I-84 Danbury Project

Concept 23 Summary: Transportation System Management Options

DESCRIPTION

Concept 23 seeks to integrate operations into planning and programming of projects. Transportation Systems, Management, and Operations (TSMO) includes a multiple set of strategies to be applied together with the purpose of improving operations and performance of the system through the implementation of multimodal and intermodal, cross-jurisdictional systems, and projects designed to improve the transportation system.[1] More information on TSMO strategies and solutions can be found at https://ops.fhwa.dot.gov/tsmo/.

The following strategies that could reduce congestion and improve mobility on I-84 and surrounding local roadways in Danbury were considered:

Strategy	Description
Dynamic Lane Use	Involves closing or opening individual traffic lanes to improve traffic flow in the peak direction and by time of day. The dynamic lane use is considered in the median section between Interchanges 3 and 7.
Temporary or Hard Shoulder Running	Involves using the right shoulder as warranted during peak hours between Interchanges 3 and 7.
Freeway Ramp Metering	Involves the use of ramp signals to meter the flow of traffic onto the freeway.
Traffic Incident Management	Involves the use of Intelligent transportation Systems technologies to detect, respond, and clear incidents on a freeway system.
Arterial Management	Improves the operations on arterial roadways with the use of traffic signal technologies such as signal retiming and optimization, signal modernization and upgrades, use of adaptive systems, and extracting performance measures using the Automated Traffic Signal Performance Measures.
Travel Demand Management	Looks at opportunities to reduce the use of single occupant vehicles on I-84. Concept 4 (Non-Highway option) explores the opportunities to enhance bus and rail transits in the Greater Danbury area.
Public Transportation Management	Improves the operations of public transportation. For the I-84 Danbury project, Concept 4 (Non-Highway option) looks at opportunities to enhance bus and rail transit in the Greater Danbury area.
Corridor Traffic Management	Involves safety applications, access management, traffic network surveillance, and others. Safety applications such as highway curve warning signage, pavement markings and striping, and others can be implemented to improve driver expectancy and travel experience on I-84.
Connected and Automated Vehicle Systems	Involves the use of applications to communicate between vehicle to vehicle, vehicle to infrastructure such as roadside devices, traffic management center, and the operations center.

[1] FHWA Office of Operations.

PROS (FOR ALL STRATEGIES)

- Typical construction methods could be used
- Does not require additional right-of-way (ROW)
- Could be implemented in a short time frame

CONS (FOR ALL STRATEGIES)

- Does not address lane continuity on I-84
- Does not address left hand ramps in the I-84 corridor
- Lacks consistent design speed throughout the I-84 corridor
- Interchange 6 remains a partial interchange
- Does not improve access to the Danbury Hospital
- Does not propose changes to the existing interfaces to local streets

The following table displays the pros and cons for each strategy.

Description	Dynamic Lane Use	Hard Shoulder Running	Freeway Ramp Metering	Traffic Incident Mgmt.	Arterial Mgmt.	Travel Demand Mgmt.	Public Transp. Mgmt.	Corridor Traffic Mgmt.	CV and AV Vehicle Deployment
Pros									
+Peak hour delay is reduced	✓	✓		✓[1]	✓[1]	✓[1]	✓[1]	✓[1]	✓[1]
+ Improves mobility on highway	✓	✓		✓[1]		✓[1]	✓	✓[1]	✓[1]
+ Improves mobility on local streets					✓[1]	✓[1]	✓	✓[1]	
+Does address other modes of travel such as pedestrian, bicycle, or public transit travel modes					✓[1]	✓[1]	✓	✓[1]	
Cons									
–Unfamiliar to drivers and may create confusion	✓	✓	✓						
–Diverts traffic to adjacent local streets			✓	✓[2]					
– Unable to use shoulder for emergency use during peak hour	✓	✓							

[1]This is based on a qualitative assessment, as a detailed quantitative analysis was not performed.

[2]This is true only in the event of incidents.

RECOMENDATIONS

Recommendations for the Concept 23 strategies include:

Strategy	Recommendation	Details
Dynamic Lane Use	Advance	■ Reduces congestion and improves mobility on the highway but on local roads. ■ Does not address other modes of travel adjacent to the highway such as pedestrian, bicycle, or public transit travel modes. ■ Potential for driver confusion and misuse of the dynamic lane specifically when it is not intended for use.
Temporary or Hard Shoulder Running	Dismiss	■ Has potential safety concerns when drivers are entering and exiting the highway at the gore areas. This is a specific concern in the I-84 Danbury corridor where interchanges are closely spaced. ■ Does not address other modes of travel adjacent to the highway such as pedestrian, bicycle, or public transit travel modes.
Freeway Ramp Metering	Dismiss	■ Does not reduce congestion or improve mobility. ■ Creates additional congestion when motorists divert to adjacent local roads adjacent to the freeway on-ramp. ■ Does not improve mobility on local roads. ■ Does not address other modes of travel adjacent to the highway such as pedestrian, bicycle, or public transit travel modes.
Traffic Incident Management	Advance	■ Could reduce congestion and improve highway mobility with the help of roadside devices such as variable message signs and cameras which can help motorists get notifications of incidents and delays in the area. This enables them to make travel choices.
Arterial Management	Advance	■ Could reduce congestion and improve mobility on local streets with the help of traffic signal technologies. ■ Addresses other modes of travel adjacent to the highway such as pedestrian, bicycle, or public transit travel modes.
Travel Demand Management	Advance	■ Could help reduce the use of single occupant vehicles on the highway. ■ Has a potential to reduce congestion and improve mobility on the highway and on the local roads. ■ Addresses other modes of travel adjacent to the highway such as pedestrian, bicycle, or public transit travel modes.
Public Transportation Management	Advance	■ Addresses other modes of travel adjacent to the highway such as bus and rail transit.
Corridor Traffic Management	Advance	■ Does not require additional right-of-way and could be implemented in a short time frame.
Connected and Automated Vehicle Systems	Advance	■ Could be deployed in the I-84 Danbury corridor once the infrastructure and testing are completed in Connecticut.

It is recommended that these strategies be considered as early action/breakout projects.