated in Oswego County, experiences winter storms with heavy snow fall and strong winds that sometimes necessitate the closure of major roadways. To mitigate the effect of closing roadways such as I-81, the Oswego Initiative was put in place to effectively deploy manual ramp gates notifying travelers not to enter the roadways during storms. The region also deploys variable message signs that notify motorists about detour routes, snow ploughs, and high winds. In addition to Syracuse, there are many other medium and small-sized cities upstate that experience major winter weather events as a result of their proximity to Lake Ontario. These areas include: Rochester, Buffalo, and Watertown, all of which experience regular Lake Effect storms.

- **SMALL:** In 2011, Hurricane Irene bypassed some of the major cities on the Eastern Seaboard, but caused major damage and flooding in the more rural areas of New York. One example cited in the aftermath of **Hurricane Irene** was the Town of Windham, located in the Catskill Mountains. The storm caused flooding that entirely submerged some small houses, and made many local roadways impassable.

Developing an ATDM Approach: Strategies to Consider for Major Emergencies and Weather Conditions

ATDM strategies can be used to keep travelers informed during and after an emergency. Emergencies can be characterized by a limited timeline for planning or communication. As a result, developing ATDM strategies for emergency situations will require a well-conceived and clear set of protocols and procedures for all agencies involved. In areas that have implemented ATDM strategies to address recurring congestion, those strategies can be adapted to actively manage traffic during emergencies. However, some measures can be implemented specifically to address significant emergencies.

Strategy Type	ATDM Strategy	Cost Estimate	Small or Rural Area	Medium Metro Area	Large Metro Area
Traffic	**Variable Speed Limits** *Variable speed limits are used effectively in Washington State on I-90 during snow episodes*	$	X	X	X
Demand	**Dynamic Ridesharing** *511 and existing social networking sites– tailored apps could be developed*	$	X	X	X
Traffic	**Real-time Traveler Information** *Information on rapidly changing conditions, including instructions to stay off roads*	$$	X	X	X
Demand	**Dynamic Routing** *Mobile VMS, sensitive to ongoing conditions, can be used to route traffic around road closures resultant from major disruptions (e.g., bridge collapse)*	$		X	X
Traffic	**Dynamic Speed Limits** *Speed can dynamically respond to changing weather conditions*	$$		X	X
Traffic	**Queue Warning** *Originally developed in Germany to address severe fog incidents*	$$		X	X

Scenario 6: Major Construction Project

About

Major construction projects can exacerbate traffic delays on already congested routes or create congestion where none existed. The strategies used will depend on the congestion conditions, the infrastructure and services available, and the ability of partners to implement ATDM on a somewhat temporary basis. Congestion related to construction can be caused by reduced capacity and reduced speeds in work zones, and can affect all times of the day and night. It can affect the facility under construction as well as connecting or alternative routes, as well.

Examples

- **LARGE**: The **Tappan Zee Bridge**, a toll bridge that carries I-87/I-287 across the Hudson River, connects New York City's bustling northern suburbs in Rockland and Westchester counties. Operated by the NY Thruway Authority, the Tappan Zee is the only bridge serving a 33-mile stretch of the Hudson River. The facility is also a major interstate trucking route, connecting the Mid-Atlantic and New England regions via I-95. The Tappan Zee Bridge operates at or near capacity throughout the day, especially during the AM and PM peaks. Now past its expected useful life, the bridge carries substantially more traffic than it was originally designed to carry. Concern about the bridge's structural integrity spurred a bridge replacement project, which will result in the construction of the New NY Bridge, a dual-span bridge north of the current structure, beginning in 2013 and ending in 2017. Other examples include the **Kosciuszko ("K") Bridge**, which connects Queens and Brooklyn and is slated for replacement because it is too narrow to accommodate current traffic levels.

- **MEDIUM:** The Southern Portion of **Downtown Albany's I-787** is currently under construction to improve overall safety. As part of the work, the concrete will be resurfaced and six bridges along the interstate will be rehabilitated. The work is being coordinated with other construction projects in the region to reduce the impact on motorists. However, two lanes will be closed at night and one during the day.

- **SMALL: Prospect Mountain** is at the junction of State Route 17 and I-81 in Binghamton. Under normal circumstances, the Route 17/I-81 interchange area has sufficient capacity throughout the day and provides a high level of service. However, the construction project, which began in the Spring of 2012 and is scheduled to be completed by the end of 2015, could have the potential to increase traffic congestion. It has not yet done so in part due to use of a wide range of strategies, including using social media (Facebook page) to alert motorists of daily construction activities. Other examples include the current project to convert Route 17 to I-86.

Developing an ATDM Approach: Strategies to Consider for a Major Construction Project

ATDM strategies can be deployed as mitigation during the construction project. In addition, some strategies can become an integral part of operations after the project is complete by incorporating equipment and design elements that will support continued use of ATDM strategies. This will require a well conceived, comprehensive concept of operations for both the construction period as well as on-going operations once complete because the set, nature, and operating conditions will vary for each.

Strategy Type	ATDM Strategy	Cost Estimate	Small or Rural Area	Medium Metro Area	Large Metro Area
Demand	**Dynamic Transit Capacity Assignment** *Added bus service frequency, shuttles on alternative routes or detours*	**$**	X	X	X
Traffic	**Real-time traveler information** *In medium and large areas with multimodal options, include info on transit and other modes. In small areas, include information on arterials. Can include info on approaches and alt. routes.*	**$**	X	X	X
Demand	**Dynamic routing** *System may include routing to arterials, particularly in small/rural areas with limited freeway options*	**$$**	X	X	X
Demand	**Incentives for avoiding peak travel during construction** *Start with "low tech" solutions, such as online calendar tied to incentives*	**$**		X	X
Demand	**Dynamic ridesharing** *Adaptive telework during reconstruction and special apps to encourage shared travel*	**$**		X	X
Traffic	**Variable Speed Limits and Queue Warnings** *Speed limits tied to safe operation during construction*	**$$**		X	X
Traffic	**Dynamic Shoulder Lanes** *Use during construction; potential use after project completion in large areas*	**$$**		X	X
Traffic	**Adaptive Ramp Metering** *Could be tied to construction only or added as part of completed facility*	**$$**		X	X
Demand	**Dynamic pricing** *Could add differential tolls for time of day and occupancy on existing tolled facilities; incentives could be provided for transit, vanpools, carpool and bicycles*	**$**			X
Demand	**Dynamic HOV or Managed Lanes** *Could operate HOV or HOT lane on temporary basis during reconstruction (i.e., T-Rex)*	**$$$**			X

Scenario 7: Special Events

About

Large scale special events, including sporting events, concerts, fairs, rallies, etc., occur often in large metropolitan areas as well as small towns, and can disrupt traffic flows. During these events, congestion can be worsened by incidents and secondary accidents. Special events are generally planned well in advance, providing opportunities to manage demand and traffic through activities in advance of and during the event. ATDM strategies can help both those participating in events, and those seeking to avoid traffic as a result of the event. For instance, participants can be assisted with various route, time and mode choice options. Similarly, for those not participating in the event, ATDM will largely involve efforts to dissuade motorists from traveling into the area at key times.

Examples

- **LARGE**: In September 2013, the **United Nations General Assembly** was held in New York City at the UN Plaza on 44th St. and 1st Ave. The Midtown Manhattan area surrounding the UN is routinely heavily congested throughout the day, especially with regards to cross street traffic. During the General Assembly, President Obama and a number of other world leaders gathered for a week and caused the closure of a small grid of roads surrounding the UN plaza. Other examples include large sporting events, such as the **NYC Marathon**.

- **MEDIUM:** Sporting events regularly cause traffic disruptions. Approximately eight Sundays during a 16-week football season (September through January), Buffalo experiences an influx of traffic for the **Buffalo Bills games**. The Ralph Wilson Stadium, where the games are held, is located south of downtown Buffalo between I-90 and Highway 219. Game day congestion is common, especially near the stadium exits, and often impacts local arterials (Route 20A) in this mostly suburban area. The Bills provide suggested route options as static information on the team website. Other examples of special events in medium sized metropolitan areas include the **State Fair in Syracuse.**

- **SMALL:** Wine festivals, arts festivals, and musical events occur regularly in many of the smaller upstate regions. Many of these attract significant traffic from outside the region, and even outside the state. For instance, the **Annual Finger Lake Wine Festival** in upstate Watkins Glen attracts thousands of attendees. Similar types of special events occur throughout the state. Even in small urban or rural areas, events that attract a lot of tourists and traffic can cause increased congestion and traffic delays to the smaller roads. With many 2-lane roads and no dedicate lanes, police will often be involved to help direct traffic, but congestion still persists. Plans are often put in place to help with parking management for special events, but additional ATDM strategies can be considered to alleviate congestion.

Developing an ATDM Approach: Strategies to Consider for Special Events

ATDM strategies can be used to alleviate the traffic caused by special events. This will require a well conceived, comprehensive concept of operations because there are various entities and agencies involved that will need to agree to the different protocols and operating procedures.

Strategy Type	ATDM Strategy	Cost Estimate	Small or Rural Area	Medium Metro Area	Large Metro Area
Demand	**Dynamic Fare Reduction** *Reduced fares for event buses or combined event ticket*	$	X	X	X
Demand	**Dynamic Ridesharing** *Special apps to match rides for events*	$	X	X	X
Parking	**Dynamic Wayfinding** *Permanent or temporary electronic displays with parking availability at or near venue*	$$	X	X	X
Parking	**Dynamic Priced Parking** *Parking pricing based on availability and/or occupancy*	$$	X	X	X
Traffic	**Adaptive Signal Control** *Fully adaptive control to go beyond manual control at key intersections*	$$	X	X	X
Traffic	**Real-time Travel Information** *Pre-event information on routes and mode options as well as on-trip information*	$$	X	X	X
Demand	**Dynamic Transit Capacity Assignment** *Assigning special event buses to park-n-ride as demand changes*	$		X	X
Parking	**Dynamic Parking Reservation** *Ability to reserve parking at venue or nearby lots as demand warrants*	$		X	X
Traffic	**Queue Warning** *Could involve use of mobile signs near key off-ramps*	$		X	X
Demand	**Dynamic Routing** *Moving traffic around event as conditions change*	$$		X	X
Traffic	**Transit Signal Priority** *Providing travel time advantage for event buses*	$$		X	X
Traffic	**Dynamic Lane Reversal** *Use of reversible or special lane for access and egress*	$$		X	X
Traffic	**Dynamic Shoulder Lane and Lane Use Control (Hard Shoulder Running)**	$$			X