

# Multimodal Transportation Approaches in Minnesota

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In the United States, improved multimodal (and intermodal) approaches are required to reduce transportation costs and urban congestion and provide effective rural access. The Minnesota Department of Transportation (Mn/DOT) has been actively involved in multimodal planning for several years and has incorporated it into a variety of planning activities including the Strategic Plan. Mn/DOT's view is that an effective solution to the nation's transportation problems must be based on a multimodal family of vehicles concept. In urban areas, the new concepts must be applied in congested highway corridors. Such approaches also include development of light rail transit and super-speed trains. In rural areas, Minnesota is concentrating on its Rail Service Improvement Program and Freight Access Improvement Program. Aspects of public and legislative support, financial alternatives, and private sector involvement in Minnesota's multimodal planning are also discussed.

A number of factors at both the national and state levels emphasize the need for increased transportation efficiency and for innovative, multimodal approaches to help fill the nation's transportation needs. Foremost among these factors is heightened global economic competition.

The United States needs a top-notch transportation system if it is going to compete in the world market. Recently, in a statement published by the Economic Policy Institute, 327 of the nation's top economists warned that if the country does not increase its infrastructure investment rate it will cripple its ability to compete in the world economy (1). For every dollar of export goods, about 25 cents is spent on the transportation of raw materials and intermediate goods in the process of being assembled into final products.

The United States has fallen behind its strongest international competitors in terms of making the infrastructure investments to give it the transportation advantage needed to help offset such advantages as lower wage rates in many foreign countries. According to a recent article, the United States now ranks 55th in the world in the percentage of gross national product (GNP) invested in capital infrastructure (1).

David Aschauer, an economist at the Federal Reserve Bank of Chicago, has developed strong evidence that links the lack of investment in infrastructure to the slowdown in economic productivity that the United States has experienced since 1970. His study suggests that investment in highways, mass transit, airports, and sewers is strongly related to a nation's economic productivity and its ability to compete in the world market. Among the seven countries studied by Aschauer, the United States had both the slowest rate of productivity growth and the lowest ratio of infrastructure investment to GNP. Japan leads in both measures (2).

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These findings indicate the need for a greater investment in our transportation infrastructure if the United States is going to successfully compete with other nations in the world economy of the 1990s and beyond the year 2000.

Three major areas stand out among overall transportation deficiencies in America. These include the need to

- Reduce transportation costs,
- Manage urban congestion, and
- Provide effective rural access.

Improved multimodal and intermodal approaches will be required to effectively respond to these major issue areas.

## TRANSPORTATION COSTS

Reducing transportation costs requires that goods and people be moved by the most efficient means. The availability of effective multimodal transportation alternatives and intermodal connections can help reduce shipping costs to maximize efficiency. Examples of multimodal and intermodal approaches include

- The availability of transit and highway connections for moving people in the nation's congested urban centers,
- The continuation of the operation of profitable rail branch lines,
- The strengthening of roadways to increase their load carrying capacity in areas where rail lines have been abandoned, and
- The provision of improved highway and rail access to water terminals.

These kinds of multimodal approaches will be needed to help ensure U.S. competitive position in the world market. The smooth and reliable functioning of the transportation system is also the key to lowering costs through "just in time" inventory control. Here, costs are kept down by having products available to a manufacturer or retailer just as they are needed, without costly warehousing.

## URBAN CONGESTION

Increasing urban area congestion is a second factor that strongly reinforces the need for multimodal approaches and intermodal connections to meet transportation needs.

There is a growing need for increased capacity to move people in the nation's metropolitan areas. In Minneapolis—

St. Paul, congestion is beginning to threaten the levels of mobility needed to preserve the area's attraction for industry and economic development. Forecasts indicate vehicle-miles of travel (VMT) will increase 26 percent by the year 2000, and that 206 mi of the metro area freeway-expressway system will be congested for over 2 hr every weekday.

In the face of this deteriorating traffic situation, it is becoming increasingly clear that new and expanded new road construction alone cannot realistically be expected to solve the urban congestion problem. A major reason is cost, but money is only part of the problem. Besides the dollar costs, there are the social costs of divided neighborhoods, environmental costs, and a public mood opposed to additional freeways. Multimodal and systems management alternatives will be needed to address the congestion problem in an acceptable manner.

## RURAL ACCESS

Providing improved access to rural America will also require a multimodal approach and improved intermodal connections. Air, rail, and intercity bus service to rural communities have deteriorated. As a result, rural mobility and access to urban areas have often suffered. In addition, lower-volume rural highways have faced increasing competition for highway improvement dollars from congested urban routes and rapidly developing suburban areas. Resolution of the transportation problems facing rural America will require a recognition that the problems are multimodal in nature and that solutions will demand improved multimodal planning, programming, and funding approaches.

## MULTIMODAL PLANNING IN MINNESOTA

The Minnesota Department of Transportation (Mn/DOT) has been actively involved in multimodal planning for several years. The experience in Minnesota suggests that the practice of multimodal planning is most effective when the following five conditions are met:

1. Agency organizational structure and mission encourage multimodal planning and intermodal coordination,
2. Agency philosophy promotes a family of vehicles concept,
3. There is public and legislative support for multimodal transportation solutions,
4. Funding sources are available for multimodal transportation programs, and
5. Private sector initiatives emerge to identify and promote multimodal opportunities.

The presence of such conditions is helping to foster multimodal transportation opportunities in Minnesota.

### Mn/DOT's Organizational Structure and Mission

Mn/DOT has established an organizational structure to manage and promote multimodal planning. The Program Man-

agement Division, under the direction of an assistant commissioner, is responsible for developing investment and management strategies to enhance the effective movement of people and goods. This structure consists of modal office directors for transit, aeronautics, highway, rail, and waterways. This arrangement promotes ongoing coordination and open discussion of individual modal issues and multimodal relationships and solutions.

The multimodal planning theme is also being incorporated into a variety of Mn/DOT planning activities, including the mission statement of the department's Strategic Plan. The introduction to this plan states the following:

We are now entering an era where we also need to be good at managing our transportation system. In addition to planning, financing, designing, constructing and maintaining, managing will focus on operating the system. This will require increased coordination and use of all modes of transportation, thus assuring that Mn/DOT will remain a true multi-modal Department of Transportation (3).

### Mn/DOT's Philosophy Promotes a Family of Vehicles Concept

Mn/DOT's view is that an effective solution to the nation's transportation dilemma must be based on a multimodal family of vehicles concept. The family of vehicles concept includes private automobiles, vans, buses, air, light-rail transit, super-speed train, and bicycles for moving people—and highways, air, rail, and water for moving commodities. In the Twin Cities metropolitan area, an appropriate response to address the area's needs might include highways, improved bus service, light-rail transit, and high-occupancy vehicle lanes. In rural areas, rail rehabilitation, increased highway load-carrying capacity, and transit service may best fill transportation needs.

### *Multimodal Transportation Activities in Urban Areas*

**Corridor Design Concepts** Minnesota has been a pioneer in the application of multimodal and intermodal transportation system management approaches in congested urban highway corridors. In 1972, the Minnesota Department of Highways (now Mn/DOT) instituted a state-of-the-art freeway management system on I-35W through Minneapolis and its southern suburbs. Since that time, similar traffic management techniques have been applied to other portions of the metropolitan area freeway system.

Minnesota's most comprehensive approach to freeway system management is being implemented on I-394. The I-394 corridor is a radial route extending from the Minneapolis CBD to Wayzata, a distance of about 11 mi.

The I-394 transportation system design concept constitutes an intermodal approach that includes many transportation elements focused on maximizing corridor transportation efficiency and service to users. Some of the elements include the following (4):

- Public information programs and community-based ride-share programs and bus services;
- Five new park-and-ride lots and expansions of existing lots throughout the service area;

- Expanded bus service, focusing on a timed-transfer system concept supported by two major transit stations on I-394 and several other stations throughout the service area;
- High-occupancy vehicle (HOV) lanes and bypasses of ramp meters for buses, carpools, and vanpools;
- Adequate law enforcement to support the HOV express lanes;
- Three parking garages offering I-394 users low-cost, transit-accessible, preferential parking for carpools and vanpools;
- Pedestrian skyways connecting the parking garages to downtown Minneapolis employment centers; and
- Work-end public information programs, employer-based rideshare programs, and bus services.

Based on travel forecasts, Mn/DOT expects that the I-394 corridor facility will provide the following benefits when completed:

- Provide a reasonable level of service for the 187,000 person-trips per day estimated for the year 2000,
- Reduce peak-hour congestion by achieving a long-term automobile occupancy goal of 1.6 persons per vehicle,
- Provide improved bus service to effectively serve the projected 14,000 daily riders on I-394,
- Save HOV users traveling the 11-mi trip from Wayzata to downtown Minneapolis an average of 11 min in the peak period,
- Save single-occupant drivers traveling from Wayzata to downtown Minneapolis an average of 5 min in the peak period,
- Save I-394 HOV users \$3 to \$4 per day in parking costs in addition to savings in automobile operating and maintenance costs, and
- Reduce the accident rate by 70 percent.

The I-394 HOV lane and related efforts clearly demonstrate the potential that comprehensive, multimodal, and intermodal approaches hold for relieving congestion and improving transportation efficiency in a major metropolitan area.

**Light Rail Transit** A variety of approaches will be necessary to solve urban congestion problems. In the Twin Cities, light-rail transit (LRT) can play an important role in providing additional capacity in high-density traffic corridors. LRT is being developed through a partnership among the seven urban counties, the Regional Transit Board, and the state Mn/DOT. Using local taxing authority, the counties have contributed approximately \$20 million to date. The state, since 1988, has contributed over \$10 million for an LRT grant program. The program is being administered by Mn/DOT, and provides funding for LRT planning, preliminary engineering, design, and construction.

The legislation, creating the state grant program, states that (a) regional railroad authorities in the metropolitan area are eligible to receive the funds, (b) the funds must be matched on a dollar-for-dollar basis, and (c) no regional railroad authority can receive more than 60 percent of the funds.

Mn/DOT has established the following categories for allocating LRT funds: (a) design and construction of LRT, (b) preliminary engineering, and (c) comprehensive planning.

More detailed application guidelines spell out the requirements for the three funding categories. Although requirements for a comprehensive plan are extensive, Mn/DOT permits a staged planning effort so counties and corridors not being considered for immediate LRT implementation may still receive funding.

Oversight for Twin Cities area transit is provided by the Regional Transit Board. The Regional Transit Board developed and approved the final metropolitan area light-rail plan February 15, 1990. The \$400 million (1991 estimated cost) first stage includes a line between downtown Minneapolis and downtown St. Paul, yards, shops, and a tunnel up to 2.2 mi in length in downtown Minneapolis.

The Regional Transit Board is considering the feasibility of a 1 percent metropolitan area sales tax to finance the first stage of light-rail transit development. Current proposals suggest that the revenues from the 1 percent regional sales tax could potentially be shared with highway, other transit, and regional trail needs. Metropolitan area counties are to help pay for lines built after the first stage is completed. The 1991 capital cost estimates for a maximum 10-year LRT plan are projected to be approximately \$1.6 billion.

**Super-Speed Train Service** Super-speed train service offers great promise for relieving airport congestion and increasing intercity transportation efficiency in crowded corridors. Super-speed trains, including both steel wheel and magnetic levitation vehicles, are in the planning stages or operating in at least 17 countries around the world.

There is increasing interest in super-speed trains in the United States. Several states including Florida, Ohio, California, and Nevada have been investigating high-speed rail. Recently, the states of Minnesota, Wisconsin, and Illinois have agreed to conduct a preliminary feasibility study of super-speed train service linking the Twin Cities, Milwaukee, and Chicago. The purpose of the study is to determine whether there is sufficient public interest in using such a super-speed train service.

The \$300,000 feasibility study will explore all super-speed train technologies (including magnetic levitation), their costs, potential route corridors, and ridership. A proposed super-speed train system would likely require private financing.

#### *Multimodal Transportation Activities in Rural Areas*

A multimodal approach is needed to properly address rural Minnesota's transportation needs. These needs include the following:

- The capacity to attract economic development and employment;
- Efficient commodity movements;
- Improved transportation, especially for the transit dependent;
- Improved intermodal connections and transfer facilities; and
- Enhanced accessibility to recreational areas.

In order to address these issues, Mn/DOT has extended its multimodal transportation improvement efforts into the small

urban and rural areas of the state. Many of these areas suffer from a lack of adequate transportation services. The solutions involve highways, public transportation, rail, and air service.

**Rail Service Improvement Program** The Minnesota Rail Service Improvement Program began in 1976 with the creation of the Minnesota Department of Transportation. The program is designed to improve rail service by combining state revolving loan funds with rail user and private railroad funds for rail line rehabilitation and other rail service improvement projects (5).

Minnesota's Rail Service Improvement Program has been a real success story. The program, which requires local shippers and railroad participation in rail revitalization efforts, is an outstanding example of state-local and public-private cooperation. Without the program, many rail lines that are now viable operations would have been lost. The result would have been higher overall shipping costs, additional damage to the state's highways as a result of increased truck traffic, and a negative impact on the rural economy.

**Freight Access Improvement Program** In addition to the Minnesota Rail Service Improvement Program, Mn/DOT has developed a public-private approach to roadway improvement financing in rural areas known as the Minnesota Freight Access Improvement Program. This program is especially useful in instances in which it is not financially feasible to preserve rail freight service and yet the need for efficient commodity movement exists. The program involves a three-way match of state funds with local private funds and local road authority funds. The focus of the program is on improvement of local access roads or connectors to enable them to serve as connectors from businesses and communities to the 10-ton road system.

#### **PUBLIC AND LEGISLATIVE SUPPORT FOR MULTIMODAL TRANSPORTATION SOLUTIONS**

Public and legislative acceptance and support are critical to the successful implementation of multimodal transportation initiatives. In Minnesota, a number of activities have occurred to promote broader levels of support and heightened awareness of multimodal planning. A good example occurred in 1989, when a long-standing highway interest group, Minnesota Good Roads, Inc., announced that it would change its name to the Minnesota Transportation Alliance. This change served as a visible sign of the group's broadened awareness and interest in dealing with overall surface transportation problems and issues in Minnesota, not just those related to highways.

A second example of the increased emphasis on multimodal planning is evident in the charge and research agenda of the legislatively created Transportation Study Board. This board was given the assignment to conduct a study of Minnesota's total surface transportation needs into the 21st century. The board will recommend a program for making multimodal transportation improvements to meet needs in the years ahead.

#### **MULTIMODAL FINANCING ALTERNATIVES**

A variety of transportation financing alternatives must be available to meet the transportation investment needs of the 1990s. A family of financing alternatives concept will be needed similar to the family of vehicles concept. The family of financing alternatives might include private contributions, tax increment financing, impact fees, and toll roads. In addition, the use of traditional transportation revenue sources must be expanded to provide for multimodal programs.

In Minnesota, a new approach in user fee concepts was instituted in 1981 when legislation was passed to permit the phased transfer of motor vehicle excise tax revenues from the state general fund to a state transportation fund (6). Under the provisions of this legislation, 75 percent of motor vehicle excise taxes are allocated to highway (shared by state, counties, and cities) and 25 percent of revenues are directed to a state transit assistance fund. Eighty percent of the transit portion of motor vehicle excise tax revenues supports transit systems in the Minneapolis-St. Paul metropolitan area and 20 percent supports transit systems in other areas of the state.

The phased transfer of motor vehicle excise tax revenues for multiple transportation uses represents a significant step in addressing overall mobility needs in Minnesota. The transfer accomplishes the following:

- Supplements existing highway revenues to meet needs of the state, counties, and cities;
- Provides an inflation-sensitive revenue source for highway improvements;
- Reduces dependence on bonding to finance highway projects;
- Provides a stable source of revenue for state assisted transit services, replacing biennial general fund appropriations;
- Permits the expansion of transit program services to meet future needs; and
- Provides a potential source of revenue to support other transportation programs such as rail rehabilitation and light-rail transit development.

The sharing of motor vehicle excise tax revenues between the highway and transit modes represents a breakthrough in terms of intermodal cooperation and revenue sharing. Without consensus building among urban and rural interests and highway and transit proponents, the legislation for transferring motor vehicle excise taxes from the general fund to transportation would not have been passed. It is this consensus building and cooperation among diverse interests that offers the hope and promise of additional multimodal funding approaches as future needs arise.

In addition to motor vehicle excise taxes, Mn/DOT rail service improvement funds also support multimodal planning objectives. For example, when a rail line is abandoned, Mn/DOT, or any established regional rail authority, may use rail service improvement funds to purchase all or part of the right of way through the state's rail banking program. The rail banking program permits these acquisitions conditioned on future use of the right-of-way for transportation purposes. Transportation use may include highways, bikeways, light-rail transit, and pipelines. Rail service improvement funds are also being used to finance the super-speed train feasibility study.



## PRIVATE SECTOR INVOLVEMENT IN MULTIMODAL PLANNING

Multimodal planning is most effective when it results in more efficient transportation service. The private sector, rather than government, is most often in a position to recognize how optimal modal choices and intermodal connections can enhance efficiency and reduce transportation costs. For this reason, the continued success of multimodal planning initiatives will be highly dependent on the private sector's ability to serve as a catalyst for identifying and promoting multimodal opportunities. A breakthrough concept in private sector involvement in multimodal planning and intermodal coordination is underway in Europe. Lufthansa provides tickets that combine flying by air and "flying by rail." Passengers purchase one ticket that allows them to move from their origin to their destination by a combination of air and high-speed rail. This is an example of the kind of change that will be needed to make the United States a world class competitor in transportation in the 1990s and beyond.

In Minnesota public and private groups, local businesses, citizen groups, and city, county, and state governments are forming partnerships to make needed transportation improvements (7). The business community has been an important factor in transportation decision-making for many years. Industry leaders and business interests have often been the major impetus for transportation improvements. They have also played a leading role in developing strong coalitions supporting legislative programs to provide transportation funding. In the Twin Cities metropolitan area, the Improve 494 Association has been created by private business representatives along the Interstate 494 beltway. The Improve 494 Association has conducted a travel behavior survey and contributed \$90,000 to the preparation of an environmental impact statement to review multimodal and intermodal improvement alternatives. The groundwork for a similar association is also being laid in the city of Minneapolis, where business leaders are interested in multimodal and intermodal solutions to downtown congestion problems.

## FUTURE DIRECTIONS

Federal and state governments are increasingly recognizing the importance of multimodal transportation policy development, planning, programming, and funding.

Federal transportation policy, *Moving America: New Directions, New Opportunities*, states "program must allow for a broad range of options, permitting investment in cost-effective projects that enhance capacity or make better use of existing resources, such as high occupancy vehicle lanes for carpools and buses. . . . Smooth, efficient travel depends on good connections between different parts of the transportation sys-

tem." AASHTO recommendations on the new national transportation policy include the following:

- Categorical highway and transit programs, and
- Flexible grant program including both highways and public transit.

In addition, AASHTO supports 20 percent state flexibility for shifting funds between the flexible and categorical programs, further increasing the potential for multimodal program and project funding.

At the state level, last January, the nine-member Advisory Committee For Alternative Transportation Financing recommended the use of new, alternative funding methods in Minnesota to address the serious problem of infrastructure needs. A number of the financing alternatives recommended by the committee offer promise of providing funding for multimodal and intermodal facilities both in the Twin Cities metropolitan area and statewide.

## CONCLUSION

Worldwide economic competition, the costs of new improvements and increasing travel emphasize the need for more efficient and cost-effective transportation services to address the nation's needs. Experience in Minnesota suggests that these challenges can best be met when transportation agency funding philosophies, sources, public, legislative, and business interests support multimodal transportation alternatives and intermodal connections. Further development of the mechanisms, associations, and partnerships that foster and encourage multimodal planning can be expected in the years ahead.

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