MULTIMODAL TRANSPORTATION

Description

In some urban highway corridors, Metropolitan Planning Organizations (MPOs) or other local planners may opt to add capacity by constructing parallel multimodal transit features such as dedicated bus-only and carpool lanes or commuter or light rail service.

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Cost:	●●●●○
Time:	**Moderate**
Impact:	**Urban Corridor**
Who:	**City/Region**
Hurdles:	**Right-of-Way**

These methods are effective in allowing person travel capacity increases through the use of transit modes that can carry more passengers per vehicle with the goal of attracting trips from highway modes. Alternate modal options might include express bus, bus-only lanes, high-occupancy toll (HOT) lanes, bus rapid transit (BRT), heavy rail (HRT), commuter rail (CR), or light rail transit (LRT). Modes that have a separate, dedicated right-of-way for some or their entire trip such as BRT, HRT, CR, and LRT may, once built, also readily provide potential for additional capacity gains by adding more buses or trains or by adding additional rail cars to existing trains. Commuters that choose to use the alternative mode generally experience less congestion by avoiding a driving commute through highway congestion chokepoints; however switching enough commuters to an alternative mode may prove difficult if the station locations do not serve the proper urban destinations and/or when congestion relief or added capacity projects continue to be applied to the existing highway facility. Shifting some commuters to another mode may provide some relief in the rate of growth of congestion on the problem highway facility. Unfortunately, the congestion reduction is generally not enough to prevent further long-term roadway congestion reoccurrence unless measures are taken to make the non-highway modal option a more attractive alternative.

Multimodal corridor development normally does not only target congested road sections. Often it is undertaken when other positive effects of implementing multimodal corridor projects such as improving sustainability, livability, changing land uses in the corridor, and/or improving economic development opportunities around station locations. Planners, and more importantly the public, may feel that these important goals are better served by modal alternatives than roadway expansion or construction of a new parallel roadway to add capacity. Parallel BRT, HRT, CR, or LRT corridors (unless funded as part of highway construction mitigation project) are likely to be funded through the use of flexible (non-mode specific) transportation funding sources, through the use of funds from the Federal Transit Administration (FTA) specifically for transit improvements, or from special funding opportunities such as the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant Program under the American Recovery and Reinvestment Act (ARRA). Strategies that more directly address

problem areas of existing roadways can be devised to work in concert with these multimodal/transit improvements for overall corridor throughput; however, the complexities of planning and funding a corridor project of this type under regulations and funding sources from multiple agencies and sources can often be daunting.

Target Market

High-Traffic, Congested Urban Transportation Corridors

Development of a multimodal transportation corridor is a viable alternative to adding capacity to an existing roadway or building another parallel roadway in the same corridor. Moving some short or medium distance trips to transit can reduce some demand for capacity on existing roadways.

Corridors Where an Existing Rail/Roadway Corridor Can Be Redeveloped

Adding rail transit options to an existing or abandoned freight rail corridor may be considered as an alternative way to add capacity in a given corridor. Development on an active freight line would require negotiating with the freight railroad company. If an abandoned rail corridor or other publicly-owned right-of-way exists, re-development could be simplified; however starting or re-starting rail service may meet public opposition.

How Will This Help?

The most current state of the practice report available on use of multimodal corridors to add capacity within an urban area is TCRP Report 145: *Reinventing the Urban Interstate: A New Paradigm for Multimodal Corridors*. This report evaluated the potential for rehabilitating and reconstructing portions of interstate freeways and similar freeways within urbanized areas of the United States as multimodal transportation facilities. According to TCRP 145, "old paradigm" multimodal corridor development attempted to use a parallel transit facility primarily as a means to augment the existing highway facility capacity and focused on automobile-oriented solutions rather than adding transit as part of a comprehensive, multimodal planning process that also takes into account livability and sustainability concepts. TCRP 145 investigated whether urban highway facilities might be better enhanced, if existing corridors offered passenger mobility by multiple modes and were better integrated into communities. This "new paradigm" for multimodal corridors emphasizes building transit lines and supporting pedestrian and bicycle facilities in high demand locations in order to:

- Enhance corridor transportation capacity and performance without adding freeway capacity by building and operating transit lines (including bus rapid transit, managed lanes, light rail, heavy rail, and commuter rail).
- Building and operating successful transit systems in multimodal corridors that attract high transit ridership and encourage livability and environmental sustainability.
- Transforming a corridor's land uses and activities to be a more transit-oriented pattern.

TCRP 145 discusses three forms that a multimodal corridor would take under the "new paradigm."

Transit-oriented multimodal corridors designed to give transit a performance advantage in serving short- and medium-length trips, while the freeway serves long-distance corridor trips.

Park-and-ride access multimodal corridors designed to provide high levels of automobile access within, and high transit speeds through, the corridor.

Transit-optimized/freeway-constrained multimodal corridors designed to give transit a performance advantage in the corridor by constraining the capacity and performance of the freeway.

Implementation

Several potential project types can be undertaken to develop a multimodal corridor approach. Some examples are:

Texas: The Houston Northwest/US 290 Corridor managed lane (HOV/bus-lane) and the DART line paralleling North Central Expressway line (LRT) are highlighted in TCRP 145 as case studies of multimodal applications meant to address highway corridor congestion.

National: Many former highway-only corridors throughout the U.S. have been converted to include other modal approaches. Examples include major many urban routes as shown in the table below.

Application Techniques and Principles

Multimodal corridor development is generally not solely focused on congestion reduction on the existing highway facilities, but rather on both addressing the need for new person-moving capacity and redeveloping the corridor to increase transit use, sustainability, and livability without adding additional highway lanes.

Issues

Funding these relatively large projects is a significant implementation issue along with identification of rights-of-way adjacent or parallel to existing highway corridors. Public approval, especially in densely-developed areas, can also be problematic when trying to create new multimodal options and selecting station locations.

Denver T-REX/ IH 25 Corridor Project — CR in Highway ROW (www.co-asphalt.com)

Who Is Responsible?

Transit agency and MPO officials, along with state DOT planners, would be most likely to propose plans that include design and construction of a multimodal corridor since much of the benefit of this strategy comes from livability and sustainability within the urban area rather than direct congestion relief to the existing highway. Transit agency and MPO officials should work with the DOT to ensure that their planned improvements and operational plans interact effectively with highway operations and planned improvements to existing freeways within the same corridor.

Project Timeframe

The timeframe for development of a multimodal corridor depends on the type and/or number of modes that are being considered. A corridor

Selected Example Multimodal Corridors and Key Performance Measures

Examples Corridor	Transit Mode	Freeway Lanes	Daily Freeway	Daily Transit	Daily Total	Percent Transit
Atlanta North-South Line/SR 400	Heavy Rail	10	326,000	22,000	348,000	6%
Chicago Blue Line/ Kennedy Expressway	Heavy Rail	6	400,000	59,000	459,000	13%
Denver T-REX/ IH 25	Light Rail	6	270,000	23,000	239,000	8%
Houston Northwest/ US 290	Bus Rapid Transit	6	316,000	6,000	322,000	2%
Los Angeles Gold Line/ IH 210	Light Rail	6	242,000	24,000	266,000	9%
New Haven Line/ IH 95	Commuter Rail	6	163,000	87,000	250,000	35%
Point Line/ SR 24	Heavy Rail	8	204,000	57,000	261,000	22%
Washington DC Orange Line/ IH 66.	Heavy Rail	6	127,000	139,000	266,000	52%

Source: Adapted from TCRP 145 Appendix B, p. 80

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

program that includes multimodal improvements such as a BRT or passenger rail component with a dedicated right-of-way apart from the freeway structure and associated land use impacts/changes may take many years (or decades) to fully implement. As a result, TCRP 145 and other research suggests that urban planners should work to preserve corridors and incrementally develop elements of the multimodal corridor over long periods of time as funding and treatment for individual components of the larger strategy become available.

Cost

Project costs vary widely depending upon the modes selected for implementation and whether new right-of-way must be purchased. A project to construct a dedicated bus- and carpool-only facility within the existing highway right-of-way or joint-use managed lanes will be less costly to construct than a parallel BRT or rail line in a new right-of-way but may not provide the land use, economic, livability, and sustainability benefits that a fixed-guideway or BRT option might. Incrementally funding elements of the overall multimodal strategy may be necessary, but such an approach often increases overall cost over one-time funding of a complete strategy program.

Data Needs

Data needs for multimodal corridor implementation go well beyond the analysis of transportation factors alone. Data on demographics, societal impacts, land use plans and regulations, and economic development are just a few of the other factors that must be taken into account in addition to transportation effects. Additionally, factors such as sustainability and livability impacts expected from the projects must be estimated.

A process for evaluating the sustainability of improvements within an urban corridor can be found in TTI's report from TxDOT Project 0-5541 as referenced below. Researchers used a multi-criteria decision-making methodology to evaluate, benchmark, and aggregate the performance measures into a set of "sustainability index" values. The methodology, applicable at the highway corridor level, was integrated into a user-friendly, spreadsheet-based analysis tool that was used to carry out several case studies including development scenarios, including along the US 281 corridor in the San Antonio region. The methodology and tool developed were found to be useful to assess progress toward TxDOT's strategic plan goals while also addressing sustainability issues. The results and findings of this project could be used to compare relative sustainability of different corridor strategies or assess corridor development options over a period of time.

Multimodal Transportation Corridor Improvement Best Practices

- Type of Location: Congested urban corridors that need additional capacity added beyond what expansion of the existing freeway can provide.
- Agency Practices: Cooperative relationships between MPOs, transit agencies, local and regional planners; ability/willingness to fund needed transit improvements in corridors parallel to congested highways.
- Frequency of Reanalysis: Should be considered whenever urban transportation, transit, and/or rail planning documents are updated or in conjunction with intercity rail planning at the state level.
- Supporting Policies or Actions Needed: Option to select funding of transit and passenger rail (express bus, bus-only/managed lanes, bus rapid transit [BRT], commuter rail [CR], heavy rail [HRT], or light rail transit [LRT]) to address capacity needs in a transportation corridor; more authority to invest in stations, rolling stock, equipment, etc. that would facilitate automobile to transit diversion.
- Complementary Strategies: Development of intercity passenger rail that would connect to urban transit corridors, use of freeway shoulders by buses during peak travel times, managed lanes, land use planning.

For More Information

Transportation Research Board. *TCRP Report 145: Reinventing the Urban Interstate: A New Paradigm for Multimodal Corridors*, Washington, DC, 2011.

Ramani, T., Zietsman, J., Eisele, W., Rosa, D., Spillane, D, and Bochner, B. TxDOT Report 0-5541-1: Developing Sustainable Transportation Performance Measures for TxDOT's Strategic Plan, FHWA/TX-09/0-5541-1, Texas Transportation Institute, College Station, TX, April 2009. Available: http://tti.tamu.edu/documents/0-5541-1.pdf.