

W A M P O

Wichita Area Metropolitan Planning Organization

Congestion Management Strategy Toolbox



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Introduction to the Congestion Management Strategy Toolbox

Traffic congestion hinders mobility of people and goods. Many areas struggle with how to manage congestion. The traditional approach has been to add capacity to the road system, such as adding lanes and building new roads. This traditional approach is very expensive to build and maintain. There are many ways to manage congestion beyond the traditional approach. The focus of the Congestion Management Strategy Toolbox (Toolbox) is to provide alternative strategies beyond the traditional approach. The Toolbox also includes the traditional approach as it is still a viable and acceptable option to manage congestion.

Using the Toolbox

The Toolbox provides options to manage congestion. The intent is not for the region to do all of the strategies identified. Prior to adding capacity to the roadway network, the region must consider reasonable alternative strategies. The region will consider reasonable Toolbox strategies during the long range planning process. Consideration of appropriate congestion management strategies will also take place during the Transportation Improvement Program (TIP) development process. These strategies will also be helpful when developing corridor studies and in the National Environmental Policy Act (NEPA) process.

The Toolbox outlines many of the potential congestion management strategies for the region. An explanation, the likely congestion impacts, and the potential costs are included for each strategy. The strategies are grouped into eight categories. The categories are:

- Technology integration and improvement;
- Access management and geometric improvements;
- Public transit improvements;
- Bicycle/pedestrian improvements;
- Work-related travel;
- Manage demand;
- Development and development patterns; and
- Add capacity.



Technology integration and improvement

Technology integration into the transportation system can help operate and manage existing infrastructure in a more efficient manner. Technology can help effectively manage congestion at a much lower cost than building and maintaining new roads or adding lanes.

Coordinating traffic signals

- Explanation: Programming traffic signals so they work together to provide improved traffic flow along a corridor.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, and reduce number of stops.
- Potential Costs: Software, hardware, operations, and maintenance.

Detecting and managing incidents

- Explanation: Using technology (cameras or sensors) or on-road vehicles to detect incidents on roads and providing a way to manage incidents and communicate with appropriate parties to take action.
- Likely congestion impacts: Reduce non-recurring delay, reduce delay caused by incidents, and reduce incident clearance time.
- Potential Costs: Software, hardware, operations, and maintenance.

Providing traveler information

- Explanation: Providing travelers with real-time information about road conditions, travel times, congestion, next bus arrival times, etc. This information can be provided via message boards, on-line, mobile devices, radio, and/or television.
- Likely congestion impacts: Reduce non-recurring delay and reduce delay caused by incidents.
- Other potential impacts: Reduce fuel consumption, reduce emissions, improve safety, and improve movement of goods.
- Potential Costs: Software, hardware, operations, and maintenance.

Access management and geometric improvements

Improvements at interchanges, intersections, and other conflict points can help with traffic flow. Turning and weaving movements cause traffic to slow, which can be a major congestion and safety issue.

Restricting left turns

- Explanation: Not allowing left turns where there are no left turn lanes, making intersection or driveways right-in, right-out only. This can include adding medians, signage, etc.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce number of stops, and reduce weaving delay.
- Potential Costs: Pavement markings, medians, and/or signage.



Adding turn lanes

- Explanation: Adding turn lanes to provide vehicles that are turning to be removed from the through traffic lanes.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, and reduce number of stops.
- Potential Costs: Construction, maintenance, pavement markings, and signage.

Improving interchanges

- Explanation: Modify interchanges to allow vehicles to move quickly through the interchange and merge with traffic safely and efficiently.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, decrease travel time, and reduce weaving delay.
- Potential Costs: Construction, land acquisition, and maintenance.

Increasing space between intersections and interchanges

- Explanation: Provide fewer intersections or interchanges along a corridor to decrease conflict points, weaving issues, and stopping along the corridor.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, and reduce number of stops.
- Potential Costs: Construction and removal of equipment.

Adding shoulders

- Explanation: Add a refuge area for disabled vehicles to be removed from travel lanes. These also provide areas for bicyclist use that is not in a travel lane.
- Likely congestion impacts: Reduce non-recurring delay and reduce delay caused by incidents.
- Potential Costs: Construction, land acquisition, and maintenance.

Adding auxiliary lanes

- Explanation: Provide a lane between interchanges on a freeway that provides drivers more time to speed up and slow down when getting on or off a freeway.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, decrease travel time, and reduce weaving delay.
- Potential Costs: Construction, land acquisition, maintenance, and pavement markings.

Adding frontage roads

- Explanation: Roads along a freeway or highway used to direct local traffic to intersections and business along the road.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, and reduce weaving delay.
- Potential Costs: Construction, land acquisition, maintenance, pavement markings, and signage.



Grade-separating or consolidating railroad crossings

Explanation:	Provide vertical separation of railroad and road to remove conflict point of railcars and vehicles. Another option, or in concert with grade-separation projects is to close railroad crossings and direct traffic to grade-separated crossings.
Likely congestion impacts:	Reduce non-recurring delay and reduce delay at railroad crossings.
Potential Costs:	Construction and land acquisition.

Public transit improvements

Improving use of, or access to, transit will have a positive effect on congestion by reducing the number of vehicles on the road.

Increasing coverage area

Explanation:	Increase the amount of area that the transit system covers and modify routes to increase the number of potential users within ½ mile of a transit route.
Likely congestion impacts:	Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
Potential Costs:	Buses, operations, maintenance, and signage.

Increasing frequency

Explanation:	Increase the frequency that buses arrive at a specific location.
Likely congestion impacts:	Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
Potential Costs:	Buses, operations, and maintenance.

Increasing service hours

Explanation:	Increase the hours of service in which buses operate (longer hours and/or more days).
Likely congestion impacts:	Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
Potential Costs:	Buses, operations, and maintenance.

Decreasing fares

Explanation:	Reduce the cost the user pays to use public transit.
Likely congestion impacts:	Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
Potential Costs:	Minimal costs.

Adding park and ride facilities

Explanation:	Use existing or add parking lots that are served by transit service to get people to and from work, special events, etc.
Likely congestion impacts:	Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
Potential Costs:	Construction, land acquisition, buses, operations, and maintenance.



Bicycle/pedestrian improvements

Improving use of, or access to, bicycle and pedestrian facilities will have a positive effect on congestion by reducing the number of vehicles on the road.

Adding facilities

- Explanation: Add bicycle and pedestrian facilities to increase use of bicycles and walking for transportation purposes. These could include options in the road right of way (bike lanes, sidewalks, side paths, etc.) or options with their own right of way (multiuse paths or sidewalks not along a road).
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
- Potential Costs: Construction, land acquisition, maintenance, pavement markings, and signage.

Improving the safety of facilities

- Explanation: Include and improve the safety of the users of bicycle and pedestrian facilities through lighting, road crossing improvements, maintenance, striping, signage, curb cuts, curb extensions, medians, etc. to increase use of facilities.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
- Potential Costs: Construction, signage, operations, maintenance, pavement markings, and lighting.

Improving amenities

- Explanation: Include and improve the amenities for bicycles and pedestrians. This would include such things as bicycle racks, bicycle lockers, bicycle racks on buses, benches, and other streetscape enhancements, especially around transit stops to improve multimodal connections to increase use of facilities.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
- Potential Costs: Purchasing equipment, installation, operations, and maintenance.

Work-related travel

Work-related travel is a major issue because much of the congestion in the region is during peak-hours, or times when most people are traveling to or from work. Reducing travel to and from work, or during peak hours, will have a positive effect on congestion.

Alternative work hours

- Explanation: Provide workers the opportunity to modify work schedule to travel to and from work at non-peak hours to reduce the number of vehicles on the road during peak hours.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, and reduce peak hour travel.
- Potential Costs: Costs to businesses will vary.



Telecommuting

- Explanation: Provide workers the opportunity to work from home to reduce the number of vehicles on the road, especially during peak hours.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, decrease VMT, and reduce peak hour travel.
- Potential Costs: Costs to businesses will vary.

Ridesharing/carpooling

- Explanation: Establish and enhance a program to provide a coordinated effort to help those willing to travel with others to increase the occupancy rates of vehicles.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
- Potential Costs: System development, operations, maintenance, and publicity.

Incentivizing alternative mode use

- Explanation: Establish a program for employers to provide incentives to employees to use alternative modes of travel (beside personal vehicles) to get to and from work. This would include transit, bicycles, walking, carpooling, etc.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce SOV travel, and decrease VMT.
- Potential Costs: System development, operations, and maintenance.

Manage demand

Providing options that reduce demand for SOV travel or vehicular travel will have a positive effect on congestion by increasing vehicle occupancy and/or reducing the number of vehicles on the road.

High occupancy vehicle lanes

- Explanation: Provide a lane of travel for vehicles occupied by more than one person.
- Likely congestion impacts: Reduce recurring delay, reduce SOV travel, and decrease VMT.
- Potential Costs: Signage, pavement markings, operations, maintenance, and potentially construction and land acquisition.

Tolling

- Explanation: Charge users of a road to utilize the road. This decreases the demand for that facility due to costs.
- Likely congestion impacts: Reduce recurring delay, reduce SOV travel, and decrease VMT.
- Potential Costs: Collections, operations, maintenance, and signage.



Development and development patterns

Development patterns have a major impact on travel patterns and can be a major cause of congestion. Development patterns that require shorter trips and less vehicular travel can aid in reducing congestion.

Pedestrian oriented development

- Explanation: Set maximum block length, building setback restrictions, streetscape enhancements, higher densities, and other design guidelines, ordinances, and development patterns to focus on providing pedestrian-friendly environments.
- Likely congestion impacts: Reduce recurring delay, reduce SOV travel, decrease VMT, and reduce peak hour vehicular travel.
- Potential Costs: Costs will vary significantly.

Transit oriented development

- Explanation: Provide higher density development along a transit corridor with walking and bicycling opportunities.
- Likely congestion impacts: Reduce recurring delay, reduce SOV travel, decrease VMT, and reduce peak hour vehicular travel.
- Potential Costs: Costs will vary significantly.

Mixed use development

- Explanation: Provide multiple land uses, such as residential, office, commercial, service, and employment in the same location (building, group of buildings, street, corridor, or neighborhood).
- Likely congestion impacts: Reduce recurring delay, decrease VMT, and reduce peak hour vehicular travel.
- Potential Costs: Costs will vary significantly.

Infill development

- Explanation: Use of existing infrastructure rather than building new infrastructure on the urban fringes.
- Likely congestion impacts: Reduce recurring delay and decrease VMT.
- Potential Costs: Costs will vary significantly.

Add capacity

Adding roadway capacity by adding lanes or building new roads is the traditional way to deal with congestion. However, studies have shown that this approach only fixes the problem short-term and has a very high cost. When addressing a congestion issue, this should be considered after all other reasonable alternatives have been considered.

Adding lanes or building new roads

- Explanation: Add road capacity by adding lanes to existing roads or building new roads.
- Likely congestion impacts: Reduce recurring delay, improve traffic flow, reduce intersection delay, decrease travel time, reduce number of stops, reduce weaving delay, reduce SOV travel, decrease VMT, and reduce peak hour travel.
- Potential Costs: Construction, land acquisition, operations, maintenance, pavement markings, and signage.

