ADDING NEW LANES OR ROADS

Description

Adding new lanes to an existing road or building new roads can reduce congestion and provide alternate routes for commuters. Providing additional lanes or a new highway, however, is a major construction project. This project type requires a significant funding commitment and typically involves a long implementation time.

This congestion mitigation technique is commonly applied to reduce serious congestion along a corridor or roadway. Although the planning and design aspects of additions and new roads are complex, the primary elements of uncertainty are acquiring the right-of-way and reducing the effects on the environment and the local community. Typical benefits from lower congestion levels and more reliable travel conditions include reduced commute times, improved freight and delivery schedules, reduced emissions and fuel consumption, and increased productivity and economic development.

Target Market

Additional lanes on current corridors are best suited for roads that have exhausted most other lower cost or more rapid implementation time options for increasing and maximizing capacity. New lanes and roads are most beneficial in urban corridors that have the necessary right-of-way for this construction. The road or area that is considered for this project should also be very congested to justify the effort and expense to develop the project. Projects to add lanes and new roads should look to incorporate other congestion-mitigation strategies into the design and operation including those strategies that manage traffic and provide travel options.

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Cost:	●●●●●
Time:	**Moderate / Long**
Impact:	**Corridor**
Who:	**City / State**
Hurdles:	**Funding**

How Will This Help?

- Adding new lanes or a new road can improve traffic flow through the area.
- The additional lanes increase the person-carrying capacity of the roadway. A new road can draw vehicles away from nearby congested roads and improve the flow on the surrounding network.
- New roads can increase mobility in the area by providing more reliable access to areas that were difficult to reach with the existing roadway system. The road can also provide additional route options.
- New lanes and roads can encourage new or re-development of surrounding lands, stimulating economic growth. As more drivers use a particular route, they may be more apt to utilize the businesses or homes in the area, possibly strengthening the economy along a particular corridor.

For more information, please refer to: http://mobility.tamu.edu/mip/strategies.php.

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- Incorporating new lanes or roads into the network can slow the rate of congestion increase. Data from 101 urban areas from 1982 to 2010 show that when vehicle capacity is increased at a rate closer to the rate of increase in the demand, areas experience slower increases in congestion, as shown in the graph below.

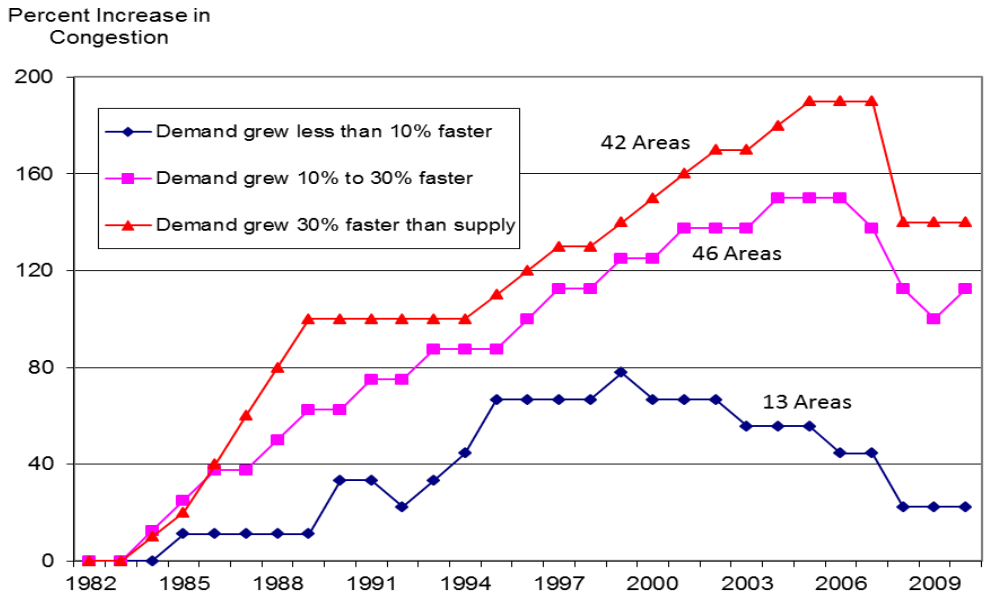
Implementation Examples

Surface Street Added Lanes and Raised Median Installation (College Station, Texas)

Beginning in the fall of 2000, TxDOT improved a 1.7 mile segment of University Drive (FM 60) beginning at Tarrow Street and continuing east of SH 6. University Drive is a major connector roadway from SH 6 into College Station and Texas A&M University. University Drive was previously a five-lane cross section (including a two-way left-turn lane) that was experiencing increased traffic growth and development. A lane was added in each direction along with a raised median to manage access along the corridor. Construction lasted approximately two years and was bid at $6.3 million in 2000. The added lanes and raised median improved traffic flow and safety of the corridor.

Freeway Added Lanes and Managed/Toll Lanes (Houston, Texas)

The Katy Freeway (IH 10) is a major east-west freeway on the west side of Houston that extends from the suburbs to the downtown. Prior to reconstruction in 2003, the Katy Freeway included two frontage road lanes in each direction and three general-purpose lanes in each direction. From 2003 to 2008, TxDOT completed a major reconstruction of a 12 mile section from west of SH 6 to the IH 10/IH 610 interchange. The freeway was widened to typically six general-purpose lanes in each direction and two managed lanes in each direction. The managed lanes allow for high-occupancy vehicle (HOV) use for free and the option for single-occupancy vehicles (SOV) to use them for a toll. The frontage roads were also widened to three lanes in each direction. The cost of the project was approximately $2.8 billion (approximately $1.5 billion for construction). The managed lanes serve to provide a mobility option to SOV drivers in the corridor and free up space in the mainlanes. The Katy Freeway reconstruction project has improved person throughput in the corridor.



Road Growth and Mobility Level (*2011 Urban Mobility Report*)

For more information, please refer to: http://mobility.tamu.edu/mip/strategies.php.

Photographs during construction (2001) of University Drive and after (2012)

Application Techniques and Principles

Roadway projects of this scale are often subject to different planning and environmental requirements that are necessary to secure funding. An environmental impact statement (EIS) should be completed if the project is expected to significantly impact the local environment. The project may also be required to minimize the air quality effects from the project, depending on the jurisdiction and local laws in the project area.

When adding new lanes or roadways to an area, the engineers, planners, and designers should consider the levels of demand at both the current and future levels. A project on the scale of adding new lanes or adding a new roadway can also change the traffic and operational aspects in the area; the project will have an impact on more than just the immediate corridor. This consideration should be discussed during the planning and design phases.

Issues

The primary concerns regarding new lanes and roadway are the available funding and space for the project. Widening a road and building a new corridor require right-of-way that can sometimes be obstructed by the current development. Cities and states should therefore work together to ensure that there is enough space for network expansion and that it will not be a detriment to the local economy or nearby developments.

Who Is Responsible?

Projects of this magnitude are often completed on all road types. The entity responsible for these projects depends on the jurisdiction of the road. One of the most common expansion projects occurs on freeways, making the local TxDOT office responsible for the design and implementation. If the new road is leading to a development, as a local street, the city officials and engineers will be responsible for the project. All entities should work together to ensure the best possible path and to ensure the project is consistent with the long-range plan of the area, serves the economy, and reduces congestion problems in the best possible manner.

Project Timeframe

The timeframe for this project type is typically very long. Adding new lanes or roads is a large undertaking due not only to the construction but also due to required impact studies and right-of-way acquisition. For added lanes or new roads on major streets or freeways, the required impact studies, right-of-way acquisition, and construction can take years to complete.

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Cost

The cost of adding lanes to an existing roadway or building a new road is relatively high compared to other congestion mitigation techniques. Adding new lanes to an existing freeway can range between $2 and $10 million per lane-mile, while large surface streets can cost about $750,000 per lane-mile. The cost of constructing a new freeway can range between $5 and $20 million per lane-mile. This number is high when compared to the approximate $1.5 million per lane-mile needed for a major surface street.

Data Needs

The city officials, engineers, planners, and TxDOT should use a travel demand model to estimate the capacity improvements needed for the roadway. The road and corridor specific data should be gathered and analyzed to consider the potential congestion mitigation and safety issues of the project.

Other useful information includes the current level of congestion, the delay reduction from the proposed change, and the current roadway geometry. These data can be used to design the best possible expansion or additional roadway.

Elements Describing the Best Practice

- Type of Location: A congested corridor or an alternate corridor adjacent to the congested corridor.
- Agency Practices: Consider added lanes or new construction after thoroughly investigating other traffic management and travel options; with added lanes or new roadway construction, integrate traffic management and other travel options into the design to the extent possible; requires extensive public outreach and stakeholder input.
- Frequency of Reanalysis: At the time of roadway widening or new construction; after substantial land use changes or development; as travel increases or trips change in the area.
- Supporting Policies or Actions Needed: Public outreach and stakeholder input; identification of substantial funding; may require transportation agency staff to work across interdisciplinary areas to identify and implement complimentary congestion-mitigation strategies into the design.
- Complimentary Strategies: Nearly all of the traffic management, travel option, and finance strategies should be considered in concert with adding new lanes or roads; consideration of all public engagement strategies are also valuable due to the importance of public outreach and stakeholder input to the success of this strategy.

For More Information

Crawford, J.A., T.B. Carlson, W.L. Eisele, B.T. Kuhn. *A Michigan Toolbox for Mitigating Traffic Congestion*, Texas Transportation Institute, Texas A&M University, College Station, TX, September 2011.

Mobility Improvement Checklist: Managing Demand, Vol. 1, Texas Transportation Institute, College Station, TX, September 2004.

Schrank, D., T. Lomax, and B. Eisele. *TTI's 2011 Urban Mobility Report*, Texas Transportation Institute, Texas A&M University, College Station, TX, September 2011.