International and National Benchmarking
For Urban Transportation Corridor Development

December 2003

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As transportation and transit corridors have become increasingly common as focal points for urban design, corridor development has emerged as one of the more interesting and complex issues in transportation planning. Problems with corridor development are always large: they need to ensure access to transportation, provide high quality transportation, develop livable communities and provide for economic development along the corridor. These problems are exacerbated and new problems are created when a corridor crosses jurisdictional boundaries.

There is a need for a model that addresses the major problems in corridor planning and management. This report develops such a model that is based upon 5 major areas of the corridor development process: governance, economic impacts, financing, design and citizen preferences. Lessons are drawn from several case studies of corridors. The prescriptive abilities of this model are then tested through analysis of local transportation corridor improvements.
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State and Local Policy Program
Hubert H. Humphrey Institute of Public Affairs
University of Minnesota

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Foreword

This study is the latest in a series on urban transportation corridor redevelopment by the State and Local Policy Program at the University of Minnesota’s Hubert H. Humphrey Institute of Public Affairs. Hennepin County and the Federal Transit Administration, through the leadership of Congressman Martin Sabo, have sponsored the research.

The study sets out an analytical methodology that examines corridors from 5 different perspectives: citizen involvement, governance, financing, economic development and design. Several notable corridors from North and South America are then examined to discern lessons about how they addressed each of these issues. Practical lessons learned from these case study analyses are drawn out and discussed, and the study concludes with a suggested decision tree model to guide planners of future urban transportation corridors.

Acknowledgement

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Executive Summary

This study is the latest in a series on urban transportation corridor redevelopment by the State and Local Policy Program at the University of Minnesota’s Hubert H. Humphrey Institute of Public Affairs. Hennepin County and the Federal Transit Administration, through the leadership of Congressman Martin Sabo, have sponsored the research.

The first study, in 1997, recommended that transportation and community economic development be integrated in corridor planning. Subsequent studies have followed this recommendation in developing an integrated framework for analyzing transportation corridor development, which recognizes that corridor developments affect five areas:

- citizen preferences,
- governance,
- financing,
- economic effects, and
- design.

This study attempts to enhance and refine this framework by examining case studies of urban transportation corridors that are examples of best practices in one or more of these areas. To identify these corridors, the research team cast a broad net, defining a corridor as simply “a geographic area between two points, linking multiple centers, and moving people and freight.” The team considered corridors developed for freight movement as well as passenger, and also corridors that serve either multiple or single modes.

Ultimately, the team settled on 10 corridors that it viewed as “successful,” that is, that accomplish the goals for which they were originally established. While these goals typically include reducing congestion and its externalities, and/or serving as an anchor for development, the team learned that these corridors also were the result of planners’ abilities to integrate and balance these five components, including recognizing when it was appropriate to sacrifice parts of one component to ensure successful implementation of others.

The study included a significant outreach element as well, beginning with a roundtable in October, 2001, to engage local experts and develop a common understanding of corridors. This forum also provided an opportunity for participants to comment on the proposed framework, and suggest potential case study corridors.

After incorporating the lessons from the roundtable, and considerable research on the ten corridors, the research team hosted a case study conference that featured a preview of findings from the research team’s work in the five areas, and representatives from three cases that the team felt were exemplary in several areas: the I-15 “managed lane” in San Diego, the “T-Rex” project on I-25 and I-225 in Denver, and the busway system in Ottawa, Ontario, Canada. Through these cases, participants learned of innovative financing plans, efforts to gain public support, and how different modes and design schemes were developed to suit the surroundings.
Lessons Learned: Based on this case study research, and feedback received from related research efforts, the research team has discerned the following points as being key to successful corridor implementation.

1. Get to know for whom you are planning, and meet them on their terms.
Because of their technical training, it at first appears that planners can know how to meet a community’s needs through the analysis of passively collected data, rather than actually engaging the members of that community, or by presuming that people’s behavior will change to fit a planned change. Of course, as discussed in section IV, laws now mandate community involvement. Instead, the common mistake is that a planner can believe the community has been engaged and informed through a number of open houses and other events planned and scheduled by the governmental agencies involved.

While these separately scheduled open houses, and a clear understanding of travel behavior, housing patterns, and similar data, will help ensure a project is planned properly, these steps fail to reach the high threshold many members of the public require before a project gains their attention. Often, this threshold is only achieved with the arrival of large construction equipment. The case studies identified here as being exemplary from the citizen involvement perspective succeeded because the planners recognized that, in addition to the steps mentioned above, they need to get on agendas of already planned meetings of existing groups and build to relationships with these groups, so that they could receive feedback throughout the life of the project, and develop a level of trust.

2. Tailor the five components to meet local conditions.
Sometimes satisfying all of the components to corridor implementation equally is not possible, or even appropriate. Local conditions vary, and local political, financial or other conditions can dictate which elements carry the day when they come into tension.

In the case of Boston, governance’s initial failures to recognize the strength of community activism lead to a huge role for the residents in project development. As a result, less emphasis was placed on financing. This was indeed an appropriate move: over ten years after the land had been cleared for the highway, nothing had been built. With land acquisition costs already taken care of, but suspicious neighbors all along the corridor, receiving resident input and “doing it right” the second time around became greater priorities than saving additional dollars or speeding project completion.

Conversely, in the T-REX project in Denver, the project hinged upon demonstrating that the financial house was in order. The project needed a significant amount of federal support, and local match dollars were needed to secure this support. Consequently, planners took a two-pronged approach: emphasizing financial mechanisms to control costs, such as design-build, and emphasizing governance measures to demonstrate the revenue would be raised, such as the Memorandum of Understanding that all but committed local entities to contribute towards the local match. In this process, citizen input was muted until the funding was in place. This trade off was appropriate, however, in that public support had already been demonstrated by the wide margin of victory for the transit funding referendum.
3. **Recognize priorities can change as scale changes.** The T-REX project also demonstrates that while controlling costs and speeding completion can be key elements on a large scale, it might be more prudent to emphasize other elements, such as citizen involvement, on smaller scale projects. As mentioned above, the T-REX project enjoyed significant citizen support when presented in funding referenda. However, it has encountered difficulties as citizens have objected to the station designs included in the design-build plan, raising the potential for expensive change-orders. This suggests that it may have been wise to keep these outside of the design-build plan. They are the most site-specific, most easily get the attention of project neighbors, and consequently could require greater amounts of time to achieve consensus and support. Also, given the potential successful station sites to generate revenue and development through creative zoning and public-private partnerships, controlling financial costs may be of less importance.

4. **Have a champion.** The most successful corridor projects are those that have a strong supporter behind them. Whether it is a politician, a contractor, planner or community group, projects to which the population can attach a name have far better chances than those that do not. Ever shifting staff and a lack of supporters show a low level of commitment. A project champion pushes the project at all times, dismisses false rumors, and puts their project in the spotlight. A project supporter with clout is ideal.

The perfect situation arises when the champion is not only recognized in the media, but on the personal level. In San Diego, a member of the city council built relationships with the existing neighborhood groups, meeting with them on their schedules (see recommendation 1) and building their support, as well as making the case on the larger scale and in the city council chambers. Such an effort obviously requires time and energy, but without the ability to “put a face” with a project in a positive manner, the ability to build and maintain support for an innovative project is hampered.

5. **Do not let present economic conditions affect a future vision.** While both the economy and people’s confidence in it fluctuate greatly, improving the future should not wait for tomorrow. Transportation projects can often be the impetus for lifting an area out of the economic doldrums, as they are a use of public dollars to attract private investment. The cases that are notable for economic development point out that the key is ensuring that a vision is built which attracts the private dollars as the public dollars are being spent. The vision must improve the status of the current residents while improving the attractiveness for new residents and investors. The corridors in Ottawa, Dallas, Portland and Vancouver are all examples of how providing additional transportation access that served needs identified by key stakeholders would lead to jump-starting the economy of a declining area.

6. **Do not let a technology or a design drive the planning process.** While the preceding notes indicate that it would be foolhardy to prescribe an order for addressing the five areas, several of the case studies demonstrate the value of not choosing the design style or technology used (rail, bus, etc.) until at least public involvement and governance issues have been addressed.
The greatest success in this regard is the I-15 corridor in San Diego. In an area that already had a successful light rail system, the planners and elected officials avoided a “one-size-fits-all” approach and worked to understand the particular nuances of this corridor. As a result, they were able to realize the opportunities created by the existing HOV lane in this corridor rather than simply add another light rail line that would require additional funding from existing revenue streams, they are created a BRT line that uses the existing lane, and receive funding from tolls paid by single occupant users of the lane. The corridor has been so successful that it has led to a multi-modal strategic plan that utilizes several different funding sources and identifies the most advantageous roles for each technology based on the places it would serve(Schumacher, 2002).

The opposite situation can be seen in the initial attempt to build a highway in Boston’s Southwest corridor. Although the planners did not have the benefit of hindsight available to those planning corridors that came later, they did make the mistake of assuming a freeway facility would be appropriate for the area, as they were expanding the freeway network throughout the metro area.

7. Connect with regional transportation planning and funding process. Throughout the case studies, a common attraction to the corridors was their ability to galvanize interest around a specific spatially-bound set of improvements. And often, as in the case of I-15 and T-Rex, these improvements were set to occur in sub-regions that were experiencing growth and hence were playing to a natural local constituency. However, the broader framework of regional transportation planning and financing can work against corridor developments, unless careful steps are made to balance the corridor plan with other priorities throughout the region. Successful integration into an overall regional schema would help ensure that the corridor is not viewed as a "zero-sum" proposition--that is, taking from other parts of the region. Rather, it can be viewed has present an innovative element to the regional plan. Moreover, to the extent this integration occurs, it will be easier to access federal and local funds that are allocated by state departments of transportation and metropolitan planning organizations.

8. Amend local zoning, as necessary. Too many times, planners are stopped in their tracks by zoning regulations. However, much of what people do like or do not like about an area can be traced to these requirements. Instead, implementing flexible zoning regulations that allow adaptation according to community needs will allow developers to respond to trends and truly “reinvent” places left behind.
Introduction

In the late 1960s, a stretch of land almost five miles long in southwest Boston was designated the future home to the Interstate 95 extension. Traffic congestion in the historic city was worsening by the day and the at-grade railway that ran through Boston’s southwest sector seemed an ideal location for an elevated highway. It would be similar to the Central Artery, constructed a few years before in the North End, and would make Boston’s highway system one of the most efficient and modern in the nation. Buildings were demolished as the land was cleared. Everything was in place.

But then something unexpected happened. Neighborhood residents rallied against the highway project and organized so effectively that the entire project was stopped. The new governor had different priorities as well, and the accommodation of more automobiles into downtown Boston was deemed irrational. What was once the future site of an intrusive highway would become home to a below-grade multi-modal transit corridor, surrounded by development and community gardens. It has been an outstanding success in terms of transit ridership, redevelopment without re-gentrification, and an object of community pride. The Central Artery, on the other hand, has resulted in the “Big Dig”- a multi-billion dollar effort to bury the elevated highway and reunite the neighborhoods previously separated by it.

The State and Local Policy Program (SLPP) of the University of Minnesota’s Humphrey Institute of Public Affairs believes that Boston’s Southwest Corridor and other highly successful examples can serve as models for transportation corridors throughout Hennepin County, the state and the nation. The secrets to their success, while subject to timing and location, hold insights that can be applied universally. SLPP has chosen to examine best practice case studies in transportation planning from around the globe. By analyzing successful corridors, SLPP hopes to address common challenges and synthesize lessons learned into a potential strategy for corridor implementation.
I. Definitions and Background

For this work, SLPP and its research partners define a transportation corridor as a geographic area between two points, linking multiple centers, and moving people and freight. Corridors are often targets of infrastructure improvement, especially when they fail to efficiently move those that rely upon them. The state of a region’s corridors may also reflect the state of the region’s economic health.

In considering corridors, it is important to understand the difference between accessibility and mobility. Accessibility is the ease at which we reach a location. Mobility is the ease at which we travel. A good transportation corridor provides both accessibility and mobility. Transit Oriented Development (TOD) is an attempt to combine these and reduce our dependence on the automobile. By concentrating mixed-use development within walking distance of a transit station, TOD attempts to take advantage of a corridor’s ability to move people efficiently, and also serve as stimuli for sub-regional economic development.

The Intermodal Surface Transportation Efficiency Act (ISTEA) is the federal legislation that encapsulates, and began to codify a new attitude in infrastructure implementation. Before ISTEA’s passage, transportation planning regulations often did not appear to be connected to the very people they were supposed serve. Infrastructure was put in place under the assumption that as long as increased speed and additional capacity had been accomplished, the project could be considered a success. But backlashes against intrusive projects, such as Interstate 95 in Boston, led to ISTEA’s creation. Passed in 1991, ISTEA is a holistic approach to transportation planning that emphasizes mobility, access, equity, reduction of external impacts, public involvement and multimodal options. It helps to bring openness to infrastructure implementation by requiring governmental bodies to disclose the financing behind projects and programs. ISTEA, and its successor, the Transportation Efficiency Act for the 21st Century (TEA-21), symbolize the end of the Interstate highway era and a new fiscal commitment to multiple options and public involvement. They have ensured that corridor planning encompasses many facets beyond automobile circulation.

In SLPP’s 2001 report on Hennepin County, Creating and Applying a New Model for Infrastructure Investment(State and Local Policy Program, 2001), five components were identified as integral to a corridor’s development. They are: citizen participation, economic development, governance, financing, and design. By examining the best practices in each of these areas, this study aims to help Hennepin County and other urban transportation planning authorities make more informed choices about transportation corridors.

Citizen participation and/or preferences create the foundation of all planning and development in a corridor project. It is the glue that holds the other four components together. Who is participating, when in the process they are participating, and how people are participating are three questions that should be of concern to corridor development teams. A project that recognizes the importance of and integrates citizen participation along every step of the way is usually a project that succeeds.
Economic development is the reason a transportation corridor is improved in the first place. When corridors are unable to move people and freight as efficiently as they should, millions of dollars are lost to traffic congestion, wasted time and fuel, while quality of life and the environment pay the price. In addition to reducing these negative impacts, corridors are often hoped to spur regional development. By clustering housing, employment and commerce around our transportation systems, a greater array of travel modes are available to the public. However, the cost of an efficient corridor cannot outweigh the benefits it provides. If it does, public support may falter.

Governance concerns the organizations that bring about corridor improvement. They consist of the local, regional, state and federal stakeholders and the institutions they represent. These institutions and associations often have very different concerns and varying amounts of influence. The importance of effective governance is paramount. It is the means by which change occurs.

Financing, the manner by which a corridor project is made possible, is frequently the most challenging piece of the puzzle to place. Community and governmental support may be high, economic impacts predicted to be impressive, but a project’s ultimate success depends on whether the financing scheme is able to capitalize on these strengths. If it fails to do so, the other pieces may also fall away.

Design is the final component in corridor improvement. It absorbs the fruits of citizen participation, the economic goals of the region and the input of multiple jurisdictions. The design of the corridor must reflect all of these diverse interests while sticking to a budget and financing scheme. The design is the final product of a collaborative approach that has integrated the other four components.

A successful corridor is defined as one that has accomplished the goals for which it was originally established. These goals are typically reducing congestion and its externalities and/or to serving as an anchor for development. It is through the successful integration of the five components mentioned above that corridors succeed. However, the extent to which each component influences the project dramatically shapes the outcome. On occasion, meeting the criteria for one component means sacrificing some aspect of another. This paper examines how successful transportation corridors are able to achieve a balance between the five components that define them and offers a strategy as to their implementation.
II. The Case Studies

The case studies chosen by the SLPP are considered examples of best practices. They include a variety of transportation corridors representing a range of modes, of metropolitan area types, of impacts on their surroundings, and in levels of use. In fact, they are all quite different from each other. However, they are all highly successful in accomplishing their original goals and they have all had positive impacts on their respective metropolitan areas. This chapter briefly examines each case study area.

Boston Southwest Corridor
The Boston Southwest corridor is most noteworthy for the role citizens played in influencing the development of the corridor, and for the interaction between public and private stakeholders. As discussed above, the southwest corridor land was dedicated to highway construction aimed at linking I-95 to Boston. In 1972, however, even though the land had already been cleared, the government of Massachusetts stopped the highway plan in response to residents’ rejection of highway construction. In the meantime, under the Interstate Transfer Act of 1975, funding for highway projects was allowed to shift to transit use. Since both the land and money were in place, the project moved ahead as a transit project. Heavy construction ensued between 1980 and 1987, with continuous involvement from the local neighborhoods and community. The 4.7-mile corridor serves 3 distinct neighborhoods, which compose nearly a quarter of Boston’s population. Also contained in the project are 3 railroad lines, a new rapid transit line, a 52-acre linear urban park, 9 stations with adjacent neighborhood facilities, a new cross-town boulevard and 143 acres of land ready for development (Praha, 2002).

The project was designed to provide high-level public transportation to a large number of transit-dependent Boston residents, as well as to revitalize the fragmented ethnic communities and to prevent negative gentrification. In accomplishing this goal, the Orange Line extension of this corridor enjoyed a 54% increase in ridership and contributed to a 26% drop of the crime rate in the project areas after the first year of service. During various planning stages, more than 1000 public meetings were held under the federally required environmental review process. Citizens were able to decide issues as detailed as fences, lighting fixtures, construction disruption, placement of curbing, a special needs garden, and the design of parkland. Also notable is that the active citizen involvement has been sustained through 20 years of the project’s initiation, negotiation, construction, changing priorities, and maintenance.
Denver T-REX Project

Denver’s Transportation Expansion (T-REX) project is most interesting from a finance perspective. Serving 3 counties and 6 cities in the Denver Metro Area, the T-REX project covers 19.12 miles of new light rail transit line and 16.55 miles of highway improvements to I-25 and I-225. The corridor is one of the most heavily used in the Denver Metro Area with more than 230,000 vehicles per day driving it every day (Denver, 2002). It connects the two main business districts, the Denver Central Business District (CBD) and the Southeast Business District. About 180,000 people work within the two districts, with an additional 30,000 along the corridor. This area, (southeast Denver) is one of the fastest growing areas in the United States and is expected to add 150,000 jobs in the next 20 years (Metro Denver, 2002).

Innovative financing methods have contributed to the T-REX project success. The project was able to put together the state and local sources of funding prior to seeking federal funds under the collaboration of the Colorado Department of Transportation (CDOT), FHWA, and FTA. Overall the project was financed with no new taxes, no increased taxes and saved money by using the design build construction technique. This was accomplished by financing the highway elements through bonding future federal allocations and by financing the transit elements through existing sales tax revenues, FTA funds and local matching funds from local municipalities and jurisdictions.

Ottawa – Carleton Transitway System

This project has demonstrated Ottawa’s success in creating government policies to support transit-oriented development. The OC transitway system provides services to 11 municipalities with a population of 650,000. The 20-mile (32 kilometer) bus rapid transit (BRT) corridor includes 25.8 kilometers of open-cut, grade separated exclusive busway with ramp access at key locations, 2 kilometers of downtown bus-only lanes and 3.3 kilometers of mixed traffic operations. The system was designed to minimize passenger transfers, by allowing neighborhood feeder buses to directly continue onto the transitway via ramps. Another goal of the project, as of January 2000, was to have 40% of the regional work force within 400 meters of a transitway station (Cervero, 1998). This was addressed through the development requirement of employment centers to be within a certain distance of the transitway. The Official Plan identified nine Primary Employments, all with more than 5,000 jobs, as well as smaller Secondary Employment...
Centers that were located near transit (Cervero, 1998). These areas were then targeted for future employment growth.

The various policies supporting the OC BRT system demonstrate the link Ottawa has made between land use design and governance. The system gained ridership by encouraging commercial and office development within walking distance of transit stations, locating major employment centers within 400 meters off the transitway, and ensuring that smaller employment centers have access to all-day transit services. Also, all regional shopping centers with more than 375,000 square feet of space are required to be located within a five-minute walk of transit stations. Additionally, the elimination of downtown free parking has been critical in gaining and maintaining a 70% ridership rate among suburban commuters.

San Diego I-15
San Diego I-15 corridor is most successful its ability to use a financing mechanisms to raise revenue and to manage congestion in limited space. The 8 mile long roadway runs from the junction of I-15 and State Route 163 north to Ted Williams Parkway, North County Area, applying different modes of carpools, vanpools, buses and motorcycles.

Originally designed as conventional High Occupancy Vehicle (HOV) on I-15, the lanes did not operate at capacity, while the general lanes continued to suffer from congestion. Transit also underserved the corridor in the early 1990’s. As an effort to fill the excess capacity, while raising revenue for transit, the project was revised to employ “alternative congestion-pricing mechanisms [that] authorize and control the use of excess capacity on the I-15 HOV Expressway by single-occupant vehicles.” This congestion-pricing (or value-pricing) mechanism has helped to maximize road capacity, improve transit and control congestion.

The accomplishment of the project goals can be demonstrated by the fact that traffic volume has increased but the travel times have gone down. The volume of traffic along the corridor has experienced a three-fold increase in the past decade and an 11-percent growth in the past two years. Currently, the Express lanes accommodate 250,000 vehicles per day at the south end, and 184,000 vehicles per day at the north end. During the first year of operation, however, the delay costs dropped by 33% from $5.2 million to $3.9 million (Ward, 2001).

Curitiba BRT
Curitiba’s transportation system is widely acknowledged as one of the leaders in the world for combining land-use policies and innovative transit design to create a remarkably efficient transit system. Curitiba adopted its Master Plan in 1965 as a comprehensive planning effort to accommodate the city’s tremendous growth. A crucial component of the Master Plan was the Integrated Transit
Network (ITN), which introduced Curitiba’s first exclusive busway in 1974. Now busways comprise the whole of Curitiba’s Transit System, which involves a variety of services, and 2252 buses that serve 8 cities, and over 2.14 million passengers a day.

Land-use regulations and supportive policies have played a major role in the success of Curitiba’s Transit System. Through the use of zoning and land use policies, the developments have been guided to happen along the corridors. In addition to the pedestrian-only downtown, parcels along the transportation axes (typically a busway) are zoned for mixed-use development to encourage more intense uses along transit corridors. Other policies that allow transferable development rights and transit supportive housing policies have created nearly 20,000 low-income units near transportation corridors.

**Dallas Area Rapid Transit’s LRT**

The Dallas DART’s LRT is successful from the perspectives of economic impacts and governance structure. Dallas Area Rapid Transit (DART) was established in 1983 when 14 cities and Dallas County voted to support regional transportation. DART then assumed control of the Dallas Transit System and began work on improving the bus service, rail transit and high occupancy vehicle lanes. The following year, voters in DART member cities enacted a one-cent sales tax to fund DART operating costs. Light rail was introduced to the DART lineup in June of 1996 and has currently expanded to 36 miles of track and 29 stations. Light rail has been a successful endeavor since its debut in 1996, average weekday ridership is approximately 68,000 (July 2002).

DART also operates 1,455 route miles of bus service with 14 transit centers and 34 miles of commuter rail that services 9 stations and 1.3 million passenger trips per year. DART also provides Para-transit service to 6,900 participants. The values of properties adjoining DART light rail stations grew 25 percent more than similar properties not served by the rail system. Proximity to DART light rail stations appears to be a plus for most classes of real estate (Dallas Area Rapid Transit, 2002). The governance structure of DART is also a point of interest, as the fact that those cities governing it also contribute to its funding, encouraging a fiscally responsible organization.

**New York’s Route 5 Corridor**

This is a project that is still under study. The uniqueness of the project is that it looks at the roles corridors play in shaping regional development. The 16.5-mile roadway is one of the major urban arterial corridors in the New York region. It connects the jurisdictions of Albany, the Village of Colonie, the Town of Colonie, and Niskayuna, as well as the counties of Albany and Schenectady. Encompassed within the corridor are roadways, bus-rapid transit (BRT), and light rail. The vitality of Route 5 has been eroded over the last 50 years due to the land use, transportation, social and market shifts in the region. The purpose of the NY5 corridor study is to examine and determine the future
transportation and land use patterns along the corridor. Specifically, the study has been
designed to achieve consensus for the Preferred Future (plan) amongst the related
communities and various stakeholders. The study envisions residential, commercial land
use and general roadway/mix-used development along the corridor.

The project is also interesting from the financing perspective. The estimated total cost of
the highway and transit system recommendations under the preferred future plan is over
200 million dollars. This requires investments from both private and public sectors.
However, routine highway rehabilitation makes the incremental cost of the corridor plan
more manageable. The preferred scenario’s commitment to Bus Rapid Transit allows
immediate implementation of a transit system with completion over time at varying
paces. Another interesting element is that the design of the corridor is carried out in
seven segments with four characterized urban typologies: urban core, urban strip,
suburban strip and regional mixed-use districts. Reuse and infill development have been
recommended to address concerns regarding to the limited right-of-way width and the
extent of curb cuts and intersections along the corridor. These restrictions, however, limit
options for implementing light rail or dedicated bus lanes while maintaining adequate on-
street parking and through traffic capacity.

**Pittsburgh’s West Busway Project**
Opening in September of 2000, the West Busway has been a success because of its
convenient access to and from downtown Pittsburgh. Operated by the Port Authority of
Allegheny County, the West Busway is a part of Pittsburgh’s bus rapid transit system,
which also includes the South Busway (opened in 1977) and the Martin Luther King, Jr.
East Busway (opened in 1983). Currently ridership on the West Busway is 8,000 per
weekday, and 40,000 per week. The number is expected to increase upon completion of
all the park-and-ride facilities. The five-mile exclusive busway incorporates six transit
stations and 485 park-and-ride stalls with 2800 total planned. The busway was built on
abandoned rail right-of-way and was financed with 50/50 FTA match, with a total cost of
$327 million. Also included in the project was Wabash HOV facility, a 1.1-mile,
reversible single lane facility.

The strength of Pittsburgh’s busway is its economic impacts on the surrounding region.
Besides the improved ridership, the busway promotes increased economic development
in the service area. Fifty-seven developments have been constructed along or near the
East Busway since 1983. The West Busway improves access to job opportunities in the
Airport/ Parkway, West Corridor and creates opportunities for transit-oriented private
land development at stations and other transportation hubs. Total value of the
development is approximately $302 million, with 58% of this investment clustered at
stations.

**Portland River District Project**
The Portland River District project is a success from the perspective that citizens, private
businesses and government came together at an early stage to create a unique and vibrant
area in what had been an industrial and underused area of the city. The district comprises
about a mile by a mile-and-a-half square area that includes an abandoned rail yard, the
existing Pearl District and the Old Town/China Town neighborhoods. As part of the
1992 River District Vision, the plan was to turn the rail yard site and the surrounding
neighborhoods into a high-density housing area. Also incorporated into the redevelopment plan was the inclusion of a streetcar line. Created under the cooperation of the city and a local business group called River District Association, the River District Vision called for transit, bicycle and pediatrician improvement to provide the residents with access to business, schools and recreation without using automobiles. The project involves many innovative initiatives that have created one of the hottest real estate markets in the city and country. The transportation aspect entails the use of area-wide streetcar system that links downtown and Portland State University to the district. The district also integrates bus and Amtrak improvements, as well as bicycle paths on the streets and river esplanade.

The entire project has been influenced by citizen involvement, which has led to changes in components of the project and resulted in improvements of the final results. Economic development also stands as the strength of this project. The streetcar was planned to go through the River District as an incentive for economic development involved in the project (original plans called for it to turn north before crossing into the river district). By creating linkage of the under-used, formerly industrial area to downtown, Portland State University, and the dense shopping and residential district of northwest Portland, streetcar planning fulfilled its major goal of encouraging development of more housing in undeveloped areas like the River District. Since opening in fall 2001, the streetcar has ridership exceeding projected levels and the river district continues to thrive.

**Vancouver Sky Train Project**

Vancouver (British Columbia) Sky Train is a 17-mile long transit system with 20 stations along the corridor. It covers areas from the city of Vancouver to Burnaby, New Westminster, and Surrey. The first segment of the Sky Train route opened in late 1985 as a preparation for Vancouver’s Expo ’86 World Exposition. It provides transportation to connect the downtown Vancouver business district with the neighboring cities. Phase I of the Sky Train was built along the path of an old rail line, which went out of service in the 1950’s. Along the route are relatively high-density residential areas, warehouses, older industrial sites, and underdeveloped land.

The strength of BC Sky Train project lies in the economic developments it brings to the region. Designed under the guide of a 1975 Livable Region Plan, the project envisioned a regional network of development nodes linked by transit, and not by an extensive freeway system. This vision has enabled the Sky Train to play an instrumental role in shaping and guiding growth in the region. In the mid-1980s for example, BC transit placed Sky Train stations in an older retail area with many abandoned warehouses.
This doubled or tripled development rates around the station area following the start of Sky Train service. In a 1989 report ‘Sky Train, A Catalyst for Development,” it identified more than $5 billion Canadian dollars worth of private investment that had occurred within a 10-15 minutes walking distance of the Sky Train light rail and passenger ferry systems.
III. Citizen Participation

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Introduction: Participation in Transportation Decision-Making

Citizen preferences are the foundation of the planning and development process. They should guide the work not only of the corridor planner, but also of the developer, the financier, and the governmental bodies coordinating the project. There are several ways in which citizen preferences can affect the rest of the transportation planning, construction and operation phases. For example, in the area of governance, when special districts are determined to help facilitate corridor planning and implementation, they must be drawn along lines that bind constituents together and not divide them. If citizens do not respond well to such special districts, even optimal recommendations are sure to meet with resistance. This may happen for a variety of reasons, including the feeling of a loss of accountability or having no experience in dealing with special districts. In the area of financing, the preference problem can be marked. Even if all of the citizens of the jurisdictions along the corridor are likely to benefit from an infrastructure improvement, it may encounter resistance if implementation requires property or other tax increases.

Corridors require a coordinated approach to citizen participation on multiple levels. Coordination must occur across jurisdictions, modes, and project phases. As economic development, governance and design are likely to gain more focus with corridor projects than with conventional projects, citizen participation efforts must be leveraged and coordinated across these issues.

Three major questions are relevant when planning for citizen involvement in transportation projects:

- Who should participate?
- When should they participate?
- How should they participate?

The “who” varies from project to project. In some cases, agencies invite major stakeholders such as developers, elected officials and community leaders to take part. Generally, a wider audience is sought to ensure community support during construction and operation of the project. Some transportation projects, like the I-95 extension in Boston, have been stopped due to citizen outcry. Clearly, establishing community support early on in project development is a wise strategy for project managers to pursue.

Public participation can occur during the planning, construction operation phases. Typically, most attention is devoted to citizen involvement during planning, or beforehand as an assessment tool to gauge public interest and support for a particular project. In Portland, Oregon, the regional transportation agency pursued an outreach program that eventually built support for a light rail system, and was funded partially by a voter-approved increase in property taxes (Meyer, 2000). In an article for American City and County, Judy Meyer stresses “Although public involvement is critical during planning, design and pre-construction, it needs to continue through project delivery as well. Residents who are alerted to design alternatives, traffic management and noise
mitigation plans . . . are less likely than uninformed residents to obstruct a project’s progress (Meyer, 2000).”

Current federal statutes and regulations derived largely from the Intermodal Surface Transportation Efficiency Act (ISTEA) and the National Environmental Policy Act (NEPA) provide general guidelines for locally developed public involvement processes and procedures. These rules designate guidelines for citizen involvement, though the implementation of citizen involvement practices varies. While there are requirements for including citizens in the planning and project development phases of significant transportation projects, the FHWA and FTA, emphasize that public participation efforts should be based on the desire for helpful citizen input rather than simply to fulfill regulatory requirements.

The FHWA and FTA recommend the following five fundamental guidelines when developing plans for public participation. They are:

1. Act in accord with basic democratic principles. Public agencies act as public servants.

2. Maintain continuous contact between agency and non-agency people throughout transportation decision-making, from the earliest stages, as one or more transportation problems are identified, through defining purpose and need or planning principles, through the development of a range of potential solutions, and up to the decision to implement a particular solution.

3. Use of a variety of public involvement techniques that target different groups or individuals in different ways. A single, one-size-fits-all approach usually results in missing many people.

4. Develop active outreach to the public, and work hard to elicit response.

5. Focus participation on decisions rather than on conducting participation activities because they are required.

**Alternatives Should Be Realistic and Participation Accessible**

Each alternative offered during a public participation process should be feasible and realistic if it hopes to engender credibility and trust in the process. Sometimes citizen participation processes result in recommendations for alternatives that are too costly or politically impossible to implement. This result is not likely to build confidence or future interest in public outreach efforts. Avoidance of unfeasible alternatives saves public and agency time and resources.

Likewise, if participation is to be truly encouraged, agencies must be prepared to accommodate different schedules and different publics. What works with the nine-to-five crowd may not with those who work night shift. Agencies should also consider attending already existing meetings, in addition to planning their own, although those willing to sit through lengthy City Council meetings do not always speak for the majority. A range of ages should also be invited to participate.
Methods for Recruiting Citizen Participation
A variety of techniques to garner citizen participation can be employed. These can be formal or informal, time-intensive or simple. In most cases, government staff guide the process, though there are instances where citizens become involved through advocacy groups or informal organizations.

Formal Processes Typically Used in Environmental Review
Formal government led processes include public hearings, oral or written comments, public meetings and focus groups. Citizen advisory committees are frequently used to involve a focused group of stakeholders over a specific period of time. The federal Environmental Impact Statement, Environmental Impact Analysis and Environmental Justice requirements, if applicable, spell out acceptable means of citizen participation though they typically focus on public meetings and comment periods.

Intensive Citizen Involvement through Citizen Panels and Advisory Committees
A citizen panel is a labor intensive but potentially highly rewarding method of attracting diverse and thorough public opinion. In Boulder, Colorado, municipal planners developed a yearlong citizen panel project that focused on developing a transportation master plan. The City Council assigned an ad hoc citizen Transportation Advisory Committee (TAC) to complete this task. To support the TAC, citizens were randomly selected from a stratified sample, assuring diverse participation from across the region and by housing type. They were asked to participate in a yearlong panel composed of a series of in-home and mail-in surveys. This panel proved to be a cost-effective way of learning about citizen preferences; an investment of $26,000 resulted in over 1,000 hours (about 7 hours per participant) of citizen input. This input was “systematic, reliable, informed, community-representative . . . in an immediately useable form.” (p. 53, Kathlene & Martin, 1991) Preferences stated by the citizens were generally used to: a) confirm existing opinions by the council; b) break ties on the council via a hypothetical final vote truly reflective of citizen preference; or c) force the council to reconsider selected plans. Following the completion of this first citizen panel, the council requested a second citizen survey panel (Kathlene & Martin, 1991).

Wide-Ranging Opportunities for Involvement through Advertising and Media
Public meetings and surveys may be too time intensive for a wide range of citizens. When it is important to gauge citizen input from a broader segment of the population (for example, if a referendum will come up for public vote), an advertising or media campaign may be appropriate. Such measures can reach a greater number of people and may require much less work by the agency to promote public awareness.

Instead of holding traditional public meetings, the Kansas DOT used an advertising campaign and media blitz for a recent Major Investment Study (MIS) in Kansas City. The project team posted billboards and other advertisements that listed a telephone number for passersby to register their opinions on the project. The strategy was met with wide support and participation from hundreds of citizens, including many who stated that they did not typically participate in civic engagement efforts (O'Connor, 1997).
The Influence of Advocacy Groups on Defining Alternatives
Occasionally, an advocacy or citizen group will organize in an attempt to influence a particular proposal. In Portland, Oregon, a group of citizens accused the Oregon Department of Transportation (ODOT) of forcing a highway plan on a resistant community with only a token public participation process. After five years of debate and the development of an alternative proposal, both sides reached consensus. Instead of building the bypass, ODOT adopted a land-use based planning system, built only a section of the highway and improved transit services in the area. The Western Bypass project is credited for encouraging ODOT to develop a corridor study approach to transportation planning, (United States. Federal Highway Administration, 1997). In this case, an advocacy group (led by citizens and 1000 Friends of Oregon) was effective in shifting the methods of the state DOT in planning major investments.

Criteria for Successful Transportation Corridor Community Participation
The following criteria provide a simple way of indicating whether or not a desired level of community participation has been achieved in a corridor project.

Resident involvement: The residents that live in an impacted area or neighborhood are often those who know the most about it. Their expertise and preferences should be included in all stages of development because they will be most directly affected. The high degree of involvement shown by residents of Ottawa during the formation of the Regional Plan, impacted design, assured resident satisfaction and avoided later conflicts.

Business interest involvement: Including business interests in project development can help assure that the economic health of the affected area remains strong or even improves. When and if business owners feel their needs are being ignored, or if project construction is detrimental to operations, outreach can help convince them of long-range benefits. The influence business interests hold is strong and their stake in the community large. In Portland’s River District, development was lead by the River District Steering Committee, which consisted of representatives from the development community and local citizens.

Formalized structure of citizen participation: The extent to which the participation process is organized is often an indicator of the seriousness it is given. When citizen participation is included in a project’s budget and when creative methods are employed to achieve it, citizen involvement will undoubtedly be more fruitful than when not. In San Diego, relationships with existing community groups were strengthened through project outreach. Media and press campaigns helped ensure that a broad segment of the population was aware of the project’s progress.

High degree of commitment from stakeholders: As with almost anything, the greater the level of commitment, the more successful the project will be. Apathy rarely produces esteemed results. Stakeholders with a strong feeling about the proposed project will work hard to make sure that their voices are heard by the planners and engineers responsible for the project design and implementation. These stakeholders can assure that local needs are met by the new or expanded project.
Range of methods used: With each new practice used to attract public participation, a new segment of the population is potentially included in the process. Diverse methods ensure diverse and thus more complete participation.

Phase of citizen involvement: Most typically, public participation is actively sought out during the planning or design phase of a project. And while of utmost importance, the construction and use phases should not be kept from the public’s eye either. As stated before, those that live and work in a project area often have the most expertise to share.

Results shaped by citizen input: An infrastructure project that has responded to and incorporated public opinion in its design and construction may have saved valuable time and money. Boston’s Southwest Corridor went from being demolished for highway expansion to becoming an extremely healthy example of multi-modal Transit Oriented Development. Citizen input was able to drastically alter the face of the neighborhood.

The use of technology in assessing public opinion: Public forums are an excellent method for gauging public opinion. However, a great segment of the population never attends such meetings. Interactive television, web sites, and email may elicit a broader range of opinions on an infrastructure project. Denver’s T-REX maintains an up-to-date interactive web site that invites questions and encourages participation.

Corridor Application
This section points out how citizen participation worked successfully in the cases described in Chapter 3.

San Diego’s managed lanes on I-15 provide an example of effective community coordination and outreach. The project manager in San Diego has attracted effective citizen participation in this largely uncontroversial project by maintaining and strengthening existing relationships with community groups. The manager has used the structure of the community groups, as well as local media, to spread news and information about the project. As a result of this and other citizen participation efforts, one of the stations has been moved from a planned location to something more palatable for the community.

Denver’s light rail and highway improvement project T-REX, was referred to the voters via a bonding referendum. Voters approved the budget for this multi-modal, multi-year project. Over sixty percent of voters approved $324 million for the transit portion. Most public comments that have been received through the Environmental Impact Statement regulatory process have been on noise, vibration, impacts during construction and specific details about interchanges, bridges and stations. In addition to the standard public meeting and public comment methods of attracting citizen input, two committees, the South East Corridor Technical Committee and the SE Corridor Policy Committee, were established and have provided input and guidance to the project.

Ottawa’s Transitway is the result of citizen-motivated directive in the area’s 1974 Regional Plan. The Regional Plan, with design approval from citizens, states that transit must be used to solve transportation problems. Citizens can appeal any or all parts of the
Regional Plan at no personal cost. However, the Regional Plans have been largely uncontroversial.

Similar to large projects in the United States, Ottawa’s Transitway was subject to environmental review with a citizen participation component. During project development, a citizen advisory group was established and public meetings were held. Hundreds of people were represented on the citizen councils and thousands more participated at some point during public meetings. Local newspapers provided another means of project outreach and education. As a result of the citizen participation, the Transitway alignment was changed in some areas. In Ottawa, citizen participation began early and influenced the project design.

**Use of Technology in Citizen Preferences Work**

Are there any examples in the case studies? – This needs to be made its own section, and supplemented with additional info from the other framework areas and case studies, or dropped.

The advent of digital and interactive technologies has opened up new opportunities for public involvement. Such technologies can allow many people to provide input and opinion with little time commitment compared to that required for attendance at public hearings and the like. Examples of methods that can be used to involve the public using technology include:

- interactive television;
- interactive displays and kiosks;
- computer presentations and simulations; and
- teleconferencing.

**Interactive television** is a person-to-person technique that allows two-way communication. Unlike conventional one-way television (TV) or radio broadcasts, most interactive TV enables viewers to respond by telephone. A further refinement of the technology uses sophisticated equipment, TV cameras, and special connections at both ends so that participants can see and hear one another. This kind of interactive TV is usually limited to small groups for long-distance conferences.

Interactive television uses:

- a television broadcast including telephone numbers to use in responding;
- telephones for participants to dial-in comments or ask questions; and
- staff who are available to record comments or respond to questions.

**Interactive displays and kiosks** are similar to automatic teller machines, offering menus for interaction between a person and a computer. Interactive displays take advantage of evolving video and communications technologies. Information is provided through a presentation that invites viewers to ask questions or direct the flow of information. Viewers activate programs by using a touch-screen, keys, a mouse, or a trackball. Software used in interactive video displays and kiosks is highly specialized, storing information on CD-ROM or floppy disks that allow retrieval of specific information.
based on directions from the viewer. By contrast, hardware requirements are fairly minimal, requiring relatively simple computer equipment.

Interactive displays and kiosks:
- deliver information to the user;
- offer a variety of issues to explore, images to view, and topics to consider;
- elicit specific responses, acting as a survey instrument;
- enable the user to enter a special request to the sponsoring agency or join a mailing list;
- are used in a variety of locations and may be either stationary or mobile; and
- receive and store user input.

### Kiosks in Massachusetts

The Massachusetts Turnpike Authority has installed interactive tourist information kiosks at each of its ten rest areas. The kiosks have a constantly-running video designed to attract passers-by. During the loop presentation, viewers touch the screen to activate certain modules of information such as museums or other attractions by region or for any part of the Commonwealth. I don’t think this is an example of community participation. It’s more like information dissemination.

*Computer presentations and simulations* are electronic displays of information. Their power derives from a computer’s ability to provide quick access to enormous stores of data and its capacity to display and rearrange images on demand. Diagrams, graphics, video and sound files can be used to communicate project information to viewers.

*Teleconferences and Videoconferences* are telephone or video meetings between participants in two or more locations. Teleconferences are similar to telephone calls, but they can expand discussion to more than two people. Using teleconferencing in a planning process, members of a group can all participate in a conference with agency staff people. Video conferencing technology is developing rapidly, capitalizing on the increasingly powerful capabilities of computers and telecommunications networks. Video conferencing centers and equipment are available for rent in many locations.

Whenever multiple jurisdictions and interest groups are involved in an infrastructure project, citizen participation becomes the best way of assuring everyone’s needs are met. Effective participation gives all involved parties a space to voice their opinions and concerns, allowing the project to develop in a way that satisfies as many groups as possible, helping to ensure its success. Addressing the public’s concerns from the beginning can also help avoid serious backlash and costly delays.

Thanks in part to ISTEA and the National Environmental Policy Act of 1969 (NEPA) citizen participation is now a central part of the transportation planning process. Project developers today should not only be concerned with who, when and how citizens are participating, but be prepared to incorporate any adaptations citizens suggest into the development itself. By making citizen participation more accessible to the public, an agency ensures that a wider variety of people will take part and that their participation is
more likely to last throughout project planning, implementation and operation. Residents who are aware of a project’s impacts are less likely to be opposed to them. Citizen participation can take place in many forms, be it public meetings, home interviews, surveys, information phone lines, citizen panels, or focus groups. Technology, such as web pages or far reaching media campaigns, can help project developers reach more citizens than ever before.
IV. Economic Development
Author: Heather Burton, Intern, Claremont Graduate University

The importance of effective transportation infrastructure to national and regional economic health cannot be overemphasized. Transportation accounts for almost 17% of the US Gross Domestic Product and represents 18% of household spending (Cambridge Systematics & Glen Weisbrod Associates, 1999). Each year, billions of dollars are lost due to congestion, while individuals, businesses and the environment pay the price. Poor transportation links hinder access to jobs, education, health care, and other important destinations. Congestion and ineffective infrastructure negatively affect individuals’ quality of life. While an inefficient transportation system can even keep investment away, an effective and heavily used system can lure development through the accessibility it provides. As a result, one way of tackling the gigantean task of improving regional mobility is through transportation corridor development.

A transportation corridor is a geographic area between two points that links multiple centers moving people and freight. Corridors become targets for infrastructure improvement when the demand for travel placed upon them becomes too great. By improving transportation corridors, immediate decreases in vehicular congestion are expected via road improvements or through the provision of additional mode options. A reduction in the externalities associated with excessive auto use, such as air and noise pollution, is desired as well. Finally, transportation corridors are also expected to help spur local economic development.

Economic development can be defined as the achievement of a community’s economic goals via increases in economic productivity, employment, business activity and improvements in the environment, equity and in other quality of life measures (Littman, 2002). Measurable or not, these objectives help explain why transportation corridors are often expected to serve as urban panaceas.

Transit Oriented Development (TOD) is one reaction to this tall order; freight-oriented corridors, such as the Alameda Corridor in Los Angeles, are another. TOD is defined as mixed-use communities within 2,000 feet of a transit stop. They are designed to be places where residents can travel to destinations by walking, bicycling or taking transit (Calthorpe, 1993). They aim to reduce the centrality of the car by placing services and housing near transit that connects to other TOD areas. There is some hope, as well, that they can be a stimulus for sub-regional economic development.

Analyzing Transportation Corridors
How can we measure the effectiveness of a transportation corridor improvement plan that includes (or does not include) TOD? Most often, a predictive or evaluative economic impact analysis is used in which three types of impacts are applied to the case at hand. These economic impacts, as related to transportation investments, have been defined by Cervero & Aschauer (1998). They are: generative impacts, redistributive impacts and financial transfer impacts.

Generative impacts create economic growth. They are measurable increases in economic productivity and quality of life. User benefits such as travel time savings, increased
safety and lowered production costs (through reduced transportation spending) are examples of generative impacts. These benefits may attract new business to an area, and in such, increase regional growth. Furthermore, by clustering business around transportation investments, the region as a whole spends less on other infrastructure, such as water and electricity. Such agglomeration and urbanization benefits translate into higher land values and rents. Generative impacts also include externality reduction, such as cleaner air and more open space. Environmental and quality of life benefits are often hard to quantify. They are nonetheless, very significant.

Redistributive impacts represent shifts of economic activity within a region. They are activities or development that would have occurred in the region even if the transportation improvement had not occurred. Examples include concentrations of development around transit stations and the resulting redistribution of employment within a region. Redistributive impacts must be carefully observed; of particular concern are the areas left behind.

Transfer impacts are shifts of money from one organization to another. Examples include the increased property tax a municipality close to a corridor may receive, or a sudden infusion of construction jobs to an affected area. Joint development income from private developers to government agencies is also a transfer impact. Transfer impacts can’t be seen as much as they are felt: when the federal government pays a local municipality to operate a transit service or maintain a corridor, no net economic gain is achieved. Still, countless people benefit.

The three categories of impacts can be felt in several different ways and need to be weighed against the cost (including opportunity costs) of the development. Direct impacts result from spending on the corridor or project, via wages for employees or revenue for suppliers. Induced impacts are felt by those businesses that supply the suppliers. Induced impacts result in a roundabout way. They account for the regional effect direct and indirect impacts have on wages and greater purchasing power.

How do these types and categories of economic impacts relate to transportation corridors? They allow for the creation of specific criteria used to evaluate whether or not a transportation investment should be made. Logically, the best corridor investments are those that have the most generative impacts. When travel time, transportation costs and environmental externalities are reduced greatly, safety improved, and access to employment and services facilitated, a corridor has achieved its goal of economic development. Redistributive impacts are also important, especially to those looking to concentrate and/or stimulate development in a particular area. Finally, financial transfer impacts weigh heavily on the type of project that can be built, and frequently, that alone determines all of the above.

Opportunities for Maximizing Economic Impact
The following criteria outline the most effective means of assuring strong, positive economic impacts on a corridor area.

Location: Transportation corridors will have the greatest economic impact when they are well placed. Any improvement in the method by which people travel must be located
where they live and work and where a significant obstacle to that travel exists. In the case of transit, lines should be placed where auto congestion is greatest. This makes transit more attractive to potential passengers. Furthermore, these lines must pass through the places people want to go and not necessarily where it is politically most convenient to do so (e.g. the Blue Line in Los Angeles, see Loukaitou-Sideris & Banerjee 1996). Just as location directly affects usage, usage in turn affects business and commercial development. Little will occur when real and perceived access produce low ridership, thereby discouraging investment.

**Density**: In order for a transportation corridor to have a strong economic impact, there must be multiple and diverse users. This is best accomplished when population densities are high, with a minimum of 20-units per acre (suburban) and 30-units per acre (urban). Be it a bike path, highway improvement, express bus lane or Light Rail Transit, if users are few or scarcely distributed, the economic impacts of such an investment will be less. On the same hand, TOD must be of appropriate densities to the surrounding community and not a local anomaly.

**Limited Highway Capacity**: Alternatives to the automobile are more attractive in areas where highways cannot be physically expanded to meet demand. Few people want to see their cities paved over. The economic impacts TOD or corridor improvement can have in such areas are greater than in areas that are not constrained physically.

**Accessibility**: Transportation corridors must provide users with high levels of accessibility and be accessible themselves. In the case of transit, service must be extensive, convenient and frequent if it hopes to compete with the automobile. Highway, bicycle and pedestrian improvements must also be accessible to their users or they will not attract them. Services located along transportation corridors must also be accessible to a wide variety of users, arriving in a wide variety of modes. Improving the ease with which we reach our destinations has direct generative impacts on the regional economy.

**Competitiveness**: Any transportation improvement must be significantly better than the alternative. Exclusive lanes (for automobiles, buses, bicyclists or pedestrians) must prove significant time and cost savings in order to justify their construction and use.

**Supportive Zoning and Land Use Policies**: The economic impact any infrastructure project can have is greatest when surrounding land uses support the goals of the project. Economic incentives to developers, such as tax abatements, housing incentive programs and parking credits, can help achieve this end.

**Joint Development**: The private-public approach can help assure that the corridor’s objectives are met. This approach ensures that both public agencies and private developers share risks and success. However, joint development must be careful not to increase densities disproportionately nor inflate land values. Neighborhood opposition may result (Dittmar, 2002).
Measures of Success
When the above-mentioned opportunities exist, or are created, a transportation project is more likely to succeed in having a positive economic impact on the surrounding region. The following is a list of some of the measures one can use to gauge economic impact:

A transportation corridor improvement project succeeds in creating economic development when it:

- Offers positive user impacts: timesaving, safety and lowered transportation costs.
- Increases property values in its vicinity.
- Helps generate employment opportunities through service/industry clustering.
- Facilitates the mobility of its users (evidenced by high ridership).
- Improves the regional quality of life via externality reduction.

When a corridor is located in an area where congestion is already having a direct negative effect on users’ quality of life, any measure that reduces the number of automobiles on the road will create positive user impacts. Property values will increase as a result of the timesaving, improved safety, and lowered economic costs that users face. The mode employed is truly competitive when it offers such advantages.

Likewise, high densities and excellent accessibility encourage investors to develop projects near transportation improvements. Supportive zoning and land use policies facilitate such moves. Employment opportunities are thus created.

High ridership is the proof, so to speak, that the corridor has been well-placed, that surrounding densities can support the investment, that riders find the corridor accessible, and that the mode involved is competitive with the automobile. The reduction of externalities, be it emissions or toxic waste, is directly related to the placement of the corridor. When the corridor improvement is placed in an area with limited highway capacity and a high population density, the impact a reduction in externalities can have is far greater. Regional quality of life is improved even more when zoning and land use policies, reinforced by joint development efforts, encourage TOD.

The case studies below are examined relative to these criteria.

Boston’s Southwest Corridor
Boston’s Southwest Corridor shines in the areas of community participation, innovative finance, governance, design and economic development. The unwanted highway proposal and subsequent community mobilization prompted the Interstate Transfer Act of 1975 (where for the first time, highway funding was provided for a transit related project) and laid the foundation for the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). It was one of the first projects to look at transportation planning from perspectives other than just transportation.
The Southwest Corridor encompasses three railroad lines, a Rapid Transit Line, nine transit stations, a linear urban park, 16 basketball, street hockey and tennis courts, 90 community gardens, 20 playgrounds, a college campus, new affordable TOD housing, redeveloped public housing, a health care center, many small businesses and a bike path. This emphasis on mixed-use commercial and residential development has resulted from community involvement in the planning process and dedication from groups such as the Boston Redevelopment Authority (BRA) and the Boston Urban Gardeners (BUG).

Apart from greatly revitalizing an area that had been stripped clear for a halted highway construction, the Southwest Corridor helped Boston make great regional strides. Within one year of its opening, transit ridership on the Orange Line had increased from 30,000 to 47,000 (American Institute of Architects, 2002). Furthermore, the Southwest Corridor Project provided an Educational Training Program in which young area residents could learn the skills necessary for careers in planning, engineering and other related fields. This innovative approach helped serve as a catalyst for economic development via permanent job creation.

Prime location and a high population density helped to assure this project’s success. In an area where citizens refused to accept highway expansion, the transportation options available had to provide high levels of accessibility and competitiveness with the auto, not only for neighborhood residents, but also for those commuting through the area. They have. Furthermore, supportive zoning and joint development guaranteed a rich variety of land uses. The Southwest Corridor is an excellent example of the implementation of the economic development criteria.

Dallas Area Rapid Transit’s Light Rail
In 1996, Light Rail Transit opened in Dallas. Built and operated by the Dallas Area Rapid Transit (DART), the LRT system would become an integral part of a thirteen-city transit authority with a service area covering over 700 miles. Rail opponents claimed LRT was a risky move in a city known for its low density and extensive highway network. Rail opponents claimed LRT was a risky move in a city known for its low density and extensive highway network. They pointed to examples of LRT’s limited positive economic impact in other cities, such as Atlanta, San Francisco and Washington DC. Nonetheless, LRT supporters saw it as a congestion reducer and urban catalyst.

In a “Before and After” study prepared for DART by Drs. Bernard Weinstein and Terry Clower of the University of North Texas Center for Economic Development and Research (1999), the argument was made that Dallas did have the right conditions for successful LRT. They pointed to Dallas’ booming regional economy and commercial real estate market. Increasing residential densities were a second factor that seemed to support the move to LRT. Finally, they highlighted Dallas’ changing demographics and a growing need for public transit.

DART’s LRT system is presently 23 miles long and includes 22 stations. Daily ridership is approximately 40,000 (Dallas Area Rapid Transit, 2002), far exceeding previous expectations. It connects the suburbs with the downtown area, linking such important destinations as the airport, the convention center, the zoo, Union Station, major medical,
shopping and employment centers. By 2004, over 30 additional miles of LRT and 14 new stations will open.

And so the question becomes: has DART’s LRT worked as an urban catalyst? Has it reduced congestion? It appears that the answer to the first question is a solid “yes.” As of 2001, more than $900 million in private funding had been invested in development along the LRT system (Dallas Area Rapid Transit, 2002). Weinstein and Clower have shown that in the impacted area taxable property values around LRT stations have increased on average by 25% (Weinstein & Clover, 1999). They also examined business occupancy rates and found healthy increases for structures located near LRT stations. In office-buildings within walking distance of LRT, rents have also risen, from $15.60 per square foot to $23 (Ibid). Finally, total retail sales increased 36.2% in Dallas’ Central Business District (CBD), as compared to a citywide increase of only 3.6%(Ibid).

While this last statistic may be an example of a redistributive economic impact, one of the main goals of this project was the stimulation of the downtown area. DART’s LRT has also had a strong effect on the relocation of business. Faced with employee-vehicle ratios for congestion management, many businesses are finding LRT proximity more attractive than suburban campus locations. The CBD is also seeing an influx of apartment and loft construction, possibly changing the CBD into a mixed-use, 24-hour community.

In relation to congestion reduction, DART’s LRT has had a minimal impact. DART and Texas Transportation Institute data show that the LRT has reduced Dallas area traffic by only 0.1 percent, or 2.3 percent of the 1995-7 average daily increase in vehicle miles (Cox, 2000). Still, pollution levels are down in the Dallas area, from a maximum Pollution Standards Index (PSI) level in 1996 of 130, to a maximum of 110 in 2000 (Sierra Club, 2000). Any PSI level above 100 is dangerous to human health (American Academy of Family Physicians, 2002).

Because DART’s LRT is young, it seems unfair to label it a success or failure just yet. While congestion has not been significantly reduced, lifestyle and commuting changes take years. The location and relocation of development around LRT stations and lines may help facilitate some of these hoped-for changes.

**Ottawa’s Transitway**

Ottawa is home to North America's most extensive busway network, over 19 miles long. Called the "Transitway," it is a diverse system, comprised of at-grade bus only lanes, reserved shoulder lanes on highways, and mixed traffic operations. There are thirty-four Transitway stations in the system and each can accommodate up to 3 buses at a time (Bonsall, 2002a). The Transitway was not born overnight. It is the result of strict land use and transportation master planning conducted during the early 1970s and determined by community members themselves. Several transit options were considered at the time, but implementing busways incrementally proved most attractive. The Transitway was also less expensive to build and operate than the Light Rail Transit or No-Build alternative. In addition, it could be built as funding became available, while at the same time more accurately respond to regional development trends.
However, the Transitway has never had to respond to development trends, it has created them. Strong regional planning in the form of strict zoning has ensured that the busways have become integral components in the city's form. Economic development has been concentrated around busway, land use intensified and open space preserved. Presently, 95% of Ottawa's citizens are within walking distance of a bus line (Bonsall, 2002a). Furthermore, Ottawa’s regional plan requires that shopping or employment centers with 5,000 or more employees are located within a five-minute walk of busway stations. With time, the surface parking at such sites has been converted to additional development and such market based initiatives as parking space credits (25 spaces for each bus retail can accommodate) have been introduced. Because 30% of all shoppers arrive by bus, shop owners make more revenue on the bus spaces than they would have made on regular spaces (Bonsall 2002).

Is Ottawa transferable? Perhaps. It is presently being copied in Brisbane, Australia, a low-density city that is similar to many in the US. However, the strong influence of federal land use planning is a given in Canada, whereas in the US, multiple jurisdictions and interests often compete for or against infrastructure projects. Nonetheless, the most valuable lesson to be learned from BRT in Ottawa is that when stations become actual destinations, development and ridership will follow. In Ottawa, supportive zoning and land use policies placed the foundation for the other economic development criteria. Joint development was encouraged, followed by higher densities, resulting in improved accessibility. Because highway capacity was restricted in the name of land preservation, the Transitway quickly proved its competitiveness with the auto. In this case, the busways were not placed in successful locations. Rather, the busways created the locations’ success.

**Pittsburgh’s Busways**

Pittsburgh was the first city in the nation to operate exclusive busways when it opened its South Busway in 1977. The East Busway followed in 1983 and the West segment was recently opened in 2000. A work in progress, the 2.3-mile East Busway Extension will be completed in November 2002. Heavily used, Pittsburgh’s Busways have proven that when done right, bus as well as rail, can attract development.

The South Busway was constructed on an abandoned streetcar right-of-way that allowed passengers to bypass standstill highway traffic and reduce commute times dramatically. The West Busway was built in the same fashion. It occupies an abandoned rail track that had been a community eyesore and source of hazardous material for decades. During its clean up, almost 20,000 tons of contaminated material were removed (Port Authority of Allegheny County, 2000). But it is the East Busway that has become Pittsburgh’s most heavily used exclusive transitway. It differs most dramatically from most Bus Rapid and Light Rail Transit projects by the fact that it runs through a heavily populated and built-up area, adjacent to a functioning
rail line. Daily ridership is approximately 30,000 (United States. Federal Transit Administration, 2001).

In a 1996 study by the Busway operator, the Port Authority of Allegheny County, over $300 million worth of new development within a five minute walk of a bus station was found to have occurred following the opening of the East Busway in 1983 (Wohlwill, 1996). During this same time frame, population in the corridor decreased by 8% (Wohlwill, 1996). What has allowed the Busway systems to attract development and increase levels of ridership during a period of regional population decline?

Pittsburgh’s Busways offer an average of 35 minutes in timesaving to passengers through their local and express services (Project Express, 2002). Because buses travel on exclusive paths for almost the entire length of service, no time whatsoever is lost in traffic or at-grade crossings. Stations have also been designed to allow express buses to pass those that are stopped loading passengers. Furthermore, service is frequent. And importantly, a strong feeder network provides transport to those unable to walk to stations. In fact, the new West Busway was the first of the three to include park-n-ride lots. The generative impacts of timesaving, safety, and reductions in personal transportation costs are evidenced by the system’s daily ridership of over 40,000 passengers (Port Authority of Allegheny County, 2000). Property values have also increased near Busways. Although not a formal study, a realtor contracted by the Port Authority found that property values near the East Busway has risen, contrary to fears it would hurt property values (Feder, 2002).

In summary, it is the success of Pittsburgh’s East Busway that best shows the importance of location for economic development. This busway runs through several communities of varying socio-economic statuses, past industrial, commercial and residential zones, and past regional hospitals, an entertainment district, convention center, downtown and a major university. Both the riders and destinations are diverse and this has been the key to its success. The Busway has been placed where people live and where people want to go.

San Diego’s I-15 Managed Lanes
The I-15 Managed Lanes Project is one of the first pilot programs in the nation to test the functionality of High Occupancy Toll (HOT) lanes. Originally, the HOT lanes were High Occupancy Vehicle (HOV) lanes, used exclusively by carpoolers and buses. But these lanes stood nearly empty for years, as San Diego’s growing population grew frustrated at the sight of such an underutilized highway “improvement.”

A demonstration project was approved for the I-15 that would allow Single Occupancy Vehicle (SOV) participants to drive the HOV lanes previously unavailable to them, bypassing stop-and-go traffic in the other lanes. This timesaving came at a price, but by renting or purchasing transponders, SOVs could have the price of the established toll deducted automatically as they sped through detectors. Thus far, the FasTrak, as it is called, has been hugely successful and popular with users. Users save approximately 20 minutes a day (Supernak, 2002), and despite an overwhelming population boom, the HOT lanes have kept traffic conditions at nearly the same level as before implementation. In addition, carpool use has not declined as a result of the FasTrak. Moreover, the money
generated from the HOT lanes is used to directly fund an express bus service that runs in the exclusive lanes.

The Managed Lanes have succeeded in large part due to their location. The I-15 is the only major corridor that runs north south in this area. Further highway expansion is not an option. And although residential densities are fairly low for this region, auto ownership is not. The Managed Lanes, while only accessible to those in car or bus, benefit their users with significant time and cost savings, at a price that fluctuates in accordance with the number of vehicles using them. Because users choose when and how frequently to use FasTrak, they determine the value of their time with each use.

Due to the fact that the Managed Lanes are a highway project, land use issues have essentially been separate. However, plans to incorporate an extensive Bus Rapid Transit and feeder system are in the works. After its initial three years of operation, the Managed Lanes had no significant effect on local businesses (Supernak, 2002). To local homeowners, FasTrak was a secondary concern in their housing choice location. This will undoubtedly change with time, depending on the amount of population and traffic growth this region experiences.

**Conclusions**

When properly planned and managed, transportation corridors can facilitate economic development in their surroundings. By increasing access and mobility, corridors can bring about generative impacts, such as timesaving, safety and lower personal transportation costs. These measurable benefits allow for real economic growth by providing users and society with more disposable income. Environmental or quality of life benefits such as cleaner air or noise reduction, are harder to put a price on, but equally important, if not more.

Corridors can help shape the way a region grows by encouraging nearby development. But in order for it to occur, several criteria should already be in place. As has been the case in the examples shown, the location and density of any planned corridor improvement is key. A transportation improvement must be accessible to users while proving its competitiveness with the automobile. Success is most notable when the corridor is located in an area where highway expansion is not a possibility. Finally, land use policies and joint development must support regional mobility goals, and not parochial interests.

All transportation improvements come at a cost that must be weighed against potential benefits. Just as the finance section will point out that benefits may be wide-ranging and that those that benefit should help in financing, planners and citizens should be sure that the economic development that results from any infrastructure project justifies its cost and benefits those that have helped finance it. In the case studies mentioned above, successful economic development did and is occurring as a result of good corridor planning. In these examples, both bus rapid transit and light rail can attract development and help decrease regional congestion. When the conditions are right for corridor improvement, transportation infrastructure can indeed serve as a stimulus for economic development.
V. Governance

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Multi-jurisdictional governance is an issue facing all planners of new transportation corridors. Most American metropolitan areas consist of dozens of cities and other self-governed jurisdictions. Aside from the major central cities, which usually provide the area with its common name (e.g. Boston, Denver, etc.), these cities are of relatively small size, and rarely serve as the location for most activities of the people that live there. The Twin Cities Metropolitan area is no exception to this rule, with 189 cities and townships within the seven county area governed by the Metropolitan Council (Metropolitan Council 2002).

The transportation corridors that are the subject of this study are the means of moving people between their activities. However, since these activities are likely to take place in several different jurisdictions, local governments must work together. Each jurisdiction through which the corridor passes becomes a stakeholder in the planning, construction, operation and maintenance of the corridor. In addition, the choices each jurisdiction make may impact other jurisdictions throughout the metro area. This can happen in several ways, either through cost-sharing measures, or in the form of widely shared benefits (for example, a large employer is attracted to the area, creating jobs for residents throughout the region).

One obvious solution to the multi-jurisdictional governance issue is for the state to create regional governance structures or statewide agencies, such as the Metropolitan Council, or a department of transportation (DOT), to oversee these corridors. These structures are effective at coordinating the planning and construction of large projects, and are also indispensable in obtaining financing for these projects. However, such methods can be unresponsive to local interests, or ineffective at achieving regional goals.

Instead, more interesting solutions can be discerned by looking to the motives that led to the creation of so many small municipalities, in large metropolitan areas in the first place, and then examining how the case study corridors identified in this project responded to the resulting challenges. William Fischel suggests a rationale for the creation of numerous small suburban cities through the “Homevoter Hypothesis,” which begins with the premise that “local politics is driven by real estate economics, and the most important and sensitive players are homeowners” (Fischel, 2001). As such, homeowners are most likely to vote “with their homes’ values in mind,” (Ibid p. 163) and support those initiatives that they view as most likely to preserve or increase their property values.

Two implications from this perspective are: (1) Homevoters will support some tax increases if they believe they will see the benefits, and (2) they will seek communities in which other voters will have similar interests and support similar policies. In other words, “suburban residents form small local governments . . . because they want to be governed by a unit of government in which people like them – people who own their own homes and who have similar demands for local services – get to call the shots about local issues.” (Ibid p. 220).
The issue for urban transportation corridors then becomes: how do multiple local governments then all see benefits from a new corridor? Fischel points out that “homeowners do not care about the source of the devaluation of their homes,”(Ibid, p. 271) and if residents see the corridor as a devaluation threat, they will respond with a “not in my backyard” (NIMBY) attitude that prevents the project from going forward. The governance structure must therefore be able to respond to and incorporate local issues.

A common method for developing these structures is the creation of partnerships between local entities. In theory, these can vary from agreeing to share information to creating structures, such as joint powers boards, to provide services across all jurisdictions (See Chart 1 below). For the purposes of transportation corridors, however, some degree of power sharing is necessary to ensure that the project goes forward. Consequently, all the examples discussed here fall within the categories on the top and right sides of Chart 1. The ensuing discussion demonstrates how the case study corridor obtained buy-in from the affected cities to the point that all committed to some level of power sharing to coordinate or collaborate in the creation of the corridor.
Case Studies

Denver: Partnering to a united front
Denver’s metropolitan planning organization (MPO), the Denver Region Council of Governments (DRCOG or “Dr. Cog”), includes over 50 local governments in the Denver metropolitan area. While the T-REX corridor runs through six of these cities, including the city of Denver, and three counties, DRCOG is not a central player. Instead, the Colorado Department of Transportation is the lead agency on the project, with considerable support from the Regional Transit District (RTD).

The corridor is not significant from the governance perspective simply for the roles of the MPO vis-à-vis the state DOT and regional transit provider. It is also an intriguing example of project development and creative governance. T-REX embodies a unique process that incorporated the interests of the most affected governments, while setting the framework for their roles as the project progressed.

To obtain the necessary federal finances interested governments needed to demonstrate unified local support, and gain voter approval through referenda. The first referendum was necessary to approve local bonding authority for the proposed light rail portion of the project. Then, once the highway expansion was added to the project, a second referendum was required to approve the additional bonding authority. (These bonds are discussed further in the Finance chapter.)

The referenda by themselves, however, were not seen as adequate to secure a federal full-funding grant agreement. Consequently, CDOT and RTD, working for the “Southeast Corridor Development Team” secured $30 million from the affected cities and counties, as well as the Joint Southeast Public Improvement Association (a consortium of affected private interests), though a Memorandum of Understanding (MOU). The MOU listed specific amounts each entity would provide towards the local match, as well as specific planning priorities for the project.

Of additional interest was that the Federal Transit Administration and Federal Highway Administration would be involved in funding this project. To address this situation, the two federal agencies also developed an Inter-Governmental Agreement (IGA) detailing the role each agency would play as the multi-modal project progressed.

This project represents a good example of agencies “Reconciling activities” which is on the top center of the partnering matrix. All partners have invested a relatively large amount of resources, but, while CDOT and RTD are working together on the specific planning and construction of the project, the organization exists as a result of several specific agreements, and has relatively little autonomy outside of the powers listed in these agreements. This arrangement has been successful in Denver because it ensures local governments are active participants and supporters, but at the same time makes
certain they retain the autonomy necessary to respond to changes in the political winds, especially from homevoters.

**San Diego: Sub-regional cooperation**
The San Diego Association of Governments (SANDAG), the MPO in San Diego, oversees all transportation planning in the area, which includes 19 municipal governments. The Interstate15 “Managed Lane” project, however, only directly affects two cities, San Diego and Poway, and the lead agencies are the California Department of Transportation (Caltrans) and the Metropolitan Transit Development Board (MTDB).

Unlike Denver, the affected local, regional and state governments in San Diego, have come together with a number of stakeholder groups to form a sub-regional organization, the I-15 Project Management Committee. While different aspects of day-to-day operation and maintenance are the specific responsibility of individual agencies, the project management committee provides oversight to the project and ensures that differing points of view can be heard, and resolved before the success of the project is jeopardized.

Even more noteworthy is that the management committee evolved through continual involvement between the lead agencies and affected communities. This relationship took form in the context of the existing community involvement process. Consequently, no formal written agreements exist. Instead, a sufficient level of trust was developed allowing input and consensus building to happen as the project was planned. For example, the project used a “mode-neutral” method of planning up until the Alternatives Analysis portion of the Environmental Impact Statement was completed. This method led to the selection of a busway mode in a city that already had light rail. Instead of being beholden to existing technologies, the process allowed the planners, and representatives of affected governments to analyze and select the most appropriate mode for the corridor.

The I-15 corridor could be described in Chart 1 as “Sharing Program Responsibilities,” located in the upper right of the chart. While several actors committing significant resources are involved, these actors were able to form a new organization that provided a new service. Rather than simply following the instructions that the founding governments had agreed upon earlier, this new organization had the latitude to make decisions based upon input from affected parties. The success of this approach is shown in the high level of public acceptance for the corridor.

**Boston: Taking time for homevoter input through existing structures**
The Boston Metropolitan Planning Organization (BMPO), the MPO for the Boston area, which includes 101 municipalities. The Southwest Corridor lies within the city limits of the City of Boston, but runs through three distinct neighborhoods. Rather than creating additional governance structures to respond to local interests, as was done in San Diego, this corridor is run by existing governmental entities. Other governmental entities involved include the Metropolitan District Commission, which manages the parkland along the corridor, the Massachusetts Bay Transit Authority (MBTA), which owns, operates and develops the transit aspects, and the BMPO as the region’s transportation planning agency.
Given that existing structures govern the corridor, this corridor is best characterized as an example of “collective planning,” where power is shared extensively, but the partners commit a minimum of resources. The project took tens of years to plan, construct and begin operation. Once the involved agencies began to work together, they were able to turn the community’s opposition to the highway expansion into constructive use as they developed a corridor that includes transit, commuter rail and parkland. This model does not allow for streamlined planning or financing efficiencies afforded by the creation of new entities or the pursuit of new revenue streams. As a result, the project took longer to complete. Nonetheless, in a situation where homevoter interests have opposed governmental plans, accountability is paramount, and a process similar to that of Boston’s Southwest Corridor becomes appropriate.

**Portland: Public-Private guidance at the neighborhood level**

The Portland River District, while not a formal corridor, provides an interesting perspective in that private interests, rather than a government entity, largely drove the development and transportation plan within it. Guided by the River District Steering Committee, whose members include representatives from the development community, interest groups and private citizens, local interests have taken on a key role. The participation of the city of Portland and Tri-Met, the transit operator in Portland, as operators and maintainers of the streetcar transit lines, ensures that the any changes made still fit within overall regional development plans. The fact that private, local and regional interests have all come together to create both a local and regional asset shows that the partnership overseeing this project is an example of “Sharing Program Responsibilities,” the highest level of resource commitment and power sharing.

**Dallas: Homevoter choice**

Dallas Area Rapid Transit (DART) is a Special District of the North Central Texas Council of Governments (NCTCOG). While NCTCOG has 231 members, including 183 cities, DART is composed of only thirteen (including Dallas and Fort Worth), plus two counties. A major reason for this small representation is that cities become part of DART when their citizens vote to join it, which includes contributing a one percent sales tax for DART revenues. Also, cities can vote to end their participation at any time, although DART does retain the right to run through the withdrawn areas, at its own expense, to serve other areas still within the authority. The result is a system that responds to the interests of only those local governments that chose to participate, and receive the service.

DART’s successful light rail lines only serve the city of Dallas and a few suburbs. Buses and commuter rail serve other participating communities. The entire rail system is planned to reach into participating suburbs in the next few years, bringing similar benefits to all members. The project appears to have support due to the fact that it is planned, built and operated by DART, rather than as the result of pressure created by the central city.

The ability of cities to opt-in when they see benefits, and opt-out if they believe the costs are excessive, along with a Board of Directors representative of the participating cities,
shows that when local governments create a sub-regional agency, services can be provided in ways not adequately addressed in the past.

**Ottawa: A different perspective**

The Ottawa busways operate in a Governance environment much different from the United States. Power in Canada devolves from the Central government, rather than from the provinces, resulting in local governments that are much less beholden to local interests than in the United States. In Ontario, the provincial government has abolished all governmental bodies below the regional level, creating instead one elected body that serves the entire metropolitan region (City of Ottawa, 2002). Consequently, Ottawa enjoys many of the planning and financing efficiencies that come with one regional government. Disputes are resolved at the regional level within the context of the government, and fewer partnerships are needed to plan and develop transportation corridors running through separate municipalities.

Such an example is not likely to occur in the United States, however, as the efficiencies created by a single level of government come at the expense of smaller communities being able to express their individual development preferences. This could create a feeling of loss of control by individual homeowners, along with a sense that they are unable to oppose the spending of their tax dollars on projects that will either have a neutral or detrimental affect on their home values. As discussed earlier, homevoters primarily support projects where they see direct benefits.

Ottawa still presents an interesting case because it is an example of the advantages that can be obtained through direct election of regional representatives, an option that, of all the other cases discussed here, only exists in Portland. While a single regional government is not likely to supplant local governments, directly elected representatives have a greater chance of providing a forum for creating new sub-regional partnerships. In this scenario, constituent interests are placed much more closely to the debate, an effect that does permeate all the examples.

**Governance criteria:**

As the above discussion demonstrates, different models of governance are appropriate for different corridors. The only constants throughout are that the corridors involve several different jurisdictions and several different levels. Consequently, these criteria are largely descriptive in nature, rather than prescriptive or evaluative. They are generated so that planners may compare their own projects and select the appropriate models for their situation.

**Number of jurisdictions involved:** Considering this criterion is critical to developing a proper governance structure. The greater the number of local jurisdictions, the greater is the need for creation of a separate governmental structure to coordinate planning and development of the corridor. For example, the Southwest Corridor in Boston did not create any new governmental entities, but the corridor is located entirely within the city.

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1 Fischel illustrates this preference toward smaller local governments in Chapter 10 of *The Homevoter Hypothesis*. He discusses the rapid incorporation of several small suburbs in Seattle shortly after the State of Washington conferred considerable development and planning powers to Seattle’s MPO.
of Boston. On the other hand, for the T-REX project to move forward at all, CDOT and RTD needed to bring affected local governments and private interests together to set guidelines, in the form of a Memorandum of Understanding.

Note, however, that increasing numbers of jurisdictions only raise the floor for necessary partnership creation. The San Diego and Portland cases demonstrate that while relatively few jurisdictions were involved, a high level of partnering proved beneficial. The extent and formality of a partnership is limited only by the resources available to the interested entities, which are controlled by the willingness of homevoters to give up some of their autonomy.

**Federal involvement:** Because the federal government often provides 50% of the funding for infrastructure improvements, its involvement becomes critical. Although more regulation is often required, federal involvement can assure the participation of a wide range of expertise and monies, otherwise unavailable to a regional project. Again, in the case of Denver, both the Federal Transit Administration (FTA) and the Federal Highway Administration (FHA) funded T-REX, reinforcing the government’s commitment to multi-modalism and break from the “either / or” mentality of previous generations of infrastructure.

**State involvement:** Second to the federal government, the state is a major provider of financial support for transportation projects, and is also the lead agency in several of the projects discussed here. Note, however that the state worked in partnership with local jurisdictions in the projects discussed here, rather than imposing its own will. The one situation that comes close to the latter is Boston’s Southwest Corridor, where state planners attempted to build a highway. Once local governments and citizens became key players, the project changed significantly.

**Metro/Regional involvement:** This level of government has become more prominent since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, which designated regional governments to be the planning agencies for major urban areas. It is interesting to note, however, that regional government plays little more than an oversight/planning role in several of these projects, while this is the most local level of government operating in Ottawa.

**County and city involvement:** As discussed at the beginning of this chapter, the Homevoter Hypothesis indicates this is the key level of involvement for projects in the United States. Higher levels of government ignore the interests of homevoters, and, by definition the local government structures they choose to create, at the peril of the proposed project.

**New or existing structures:** The permanence of governance structures may also indicate the resources available to them and the level of commitment involved. When stakeholders have been brought together solely to collaborate on the project at hand, a unifying pursuit may work to their advantage if commitment is high. At the same time, existing governance structures, while saddled with other obligations, often have greater resources and staff available to dedicate to the project. In the San Diego case study, the MPO, San Diego Association of Governments (SANDAG), oversaw the project though
lead agencies were the California Department of Transportation (Caltrans) and the Metropolitan Transit Development Board (MTDB). In addition, the sub-regional I-15 Project Management Committee was formed, which dealt primarily with the day-to-day construction, operations and maintenance issues. The collaboration of new and existing structures assured this project’s success.

Memorandum of Understanding: A Memorandum of Understanding (MOU) is the establishment of a formal partnership that officially defines the parameters of the relationship. Although not always necessary, an MOU may bolster commitment by its formality. The greater the number of participants, the greater is the need for a formal covenant. The MOU signed in the T-REX project between the Southeast Corridor Development Team and the Joint Southeast Public Improvement Association helped secure $30 million for affected cities and counties. The MOU spelled out each entity’s local match amount and specific planning priorities of the project.
VI. Financing

Author: Ken Kriz, Hubert H. Humphrey Institute.

Financing a large capital-intensive project like the implementation of a corridor infrastructure project presents many challenges and complexities. However, the process is essentially one of creating and matching cash flows. Cash flows refer to revenues either generated by the project or used to subsidize it. These revenues create the cash needed to make periodic payments of principal and interest on bonds issued to build the project, pay for maintenance, and pay for related development projects. An example of this is given in the table below. In this example, the project is projected to generate ridership of 10,000 passengers per day (one-way). At an average fare of $1.50, this will generate $5.475 million in fare box revenue. Added to hypothetical TIF revenue and development fees, the associated project revenues will be $6.225 million in year 1. Assuming that ridership grows a little each year (for this example, I assumed one percent annual growth) and that fares increase a little after a few years (I assumed a 25 cent increase every 5 years), TIF revenues grow until the district is decertified (here I assume that the district desertification date is greater than 25 years), and that development fees drop off after a few years, the revenue estimate is given in the total column. To form that pool of resources, the transit and development agencies have to do the things mentioned above.

Most often, local sources of revenues do not generate enough cash flow to secure adequate levels of capital to build the project. In our example, the fare box, TIF, and development revenues would only support a bond issue in the $110 million range. This is unlikely to be enough to develop a project that will generate 10,000 daily riders. Inevitably, the project initiators must secure additional sources of financing. Traditionally, this has meant going to federal, state, or local governments in order to raise additional project capital. The most common financing structures for large projects have in the past been for the federal government to provide nearly half of the project capital, with state and local governments splitting the other half. The inflows of revenue from federal, state, and local sources that cannot be ascribed directly to the operations or economic impacts of the project represent a capital (and perhaps operating) subsidy. While there may be good economic reasons for such a subsidy, it may be politically contentious. The subsidy is often seen as a case of concentrated benefits and diffused costs (most often expressed in questions such as “why should we have to pay for something that we don’t use?”). While this logic ignores many of the benefits generated by these projects to the community or state as a whole, these arguments are often strong enough to undermine support for a project.

As mentioned earlier, the traditional financing sources for capital projects have in the past been mainly federal dollars, with state and local governments covering the remainder. But there are reasons to doubt the viability of such strategies in the future. Federal funds for new construction projects are likely to be under increasing budgetary pressure. State resources are also decreasing, causing some states to prioritize dollars into a few high profile projects. Local governments are often constrained in the resources they can

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generate, either through formal (constitutional or statutory) limitations or informally through calls for lower taxes. Because of these pressures, communities wishing to undertake large capital projects have increasingly been turning to innovative sources of finance.

Table 1. Hypothetical Project Cash Flows

<table>
<thead>
<tr>
<th>Year</th>
<th>Fare box</th>
<th>TIF</th>
<th>Development Fees</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>5,475,000</td>
<td>500,000</td>
<td>250,000</td>
<td>6,225,000</td>
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<td>5,529,750</td>
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<td>250,000</td>
<td>6,304,750</td>
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<td>551,250</td>
<td>200,000</td>
<td>6,336,298</td>
</tr>
<tr>
<td>4</td>
<td>5,640,898</td>
<td>578,813</td>
<td>200,000</td>
<td>6,419,710</td>
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<td>6</td>
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<td>150,000</td>
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<td>100,000</td>
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<td>100,000</td>
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<td>738,728</td>
<td>50,000</td>
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<td>50,000</td>
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<td>14,357,512</td>
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What are the criteria for a good transit financing implementation? Some would argue that a good transit finance plan is one that gets the job done. However, this ignores some fundamental points regarding the feasibility of project completion and the minimization of project costs.

One criterion for transit financing is undoubtedly that it *accelerates project completion*. Accelerating project completion should be a fundamental goal of the project sponsors. The reason is that inflation costs can be avoided by completing the project earlier than it would have been completed using traditional financing techniques. This is a major reason for the use of turnkey (for example, Design-Build) contracts. By having a single firm design and build the project, considerable amounts of time can be saved. The cost savings from a hypothetical turnkey project are illustrated below. This is for a project estimated to have $500 million in nominal costs (before the effects of inflation are taken
The total cost of the project will be $558 million under traditional techniques and $520 million using design-build contracts, an inflation savings of over 7 percent of nominal project costs.

### Table 2. Inflation Cost Savings from Project Acceleration

<table>
<thead>
<tr>
<th>Year</th>
<th>Traditional Cost Pattern</th>
<th>Design-Build Cost Pattern</th>
<th>Traditional Costs</th>
<th>Design-Build Costs</th>
<th>Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5%</td>
<td>30%</td>
<td>25,000,000</td>
<td>150,000,000</td>
<td></td>
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<tr>
<td>2</td>
<td>10%</td>
<td>40%</td>
<td>52,000,000</td>
<td>208,000,000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15%</td>
<td>30%</td>
<td>81,120,000</td>
<td>162,240,000</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>40%</td>
<td>0%</td>
<td>224,972,800</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>30%</td>
<td>0%</td>
<td>175,478,784</td>
<td>0</td>
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<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>558,571,584</td>
<td>520,240,000</td>
<td>38,331,584</td>
</tr>
</tbody>
</table>

A second important criterion is that the financing *captures the full economic value of the project*. This is important on at least two levels. First, in an economic sense, if the full value of the project is not captured, then the project is likely to not be carried on at the optimal scope. If the project creates an economic value that is not fully captured, in the long run economic models would predict an under investment in the project. If the project costs more than the economic value it creates, then we would expect a greater than optimal investment. The second aspect where full value capture is important is in generating political support for the project. Ultimately, decisions in this country to support or refute projects are political in nature. Matching costs and benefits is extremely important to generate and maintain support for a corridor improvement project.

The importance of matching benefits and costs has spatial, economic, and demographic dimensions as well as an aggregate nature. In other words, costs and benefits not only have to match for the project as a whole, but also should match over space and for different socio-economic groups. Spatially, one can envision a set of “value curves” over which the benefits of the project are distributed. Figure 1 below illustrates a hypothetical set of value curves for a project. It seems logical that the majority of the benefits of a project accrue to those individuals living or working in or near the corridor. For example, it is a stylized fact that direct usage (ridership) of transit projects is highest within 1/4 mile of the transit line with usage falling dramatically after that distance. The benefits will likely fall after a short distance, then become small outside of the vicinity of the project. The benefits will likely be manifested by the users of the system and residents of the area through increases in their consumer surplus (the satisfaction they receive from consuming their typical “market basket” of goods and services). The residents may see the direct impact of the economic effects through increases in their home values. Businesses may see increases in revenues and net income from greater economic activity in the area. However, the benefits do not reach zero outside of the immediate vicinity of the corridor. There may be some region-wide economic benefits.
from construction of a corridor. Also, people living quite far from the corridor but still within the same region may recognize an increase in their consumer surplus due to their new ability to move to the area of the corridor to consume the corridor improvements directly. Because of this fact, it may make economic sense to ask all residents and businesses in a region to help defray capital costs of a project.

**Figure 1. Hypothetical Value Curves**

![Hypothetical Value Curves](image)

The third criteria for a good financing plan is that it should create an easily understood stream of costs so that the public can understand what costs it is bearing to support the project. In a way, this criterion is complimentary to the previous criterion. They both relate to what is known in public economics as the benefit equity principle. The benefit equity principle suggests that the payment for a public good or service should equal the value of the benefit received by the individual who consumes the service.

One of the important preconditions for the benefit equity principle to be realized is that taxpayers or users of the improvement (sometimes these groups are not the same) understand the full cost of the improvement. Otherwise, they will tend to consume too much service (if they perceive the cost of the improvement to be below the true cost) or too little service (if the perception of cost is above the true cost). This implies that any financing mechanism must reveal the true cost of the service in a straightforward manner.

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4 Ron Fisher (State and Local Public Finance) refers to this second factor as the “option value” of a capital improvement.

5 Fisher, State and Local Public Finance. Fisher points out that direct users of a program or project and those that benefit from reductions in externalities should pay for the operating costs of a project.

so that proper consumption decisions can be made. This point can be illustrated in the
graph below. In this situation, the marginal cost (or supply) curve intersects the demand
curve at the equilibrium price and quantity \( P^*, Q^* \). If consumers of this good (or service)
perceive that the price of the good is \( P_1 \), they will demand a less than optimal amount of
the good (\( Q_1 \)). If they perceive a price of \( P_2 \), they will demand too much of the good
(\( Q_2 \)).

**Figure 2. Demand and Desired Consumption for a Public Good**

![Graph](image)

But why should this happen? Won’t consumers of a good perceive the true market price
\( P^* \)? This might happen for a good with a well-defined market. But for public goods,
often times the government “sets” the price for a good through its tax and user charge
policies. So the governmental organization that makes the investment in a corridor
improvement can control the effective demand through its financing choices. This
discussion implies that government’s should employ a financing scheme that is easy for
citizens and users to understand so that they can make optimal decisions regarding
consumption.\(^7\)

The fourth criterion for financing plans is that they *enhance project control*. Financing
should provide a stable set of cash flows that coincide with the project’s needs. This is
because the project managers need to know that they have the resources available to
complete each stage of the project. This criterion has much to do with the management
of financial risk for a project. In terms of our discussion there are two broad sets of
financial risks. The first type of risk involves the volatility of the revenue source used to
finance a project. Excessively volatile revenue sources may preclude the smooth
planning of a project due to managers not knowing in advance their budget constraint.
The second risk to a project’s cash flow is from political and governance factors.

\(^7\)Note that this discussion is not limited to those directly affected by the corridor improvement, but also
those that recognize benefits in the form of externality mitigation or through capturing option values of
investment.
Projects that rely on too many jurisdictions’ approval of financing or timely payments may find that voters or their representatives from that jurisdiction have soured on the project as a whole of specific particulars.

Beyond the scope of the initial project implementation, since municipal bond credit ratings are based in part on the stability of a project’s revenues, the project will become more costly as revenue volatility rises. On a macro level, the reliance on volatile revenue sources to fund infrastructure investments may lead to less than socially optimal investment because a lack of consistency in revenue sources hampers effective planning.

The fifth criterion for corridor investment financing plans is that they take into account the operating cost implications of putting the transportation investment in place. The operating costs of a corridor project should not be ignored when the project is formulated. At average costs per passenger mile, if a light rail system is implemented in a corridor that draws 20,000 passengers each workday and 5,000 passengers on weekends and the average ride is 5 miles in length, the operating cost for the system will be an estimated $12.6 million per year. Such costs are obviously not trivial.

Case Studies
Next, we apply our criteria to the case studies discussed earlier in the report. We will see that each case study city has used a different funding mechanism with its own strengths and weaknesses and that there are identifiable reasons for the choice of financing.

Ottawa
The Metropolitan Ottawa Transitway and bus system consists of 31 kilometers (19 miles) of grade-separated right-of-way reserved for buses along with a system of bus shoulder and street separation lanes. In terms of financing, Ottawa had the unique position of having a supportive provincial government. The province of Ontario provided 75 percent of the capital costs for building out the dedicated BRT line. The remaining 25 percent of capital costs are paid for through a local property tax within a defined “urban transit area.” The parts of the BRT line that operate on roadway shoulders are paid entirely from the local property tax. The province has also provided operating funding through the following mechanism. The province sets a fare box recovery ratio of 65 percent, meaning that fare box revenue has to cover 65 percent of operating costs. If this happens, the province will provide half of the remaining operating costs, or the equivalent of 17.5 percent of costs if the threshold is met (Bonsall, 2002b). Additionally, some station construction costs have been shared with developers (Cervero, 1998).

In terms of our criteria, it is not possible to say whether the financing plan sped up the completion of the system. However, one could assume that if strictly local funds had been applied, system completion would have taken much longer, if it were achieved at all. This illustrates the importance of higher levels of government becoming involved in

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8 For example, see Maria Matesanz and L’Quentas Thomas, June 2000, “Rating Methodology” in: Mass Transit., New York.
9 Author’s calculations from data derived from the National Transit Database. Operating costs per passenger mile were calculated as 28 cents for commuter rail and heavy rail, 44 cents for light rail and 59 cents for bus (including both bus rapid transit and traditional city bus service).
local projects. However, excessive reliance on intergovernmental transfers to fund transit system construction may reduce autonomy of the local governments to make planning decisions. In Ottawa’s case, the provincial government no longer funds transit construction (Bonsall, 2002b). Therefore, this reduces the viability of making large-scale commitments to transit.

With respect to economic value capture, the Ottawa plan is likely to fall somewhat short. Reliance on an area based tax such as the local property tax probably places too much of the burden of payment on individuals within the urban transit area. The problem of “in-commuters” is endemic to plans that rely on property taxes. This problem is created because there is a marginal benefit to locating just outside of the urban transit area and then commuting into the city. The problem of in-commuters is being debated presently in Ottawa (Bonsall, 2002b). A second problem with this financing plan is its reliance on the provincial government. It is doubtful that a taxpayer in Windsor or another part of Ontario recognizes much of a benefit from the Ottawa busway. But they are participating in funding the majority of the system. It should come as no surprise that support for funding transit system completion at the provincial level has waned. Indeed, it took the efforts of a strong policy entrepreneur at the provincial level to create support for funding the system. Finally, the operating cost subsidy is problematic from the standpoint of value capture. The traditional way of thinking about infrastructure finance is for the region to help fund capital costs but the users and local beneficiaries to support the ongoing operations of the system. This is mitigated somewhat by the mechanism employed by the province to subsidize system operations, as discussed below.

From our perspective, one of the major strengths of Ottawa’s financing system is that it does create a fairly easily understood stream of costs, at least with respect to the local component of the funding. The property tax is one of the most visible and easily understood taxes. One receives an annual reminder of how much one is paying to support the transit system. Additional mechanisms such as increasing public access to budgets may be necessary to ensure that taxpayers understand the expenditure mix, but at an aggregate level, taxpayers should have a good feel for how much they support the system.

Another strength of the financing plan is that for the set of projects funded by the provincial government, a steady stream of revenues was provided. The province was able to use its greater economic power and more diversified revenue base to ensure project funding. From a micro level this increases the ability of construction project managers to plan for project completion. However, again from a macro system level, this reliance on higher levels of government may reduce the ability of local governments to replicate the success of Ottawa.

Finally, from the perspective of our fifth criteria, the inclusion of funding provisions for operating costs is a plus in the Ottawa case. The subsidy scheme applied by the province provides incentives for the setting of fares necessary to recover the bulk of system operations. Of course, this is true only up to a point. The provincial government should

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10 Though in some classified systems (such as Minnesota’s), understanding the tax value placed on property is problematic.
act to ensure that Ottawa isn’t just meeting their target, but striving to make sure that the appropriate level of fare box recovery is reached. This optimal level will be inversely related to the level of external economic effects generated by the system. For example, if the level is high (through increases in land-use values and other economic gains), a lower fare box recovery is desirable from an economic sense.

**Denver**

The Transportation Expansion Program (T-REX) corridor investment, recommended for implementation and adopted by the Denver Regional Council of Governments (DRCOG) Board in 1997, consists of a light rail element, highway improvements, improved pedestrian/bicycle facilities, and transportation management elements within Denver’s Southeast Corridor. The project had received broad public support, but the final hurdle was financing. Unlike Ottawa, Denver’s planners did not have a strongly supportive financing environment. However, the Southeast Corridor initiative assembled a financing package that brought together four partners: the Colorado Department of Transportation (CDOT), the Regional Transportation District (RTD), FHWA, and FTA.

CDOT’s share of the funding (used primarily for the highway improvements portion of the project) will be provided through the issuance of $671 million of GARVEE bonds. These bonds were authorized by the Colorado legislature in 1999 as part of a funding package to finance nearly $5 billion in corridor projects throughout the state. In addition, the funding legislation transfers $200 million in sales and use tax revenues to CDOT annually to finance the projects. Because Colorado law requires voter approval for all tax increases and debt financing transactions, CDOT was required to seek voter approval in November 1999 for the issuance of its bonds. By a majority of 62 percent, Colorado voters approved the initiative to sell bonds to accelerate project completion. The first bonds were issued in June of 2000. They are 15-year direct GARVEE bonds repaid with future federal and state matching funds.

RTD will also secure up-front financing for the project’s light rail improvements through the issuance of sales tax revenue bonds, since a pay-as-you-go approach will not provide sufficient cash balances for a project of this magnitude. RTD also sought voter approval in November 1999 for the issuance of debt to partially finance the transit portion of the Southeast Corridor project. Like the CDOT initiative, voters overwhelmingly approved RTD’s ballot measure. In addition, RTD and CDOT received a full funding grant agreement (FFGA) with FTA in the amount of $525 million, which when combined with the issuance of $320 million in sales tax revenue bonds and $30 million in local funds, will allow the District to fund the project.

There is little doubt that the innovative financing employed by the Southeast Corridor initiative accelerated project completion. Colorado’s rather strict revenue limitation virtually ensured that the transportation agencies and districts could not build up enough cash to ensure funding for a similarly scaled project. Also, the federal government had expressed concern about the support for such a major transportation project in the Denver metropolitan area. And so the prospects of completing a project as large as T-REX in the Denver area seemed slim at best, and if it were complete, it would take several years to put the necessary financing in place.
The heavy reliance on sales and use taxes in the T-REX financing plan produces some interesting effects in terms of economic value capture. The statewide portion of the sales tax (the so-called “7th Pot” of financing for CDOT, in contrast to the 6 traditional sources of funding) means that individuals who consume services in Pagosa Springs, Colorado (about 275 miles southwest of Denver) will help pay for T-REX. In addition, tourists and other individuals outside of the state may ultimately bear a large portion of the burden of the tax. Continuing this strategy may lead to the over consumption of resources for these types of plans and (arguably more importantly) may be hard to sustain politically. The political acceptability of the statewide 7th Pot strategy is aided, however, by the geographic dispersion of projects. Pagosa Springs, for example, is served by US Highway 160. One 7th Pot project will improve the high mountain Wolf Creek Pass stretch of US 160. This dispersion builds political support for the package of projects.

One of the major weaknesses of the Denver financing plan is that it does not produce an easily understood set of costs. The burden of financing will vary largely based on the location of consumption. Since an add-on to the general retail sales tax was used, it isn’t all purchases that are taxed, only purchases of goods (and a few services) that are not exempted, so someone purchasing an exempted item in a store at a station stop along the light rail line will not be paying the add-on tax while someone purchasing a non-exempt item in a store on the Colorado-Kansas state line will pay the tax. Also, the sales tax is not an extremely understandable tax from the standpoint that individuals often underestimate what they pay in sales taxes due to their small, frequently collected nature.

Another strength of the financing plan was that the strong state and regional support allowed for a steady stream of project revenues and the use of design-build contracts shifted uncertainty to the project contractor. The local component of the financing was relatively small (less than 2 percent of total project revenues) and was managed using a set of Memoranda of Understanding (MOUs) among RTD, CDOT, and the local governments. Though the inflows under the MOUs have been less than originally agreed upon, the strong coordination of project participants should help ensure that obligations are met (Randolph, 2002).

A major weakness of the T-REX plan is that it does not appear to make allowances for operations. This is a missed opportunity for the project. It would have been possible to write an additional contract to create a true turnkey (design-build-operate and possibly maintain) project. The decision makers in the Southeast Corridor initiative should move to a definite plan for financing ongoing operations and maintenance responsibilities.

Possible Application to Minnesota: A Regional Sales or Income Tax
Implementing a regional sales or income tax add-on is one way the metropolitan Twin Cities could put several transportation corridors into place within a relatively short period of time. The Twin Cities is unique among metropolitan areas in not having a dedicated sales or income tax to pay for transit system construction, operations, and maintenance. Such a tax would need to be approved by the state legislature, which is a definite

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11For the purposes of this research, I used the U.S. Census and Met Council definition of the metropolitan area as these seven counties: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.
impediment, but once it is in place it could provide a lot of revenue for project completion.

In order to estimate the revenue creation capacity and burden of such a tax, I created an economic simulation model. Using the current level of personal income and historical relationships between personal income and the sales and income tax bases, along with historical growth rates and variability of personal income, I projected the growth of the two tax bases. Then I adjusted the tax bases for estimated elasticity effects of the tax increase. Next, I multiplied the projected tax base by a number of potential tax rates to estimate total tax revenues for each year. After adjusting for the need for operating expenses, I discounted the available tax revenues in each year to the current period to determine the maximum amount that could be borrowed for capital purposes.

Table 3 lists the results of the simulation for a sales tax. Panel A shows the results for the base simulation, with 10 percent of the tax revenues in each year allocated for operations and maintenance, and a 1/2 percent tax rate. The median estimate for the amount that could be borrowed is approximately $3.1 billion. This tax would cost an average of $56 for each citizen in the seven county metropolitan area.\(^{12}\) Panel B shows that regardless of the amount that will be necessary for operations and maintenance, the amount that can be borrowed is large. Panel C reports estimated borrowing amounts for different tax rates.

Table 4 lists the results for a regional income tax. Panel A shows that a 1/4 percent income tax would raise about the same amount of capital as would a 1/2 percent sales tax. Panel B shows that the income tax has slightly less volatility than does the sales tax (the coefficient of variability\(^{13}\) of the results for the income tax is 12.65 percent, as compared to 12.76 percent for the sales tax). Once again Panel C reports estimated borrowing amounts for different tax rates.

### HOT NETWORKS:
High Occupancy Toll Lanes could provide another alternative source of transportation project financing. The concept is simple, allow SOV to access underutilized HOV lanes for a toll or fee. The concept has been well received along the I-15 corridor in California, and is now being proposed in multiple states. A recent HOT network study conducted by Robert W. Poole, Jr., and C. Kenneth Orski estimated that if this concept were expanded to entire regions, the total annual revenue for a metropolitan region could be $116-922 million a year (based on eight different metropolitan regions).


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\(^{12}\)This assumes that none of the tax is exported to citizens of other counties outside the metropolitan area. Since this is unlikely, the actual tax burden for citizens of the area will be less than $56.

\(^{13}\)Found by dividing the standard deviation of the results by the mean of the results.
Table 3. Simulation Results for Sales Tax

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<tr>
<th>Panel A: 90% Capital Allocation, 1/2% Tax</th>
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<thead>
<tr>
<th>Panel B: Varying Capital Allocation Rates, 1/2% Tax</th>
<th>5%</th>
<th>Median</th>
<th>95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>$2,362,274,259</td>
<td>$2,816,882,942</td>
<td>$3,530,642,727</td>
</tr>
<tr>
<td>85%</td>
<td>$2,509,916,400</td>
<td>$2,992,938,126</td>
<td>$3,751,307,897</td>
</tr>
<tr>
<td>90%</td>
<td>$2,657,558,541</td>
<td>$3,168,993,310</td>
<td>$3,971,973,068</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel C: Varying Tax Rates, 90% Capital Allocation</th>
<th>5%</th>
<th>Median</th>
<th>95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1%</td>
<td>$666,945,822</td>
<td>$676,051,906</td>
<td>$847,354,254</td>
</tr>
<tr>
<td>0.2%</td>
<td>$1,116,174,587</td>
<td>$1,330,977,190</td>
<td>$1,668,228,688</td>
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<tr>
<td>0.3%</td>
<td>$1,647,686,296</td>
<td>$1,964,775,852</td>
<td>$2,462,623,302</td>
</tr>
<tr>
<td>0.4%</td>
<td>$2,161,480,947</td>
<td>$2,577,447,892</td>
<td>$3,230,538,095</td>
</tr>
<tr>
<td>0.5%</td>
<td>$2,657,558,541</td>
<td>$3,168,993,310</td>
<td>$3,971,973,068</td>
</tr>
</tbody>
</table>

Table 4. Simulation Results for Income Tax

<table>
<thead>
<tr>
<th>Panel A: 90% Capital Allocation, 1/4% Tax</th>
<th>5%</th>
<th>Median</th>
<th>95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond Size</td>
<td>$2,541,492,853</td>
<td>$3,027,072,399</td>
<td>$3,793,524,917</td>
</tr>
<tr>
<td>Per Capita Impact</td>
<td>$51.50</td>
<td>$53.17</td>
<td>$55.87</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Varying Capital Allocation Rates, 1/4% Tax</th>
<th>5%</th>
<th>Median</th>
<th>95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>$2,259,104,758</td>
<td>$2,690,731,021</td>
<td>$3,372,022,148</td>
</tr>
<tr>
<td>85%</td>
<td>$2,400,298,806</td>
<td>$2,858,901,710</td>
<td>$3,582,773,533</td>
</tr>
<tr>
<td>90%</td>
<td>$2,541,492,853</td>
<td>$3,027,072,399</td>
<td>$3,793,524,917</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel C: Varying Tax Rates, 90% Capital Allocation</th>
<th>5%</th>
<th>Median</th>
<th>95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1%</td>
<td>$1,016,597,141</td>
<td>$1,210,828,960</td>
<td>$1,517,409,967</td>
</tr>
<tr>
<td>0.2%</td>
<td>$2,033,194,283</td>
<td>$2,421,657,919</td>
<td>$3,034,819,933</td>
</tr>
<tr>
<td>0.3%</td>
<td>$3,049,791,424</td>
<td>$3,632,486,879</td>
<td>$4,552,229,900</td>
</tr>
<tr>
<td>0.4%</td>
<td>$4,066,388,565</td>
<td>$4,843,315,838</td>
<td>$6,069,639,867</td>
</tr>
<tr>
<td>0.5%</td>
<td>$5,082,985,706</td>
<td>$6,054,144,798</td>
<td>$7,587,049,834</td>
</tr>
</tbody>
</table>

The results of the simulations indicate that either financing source could produce large amounts of capital to construct corridor infrastructure. Now we turn to a comparative analysis of the revenue sources. We analyze the sources through four lenses: economic efficiency, equity, transparency, and political acceptability. In terms of economic efficiency, it is generally accepted that income taxes produce less economic distortions than do retail sales taxes. Any tax change will produce two sets of economic effects, an income effect and a substitution effect. The income effect comes from reducing
individual’s effective purchasing power. The individual can consume less of all goods and services because of a tax. The substitution effect is felt when one type of good or service is taxed while others are not. Individuals have an incentive to shift their consumption to non-taxed goods and services because of their lower relative price. Both income taxes and sales taxes produce income effects, but sales taxes produce much higher levels of substitution effects. Because of equity concerns (discussed next), states tend to exempt many items from the sales tax. An additional sales tax will exacerbate the over-consumption of non-exempt items. Because an income tax taxes most all income, it produces substitution effects only in non-goods markets (such as the labor and capital (savings) market). And the substitution effects in labor and capital markets have been shown to be very small. One area of great concern is how any tax might affect land-use and location decisions. Geographically based income taxes may produce an incentive to locate outside of the geographic area of the tax. In this case, an income tax may spur residential development outside of the seven county metropolitan area. This may accelerate sprawl somewhat. Geographically based sales taxes may likewise cause shifts in the pattern of retail development.

In terms of equity, the sales tax is generally less regressive than the income tax. This is especially pronounced in Minnesota. The Minnesota Department of Revenue calculates an estimated Suits Index for major revenue sources. The Suits Index measures the progressivity of taxes, ranging from a measure of +1.0 (perfectly progressive, where the top income earner pays all of the taxes) to -1.0 (perfectly regressive). The estimate for 1998 (the most recent data available) indicates a Suits Index of +0.173 (fairly progressive) for the individual income tax and -0.204 (fairly regressive) for consumption taxes (Tax Revenue Division 2001). This regressivity of the sales tax is even after exempting a large portion of the sales tax base in order to increase progressivity. As part of the simulation model we estimated that the sales tax base constituted only 39 percent of personal income, indicating that a large portion of sales are exempt from tax.

In terms of transparency, the sales tax is generally regarded as more transparent than the income tax. Though there are many misunderstandings regarding marginal and average income tax rates and the mechanics of income taxation, there are marked misunderstandings about sales tax rates and total burden. The sales tax is relatively small and collected frequently, making it rather opaque. To economists, this may lead to over-taxation and over-consumption of public goods.

However, for politicians, the opacity of the sales tax makes this source tremendously palatable. “Consumers are the most directly affected, but they pay sales taxes in small, almost invisible amounts during the year, so they tend not to mind them too much.”(Rubin & NetLibrary Inc., 2000). Business groups also tend to favor sales taxes over income taxes. Since these groups hold tremendous lobbying strength, it may be much easier to pass an add-on to the sales tax than it would be to increase the income tax by a revenue-equivalent amount.

14 The term consumption taxes includes excise taxes. Tables in the report, however, indicate that the general sales tax is more regressive than excise taxes. So if anything this figure may understimate the regressivity of the sales tax.
**Conclusion**

Financing any large corridor infrastructure project that costs hundreds of millions of dollars is a challenging endeavor. The revenue the project is expected to produce, either through fares, tolls, or development fees, is usually not enough to support the bonds issued to pay for its construction. This happens in part because the pricing of transportation corridor use rarely reflects the true cost of improving the user’s mobility. Luckily, as has been previously mentioned, short-term cost per rider is not the only influencing factor in whether or not a corridor improvement is made.

Because predicted initial revenues rarely match the cost of building such infrastructure, project developers must implement financing methods that speed project completion, are easily understood, capture a project’s true value, enhance project control and that account for operating costs. While this may be asking a lot of a financing scheme, abiding to these criteria may avoid voter or politician backlash in the future, help to maintain a stable funding source or greatly encourage investment along the corridor. In sum, because financing is, in essence, what makes a project possible, it must be planned well in order to survive the ups and downs that go with all infrastructure development.
A significant challenge of developing metropolitan transportation corridors is determining the desired functions and designs for each corridor. Successful metropolitan transportation corridors need to establish compatible relationships with their diverse and complex surrounding environments and movement networks. Each metropolitan transportation corridor has a unique physical design reflecting the relationships between three primary structural components: transportation infrastructure and networks, mix and form of communities and land uses, and its natural systems. The dominant transportation planning approach of roadway functional classifications and design standards primarily focuses on automobile movement functions. However, the design of a metropolitan transportation corridor should proactively integrate the broader elements of corridors including: the travel route’s capacity for multiple transportation modes, connections to adjacent movement networks, relationships to surrounding land use patterns and scale, local community character, and impacts on natural systems and landscapes. Review of the literature relating to metropolitan transportation corridors indicates a significant movement toward new corridor typologies that balance multiple travel modes and trip types, integrate transportation and land use planning, and identify new corridor design types that serve the diversifying needs of metropolitan regions and local communities.

Historically, most transportation corridors have had a radial orientation to the city’s central business district. However, newer metropolitan transportation corridors are typically positioned as beltways, often interstate freeways, that circumnavigate the original CBD and connect multiple regional activity centers. Consequently, the diverse mix of activity centers that transportation corridors connect, as well as the corresponding travel markets they serve, defines metropolitan corridors differently than the urban corridors of the past. Transportation corridors function as the critical connection points of the metropolitan region where the greatest interaction occurs between transportation, urban form and natural systems, creating unique areas with highest levels of activity, diversity, and complexity. By creating the desired relationships between various travel modes, urban form and natural systems, today’s transportation corridors can be designed to balance their multiple functions and optimize the livability of both the metro area and local surrounding communities.

This chapter defines a range of corridor design types or forms for metropolitan transportation corridors, including: regional expressways, subregional exclusive transitways, metropolitan arterial boulevards, and urban connector streets. Each type represents unique relationship between transportation infrastructure, urban form, and the natural landscape, while balancing needs for both mobility and access. Based on contemporary urban design approaches relating to transit-oriented development, livable community design, smart growth, and context-sensitive roadway design, six general corridor design principles are identified to help guide the development of metropolitan transportation corridors. Finally, the proposed corridor typology and design principles are illustrated through the analysis of several national and international transportation corridor case studies.
Expanding the Definition of Transportation Corridor Design

Transportation corridor design is typically approached as a transportation planning exercise that optimizes travel opportunities (vehicle mobility, access, safety, etc.) and limits negative impacts (noise, air pollution, traffic through neighborhoods, crime, etc.) on the surrounding areas. In the U.S., the classification of roadways into functional classifications is based primarily on vehicle traffic volume and the needs for travel mobility versus property access.\(^{15}\) Urban design researcher Allan Jacobs concludes: “Generally these standards are the basis on which American streets are designed, or redesigned. Often they are the only criteria applied. This acceptance of engineering standards as the sole basis for street design has resulted in streets that are designed for cars and not for people.”\(^{16}\) In addition, environmental impact studies, access management, traffic studies, major investment studies, and local zoning ordinances are some other approaches used to guide the design of transportation corridors that in the past favored vehicle mobility needs over all other corridor functions. Although these approaches address surrounding land use and natural environment issues, they are essentially reactive rather than proactive approaches to building good metropolitan transportation corridors.

Spatially, corridor planning typically focuses on the actual transportation route, specifically the road or transit right-of-way, and the primary users of that route, which are usually automobile drivers or transit riders. Much less attention is usually given to the surrounding natural and built environment. Part of the challenge is that metropolitan corridors are often planned first as transportation corridors, under the jurisdiction of state, county, and/or city transportation agencies. Since land use is under local control and corridors typically cross multiple communities, the land use design of directly adjacent and surrounding areas is typically split up among multiple jurisdictions. This misalignment between transportation engineering and land use design can result in corridor designs that fail to balance a corridor’s multiple functions. In some cases, a premature obsolescence of either the transportation infrastructure and/or development can occur.

The overriding design challenge facing metropolitan transportation corridors is expanding the spatial definition of corridors to enable the integration of local communities’ visions for livability, revitalization, and transit-supportive development, within the transportation planning processes of regional and state agencies. Within this broader definition of metropolitan corridors, a number of more detailed design elements can be identified that are essential to creating a successful metropolitan corridor. At the corridor scale, key design challenges include balancing local access with regional mobility needs, developing efficient and compatible land use patterns, supporting community economic health, creating a safe and pleasant pedestrian environment, linking transit services with transit-supportive development, minimizing corridors as community

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\(^{15}\) The American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHA) publish the standard guidebooks defining the roadway functional classification for U.S. highways and streets, delineating between urban and rural roadways. This functional classification system was first established in the 1930s and continues to guide most roadway design today.

\(^{16}\) Jacobs, Allan B., Elizabeth MacDonald and Yodan Rofe’, The Boulevard Book: History, Evolution, Design of Multiway Boulevards, p. 90.
barriers, improving sensitivity to the natural environment, and redesigning auto-oriented
development and road patterns.

Substantial research exists in the area of integrative design of transportation
infrastructure, urban form and the natural landscape, although much of the research does
not specifically address metropolitan transportation corridors. However, the Transit
Cooperative Research Program has completed a major research study focused on the
interactions between transit and urban form and targets metropolitan transit corridors17.
Three of the most prevalent integrative urban design approaches are transit-oriented
development, livable community design, and context-sensitive roadway design, which
have major implications for the design of metropolitan transportation corridors. Transit-
oriented development is typically defined as mixed-use areas along major transit routes,
within walking distance of a transit stop, that integrate moderate and high-density
housing and/or workplaces with complementary retail, services, and public uses in
compact, walkable development patterns.18 Livable community and smart growth design
are broader approaches that focus on resource-efficient land use patterns, local integration
of complementary activities, access to a range of housing, transportation, public space
and recreation options, unique sense of place, preservation and enhancement of natural
systems, and community participation.19 Finally, context-sensitive roadway design uses
an approach that balances the needs of transportation safety and performance criteria with
broader community, aesthetic and environmental values, for both the built and natural
environment.20

**Integrating Corridor Structural Components and Design Elements**
Each of the three primary structural components of metropolitan transportation corridors
consists of a wide range of design elements. By understanding the many design options
possible for different types of corridors, we can strategically integrate the various
elements to design the desired corridor type that fits the function and character of each
place. The design elements and goals for corridor transportation infrastructure, urban
form, and natural systems are summarized below:

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17 Please refer to Transit Cooperative Research Program (TCRP) Report No. 16, *Transit and Urban Form*,
which synthesizes the findings and conclusions regarding the influences between transit and urban form,
analyzes the land use-transit connections in fixed rail corridors, provides a guidebook for corridor and
station-area planning, and explores the public policies supporting transit-oriented development for six case
18 Refer to *The Next American Metropolis: Ecology, Community, and the American Dream* by Peter
Calthorpe for a full description of the transit-oriented development (TOD) concept, including arguments for
using TOD as a new development pattern for metropolitan growth, definitions, guiding principles, design
criteria, and illustrations of TOD concepts applied to projects at various geographic scales. The Twin Cities
Metropolitan Council has also published a TOD guidebook, *Planning More Livable Communities with
Transit-Oriented Development*, that provides specific guidelines and criteria for Twin Cities communities.
19 Numerous publications are available regarding livable community design. The Local Government
Commission through its Center for Livable Communities offers several publications focused on building
livable communities. Another good resource is TCRP Report No. 22, *The Role of Transit in Creating
Livable Metropolitan Communities*.
20 Refer to the Federal Highway Administration’s website, [www.fhwa.dot.gov/csd](http://www.fhwa.dot.gov/csd),
for more detailed information regarding the context-sensitive design approach.
Transportation Infrastructure

From an overall movement perspective, transportation systems encompass a whole range of travel modes, including roadways, transitways, freight routes, bike routes, and pedestrian paths. Different mixes of transportation modes and infrastructure should align with each corridor’s planned connections to nearby travel networks and land use patterns. Roadway types can range from high-speed freeways with separated-grade interchanges, to medium-speed minor arterial highways with limited at-grade intersections, and to slow-speed town center streets with frequent access to surrounding activities. Transitways encompass commuter rail trains, light rail transit, exclusive busways, freeway express buses, and local street buses. Bike routes may be on-street bike lanes, adjacent bike paths, or exclusive bike trails. Pedestrian paths range from pedestrian crossings of roads, to transit stop pedestrian routes, to walkable centers connecting many different activities.

From a transit perspective, successful corridors maximize the demand for transit and minimize the costs of providing it. Transit corridors can be defined as the catchment area for riders, thus the width of a corridor may vary depending upon the primary mode of access to the transit corridor – narrower for compact, walking areas and wider for low-density, park & ride areas. The mode of access to and from the corridor’s transit stations and the size of the catchment area are determined by the surrounding residential density, the corridor’s link to the Central Business District, or CBD (often the major transit destination), availability of parking at transit stops and destinations, availability of feeder bus services, and provision of a pedestrian network and amenities. The most cost-effective transit corridors will link a CBD with subregional employment centers. This occurs because transit is at its most effective when its riders are concentrated in specific areas, thus allowing transit providers to offer multi-directional service all day. It is imperative that transit corridors provide travel-time advantages for transit riders, e.g. exclusive transit lanes, traffic signal priority, minimal need for transit transfers, and frequent service.

From an automobile perspective, roadways are designed to balance vehicle mobility (speed, safety) and property access (road exits and entrances) within the corridor. For principal arterial roads, including freeways, mobility takes priority over access to facilitate long-distance travel at higher speeds. Freeways provide the least frequent level of access to other roads and adjacent places along the freeway, but enable nonstop access to the entire freeway network. Limiting freeway construction and expansion, or automobile travel capacity, is one strategy for reinforcing the use of transit. For minor arterial roads, mobility and access needs are balanced. Access takes priority over mobility for local streets. These roads typically accommodate medium- to short-distance trips.

Finally, pedestrian and bike routes are often overlooked in transportation corridor planning or seen as somewhat optional. In order to effectively support transit usage, access to more compact, mixed-use development patterns, and compatibility between transportation infrastructure and land uses, corridor design must provide for safe and pleasant pedestrian and bike systems.
**Urban Form**
Successful metropolitan transportation corridors link central business districts, regional centers, neighborhoods, districts, and cities that have diverse land use patterns. Corridors that are developed with a mix of activities – residential, employment, shopping, and services – enable the provision of high-quality transportation infrastructure and cost-effective transit services. Major origins and destinations are necessary to support convenient and cost-effective transit, including the CBD, subregional employment centers, and higher density residential areas. Limiting the number of subregional employment centers in the metro area increases the transit agency’s ability to focus transit services on limited transportation corridors and attract higher transit ridership. Planning for a good jobs-housing balance within the corridor can reduce some residents’ travel distances and increase their mode choices, improving the corridor’s efficiency. Metro growth boundaries can also steer development in transportation corridors toward higher residential densities, clustered employment growth, and improved travel demand management.

Transit-oriented development near transit stops offers convenient non-auto access to daily life's amenities, encourages transit ridership and reduces the negative impacts of auto travel. For corridor workplaces, the development of activity centers (locations of concentrated retail, entertainment and other services) allows employees to use non-auto travel options for short distance trips near their workplaces. In addition, workplaces should be located close to transit stations to encourage walking from the transit station to the workplace.

Automobile parking is a somewhat overlooked land use because it is typically handled as a zoning standard rather than as a designated land use. Parking areas for transit riders, shopping centers, institutions, and high density residential, can discourage non-auto travel and reduce the quality of the urban environment. Determining the appropriate level of parking can often be the Achilles heel of TOD developments. However, low-density areas will need park & ride space, at least in the short term, until higher densities are achieved in the area. Surface parking areas (park & rides) can serve as land banking areas for future transit-oriented development when real estate values increase enough to attract development and structured parking.

**Natural Systems**
Historically, transportation corridors were at times developed to take advantage of the natural landscape. Such locations allowed for improved functionality while keeping costs to a minimum, often running alongside rivers, skirting lakes and wetlands, or following flat low-lying valleys. However, transportation corridors were often developed with little respect for the natural systems they passed through. To maximize transportation efficiency and/or minimize construction costs, creeks were rerouted through underground pipes, wetlands were filled in, tree groves were removed, and viewsheds were blocked by development. Consequently, many existing transportation corridors virtually ignore or hide any functional or aesthetic connections to surrounding natural systems.

From an environmental and natural aesthetic perspective, transportation corridor design should respect the original and existing natural environment of the surrounding areas.
Being sensitive to the corridor’s natural context involves developing an inventory of the physical features of the landscape, including soils, topography, waterways, drainage patterns, water quality, vegetation, air quality, and viewsheds. An inventory of natural systems will help identify physical constraints, protection areas, and enhancement opportunities for designing the corridor. For example, stormwater runoff from the roadway’s pavement may need to be rerouted away from lakes to improve water quality, views of forested areas from the roadway protected, or bridges built over previously buried creeks to enable daylighting of the creek. Ultimately, good metropolitan corridor design or context-sensitive design should strive to optimize the natural functions of the environment and the aesthetic qualities of the corridor’s unique landscape.

Establishing a Typology of Metropolitan Transportation Corridors

Historically, even before the automobile era, Charles M. Robinson proposed urban street classifications in 1916 that distinguished between traffic streets and residential streets, as well as swift versus slow-moving vehicles. According to Allan Jacobs, “Practitioners of the new professions of city planning and traffic engineering, which emerged late in the 19th century, came to see urban order as synonymous with functional separation.” He adds, “As early as 1916, American cities were zoned into separate land-use districts – residential, commercial, or industrial. Around the same time planners and engineers began separating streets into different classifications.”21 With the beginning of the highway building era and the founding of the Institute of Traffic Engineers in the 1930s, the system of roadway functional classifications was created as the accepted practice for designating and designing streets in the U.S., and continues as the prevalent roadway design approach today.22

The design of a corridor’s transportation, urban form and natural landscape can be used to establish a metropolitan typology of transportation corridors that differentiates the relationships between transportation infrastructure and land use, travel mobility and property access, and automobile versus transit options. In reviewing the literature regarding classification approaches for urban corridors or streets, we can see an emerging trend toward a more integrative approach to defining metropolitan transportation corridor types. Please refer to the matrix below that summarizes and categorizes the various approaches to urban transportation corridor typologies, including those of transportation planning organizations, cities, metro regions, and urban planning researchers. Moving beyond the traditional functional classifications of traffic engineering, newer approaches highlight new corridor types including exclusive transitways, multi-function boulevards, connector streets rather than collector streets, and truck routes. A key area of exploration has been the redefining and reclassification of minor arterial corridors.

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21 Jacobs, Allan B., Elizabeth MacDonald and Yodan Rofe’, The Boulevard Book: History, Evolution, Design of Multiway Boulevards, p. 90. Refer to this book for a brief discussion of the history of U.S. road design, particularly the Introduction section and pages 89-93.
Based upon this literature review of corridor typologies and an integrative approach to transportation, urban form and natural systems design, the following four metropolitan transportation corridor types are proposed:

- Regional expressways
- Subregional exclusive transitways
- Metropolitan arterial boulevards
- Urban connector streets

Regional expressway corridors are primarily designed to optimize the speed and safety of long-distance travel; therefore, transportation infrastructure dominates these corridors and is physically very separated from the corridor’s urban form and natural landscape. These interstate freeway and other highway corridors, typically under federal and state jurisdiction, serve as the principal arterials for the metropolitan area and are the most heavily traveled roads. Mobility takes precedence over access with only limited land access at grade-separated interchanges with other principal arterials. Freeways may provide both auto and transit routes but auto travel dominates their form and function.

Exclusive transitway corridors serve sub-regional needs for rapid transit with advantages like exclusive routes (separated from roadway right-of-way, elevated, or underground) and minimum access points. These commuter transit routes often use existing or former railroad rights-of-way. Transportation infrastructure also dominates these corridors but a more integrated relationship with urban form and the natural landscape is desirable. This usually occurs at transit station areas, typically placed where the transitway intersects with roadways. Corridor responsibilities involve the state and county regional rail authorities, and funding is often found at the federal level.

Metropolitan arterial boulevards are typically minor arterial routes that link large regional centers and integrate both auto and transit facilities on the same travel route. Transit may use exclusive lanes, signal prioritization, and/or queue jumping to provide travel time advantages over auto travel. Movement is favored over access but the two are more in balance, with more frequent spacing of transit stations and signalized at-grade road intersections. These corridors offer a good opportunity to balance the design of transportation infrastructure, urban form, and the natural landscape. Strong connections exist between transportation and land use activities throughout the corridor but are intensified at transit station areas. Responsible jurisdictions typically include city, county and state agencies.

Urban connector streets are minor arterial and collector corridors that have the most integrated and compatible relationship between transportation infrastructure, urban form, and natural systems, consistently along the entire corridor. Urban corridors attempt to balance mobility and access by prioritizing frequent access over high-speed movement, and providing a range of transportation modes (cars, transit, bikes, pedestrians). Unlike the intermittent spacing of transit stops along regional and metropolitan corridors, transit stops are spaced frequently on urban streets. Corridor responsibilities typically involve city and county jurisdictions.
Classifying Twin Cities’ Transportation Corridors

The corridor typology mentioned above can be helpful in identifying the general scale, function, and form of the important automobile, transit, and multi-modal corridors within the Twin Cities metropolitan region. Once the corridor type has been identified, engineers, planners, and urban designers can collaborate on unique design functions and features that fit the particular corridor using design criteria and elements. For example, State Highway 55/Hiawatha Avenue in Minneapolis has been packaged primarily as a state highway and light rail transit project rather than a corridor project consisting of diverse districts, neighborhoods, centers, and transportation modes. The corridor lacks a broad, clearly articulated corridor-wide vision for the future beyond the transit line, the highway, and some planning for the station areas. In contrast, County Highway 81 in northern Hennepin County has developed a preliminary corridor vision for the roadway, potential transitway, and surrounding communities that has the potential to substantially guide and coordinate the future design of expanded road connections, convenient transit services, mixed land uses, new development types, and enhanced natural systems. Twin Cities’ major transportation corridors can be classified as follows (although this list does not include every minor arterial and local street in the metro region):

Regional expressways

HOV Lanes: I-394, I-35W South
Busway: I-494 (Airport to Eden Prairie), Hwy 100 (Hwy 81 to I-394) and Hwy 394 (Hwy 100 to Downtown Mpls)

Subregional exclusive transitways

Light Rail Train Line: Hiawatha (south of Hwy 62)
Commuter Rail Train Line: Northstar, Red Rock
Busway: Northeast, Minneapolis East, and Southwest (technology undesignated)

Metropolitan arterial boulevards

Minor Arterial + Busway: Hwy 81 (Northwest), West Seventh Street/Hwy 5 (Riverview)
Principal/Minor Arterial + LRT: Hiawatha (South Minneapolis), University Avenue/Hwy 52 (Central)

Urban connector streets

Arterial/Collector + Bus Routes: Broadway Ave, Lowry Ave, Emerson/Fremont Ave, Central Ave, University Ave, France Ave, Hennepin Ave, Lyndale Ave, Nicollet Ave, Chicago Ave, Lake Street, Minnetonka Blvd, 46th Street, 37th Ave, 77th Ave, Cleveland Ave, Marshall Ave, Grand Ave, Randolph Ave, Larpenteur Ave, Rice Street, Arcade Street, County Road C, White Bear Ave, Robert Street, West Seventh Street, etc.
Downtown LRT: Fifth Street (Minneapolis), Cedar Street (St. Paul)
Identifying Design Principles for Metropolitan Transportation Corridors

The following proposed design principles are intended to broadly guide the design of effective, efficient, and attractive metropolitan transportation corridors. These six principles represent a synthesis of ideas from existing urban design approaches. The design of corridor transportation infrastructure, urban form and natural systems should encompass approaches that integrate the planning of a corridor’s multiple functions. These include travel demand management, context-sensitive roadway design, regional growth management, comprehensive land use planning, site design, community redevelopment, green infrastructure, and community participation strategies.

Make metropolitan corridors that link multiple and diverse activity centers: Corridors that provide convenient connections to multiple employment centers, activity areas, and movement networks will encourage the highest-level use of the transportation infrastructure, enable multiple transportation options, and attract investment in transportation-supportive development. For instance, a corridor that connects primarily to a major CBD or a single regional employment center is more likely to create a demand for long-distance and one-directional travel by workplace commuters at specific time periods, whereas, the presence of multiple and diverse centers along the corridor translates to a mix of travel markets that use the corridor in different ways and at different times. Ideally, the corridor also contains a good balance of housing and jobs. Multiple corridor destinations and travel markets will ensure that a corridor is well used and warrants reinvestment in infrastructure improvements.

Provide sufficient access to multiple transportation modes and networks: Successful metropolitan corridors should offer access to multiple transportation modes to provide users with travel options and to optimize the corridor’s transportation role. Transit modes need to be competitive with automobile travel in terms of length of travel-time, access, and frequency of service. Connections to transportation support facilities are important and should include transit stations or shelters, services allowing efficient bus transfers, bus turnout areas, drop-off areas, park & ride areas, and bike storage. A primary function of transportation corridors is providing sufficient access to surrounding travel networks, including roadways (freeways to driveways), transit routes (exclusive transitways to local feeder bus routes), bikeways (commuter bike lanes to recreational bike trails), and pedestrian routes (both pedestrian crossings and sidewalk systems).

Develop transportation-supportive land use mixes and densities: In order to support the significant costs of transportation infrastructure, planners must provide people with convenient access to transportation infrastructure (both road and transit connections) and generate sufficient transit ridership. Development along corridors should include the appropriate types, mixes, and densities of land uses. Transit-orientated-development, or TOD, encompasses higher residential and employment densities, is located within walking distance of stations, and provides a mix of activities. Such designs allow non-auto travel options via pedestrian and bike networks, pedestrian-oriented site design, and structured parking.
Design transportation routes to be compatible with surrounding community character: Community character is created through site design (including placement of buildings, street and pedestrian access, parking, landscaping), local travel patterns and street configuration, and cultural/natural amenities (including public spaces, recreational parks and trails, civic institutions). The design of the transportation route should respect the scale of adjacent buildings and road patterns, as well as enhance local community identity. Since metropolitan transportation corridors often run through multiple municipalities, a corridor’s design should reflect the differences in the scale of development scale and identity of each city or community. For example, the physical relationship of the roadway or transitway to adjacent land uses (at-grade, elevated, underground, cut below-grade) and placement of access points are critical elements of its compatibility with local community character.

Optimize the character and functions of the area’s natural systems: The functional and scenic qualities of a corridor’s natural systems should be protected and enhanced whenever possible. The first step in the process is completion of a comprehensive inventory of the natural systems connected to a metropolitan corridor. Good corridor design should prevent destruction of environmental functions, including water quality, major drainage patterns, native vegetation, and animal habitats. Road, transitway, and bridge design should allow flexibility in standards to allow restoration or enhancement of the natural landscape, including creek daylighting, native vegetation landscaping, greenway corridors and natural viewsheds. For example, Context Sensitive Design, an approach to roadway design, seeks to create transportation projects that preserve the environmental, scenic, aesthetic, and natural resources valued by the community and region.

Relating Corridor Design Principles to National and International Case Studies
The development of these proposed corridor design principles is based upon the analysis and evaluation of selected national and international corridor case studies. From a design perspective, it is helpful to categorize these case studies within the proposed corridor typology. The following case study summaries include Denver’s Southeast Corridor and San Diego’s I-15 Corridor (regional expressways), Ottawa’s Transitway System (subregional exclusive transitways), Curitiba’s Integrated Transit Network (metro arterial boulevards), and Portland’s River District Streetcar Line (urban connector streets). The case studies highlight the unique challenges of corridor design based on the corridor type, the importance of both a corridor and metropolitan vision, and the need for integrating the design of transportation infrastructure, urban form, and natural systems.

Regional Multi-Modal Expressways: Denver and San Diego
Corridor’s role and destinations: Denver’s Southeast Corridor (I-25/I-225) T-REX Project and San Diego’s I-15 Managed Lanes Project both represent multi-modal expansions of existing regional expressway corridors. Both corridors are extremely critical regional freeway links because the geography of both metro areas limits the number of freeway corridors, resulting in major traffic congestion. Denver’s Southeast Corridor is the primary transportation corridor linking the metro region’s two largest employment centers, downtown Denver and the Southeast Business District (a.k.a. Denver Tech Center). It is also the only north-south freeway corridor in the metro area and the state of Colorado. In contrast, San Diego’s I-15 Corridor is not directly linked to
the CBD nor does it link to other regional employment centers. It functions primarily as a commuter freeway link for residents of developing suburban communities commuting into San Diego.

**Multi-modal connections:** Both corridors are expanding access to multi-modal transportation options. In Denver, additional auto lanes and a new LRT line with improved pedestrian and bike access will give area residents improvement on all sides, while in San Diego the addition of managed lanes to the I-15 will increase the corridor’s capacity for high-occupancy vehicles and Bus Rapid Transit. As regional freeways, both corridors have limited access for both auto and transit vehicles, although San Diego access to the Managed Lanes will be especially limited, enabling high-speed commuting. Rapid transit will be further supported by major park & ride areas. Both corridors will link up with existing transit networks, including LRT and trolley lines.

**TOD planning:** Both San Diego and Denver have experience with Transit Oriented Development (TOD), by way of several very successful implementations along existing LRT lines. Nonetheless the large scale of these two freeway corridors will make TOD more difficult. Denver’s plans are focused on high-density employment TOD’s with structured parking. San Diego’s TOD focus is limited to the BRT station areas although planned park & rides and existing low-density residential present substantial barriers to TOD.

**Land use scale & compatibility:** Achieving compatibility between the large scale of the freeway corridors and the surrounding community character has been more of a mitigation process, involving noise walls, landscaping and large setbacks. Adjacent land uses are very separated from the freeway corridors in both Denver and San Diego.

**Natural systems quality:** The environmental systems are a major component of Denver’s T-REX Project because the existing roadway has major drainage problems, resulting in flooding. The new transportation infrastructure includes a new storm water drainage system. Again, the large scale of these freeway corridors and focus on transportation mobility physically separates the corridors from their natural environment in both Denver and San Diego.

**Subregional Exclusive Transitways: Ottawa**

**Corridor’s role and destinations:** Ottawa’s metropolitan system of busway corridors links downtown Ottawa, the metro’s largest employment center, to Primary Employment Centers (5,000 or more jobs) and Secondary Employment Centers (2,000 or more jobs) that have been designated in the metro region’s comprehensive land use and development plan. The region’s long-term future vision for a multi-centered metropolitan area, focused on downtown Ottawa as the dominant center with a hierarchy of supporting centers ringing it, led to the region’s transportation vision of creating a transitway network.

**Multi-modal connections:** The Ottawa Transitway System primarily consists of open cut, grade-separated busways that do not allow car traffic and accommodate three types of transit routes: bus rapid transit, express, and local feeder. As a metropolitan region with low-density residential patterns and concentrated employment areas, the busway corridors fluctuate in design from at-grade urban street alignments downtown, to grade-
separated transitways stretching out from the CBD, to the feeder buses that navigate the residential streets of the suburbs.

*TOD planning:* Development of the Transitway is the result of strong coordination between long-term land use and transportation planning. The metro region’s future employment growth is targeted for designated employment centers along transit corridors, in accordance with the long-term goal of locating 40 percent of the region’s jobs within walking distance of the Transitway. Ottawa has focused on developing high-density commercial-office centers at transit station areas but has chosen to accommodate the existing low-density residential patterns with feeder buses. Park & ride areas have been discouraged at employment centers in favor of higher density development and as a strong incentive for transit ridership.

*Land use scale & compatibility:* Ottawa provides the strongest design model for a network of exclusive transitway corridors that also offers significant flexibility. Because the busways are mostly located below-grade, physical compatibility with the surrounding communities’ character has generally gained less attention. The exception has occurred at transit station areas, where station integration with commercial and office development has been a high priority.

*Natural systems quality:* Clustering of employment growth along transportation corridors is also part of a long-term vision to protect an existing greenbelt that rings the metro region.

*Metro Arterial Boulevards: Curitiba*

*Corridor’s role and destinations:* Curitiba’s Integrated Transit Network (ITN) has also been the result of a regional long-term vision of the metro area’s structure. In this case, the vision is based upon a linear city structure with designated transportation corridors or structural axes planned as the primary connection routes. Metro growth has been channeled into these linear corridors, which connect directly to the CBD, as a means to align land-use intensities with transportation infrastructure. Other aspects of this long-term vision included revitalizing the CBD as the dominant center, and transforming it into a network of pedestrian-oriented streets, expanded parks and public spaces, and solid waste recycling.

*Multi-modal connections:* Curitiba’s ITN consists of four types of transit service that provide a range of service frequencies and access: express busway, feeder, inter-district, and direct-line routes. A key component of Curitiba’s transportation network is an innovative trinary road system that cleverly accommodates car and bus routes, as well as local versus regional movement, among three parallel boulevards. This road system creates multi-modal corridors that truly integrate roadways, transit and land use patterns.

*TOD planning:* High-density and mixed-use developments have been encouraged along transit corridors as a means of supporting high-quality transit services. The development of centers along these corridors creates a more transit-centric metro structure and facilitates multi-directional travel movement.
**Land use scale & compatibility:** Achieving compatibility between the scale of transportation infrastructure and land use activities has been addressed by placing high-density developments along high-volume streets, which also serves to protect the character of low-density residential neighborhoods from intense transportation corridors. Another compatible feature of the trinary road concept is that all road and transitways operate at grade, rather than relying on the freeway overpasses that tend to separate transportation and land uses. In essence, the trinary road system seeks to align the hierarchies of roadways with those of land uses and transit services to attain complete alignment between the two.

**Natural System Quality:** Preservation and enhancement of natural systems was not a key component of the development of Curitiba’s high-density transportation corridors.

**Urban Connector Streets: Portland**
**Corridor’s role and destinations:** Portland’s River District Streetcar line represents an urban multi-modal street corridor that aligns new transportation options with the scale of the urban district’s long-term vision. Formerly an industrial area, this underused area adjacent to downtown Portland is being redeveloped into a neighborhood with higher-density housing. The Portland Streetcar runs through the district and connects the neighborhood to downtown Portland’s business and cultural amenities, Portland State University, and Union Station (Amtrak and Greyhound services).

**Multi-modal connections:** In addition to the streetcar, which provides frequent service and convenient stops, the corridor offers car lanes, bus lanes, bike paths and a pedestrian sidewalk network. The corridor provides convenient connections to regional LRT lines, commuter trains, local and regional bus services, and the river esplanade bike trail system.

**TOD planning:** The future vision for this district is redevelopment into a mixed-use, higher-density urban neighborhood focused on great transit access. An overriding objective was the creation of strong non-auto connections to downtown Portland and nearby amenities, including businesses, schools, recreation facilities, and river parks and trails.

**Land use scale & compatibility:** The Portland Streetcar alternative was selected as the signature transportation mode for the corridor because it best aligns with the district’s future vision for land use and transportation character. A streetcar line fits the scale of both converted industrial buildings to housing and commercial uses, as well as new residential development, that offer new living options and evoke the area’s former industrial heritage.

**Natural systems quality:** A major priority of redevelopment of the River District, including the added transit line, was to improve the natural environment, including cleanup of polluted land, better access to the river, and creation of new parks and open spaces.
Conclusion
Successful design of metropolitan transportation corridors is the result of compatible relationships between the three physical components of transportation infrastructure, urban form, and natural systems. Community economic development goals for a corridor are ultimately determined by the citizen participation process, which is led by governance structures of varying sizes and forms, and delimited by financing. A corridor’s design must prove its effectiveness and return on investment to citizens and elected representatives who will use, live near, invest in, and pay for the corridor. The corridor must move travelers quickly while providing them with outstanding accessibility to adjacent properties and activities, and at the same time, blend as harmoniously as possible with the natural landscape. Accomplishing good design is no easy task.

Corridor design goes far beyond the travel route itself, encompassing issues of accessibility and mobility, land use patterns, natural landscapes and community values. Because corridors impact surrounding communities so greatly, an integrative design linking transportation, land use and the natural environment must be established. The days of total separation between transportation and land use planning and auto-emphasis have passed. Nonetheless, corridors are not all the same, therefore establishing an overall vision for the corridor’s functions and form is essential to determining its design type. Corridors vary in the way they mix transportation infrastructure with other land uses, their emphasis on movement versus access, and in their provision of various modes of travel. The most successful corridors, therefore, link multiple destinations in multiple ways. They enhance the natural environment that surrounds them and are compatible with the communities they run through. Corridors designed according to the tenets of transit-oriented development offer the potential to maximize a corridor’s capacity in terms of public infrastructure investment and economic benefits, by providing a greater number of people with a greater number of transportation options. Good corridor design can effectively change the face of an area. High levels of mobility on corridors no longer means low quality of life for the communities they happen to run through.
VIII. Achieving a Balance: Potential Conflicts Between the Components of Corridor Implementation

The previous chapters have shown the important role that each of the components of corridor implementation plays during project development. Though community participation is the foundation of any infrastructure project, economic development is its backbone. Governance guides these two components, with the help of a financing scheme, resulting in the design, or physical expression of the goals of each component. In the case studies examined, planners, community members, governmental structures and project financiers worked to give the best results possible. But were there times when their methods clashed? Can the criteria for one component be met without infringing upon the criteria for another?

Balancing the Components: Boston

Boston’s Southwest Corridor again provides a useful illustration of how the five components of corridor implementation must be applied in measured doses, according to the local and regional context. As stated before, it is a prime example of the power of an involved citizenry as the corridor would have been another Central Artery, had it not been for the active and organized community that surrounds it. Divided first by a railway, Corridor neighbors watched as land was cleared to accommodate an elevated highway. Aware of the fate of North End residents, who a decade earlier had seen over 1,000 structures demolished and more than 20,000 residents displaced during the Central Artery construction (Central Artery/Tunnel Project, 2001), residents of the Southwest Corridor organized to transform their neighborhood into something they wanted.

The first thing that went wrong (or right, depending on the perspective) in the Southwest Corridor was the state government planning an elevated highway without any local input. The local reaction was so strong, in fact, that it was able to halt the project completely, forcing project developers to reevaluate their approach. Following this failed governmental approach, a new coalition was formed, in which the Massachusetts Bay Transit Authority came aboard to work in conjunction with city and state agencies. Community participation was also shifted from “nonexistent” to the front burner. Over twenty community-based groups, twelve public agencies, and six “Corridor Committees” joined forces and construction began after nine years of planning. From a finance perspective, this lengthy process undoubtedly raised costs, incurring inflation and perhaps unsettling investors. However, had the Southwest Corridor highway project endured the same fate as the Big Dig, its removal and literal “burial” might have cost over $14 billion.

From the viewpoint of economic development, the original plans had favored auto mobility over that of neighborhood residents. The elevated highway may have initially reduced traffic congestion and reduced travel time for users, but if conditions on the Central Artery were any indicator, capacity would have been reached shortly after project completion. The “Green Monster” as the Artery was affectionately called, became one of the most dangerous stretches of highway in the nation with an accident rate four times the national average and bumper to bumper traffic eight to ten hours a (Central Artery/Tunnel Project, 2001).
While it is hard to know if the same fate would have fallen upon the Southwest Corridor, the economic impacts created by a multimodal subterranean corridor have only been outstandingly positive. Local traffic congestion has been alleviated, evidenced in the strong transit ridership the Orange Line receives. The neighborhood has been infused with mixed-use development, gardens, bike and pedestrian paths. The design of the corridor was focused on neighborhood residents’ needs, in place of the mobility of those passing through.

It is possible to say that Boston’s Southwest Corridor would not have resulted in the success it is today, had it not been for the mistakes of the past.

**Design-Build and the Community Participation/Financing Debate**

There are three types of project delivery in construction today, each of which has aspects appropriate for different regions, publics, budgets and politicians. *Traditional delivery* consists of design-bid-build and is a very linear process, well known to the majority of players involved in the construction process. Though it is the most familiar method, traditional delivery leaves much to be desired in terms of cost and time efficiency. Each step only takes place once the previous one is completed, thus increasing the total time required for the entire project. Further, as the time between initial project planning and completion increases, inflation, land speculation and other factors serve to drive up the cost of each subsequent step. The *construction management* delivery method occurs when one constructor supervises and administers the planning, design and construction phases of the project. This increases project efficiency through better coordination, fewer claims, and often speeds completion. However, it can complicate the process if the construction manager fails to designate responsibilities in an orderly fashion. In *design-build*, both design and construction are the responsibility of one contractor. This may immediately reduce costs, as the entire project is bid at the time of design, and the chosen firm must finish their project on time and within budget. Inflation and interest costs are thus avoided, immediately reducing the burden to taxpayers and the risk to all financers. Design-build puts all project responsibility in the hands of one contractor, reducing the direct involvement of project implementers.

While attractive in a financial sense, design-build cannot be applied everywhere. In the desire to create a process that increases the opportunity to finish a project on time and under costs, the level of involvement of local representatives and organizations may be reduced. If changes are desired after the design-build project has been awarded, change orders can be much more expensive and difficult to obtain than through the traditional delivery method. Citizens may also feel frustrated in having to deal with contractors instead of the officials they elected. Finally, elected officials themselves may feel frustrated in their inability to represent their constituents.

Cheryl Humann, who has written on school construction projects, suggests evaluating several key project aspects before deciding on a delivery method. Some of these include: the availability of market resources, (such as design professionals, contractors and labor); the complexity of the project; the schedule; the head agency’s fiscal and risk management policies; and the level of user and community involvement (Humann, 2000). Undoubtedly, a full comprehension of the environment in which a project will be located
will help assure the project’s success in terms of community involvement and advantageous forms of financing.

**Redistributive Impacts: The Strength/Danger of the Homevoter**

Apathy is, without doubt, one of the most common problems faced by local politicians. Low voter turnout and a lack of knowledge of the issues plague most elections. But is an active, enthused and assertive constituency the solution to disheartened local politics? The following discussion will show that that this is the case in the active constituents’ home district, but the results may not lead to a solution that works in the interest of the entire region.

For the past century across this country, public transit has increasingly become the domain of the inner city poor, women, and minorities. As facilities for private automobiles have increased, transit’s share of all travel decrease, leaving only those that cannot or cannot afford to drive on-board. Notwithstanding, new light rail and commuter rail projects have opened, are under construction, or are being planned in many different parts of the United States, thanks in large part to their popularity with suburban voters and politicians. Such a trend may be a result of homevoters realizing there could be economic development benefit to their neighborhood if it is served by a new, high volume transit facility, regardless of whether they use it. As such, they actively support the use of federal and state tax dollars to build new transit in their home district.

These new transit facilities have high capital costs, and that new systems will have to compete with inner city systems for operating subsidies. However, in spite of this, the suburban desire for rail has found support in most of the major metropolitan areas in this country. In fact, “…many transit systems have responded by directing their planning efforts toward expanding suburban commuter services over improving local operations and increasing rail service over buses, despite the shift in demand towards an increasingly poor ridership base” (Garret & Taylor, 1999). Might this triumph in community involvement and governance actually be redistributing dollars from transit in inner city neighborhoods to more affluent suburban areas, whose residents that may not be as dependent upon it?

The Bus Rider’ Union (BRU) of Los Angeles says yes. A grassroots organization of approximately 3,000 members, the BRU won a 1996 consent decree settlement against the Los Angeles Metropolitan Transit Authority (MTA) in which it alleged “transit racism.” The BRU alleged that a disproportionate amount of MTA funding was being used to finance commuter rail projects that would serve mostly white upper class residents. At the same time, the BRU alleged, bus service in the city was suffering from a severe lack of funding. The consent decree was an agreement reached by both sides, to significantly reduce overcrowding on MTA buses and generally improve service.

In terms of corridor implementation, the BRU consent decree provides a number of lessons. First, that with the support of the community and elected officials, major changes can occur. In Southern California rail is being implemented not so much because there is a demand for it, rather because some day it may help alleviate traffic congestion, for which there is huge support. But most importantly, the BRU situation
shows corridor implementers the danger of redistributive economic impacts: new transit facilities should not be financed at the expense of existing service.

**ADA**

Complying with the American with Disabilities Act of 1990 (ADA) has provided an arena in transportation infrastructure development in which community participation, economic development, governance, financing and design can convene. In a nutshell, the ADA requires that all projects receiving federal funding meet national standards for accessibility to people with disabilities. In the past twelve years, the ADA has dramatically changed the face of infrastructure and public transit, evidenced by accessible ramps, wheelchair lifts, Braille signs, etc. However, some designs may be slightly more accessible than others and this is where the debate over costs, financing and economic development can get complicated.

Retrofitting existing transit vehicles, stations or any structure associated with TOD is the most immediate solution for ADA compliance. In addition, all new designs are required to meet ADA standards. However, the degree to which ADA compliance is accommodated and fully incorporated may substantially impact project costs. This prioritization may depend on the characteristics of the community through which the corridor runs, or on the governmental organizations mobilized in the area. Because costs usually play a substantial role in design, those that pay for a project can often be turned off to financing something that only benefits a small percentage of the population.

This is where economic development comes in. As stated before, the cost of providing a service cannot outweigh the benefit that service provides. Frequently, ADA accommodation is measured in terms of costs and benefits. While the costs are easy to measure, “All too often the value of human rights has been neglected by narrow-gauged and short sighted economic reductionism” (Winter & Williams, 2001). The economic price of inaccessibility can be found in the income derived to people without access to jobs, in the unrealized production of goods and services and in the local, state and federal expenditures made on services that specifically accommodate those with disabilities.

Although the debate over the costs and benefits of the ADA will undoubtedly rage on for some time to come, those implementing a transportation corridor should be aware the big picture. As of 1990 ADA compliant design is law; this is not up for debate. Regardless, certain designs (such as low floor buses) make transit infinitely more attractive to the disabled than others (standard buses equipped with wheelchair lifts). And while these designs may be much more expensive than the standard (though equally compliant) designs, they can make a huge difference to those that use them. Corridor implementers should remember that while the price of implementing a design that truly accommodates the disabled may be stiff, the price of not doing so might be equally high.


IX. Lessons Learned

While there is no one-size-fits-all for successful corridor implementation, certain strategies have worked extremely well in the projects profiled in the case studies. In compiling this paper, SLPP has formed a checklist comprised of the criteria present when each of the five components has been attained. The matrix on the following page allows policy makers and planners to gauge their project as it is implemented.

In addition, SLPP has prepared the following short list of good practices to keep in mind as a corridor is planned and develops. This list is not intended to replace legislatively mandated process and protections, but instead incorporates the lessons from the case studies to better guide planners through these requirements. A discussion of how these steps can be applied to potential corridors in the Twin Cities area is located in the next section.

1. Get to know for whom you are planning, and meet them on their terms.
Because of their technical training, it at first appears that planners can know how to meet a community’s needs through the analysis of passively collected data, rather than actually engaging the members of that community, or by presuming that people’s behavior will change to fit a planned change. Of course, as discussed in Section IV, laws now mandate community involvement. Instead the common mistake is that a planner can believe the community has been engaged and informed through a number of open houses and other events planned and scheduled by the governmental agencies involved.

While these separately scheduled open houses, and a clear understanding of travel behavior, housing patterns, and similar data, will help ensure a project is planned properly, these steps fail to reach the high threshold many members of the public require before a project gains their attention. Often, this threshold is only achieved with the arrival of large construction equipment. The case studies identified here as being exemplary from the citizen involvement perspective succeeded because the planners recognized that, in addition to the steps mentioned above, they need to get on agendas of already planned meetings of existing groups and build to relationships with these groups, so that they could receive feedback throughout the life of the project, and develop a level of trust.

2. Tailor the five components to meet local conditions.
Sometimes satisfying all of the components to corridor implementation equally is not possible, or even appropriate. Local conditions vary, and local political, financial or other conditions can dictate which elements carry the day when they come into tension.

In the case of Boston, governance’s initial failures to recognize the strength of community activism lead to a huge role for the residents in project development. As a result, less emphasis was placed on financing. This was indeed an appropriate move: over ten years after the land had been cleared for the highway, nothing had been built. With land acquisition costs already taken care of, but suspicious neighbors all along the corridor, receiving resident input and “doing it right” the second time around became greater priorities than saving additional dollars or speeding project completion.
Conversely, in the T-REX project in Denver, the project hinged upon demonstrating that the financial house was in order. The project needed a significant amount of federal support, and local match dollars were needed to secure this support. Consequently, planners took a two-pronged approach: emphasizing financial mechanisms to control costs, such as design-build, and emphasizing governance measures to demonstrate the revenue would be raised, such as the Memorandum of Understanding that all but committed local entities to contribute towards the local match. In this process, citizen input was muted until the funding was in place. This trade off was appropriate, however, in that public support had already been demonstrated by the wide margin of victory for the transit funding referendum.

3. **Recognize priorities can change as scale changes**

The T-REX project also demonstrates that while controlling costs and speeding completion can be key elements on a large scale, it might be more prudent to emphasize other elements, such as citizen involvement, on smaller scale projects. As mentioned above, the T-REX project enjoyed significant citizen support when presented in funding referenda. However, it has encountered difficulties as citizens have objected to the station designs included in the design-build plan, raising the potential for expensive change-orders. This suggests that it may have been wise to keep these outside of the design-build plan. They are the most site-specific, most easily get the attention of project neighbors, and consequently could require greater amounts of time to achieve consensus and support. Also, given the potential successful station sites to generate revenue and development through creative zoning and public-private partnerships, controlling financial costs may be of less importance.

4. **Have a champion**

The most successful corridor projects are those that have a strong supporter behind them. Whether it is a politician, a contractor, planner or community group, projects to which the population can attach a name have far better chances than those that do not. Ever shifting staff and a lack of supporters show a low level of commitment. A project champion pushes the project at all times, dismisses false rumors, and puts their project in the spotlight. A project supporter with clout is ideal.

The perfect situation arises when the champion is not only recognized in the media, but on the personal level. In San Diego, a member of the city council built relationships with the existing neighborhood groups, meeting with them on their schedules (see recommendation 1) and building their support, as well as making the case on the larger scale and in the city council chambers. Such an effort obviously requires time and energy, but without the ability to “put a face” with a project, in a positive manner, the ability to build and maintain support for an innovative project is hampered.

5. **Do not let present economic conditions affect a future vision**

While both the economy and people’s confidence in it fluctuate greatly, improving the future should not wait for tomorrow. Transportation projects can often be the impetus for lifting an area out of the economic doldrums, as they are a use of public dollars that attracts private investment. The cases that are notable for economic development point out that the key is ensuring a vision is built that attracts the private dollars as the public dollars are being spent. The vision must improve the status of the current residents while
improving the attractiveness for new residents and investors. The corridors in Ottawa, Dallas, Portland and Vancouver are all examples of how providing additional transportation access that served needs identified by key stakeholders would lead to jump-starting the economy of a declining area.

6. Do not let a technology or a design drive the planning process
While the preceding notes indicate that it would be foolhardy to prescribe an order for addressing the five areas, several of the case studies demonstrate the value of not choosing the design style or technology used (rail, bus, etc.) until at least public involvement and governance issues have been addressed.

The greatest success in this regard is the I-15 corridor in San Diego. In an area that already had a successful light rail system, the planners and elected officials avoided a “one-size-fits-all” approach and worked to understand the particular nuances of this corridor. As a result, they were able to realize the opportunities created by the existing HOV lane in this corridor: rather than simply add another light rail line that would require additional funding from existing revenue streams, they are created a BRT line that uses the existing lane, and receive funding from tolls paid by single occupant users of the lane. The corridor has been so successful that it has led to a multi-modal strategic plan that utilizes several different funding sources and identifies the most advantageous roles for each technology based on the places it would serve(Schumacher, 2002).

The opposite situation can be seen in the initial attempt to build a highway in Boston’s Southwest corridor. Although the planners did not have the benefit of hindsight available to those planning corridors that came later, they did make the mistake of assuming a freeway facility would be appropriate for the area, as they were expanding the freeway network throughout the metro area.

7. Connect with regional transportation planning and funding process
Throughout the case studies, a common attraction to the corridors was their ability to galvanize interest around a specific spatially-bound set of improvements. And often, as in the case of I-15 and T-REX, these improvements were set to occur in sub-regions that were experiencing growth and hence were playing to a natural local constituency. However, the broader framework of regional transportation planning and financing can work against corridor developments, unless careful steps are made to balance the corridor plan with other priorities throughout the region. Successful integration into an overall regional schema would help ensure that the corridor is not viewed as a "zero-sum" proposition--that is, taking from other parts of the region. Rather, it can be viewed as an innovative element to the regional plan. Moreover, to the extent this integration occurs, it will be easier to access federal and local funds that are allocated by state departments of transportation and metropolitan planning organizations.

8. Amend local zoning as necessary
Too many times, planners are stopped in their tracks by zoning regulations. However, much of what people do like or do not like about an area can be traced to these requirements. Instead, implementing flexible zoning regulations that allow adaptation according to community needs will allow developers to respond to trends and truly “reinvent” places left behind.
X. A Strategy for Corridor Implementation

Based upon the lessons learned, SLPP researchers have started to assemble the basics for a decision model that planners can use in designing or revising their own corridor development strategy. As the decision tree that follows (figure 3) shows, the key is to identify which element of the framework is implicated by a particular issue. Then, determine which lesson stemming from that element pertains to the issue in question, and answer the related questions.

While this decision process appears simplified, it was utilized for analysis of several corridors in the Twin Cities Metropolitan Area, which are included as appendices to this study.
SLPP’s International and National Benchmarking for Urban Transportation Corridor Development

*Figure 3: Analysis Flowchart*

**ANALYTICAL CATEGORY**

- **Public Participation**
  - Get to know for whom you are planning.
  - Tailor the five components to meet local conditions.
  - Recognize priorities can change as scale changes.
- **Governance**
  - Have a champion.
- **Finance**
  - Connect with regional transportation planning and funding process.
  - Amend local zoning as necessary.
- **Economic Development**
  - Do not let economic conditions affect a future vision.
- **Design**
  - Do not let technology or design drive the planning process.

**LEsson LEarned**

- Get to know for whom you are planning.
- Tailor the five components to meet local conditions.
- Recognize priorities can change as scale changes.
- Have a champion.
- Connect with regional transportation planning and funding process.
- Amend local zoning as necessary.
- Do not let economic conditions affect a future vision.
- Do not let technology or design drive the planning process.

**Questions to Ask of Your Project**

- Have stakeholders been extensively involved? Have methods other than separate public meetings been used?
- Which lesson(s) present the greatest challenge? What should be accomplished now? What will take longer?
- Is there a recognizable champion that represents the entire corridor?
- Does the governing body have representation from all affected jurisdictions and funding sources?
- Does the governing body have land use powers or access to them?
- Is a lack of a dedicated or alternative funding source or is an economic down turn hindering project completion?
- How was the preferred technology or design selected? By ridership projections? Or by political preference?

**Action**

- **YES:** Continue to involve and inform the public at all phases and levels of development, though conventional and unconventional methods.
- **NO:** Engage the public by meeting on their terms, on their agendas and at their location.
- **PRIORITIZE:** Activities in different analytical areas have different timelines. Consider setting aside planning and outreach in some areas until activities in others are well underway or
- **YES:** Build upon visibility and voice of the champion to build consensus and momentum for the corridor.
- **NO:** Find a champion with political clout and high visibility throughout the region.
- **YES:** Utilize all member organizations governmental powers and funding sources.
- **NO:** Create a governing body with broad representation from all levels of government.
- **YES:** Develop a community vision and adopt zoning regulations supportive of that vision along the corridor.
- **NO:** Consider a Memorandum of Understanding between municipalities to facilitate rezoning.
- **YES:** Consider a dedicated regional sales tax or high occupancy / Toll (HOT) lane network.
- **NO:** Continue to lobby for a dedicated, sustainable funding source. Traditional methods may prove to be inadequate.
- **Projection Based:** Good. Basing design and technology decisions upon ridership projections helps to ensure long term success of corridor projects.
- **Political Pressure Based:** Not good. Decisions based upon political pressure can be premature and can undermine project legitimacy.
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APPENDICES
APPENDIX A: LOWRY AVENUE CORRIDOR

I. PROJECT OVERVIEW

Lowry Avenue is an east-west arterial that dissects the northern portion of Minneapolis, MN. Technically a Hennepin County road, it extends completely across Minneapolis from the City of Robbinsdale on the west, to St. Anthony Village on the east. It provides one of the only Mississippi River crossings in northern Minneapolis. The corridor crosses many major inner-city streets, as well as Interstate 94; though it does not have direct access to the interstate.

The corridor can be characterized as largely residential, with sporadic nodes of commercial uses at the key intersections of Penn, Central, Lyndale Avenues, Emerson and Freemont. A large industrial area exists between Interstate 94 and the Mississippi River.

The corridor has been involved in two studies in recent years, including the Lowry Avenue Corridor Plan in May of 2002. This plan was created by Hennepin County and approved by the City of Minneapolis.

The intent of the study was to determine how the corridor could enhance access to jobs through public transportation; effectively link civic spaces through transit, bicycle and pedestrian connections; and congregate services, retail and office space around transit centers/nodes (Lowry Ave Corridor Plan, 2002).

The report concluded that much of the corridor should be redeveloped to include left turning lanes, wider sidewalks with boulevards and landscaping, bicycle lanes and redevelopment of the commercial nodes should take place at major intersections. In addition, Lowry Avenue is being redeveloped with the intention of future BRT use. This will include station and lane configuration designs that incorporate BRT guidelines and efficiency goals.

II. FRAMEWORK APPLICATION

Public Participation

Three sets of community meetings took place to allow for community input to influence the planning process. Included in the first meetings, were an image preference survey and a SWOT analysis (strengths, weaknesses, opportunities and threats). The image preference survey consisted of community members ranking images of urban areas to draw out the urban environment they found most appealing. The SWOT analysis provided a list of positive attributes the community found important and would wish to preserve and a list of attributes the community wished to change. The consultant than used the preferences of the community and the results of the market, traffic, historical and environmental studies to develop preliminary design and development options. The options were then brought back to the community in a second series of meetings for additional review and comment. A third series of meetings focused on presenting the findings of the analysis to the community.
A similarly designed public participation process will be used throughout the implementation stage of the project.

**Governance**

Throughout the planning process Hennepin County has worked with many vested parties to facilitate the redevelopment plan for the Lowry Avenue Corridor. In particular, Hennepin County has collaborated with the Minneapolis Community Development Agency (MCDA) and the City of Minneapolis. This included regular technical advisory meetings.

The MCDA will also conduct a blight analysis and write a redevelopment plan. The City of Minneapolis has endorsed the project through approval of the city council. The planning process has involved council members Biernat, Ostrow and Johnson.

The Village of St. Anthony and the City of Robbinsdale are not currently involved in the planning process, though they have officially given their support of the Lowry Avenue Corridor Plan.

**Finance**

Hennepin County received a Transportation and Community and System Preservation (TCSP) grant from the Federal Highway Administration (FHWA) to conduct a planning process and association analogies.

In-kind funding from the MCDA has been/will be used to staff the blight analysis and possibly land acquisition process.

Implementation funding sources include: directly from capital improvement fund of Hennepin County and through identified and unidentified grant resources.

**Design**

If implemented, the recommended design options for the Lowry Avenue Corridor would drastically improve the livability and viability of the corridor. The entire corridor will benefit from landscape boulevards, bicycle lanes, wider sidewalk and left turn lanes at primary intersections.

At each commercial node, the plan calls for additional retail and residential uses, as well as improvements in the transit infrastructure. This would follow basic transit orientated design principles, and further the goal of creating a walkable community.

As previously mentioned, Lowry Avenue is being designed to incorporate BRT in the future. It is anticipated that a BRT line would run from the western end of the corridor to Lyndale Avenue, where it would head for the downtown CBD.
III. FINDINGS AND RECOMMENDATIONS:

**Strengths of the Project**

*Utilize existing champions:* The Lowry Avenue Corridor Plan has endured because of the dedication of a few key elected officials. Maintain the relationship with the city council members championing the project. Their support could be critical throughout the condemnation and implementation process.

*Continuing public “visioning” into the design and implementation stage.* The Lowry Avenue community visioning process created a solid foundation and support base to work from. Building from the foundation it provides will assure community buy-in.

*Adapting to innovations in technology.* The project has done an exemplary job of adapting to available and future technologies. By not focusing on a particular form of technology, BRT has been incorporated into the design with little complications. Street and station designs will be constructed to provide an easy transition from one technology to another.

**Recommendations**

*Consider engaging the public on their terms.* Create community buy-in by attending preexisting meetings. This may expose residents unaware of the project, and those unable to attend project specific meetings.

*Continue communication with adjacent municipalities.* Although the adjacent cities of St. Anthony and Robbinsdale are in support of the project, it may be beneficial to draw them into the design and implementation stage. As Ken Kriz’s finance section explained, the effects of a corridor extend well beyond the boundaries. The design of the corridor could have direct ramifications on the two adjacent cities if the corridor is ever extended into their municipalities.

*Draw out the regional importance of the corridor.* The small-scale nature of Lowry Avenue can hide it from the regional radar. Incorporate the project into the regional context whenever possible. This will help to bring exposure to the project and area.

*Consider alternative sources of funding.* The State and Federal governments are not the only source of funding. Consider a regional or major city sales tax partnership dedicated to transit. This would provide stability and continuity to transit planning and development. It would also avoid the partisan differences of the legislature.
APPENDIX B: CEDAR AVENUE/HWY 77 CORRIDOR

I. PROJECT OVERVIEW AND CORRIDOR DESCRIPTION

The Cedar Avenue (TH77/CR23) Transit way project has been a study of the Dakota County Regional Railroad Authority (DCRRA) since 1998 and supported as a Bus Rapid Transit project since April 2001. Beginning in the summer of 1999, the project was initiated to solve severe congestion, to accommodate the projected 80% increase of traffic demand along the corridor by 2020, and to provide increased transit capacity and improve the transportation system serving northern Dakota County. The proposed timeline for the project development process indicates the following six major steps and durations of the project:

Feasibility Study (current phase) 1.5 years
Combined Draft Environmental Impact Statement/ Alternatives Analysis (DEIS/MIS) 1.5 years
Preliminary Engineering/ Final EIS 1 year
Final Design & Engineering 2 years
Construction 3 years
Operations

Currently, the project has completed the Phase 1 feasibility study, which has led to the identification of BRT as the most appropriate mode in the Cedar avenue alignment. The feasibility study also indicated significant opportunity to implement improved transit service in the corridor and to proceed to the next step of the project.

Specifically, the 12-mile corridor runs southward along TH 77 (Cedar Ave) from the Mall of America in Bloomington to 157th street in Apple Valley. The corridor passes through the cities of Bloomington, Apple Valley, Eagan, Burnsville, and Lakeville, with most of it located in Dakota County except for the northern-most segment, which extends into Hennepin County. The existing land use pattern along the corridor is predominantly residential with focused commercial, retail, and mixed-use activity within Eagan at major intersections (report). The future land use will most likely be influenced toward transit supportive pattern in vicinity of the corridor.

II. ANALYSIS FRAMEWORK APPLICATION

Public involvement

As a central element of the project, public involvement, began at the earliest phase of planning and should continue through design and construction. Particularly, a Public Involvement Plan has been developed, major components of which include a Technical Advisory Committee (TAC), a Citizen Advisory Committee (CAC), Focus Groups, Newsletters and Open House. Among these components, the key groups are CAC members and TAC members: (1) The CAC is composed of two representatives from each of the cities along the corridor, representing neighborhoods and business groups. The CAC was active in Phase 1 of the Study, but is not planned to be in Phase 2. There’s a Management Committee new to Phase 2, which will provide oversight and general
direction to the study. (2) The TAC members are selected by various project partners based on their technical expertise to convey the goals of their agencies.

The project involves the residents, businesses and other interests groups through the CAC, members of which have helped to identify issues and problems, give advices to study recommendations, convey study information, and provide a "listening post" for feedback on public involvement activities. The project information was disseminated to the communities through the TAC, Focus Groups, Newsletter and Open Houses. Citizen feedback was gathered primarily through the CAC and focus groups.

The approach to public involvement of this project attempted to balance the traditional methods with more innovative techniques to make it a focused and responsive program. For example, the focus groups are conducted in an innovative format with a small group discussion under professional leadership that provided qualitative information on the corridor.

**Economic Development**

Similar to most of the cases researched under our study, economic development is the reason for the project initiation in the first place. The economic impacts with the Cedar Ave transitway project can be viewed in two folds: (1) An enhanced transit system is being promoted in this corridor for its potential to relieve existing congestion and future travel demand through additional carrying capacity that requires a minimum of additional infrastructure. (2) Another advantage the transit system might offer is opportunities for transit-oriented development and economic revitalization on the project areas.

The two-fold project initiation is validated with the forecasted population and employment growth. Particularly, growth will be the greatest in the southern portion of the corridor, especially within Lakeville and Apple Valley. Employment growth is concentrated in Lakeville, Apple Valley and around the Mall of America area.

Transit oriented development and economic revitalization are another function served by the project. Specifically, “land use pattern along the corridor is viewed as reflecting the evolution of transportation investments and intensification of retail/commercial activity at major road intersections.” With this vision, the relation between transit, land use, and economic development has been addressed in the project. During the feasibility study, three scenarios that link transportation and land use were developed to see how transit ridership could be affected by implementing transit supportive development at the proposed station locations along the corridor.

Since transit-oriented development has not been institutionalized within the regulatory environment of most jurisdictions, recommendations were made under the project feasibility study to change local zoning and development codes to encourage appropriate station area development activities.
Governance

Overall, the project partners include Dakota County, Mn/DOT, the Metropolitan Council, the Minnesota Valley Transit Authority (MVTA), and the Hennepin County, the cities of Bloomington, Apple Valley, Burnsville, Lakeville, and Eagan, all of which have an interest in the operation of the roadway. Among the partners, Dakota County is the lead agency in managing the project. The partners are involved in the project as participating members of the Management Committee and Technical Advisory Committee (TAC).

The Management Committee was created in Phase 2 of the study and is responsible to provide oversight and general direction of the project. The TAC members are selected by individual project partner. Their responsibility is to convey to the project team the goals of each agency and make sure the project go compatibly with local policies and conditions.

The federal government is proposed to be involved through the application for the FTA New Starts funding, which, if obtained, would require the project follow the New Starts Final Rule. However, under the provision of TEA-21, state authority and flexibility in project investments and determination would still be preserved.

Financing

Currently, major funding for the project comes from the State legislature and the Metropolitan Council. The FTA New Starts funding might also be available based on the qualification of the project. Thus the project envisions three major sources of funding: (1) At federal level, FTA would possibly provide New Starts funding if the project meets the New Starts Final Rule. (2) At state level, the Minnesota Legislature appropriated $500,000 in 1998 and another $500,000 in 2001 for project studies and analysis. (3) At regional level, the Metropolitan Council provided the project with $400,000 funding in 2002.

The availability of the FTA funding is determined by the qualification of the project with the FTA New Starts Final Rule, published in the Federal Register on December 7, 2000. To match federal funding requirements, the project needs also to prepare an Alternatives Analysis and Draft Environmental Impact Study (DEIS) under the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.).

Design

Final design will take place in the fourth phase of the project. Currently, the only decision made on design is the mode selection of BRT. Full range of available transit modes, including Conventional Bus, BRT, LRT, Monorail, and Personal Rapid Transit, have been evaluated under a systematic process. While a 1999/2000-feasibility study indicated that both modes are feasible in this corridor, the Dakota County Board of Commissioners have gone on record supporting BRT as the preferred mode. The estimated capital cost for completing the BRT system is about $108 million and the estimated annual operations and maintenance cost is about $1.5 million in 2000 dollars.
III. FINDINGS AND RECOMMENDATIONS

Strengths of the project

Mode Choice: While the potential advantages of LRT have not been discarded, the decision to recommend BRT at this relatively early stage was savvy. Given the tight fiscal times, and obvious physical constraints posed by the Minnesota river crossing going on record with a non-binding recommendation for BRT demonstrates that Dakota County is serious about addressing this potential transportation bottleneck as soon as possible.

Local zoning amendments have been proposed: Specifically, three zoning modifications are proposed to pursue a more effective and flexible regulatory environment for transit-oriented development. These are efforts aiming to allow adaptation of community’s needs and to stimulate positive development.

Good connection with different scales of planning and funding process: Through the Technical Advisory Committee (TAC) and funding mechanism, this project involves various jurisdictions and partners from regional, state, county, and municipal level. This is helpful for integrating the project into the broader transportation planning framework and balancing the project needs with other priorities in the region. Particularly, as the Cedar Avenue project is a component of the Metropolitan Council proposed 2025 transit network, balance needs to be made between the corridor plan and other priorities in the region.

Recommendations

Clarify whom to plan for, and when to involve the stakeholders. The existing public involvement plan focuses more on “how to involve.” The involvement of clearly defined stakeholders in an earliest possible phase is recommended as a critical component for the successful project implementation in the future.

Have a champion. So far, this project does not seem to have a significant supporter for it. However, the characteristics of a champion can be planted into the project to ensure a successful result. Thus, it is recommended for the major players of the project to build clear visions of the future, and develop passions, commitments, as well as determinations on these visions (Cervero, 1998).

Recommendations for project financing

- Continue to pursue legislative support.
- Raise business and local stakeholders involvement as part of the fund raising strategy. Business and public supports might enhance lobby power at the legislature.
- Investigate benefits from general sales tax.
Maximize the flexibility advantages of BRT in design, construction, and implementation.

- Construct the corridor in stages: finished portions could be put to operation early.
- Begin construction from portions in lower density areas, such as to minimize local interruption and increase possibility of gaining supports for further funding (or reduce the potentials of rendering oppositions).
- Services implementation: have the same bus serve both mainline and feeder lines to reduce transfer. A successful application of this concept is the Ottawa’s busway.
APPENDIX C: THE SOUTHWEST CORRIDOR

I. PROJECT OVERVIEW

The Southwest Transit Corridor extends from the Minneapolis urban core to the southwestern outer-ring suburbs of Eden Prairie and Chanhassen. Along the way it passes through the communities of Minnetonka, Hopkins and St. Louis Park. It is mainly composed of an abandoned railroad bed formerly owned by the Canadian Pacific Rail Company, which was purchased by the Hennepin County Regional Railroad Authority in the early 1990’s. During the interim, the corridor has been leased to the Three Rivers Park District and converted to a temporary trail.

Currently the corridor is undergoing a Rail Transit Feasibility Study. This study will detail the purpose and need for the project, provide alternatives, design concepts and ridership costs. Before construction of the project, the HCRRA needs to conduct a series of actions. These include an alternatives analysis, preliminary engineering, the entire environmental impact statement process, record of decision and final design.

II. FRAMEWORK APPLICATION

Governance

The Hennepin County Regional Railroad Authority was created in 1980 by the State Legislature as a political subdivision of Hennepin County. Its primary function is to acquire railroad corridors to preserve them for future transit use. The HCRRA is governed by the seven members of the Hennepin County Board of Commissioners.

The HCRRA established the Policy Advisory Committee to oversee the Southwest Corridor Development. The committee is made of representatives from the Metropolitan Council, Southwest Metro, Hennepin County, the Three Rivers Park District and each of the cities along the corridor. If the committee approves the Southwest Corridor Plan, it will then informally ask for approval from each member city, before bringing to the Hennepin County Board Commissioners for final approval.

The Federal government has not been involved with the planning or funding of the Southwest Corridor because it is not currently recognized as a transit corridor.

Public Participation

Hennepin County has already completed a public involvement plan for the development of the Southwest Corridor. Using a strategy that identifies potentially affected interests, the county identified potential advocates and opponents of the project. It then devised a plan to mitigate or enhance the relationship with each affected group. The plan includes:

♦ Newsletters to be released to councils, legislators, community groups and local newspapers.
♦ Community Meetings to inform the general public and adjacent property owners, including storefront displays at shopping and community centers.
Council Workshops in all of the five affected cities.

- A Hot Line established and monitored by a private consultant to respond to public questions and comments
- Email messages to all addresses that contacted the county for information through the use of auto response and broadcasted emails to recorded addresses received.
- Technical Advisory Committee made of city staff and representatives from the Metropolitan Council, Southwest Metro, MN DOT and Metro Transit
- Special Presentations to Chambers of Commerce, neighborhood groups and project opponents by requesting time on their regular meeting agendas.

City Council Presentations, as well as planning commissions and general public.

Financing
Due to the fact that the Southwest Corridor is not recognized by the FTA as a transit corridor, currently the only available funding would be from local and state sources. None have been identified at this time.

Design
The corridor was originally identified in the 1988 as a rail corridor that extended to the City of Hopkins. Then 1999, Hennepin County did a study examining the potential for a busway along the corridor. In 2000, the Met Council produced their 2020 plan identifying the corridor as a busway and extending out to Eden Prairie. The future of the corridor took a drastic turn when the ’01 State Legislature prohibited the Metropolitan Council from pursuing any form of dedicated busway in the cities of Minnetonka, Eden Prairie, Chanhassen and Chaska. This shifted the focus of the corridor away from bus and towards rail transit technologies. Due to this change, the Met Council reissued a transportation plan (2025) with the Southwest having an unspecified technology. The HCRRRA has since begun a rail transit feasibility study. Consequently, the two leading forms of technology tentatively proposed for the project are: light rail transit (LRT) and diesel multiple unit (DMU). LRT is fairly well known, as it is being constructed along the Hiawatha Corridor. It is also used in the cities of Denver, Portland, St. Louis and Salt Lake City.

DMU is a relatively new technology to the United States. DMU uses existing heavy rail lines and can be intermixed among regular freight traffic. Unlike many of its European and Canadian counterparts, the (U.S.) DMU had to be designed with a higher collision standard in order to meet/exceed Federal Railroad Administration 49 CFR Part 238 specifications. None are currently operating in the United States.

The design of the corridor could be a pivotal component to the success of the Southwest Corridor. When officials first began introducing the notion of developing transit along the corridor, they began receiving substantial backlash from area residents; either because they fear the loss of the recreational trail, or because the addition of transit could drastically increase noise and disturbance levels in their neighborhoods. Nearby property owners and residents organized and created a website protesting the conversion of the corridor to transit. It was apparent from that point on, that the design of the corridor would be a critical component to its success. The HCRRRA has since begun producing
pamphlets explaining how both transit and trail could coexist together, along with other mediating measures.

**Economic Impacts**

The business community in the southwestern region of the Twin Cities is in full support of the project. Their concerns stem from the inability to retain and recruit employees. The southwest corridor could reduce or eliminate the drawbacks of the commute into the region by avoiding the congestion on the roadways. This would substantially expand their employee base, and provide for a more competitive job market in the region.

### III. FINDINGS AND RECOMMENDATIONS

**Strengths of the Project**

*Meet the public on their terms.* The HCRRA has done an excellent job of initial public outreach. By attending preexisting meetings, the HCRRA is informing members of the public whom would not normally attend a meeting specifically on the Southwest Corridor.

*Comprehensive Governance Structure.* The policy and technical advisory committee has incorporated every governing agency along the corridor. This assures that all positions are considered and have a say in what the final report actually states without creating an expensive and complicated power-sharing government entity.

**Recommendations**

The Southwest Corridor has a few political and technical problems it must overcome to be successful. Our recommendations include:

*Identify and recruit a champion.* This is by far the most critically needed attribute of the corridor. Without a voice, the corridor is in danger of losing momentum and importance. It also allows minority opinions with a voice to trump the silent majority.

*Clarify whom to plan for, and when to involve the stakeholders.* The public participation process needs to proactively assure concerned residents that their trail will not disappear. To accomplish this, the public participation needs to be maintained and emphasized, especially through the design stage.

*Maintain alternatives to rail technologies.* Although State law prohibits any expenditure on research and development of bus-related technologies, it should not be ruled out by the HCRRA. Attempts to raise the importance of the corridor to the region, may shift the political atmosphere and allow the law to be reversed.

*Does the mode fit the scale? (Do not let technology drive the process.)* When the Southwest Corridor was originally identified, it was a rail corridor that extended to Hopkins. Later, when the corridor was extended beyond Hopkins, the overall density along the corridor decreased. However due to the state law, planning focused on rail technologies and not by design and efficiency. Regardless, there is a need to continually
search for the most efficient form of applicable transit alternatives. Only the most
efficient form of transit will appease state legislators and the public that funding is indeed
warranted.

*Bring regional importance to the corridor.* Currently the corridor is mildly being
supported and opposed by a few small interest groups. If the regional context and
significance is publicized, it will help secure support from within the cities along the
corridor, as well as from the region as a whole. This could also test the validity of the
state law that prohibits bus related technologies to be used on the corridor.

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APPENDIX D: CENTRAL CORRIDOR

I. Project Overview

Background
The Central Corridor is located in St. Paul and Minneapolis including both University Avenue and Interstate 94. Situated between the Minnesota State Capital and the Minneapolis CBD, the Central Corridor has been the focus of transit development for decades. The 11-mile corridor supports both the highest transit ridership and the busiest auto-related intersection in the State of Minnesota. It has also been studied numerous times for improvements and innovation without any of them ever coming to fruition.

The current push for development of the corridor, however, is considered to be well positioned to receive federal funds for construction. It centers on the addition of light rail transit or bus rapid transit and has involved several local governments as well as non-governmental organizations. Currently the Central Corridor project is going through the federal Alternatives Analysis / Draft Environmental Impact Statement process.

II. Application of Framework

Public Participation
The Central Corridor Project has involved and incorporated public input throughout nearly all of the planning process to date. More than 90 public meetings and presentations were made to local organizations, governments and business groups. A survey was also conducted to assess priorities of residents located along the Central Corridor.

One unique aspect of the project is the separation of consultant duties. Many projects rely upon their consultants to facilitate the public input process. However, many firms specialize in one particular aspect, such as engineering and may not be as successful with other duties such as the public outreach and input process. To circumvent this potential problem, planning officials hired a consultant specifically to conduct the community involvement process. This resulted in a high quality mix of input gathering techniques and an easily referenced tabulation of community opinion and statistics.

Another innovation in the corridor is that land use planning discussions are taking place in advance of the preliminary engineering. The City of St. Paul has identified the corridor as having the potential for significant growth, enabling planners to begin discussions about development irrespective of what mode will be used to move people throughout the corridor. Transit is being thought of as a transportation tool that will serve new development, rather than claiming transit will be the primary catalyst in “creating” new development.

Governance
The Central Corridor Coordinating Committee (CCCC) will oversee the Central Corridor Project once a project is approved. Rather than an MOU or other organic organizing mechanism, the CCCC was created by state legislation, which designates the
governmental entities that are on the CCCC, but which does not provide it with taxing authority or other formal powers. Instead, the local governments retain their powers, and undertake their own additional supporting activities as well.

The CCCC can be considered relatively responsible to the public with over 50% of the representatives elected, and the others appointed by elected officials. It includes representatives from: the City of St. Paul, the City of Minneapolis, Washington County, Hennepin County, Ramsey County, the University of Minnesota, the Department of Transportation, and the Metropolitan Council. Representatives from the Red Rock Corridor Commission and the Northstar Corridor Development Authority are non-voting members, although the Red Rock representative may vote on issues that may affect commuter rail. The non-voting members are incorporated into the governance structure due to their potential involvement with the corridor. For instance, if the Red Rock commuter rail line were completed, it would disperse passengers to, and receive passengers from, the Central Corridor, creating a significant interest in coordinating operations.

Until a project is selected, the directive of the committee is to advise the Minnesota Commissioner of Transportation and the Metropolitan Council on public transit and transportation issues. In the meantime, The Ramsey County Regional Railroad Authority has held the consultant contracts and provided staff support for the study, and the Metropolitan Council intends to set up a similar organization once preliminary engineering begins. At that time, if LRT is selected as the locally preferred alternative, the CCCC would need to evolve into a corridor management committee, integrating some of the activities of the local governments with the work of this group, resulting in one comprehensive process.

The Metropolitan Council will manage operation of the corridor after construction, similar to the Hiawatha LRT line.

**Finance**

To date, there is no formal financing plan for the project. However, the Central Corridor is expected to receive a 50% match from the Federal Government once local funding is in place. This would require a local match, whose origination has yet to be identified. To obtain this funding, the CCCC and other supporting groups face significant challenges at the state level. The project is currently hindered by an economic downturn and a gubernatorial administration that is hesitant to spend resources on transit projects. The capital costs of the Central Corridor LRT are $840 million in 2008 dollars with an operating cost of $13.3 million. It would replace $10.6 million in bus operating costs, for a marginal increase in operating cost of $2.8 million.23 The mid-construction status of the Hiawatha LRT line has served to slow the progress of obtaining local funding commitments as state and local officials have taken a “wait-and-see” attitude towards additional LRT lines until the Hiawatha LRT line is fully operational and maintaining adequate ridership levels. Alternative sources for the local match may need to be derived from either the counties or cities, or through innovative funding/financing techniques.

23 Source: Central Corridor Fact Sheet, RCRRA.
**Design**

While the Central Corridor includes both I-94, and University Avenue, the transit improvements are most likely to take place on the latter, and it is consequently the focus for this section. University Avenue is considered a Major Arterial Boulevard in the Twin Cities Metropolitan Region. Major Arterial Boulevards are “typically minor arterial routes that link large regional centers and integrate both auto and transit facilities on the same travel route.”

According to Jeff Miller, Design Center for the American Urban Landscape, a successful urban transportation corridor needs to have the following attributes:

1. **Role and Corridor Destination:** The Central Corridor has long been established and envisioned as a transportation corridor that links the Minneapolis CBD, the University of Minnesota, Minneapolis campus, the Midway Commercial area, the Minnesota State Capitol Area and the Saint Paul CBD. The current vision of the Metropolitan Council’s 2030 Regional Development Framework recognizes the corridor as a potential LRT corridor in a network of regional transitways.

2. **Multi-modal connections:** The current plan for Central Corridor consists of LRT (currently favored alternative), and four auto lanes with a limited reduction in parking. Current vehicular movement would not be reduced, while the transit (LRT) component would provide long-term sustainable service. A major transit hub would be built in downtown Minneapolis, providing direct connections to the Hiawatha LRT, NorthStar Commuter Rail, the Northwest BRT line, numerous local bus transit routes and, potentially, future commuter rail, BRT and LRT routes, creating a seamless transit network. Another hub in downtown St. Paul would provide direct connections to the Red Rock commuter rail, regional high-speed rail to Chicago, local bus transit and inter-city bus service.

3. **Develop transportation-supportive land use mixes and densities:** University United, a coalition of the community planning councils and several business interests located along the Central Corridor with an interest in attracting investment and development, has led several community-based planning and development efforts to introduce transit-orientated development along the Central Corridor. They have completed market and land use studies for both the Midway commercial area and the housing needs of the corridor. Both studies concluded that due to future population projections and the potential for LRT that much of the corridor would need to be rezoned in order meet and accommodate intensified uses along the corridor.

While the local governments have been reluctant to do rezoning at this stage of planning, they have begun efforts to develop complementary land uses. The City of Saint Paul has been actively engaged in a series of initiatives. The city’s

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24 Jeff Miller, Co Author. “SLPP’s International and National Benchmarking for Urban Transportation Corridor Development.

25 The Framework also notes that additional federal, state and local resources will be needed to fund construction of that network, however.

26 “Potential Housing Sites on University Avenue,” A Report by University United.
Comprehensive Plan lists the corridor as one of 5 critical corridors for redevelopment, calling for an urban village, intermittent housing focus areas, major redevelopment at several major intersections, designation of a regional shopping area and an Asian Business Cluster. The city also has designated the corridor as having the greatest growth potential in the city, and the city is already developing transit oriented development plans in conjunction with the Metropolitan Council at three intersections. Finally, city planning staff have developed a new zoning classification, Traditional Neighborhood Zoning, which will enable better and more intensive mixed-use redevelopments.

4. **Design transportation routes to be compatible with surrounding community character:** University Avenue is an extensive urban retail and employment corridor, with ample opportunities for intensive transit-oriented redevelopment. However, there are major land uses along the corridor that are more suburban in character. Most notable is the Midway Commercial Area, which resembles a suburban strip or shopping mall and is heavily dependant upon auto related uses. This includes large expansive parking lots that are prohibitive to a walkable retail center needed to support an LRT line along the corridor.

**Economic Development**

The most “effective means of assuring strong positive economic impacts” are to ensure that corridors possess the attributes found in Table 1. The Central Corridor project currently incorporates four of the six preferred attributes for successful corridor development.

<table>
<thead>
<tr>
<th>Preferred Attributes</th>
<th>Central Corridor</th>
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<tbody>
<tr>
<td>An attractive location, located in high-density areas.</td>
<td>+</td>
</tr>
<tr>
<td>Have limited highway capacity.</td>
<td>+</td>
</tr>
<tr>
<td>Are accessible by multiple modes.</td>
<td>+</td>
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<tr>
<td>Provide a cost savings over other modes</td>
<td>+</td>
</tr>
<tr>
<td>Have supportive zoning and land use policies</td>
<td>-</td>
</tr>
<tr>
<td>Developed as a public-private partnership</td>
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The study also concluded that successful corridors must create generative impacts. That is, measurable impacts such as time savings, job growth or clusters, improved safety, increases in property values or high ridership. The Central Corridor has the potential to produce many of these. They include:

27 Heather Burton, Co Author. SLPP’s “International and National benchmarking for Urban Transportation Corridor Development.”

28 Typically, a corridor should be fully developed to accurately measure the economic development effects. Consequently, it should be acknowledged that this assessment is only a “snapshot,” and not intended diminish the potential of current or future efforts to develop new partnerships or introduce further zoning or other land use changes.
1. **Lowered transportation costs:** The Central Corridor is more cost effective than adding lanes to a land-locked Interstate 94. Adding additional lanes to Interstate 94 is estimated to cost over 1 billion dollars. The preferred alternative (LRT) will have the ability to move twice as many people as potential capacity increases to I-94 at smaller capital cost - $840 million, with a $2.8 million dollar marginal increase in annual operating cost.

2. **Facilitates mobility of its users:** Projected ridership estimates are 38,000 daily passengers, which is sufficient to support a single light rail line based upon ridership levels of existing LRT lines. This ridership would be in addition to local route 16A on University and express routes 94B and 94D on Interstate 94. This corridor is a good example of how local, express and limited stop transit service can all coexist and support one another in a heavy transit-use corridor, with multiple major nodes. This corridor also benefits from three major north-south bus lines at Rice, Dale and Snelling and potentially two more at Raymond and Lexington.

3. **Supportive land use policies:** According to national best practices, successful transportation corridors located in urban areas typically have a minimum density of 30-units per acre. The efforts to encourage redevelop by the city of St. Paul, discussed above, should support this effort, and the Central Corridor has begun to see examples of increasing density, such as the 50-unit per acre Episcopal Homes development at Fairview and University. For the Central Corridor to be successful as both a transit corridor and an economic development area, land use policies supporting this type of development should continue to be developed and incorporated into the overall redevelopment plan.

### III. ANALYSIS

Based upon the lessons learned from this case-study report, the research team noted the following:

1. **Get to know for whom you are planning, and meet them on their terms**

The CCCC and RCRRA have conducted an extensive outreach process that included numerous presentations and community open houses. Planning officials also made a concerted effort to get on the agendas of pre-established meetings of community groups. This extensive involvement of the public creates trust between planning officials and community members while also reducing the number and intensity of conflicts.

As the planning moves forward this strategy should be continued, involving additional critical parties, such as the cities and the Met Council which will have authority to change zoning and finalize transportation plans. Explaining the technical process, and the reasons for decisions made during that process, will be very useful in maintaining public support.

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29 Source: Central Corridor Fact Sheet, RCRRA.
30 Note: Dallas DART LRT has an estimated 70,000 daily passengers with two lines (lightrailnow.org & dart.org). Portland’s Trimet LRT line has a weekday ridership of 80,000 on three lines (trimet.org).
2. **Tailor the five components to meet local conditions**

To date, the CCCC has done an excellent job of including the public in the planning process through both public participation processes and through information dissemination. The next challenge will be securing financing and spurring economic development, while not losing the contacts and connections made to the neighborhoods and public.

The success of the corridor will hinge upon the CCCC’s ability to work with other parties to maintain the issues raised through the public participation process while bringing together and implementing an economic development plan and funding source. Throughout this work, even though the corridor presents several economic development and redevelopment opportunities, it will be key to continue to present the transportation problems faced by the corridor, and how this project best addresses those problems.

3. **Recognize priorities can change as scale changes.**

Projects are typically more successful if it appears to benefit the entire region. For the central corridor, the scale of the project does not easily lend itself to this argument. The proposed LRT line could be seen as something that only benefits the two core cities without having any positive externalities on the suburbs. This creates a level of skepticism within the region that the project will benefit only those residents who reside along the corridor.

To address these potential arguments against the corridor, advocates must engender a higher level of public acceptance and possible base of funding. Officials now need to move from discussing local development opportunities to discussing the regional burdens created by current limits of the carrying capacity of the corridor. Interstate 94 is physically constrained and could probably only be expanded through additional side lanes or even a second traffic deck between downtown Minneapolis and downtown St. Paul. As mentioned in the economic development section, these solutions would cost significantly more to construct, and probably face considerable local opposition, which would add a significant amount of time before the project could be completed. Work done to date shows non-highway additions (LRT or BRT) to the capacity of the corridor can be done more quickly and at lower cost. The regional benefits that are created through these means need to be brought to the forefront of the debate.

4. **Have a champion.**

Advocates need to encourage and build upon existing champions. To date, the public and the media have been unable to link a face with the Central Corridor Project. A few local elected officials have publicly promoted the project, but the voice of such promoters has not reached a level to influence opinion at the regional or statewide level.

These individuals should be encouraged to step into the spotlight in order to garner public support at higher levels of government and accelerate project completion. A RCRRA Audit Report Summary stated “leadership must emerge from the community in order to advance a transportation agenda.”

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31 Source: RCRRA Audit Report Summary
report, provides a consensus from both the academic and government point of view, that a visible and vocal champion is needed for the Central Corridor project.

5. Do not let present economic conditions affect a future vision.
The Central Corridor has been the focus of several infrastructure investment plans over the course of several economic booms and recessions, with the likelihood of implementation rising and falling proportionately. A key reason for this lack of progress is that capital funding has been contingent upon the state’s economy producing sufficient revenue. This dependency is the reverse of what should be in place to ensure project success: improving transportation in the corridor needs to be seen as a key method for improving the regional economy, rather than the state’s economy needing to improve before the corridor can improve.

To overcome this dependence on favorable economic conditions for state resources, the CCCC and transportation officials should consider creating a dedicated funding source that will allow project improvement to move forward with less dependence upon surplus state resources. This concept has worked elsewhere – in fact, compared to other regions in the study, the Twin Cities are the only region that does not have a dedicated funding source for transportation projects.

There are two viable options that could be considered and promoted in the Twin Cities region: a local sales tax, or creating revenue through High Occupancy Toll lanes. Note, that these two examples discussed here are qualitatively different and should not be considered perfect substitutes for each other.

The first funding alternative is the adoption of a sales tax dedicated to transportation projects. Ken Kriz, formerly of the Humphrey Institute, estimated that $143,037,200 could be raised annually though a half-cent sales tax in the 7-County Metro. This could in turn allow the State to bond $3.1 billion for transportation projects. It would also significantly accelerate the implementation of a regional transit system that currently will take numerous decades to fund.

The second alternative has come about recently with the discussion of adding a High Occupancy Toll (HOT) Lane along the Interstate 394 Corridor. The projected revenue from this single HOT lane corridor is expected to be $5.5 million annually and will be used for transit or roadway improvements. If this concept would be expanded to the Twin Cities Region at large, HOT lanes could become a source of a sustainable dedicated funding for transportation projects. A recent HOT network study conducted by Robert W. Poole, Jr., and C. Kenneth Orski estimated that total annual revenue for eight different metropolitan regions ranged from $116-922 million a year.

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33 Ibid
34 SRF Consulting Group. “Making HOV Lanes More Efficient: An Express Lane Approach.” 3-14-03. This proposal uses projected revenues from HOT lanes for transit related purposes.
6. Do not let a technology or design drive the planning process.

The Central Corridor has been approached from nearly every transit technological innovation: bus rapid transit, light rail transit and commuter rail. The current preference toward LRT may seem, at first, to be prematurely decisive, but as this choice was based upon ridership projections resulting from land use planning efforts that are taking place outside of the corridor planning process, and not on the basis of the mode-driven community development or other non-transportation goals, it should be applauded. Continuing to emphasize the importance of selecting the mode that is best suited to serve, instead of generate, new growth, should yield greater consensus once it becomes time to finally settle the mode choice at the end of the EIS process.

7. Connect with regional transportation planning and funding process

Although the CCCC does not retain any formal powers, it does have access to power through its elected and appointed members. This allows the committee to overcome the lack of formal powers, such as the lack of land use powers, by using its members to lobby for actions on its behalf. If the link between its members and their respective governmental entities fails to be an effective method of creating political power, either the CCCC or the Metropolitan Council should pursue a formal Memorandum of Understanding between the involved governmental jurisdictions to demonstrate support for the project.

One representative that could greatly enhance the viability of the project, however, is a representative from the state legislature, or someone who is similarly able to influence opinion at this level. If the CCCC had a direct voice in the state legislature, the likelihood of a State-funding source would greatly increase. This representative would also provide the project with a high profile project champion.

8. Amend local zoning, as necessary

To date, the CCCC has focused on transit and transportation issues related to the corridor. It has not focused on land use and zoning issues as they are not within the charge or scope of the committee. In the meantime, however, several organizations have begun promoting changes to the land use plans along the corridor, while some businesses have been resistant to any change. Getting all parties to the table to resolve these differences now will ease passage of new zoning regulations after the land use planning activities are completed.

IV. CONCLUSIONS AND RECOMMENDATIONS

The Central Corridor Project has been built upon a solid foundation consisting of high levels of public involvement and a statistically supported rationale for preferred project design. As the project progresses, it will face obstacles surrounding the issues of economic development and financing. Based upon the analysis above, the chances of the Central Corridor becoming a success would be further improved if the following recommendations were implemented.

1. Emphasize the transportation need. The greatest argument supporting investment in this corridor is the fact that it will greatly exceed its current carrying capacity as an effective transportation corridor using a relatively inexpensive transit
investment. The CCCC and other stakeholders have made the case for the cost-effectiveness of LRT as the most efficient mode for expanding carrying capacity. They now need to tell that story to anyone who will listen.

2. **Seek out a state level champion who can articulate the benefits to the region.** Whether local match funding comes from a state appropriation or from more innovative sources, legislative approval of some type will probably be necessary. Engaging a champion who can articulate the regional and state level benefits, such as cost savings of not double decking I-94 while improving mobility and access in the corridor, will greatly enhance the chances for success.

3. **Bring the business community to the table, including potential developers.** Constructing a new transportation facility in this corridor could have some disruptive effects while it is being built. Once completed, however, new economic opportunities should arise for both existing and future businesses. Consequently, existing businesses and developers interested in taking advantage of the new opportunities should be engaged to help develop the future vision, and to discuss methods for ameliorating as many negative effects as possible during construction.

4. **Aggressively pursue innovative methods for securing local matching funds.** While state surpluses may again return one day, this corridor should not wait and count on competing for support from the state general fund. Successful corridors typically have dedicated funding sources, and the CCCC should build a consensus for a dedicated funding source by partnering with other corridor stakeholders, committees from other corridors and regional centers to create a unified lobby supporting this effort.

5. **Continue to communicate with residents, neighborhoods and other existing stakeholders.** A strength of the current planning process for the corridor has been its ability to engage and energize residents from surrounding neighborhoods. However, the vision may change somewhat to reflect business interests, and to obtain funding. Further, these additional efforts will take time. A key role for the CCCC and local governments will be to keep these residents informed of these changes, receive their feedback, and ensure that they continue to believe they are as much in control of the process as they have been up to this point.

6. **Promote zoning changes that are supportive of the project.** The CCCC and officials must take action to support the land-use planning activities along the corridor, arguing that redevelopment will have a positive effect on corridor businesses. Due to its broad membership, the CCCC may be well positioned to bring disparate interests together and develop some agreement regarding the adoption of new zoning classifications along the corridor. However, it should only do so in ways that are sensitive to the land use planning processes underway, and which do not interfere with the progress of these efforts.
APPENDIX E: Proceedings from March 7, 2001 Roundtable for Transportation Corridor Redevelopment

Introduction

On March 7, 2001, the State and Local Policy Program of the University of Minnesota’s Humphrey Institute of Public Affairs (SLPP) hosted a roundtable discussion at the Carlson School of Management. The purpose of the roundtable discussion was to explore new models for transportation planning in corridor redevelopment. This event was organized as a roundtable, wherein SLPP invited experts in transportation and community development to gather with representatives from government agencies, area businesses, and other stakeholders from local corridors to listen and interact with one another while sharing important planning and policy information, which could shape the future of the metropolitan area. The conference also provided a platform to present case studies from around the world that addressed the opportunities of corridor development.

The agenda for the roundtable included morning and afternoon sessions. The morning session was responsible for discussing topics related to developing a framework for assessing corridor development opportunities by using examples of events and programs at the local level designed to positively influence corridor development. The morning session featured Professor Robert Cervero, an expert on transportation corridor development planning from the University of California, Berkeley, as the keynote speaker. Other speakers represented the Federal Transit Administration, the Minnesota Department of Transportation, the Humphrey Institute, Claremont Graduate University, and the Design Center for the American Urban Landscape. The afternoon session was responsible for discussing the merits of focusing on corridors in community development. The afternoon session included representatives from the Metropolitan Council, Hennepin County Highway 81, Hiawatha Avenue, North 35W Coalition, and Hennepin County.

The roundtable ended with a wide-ranging discussion that included the entire audience, including the speakers from the morning session.

After the panelists had an opportunity to voice their views and experiences regarding the prescribed subject matter, the audience, which consisted of approximately 55 people, was encouraged to ask questions and list their concerns with the issues related to transportation corridors. Opening the conversation up to the audience produced new ideas and thoughts as to developing a framework for assessing corridor development opportunities. The audience members were enthusiastic about the concept of developing a framework for transportation corridors in the Twin Cities metro area.

Welcome and Convening: Olin Moore, Representative for Congressman Martin Sabo:

Mr. Moore set the context for the day by providing an overview of the importance of transportation corridor development in the metro area. Moore stated that transportation corridors, as a stimulus for community development, are important issues for Congressman Martin Sabo, and highlighted the Congressman’s efforts to increase transportation corridor development activity at the community and the legislative levels. Moore closed by emphasizing that increased commitment at both levels strengthens financial and public support for overall corridor development in the metro area.
Keynote: “What Makes Corridors Unique?” Professor Robert Cervero, University of California, Berkeley

Professor Robert Cervero, an expert on transportation planning from the University of California, Berkeley, described the uniqueness of corridors in his presentation. Transportation corridors are multi-jurisdictional, have infrastructure driving growth, and various political and financial opportunities. When planning for development along transportation corridors, planners should recognize opportunities that favor corridor growth, such as maintaining a balance between the ability to quickly travel a corridor with the ability to easily access the corridor and developing a strong vision of the corridor and shape economic development in the region. Public perception should also be considered from the start, in order to shift the planning process from reactive to proactive, thus creating long-term benefits for the community. Proactive policies can catalyze financial investments up-front, which strengthens development planning.

Many examples from around the world demonstrated various avenues of transit, from Curitiba, Brazil to Stockholm, Sweden. Both Bus Rapid Transit and Light Rail Transit have benefits to the community and, rather than choosing the “corridor of least resistance,” a transit system must be carefully developed to fit the needs of the community. Cervero stated that evaluators of economic development should consider opportunities to market the project, coordinate policies, and work with various sectors on the project, especially the private sector.

Federal and State Views of Transportation Corridors

Elaine Dezenski, Manager for the Joint Partnership Program in the Office of Research, Demonstration and Innovation at the Federal Transit Administration, spoke on the role of the federal government, which is to provide incentives, align departmental actions in support of local smart growth initiatives, supply information on tools, and offer resources to empower citizens and communities to lead development projects. Corridor development is enhanced with livability and transit-oriented development. This includes smart growth, combined finances, and more choices for the community. These programs
SLPP’s International and National Benchmarking for Urban Transportation Corridor Development

work with current institutions to make a project work, which allows flexibility at the local level. There are also options to use various models for transportation, even at the incremental development process. To gain ridership, the community must actively market the availability, the ease of usage, and the new technology opportunities of the transportation system. Ms. Dezenski discussed Bus Rapid Transit as one viable transit alternative gaining interest in the United States.

Richard Bautch, an Inter-Regional Corridor Manager with the Minnesota Department of Transportation (Mn/DOT) spoke on the development and anticipated impacts of the Mn/DOT Inter-Regional Corridor initiative (IRC). Since connecting urban centers are a large priority, Mn/DOT has identified a network of Interregional Corridors to focus on the effects of speed limits, congestion, and traffic lights within corridors. Mn/DOT’s current investments are targeted at improving corridors with below and near-below rankings to improve overall state transportation. Furthermore, Mn/DOT is promoting the IRC system as an opportunity for alternative transportation and land use stewardship throughout state, including the metro region. Bautch stated the key planning concepts for transportation corridor development includes the partnership of various organizations to formulate a corridor vision with a sound action plan and ongoing corridor management. As part of the governor’s “Big Plan,” the Inter-Regional Corridor has been rolled into the governor’s smart growth initiative.

Developing a Framework for Assessing Corridor Development Opportunities

Ken Kriz, an Assistant Professor at the Humphrey Institute, spoke on designing a sound framework for corridor development. He stated that a framework should consider the challenges for corridor planning and development including citizen preferences, financing, potential impacts, design, and governance. Reviewing travel patterns, housing, commerce, and open space will also strengthen the framework by directing development to occur in patterns that are congruent with transportation system designs. The planners should also keep in mind successful corridors, like Curitiba and Stockholm, as discussed by Professor Cervero.

Tom Horan, Associate Professor at the Claremont Graduate School, offered an initial response, noting the differences between new corridor development and existing corridor redevelopment. He noted that the redevelopment of existing corridors is particularly immersed in political, economic, and social context of the project. Horan raised the following questions to the roundtable: “Can the corridor be thought of as a place?” and “How do you develop an integrated approach that respects both the mobility and community aspects of the corridor in mind?” These questions involve analyzing public sentiment and corridor development in terms of assets and liabilities.

Dan Marckel, a Research Fellow at the University of Minnesota’s Design Center for the American Urban Landscape, introduced the different approaches to in-fill versus re-fill opportunities in economic development. Marckel raised the issue to foster discussion of corridor development, using the 8 communities on the Hennepin County Highway 81 project as an example. Since Highway 81 passes through urban, 1st and 2nd ring suburbs, there are redeveloped, developing, and new development phases that need to be
coordinated. As various sectors work on the corridor redevelopment project, the coalition needs to consider public needs and wants for the corridor.

Audience discussion: How do we maximize the role of corridors in the urban development and redevelopment process?

Various speakers and members of the roundtable advocated developing a framework by emphasizing design, additional research, informing the public with marketing campaigns, or getting the community involved. Gail Dorfman, a Hennepin County Commissioner, noted that St. Louis Park’s current plans to develop a downtown area have increased community involvement as well as created economic development opportunities. By planting flowers and trees along roads and lighting the streets at night, citizen interest in community centers and bike paths have been generated as well.

Connie Kozlak, from the Met Council, proposed using a strategic planned vision for economic development. She noted that since economic development and transportation planning are two moving targets that are difficult to coordinate, planners could stabilize one target according to the vision and then develop the other target to complete the vision. Furthering the conversation, Tom Horan described this as a way to compare the opportunities of BRT versus LRT in transportation planning.

Other topics explored transit stop opportunities, dedicated right of way, and permanency in development. Tom Horan described the potential for proper development to increase pedestrian activity and secure investment dollars. Elaine Dezenski spoke on the opportunities to create incremental improvements within existing transportation infrastructure. Karen Chapple raised the work of local grassroots campaigns like the 35W corridor as an example of a project that brought businesses and governmental agencies together for the community. Natalio Diaz concluded the discussion by emphasizing the importance of the community foreseeing future problems of transportation and demanding alternative transportation modes.

Plans to Increase Transit Corridors: Natalio Diaz, Metropolitan Council

Natalio Diaz, Transportation Director at the Metropolitan Council, described the three most important parts of corridor development:

- An evolving vision of growth,
- A theory of corridor development, and
- Transportation design.

He also described three goals of the Metropolitan Council for transportation development in the region:

- Double capacity of bus system,
- Develop network of transit ways, and
- Provide incentives for integration for development purposes.

Long-term success of transportation is represented by heavily traveled corridors, opportunities for development, and enthusiastic political support. The practical application of creating a framework needs a number of things including partnerships, resources, and flexible solutions that create a good interchange of suburban and urban
policies. Mainly, multi-modal transportation needs to have public and financial support, especially in the legislative bodies.

**Transportation Corridor Development in the Twin Cities:**

Representatives from three developing transportation corridors in the Twin Cities discussed the challenges that they have faced in the process, and how they are addressing them.

*Hennepin County Highway 81:* Larry Blackstad, the Director of Hennepin County’s Community Works Division, described the need to create a framework that respects the challenges in the implementation of the project. There are many complicated issues that have shared responsibilities and a strong structure is needed to provide for coordinated action. Under Commissioner Opat, there is a partnership-led initiative to bring private and public opinion together under a common vision. Blackstad stated that there is a need for a smart growth development framework fueled by the enthusiasm from the local communities.

*Hiawatha Avenue:* Hennepin County Commissioner Peter McLaughlin described the many obstacles to various development projects along this corridor, including lack of investments, dead-spaces, micro details, and political opposition. The Hiawatha corridor has been in various planning and construction stages for nearly 40 years, and a structure is needed to speed up the development process. McLaughlin stated that such a process would require up-front financing and the support of the public. Investments need to target infrastructure, and civic leaders need to work with the community to make a vision, raise finances, and deal with opposition.

*North Metro I-35W:* Bob Benke described the efforts of the North Metro I-35W Corridor Coalition, a seven-city joint powers organization. The Coalition was formed to provide the framework for coordinating economic development, housing and transportation infrastructure investments. Initial priorities were the development of an extensive common database and assessments of growth related issues. The Coalition is currently conducting a "Build Out" study that will form the base for future investment priorities.

Lessons learned from the coalition are:

- The need for dedicated people,
- The need for leaders with a vision, and
- The need for community participation.

The Vision Statement for the North Metro I-35 Corridor Coalition is “To jointly and cooperatively plan for and maximize the opportunities for regional community development, quality growth, and diversification through a system of collaboration.” The desires of the coalition are weighed with the abilities of the coalition to build a living community.
**Audience Discussion: Merits of Focusing on Corridors?**

Serving as moderator for this session, Tom Horan invited discussion on aspects of the model framework. Beginning with financing, he referred back to the heavy allocations of funds to highways, rather than a balanced approach between highways and mass transit. Sandra Vargas noted that cities do not have the resources and need more flexible dollars; Mark Garner offered the possibly of a grant-coordinated project. Another member of the audience mentioned that given the need for constant highway upgrades, transportation dollars cannot be diverted away from current budgets. A larger allocation of funds from the state to transit needs to occur instead. Peter McLaughlin reiterated his point that an adequate funding mechanism was key to the success of corridors, and that keeping it as a sub-regional initiative meant that major capital funds would generally not be available.

Horan then introduced the topic of public opinion. Mark Garner noted that public infrastructure needs to support redevelopment of land and recycled areas. Robert Cervero encouraged creative fundraising with the private sector. Economic clusters would support with transit alternatives to ensure efficient corridor use in the future, noted by Lee Munnich.

In regards to public opinion, Commissioner McLaughlin noted the issue of the public’s current negative perceptions of mass transit. Bob Benke noted the need for the government to correlate transportation policies with the wants of the people. Karen Chapple noted that despite initial reluctance to support transit corridors, proactive development policies can contribute to the growth of livable communities. Dan Marckel remarked on the impact of positive marketing campaigns and extensive community involvement in transportation planning. Another member of the audience noted the need to bridge the gap between views of rural legislators and urban legislators in the transportation legislative bodies, in order to strengthen statewide transportation policy.

Tom Horan discussed the topic of successful consensus building at the corridor level, which includes private and public interests. The consensus needs to recognize the larger regional goals and work with other corridor development projects. Connie Kozlak described how a plan carefully developed at the regional level could alleviate in-fighting between corridors and allow development projects to occur, even if they are developed, funded and implemented one project at a time.

**Reaction**

A framework for transportation corridor development needs to be designed and include proper means of implementation. This framework needs to have committed support across various parties represented at the roundtable to heighten financial and public support of the program. There are many examples of successful transportation corridors around the world, from which we can adapt the structures, technology, and development to benefit the local transit system. Benefits from the system may include invigorated urban centers, attractive housing, and well-planned communities. Opportunities for long-term investments in land purchases can be reinvested into the transit system.

Themes that emerged from the roundtable, applicable as lessons for current and future corridor planning efforts are:
• For corridors that affect multiple jurisdictions, it is important to get leaders from each place into the room to discuss issues and opportunities of development.

• Open communication between bureaucrats/planners and citizens is critical to project development and eventual success. There is often a difference between what citizens are saying and what government thinks citizens are saying. Planners and politicians should carefully listen to what those affected by development really want in and from their communities. There may be difficulties in communication between planners and citizens because citizens may not understand what different types of development might look like when built. For this reason, showing a picture or otherwise presenting concepts might be more effective for some people—convincing them that density can be attractive—than merely using words to describe concepts such as transit oriented design.

• Funding for transit is difficult to piece together. For this reason, cooperation between communities and representatives from different (city, county, state, federal) governments is essential to get projects moving forward.

In order to create such successes, local corridors need to compromise to focus energy on certain corridors in certain stages. Success also depends upon more developed funding and growth models.

There were some questions raised:

• How to integrate the transportation corridor development plans
• How to best serve the present and future transit customers in the metro area
• How to finance these plans at the state and federal levels
• How to develop a political constituency to support integrated corridor development

These and other questions are very important in developing a framework for transportation corridor development. With these questions in mind, it would be useful to reconvene this group to further discuss building a framework for transportation corridor development in the near future.
APPENDIX F: Proceedings from October 17, 2001 Roundtable for Urban Transportation Corridor Redevelopment

Introduction

On October 17, 2001, the State and Local Policy Program (SLPP) of the University of Minnesota’s Hubert H. Humphrey Institute hosted a roundtable discussion at the Carlson School of Management. Designed as a continuation of a roundtable held earlier this year, the meeting was part of an eighteen-month study of national and international best practices of urban transportation corridor redevelopment.

The purpose of this roundtable was to allow local participants to offer perspectives on several framework issues raised by the Humphrey Institute. These issues included citizen preferences, economic impacts, financing options, design elements and governance structures of urban transportation corridors.

Frank Douma, Research Fellow at the Humphrey Institute, started the day with a brief welcome and description of the objectives for the day. Following the welcome, Robert Johns, the Director of the Center for Transportation Studies, gave short address before introducing the keynote address by Tom Horan, Associate Professor at the Claremont Graduate University. This was followed by a framework overview given by Professor Ken Kriz of the Humphrey Institute. The remainder of the day became an interactive discussion between panelists and audience members through the use of two separate panels and a facilitated discussion lead by Darryl Anderson of the Minnesota Department of Transportation. The first panel consisted of high-level administrators from Hennepin County, Metropolitan Council, Minnesota Department of Transportation, and the IBI Group. The second panel consisted of elected and appointed officials from the Metropolitan Council, Hennepin County, the Minnesota Legislature and the Greater Minneapolis Chamber of Commerce.

After the panelists had an opportunity to voice their views and experiences regarding the prescribed subject matter, the audience, which consisted of approximately 55 people, was encouraged to ask questions and list their concerns with the issues related to transportation corridors. The conversation broadened the understanding of areas and specific questions that need to be addressed by the legislature, non-elected officials and research institutions.

Keynote: ‘The Architecture of Place in the Information Age: Implications for Regional and Corridor Development. Digital Places: Design considerations for Integrating Electronic Space with Physical Place’ Professor Thomas A. Horan, Claremont Graduate Research Institute

Tom Horan, Associate Professor at Claremont Graduate University, talked about the need for design considerations that integrate electronic space with physical place. After briefly discussing trends in urban spatial structure and the definition of the concept of digital places, Horan defined three scales at which digital places operate: behavioral setting, neighborhood scale and regional scale. There is a need for making linkages across scales,
not just to design and create transit facilities, but a place containing networks of activities that are economic and social in nature. Linkages, places and networks should be spatially defined to create a “sense of place.”

In the second part of Dr. Horan’s talk, he examined how the themes of digital places are manifested in regional and corridor development. The Magnolia Corridor in Riverside California can demonstrate issues with transit corridors in urban and regional spatial environments. In this case, a variety of social and economic issues had to be addressed at the micro, meso, and macro levels. Horan closed his presentation with the following recommendations:

- Take a network approach to improving places:
- Assess and implement economic and community enhancement proposition of (transit) corridor development.
- Consider the full range of transportation options (bike, pedestrian, and transit) as part of the corridor development process.
- Address linkages across scales and institutions:
- Consider dedicated funding as part of corridor development budget would serve as a defining element for consistent planning, implementation and accountability.
- Embrace citizen views as pieces of the solution:
- Devise means for solidifying ongoing partnerships, including partnerships with private sector.

Framework Overview

Ken Kriz, an Assistant Professor at the Humphrey Institute, discussed a proposed corridor-planning framework with an emphasis on project financing. He stated that there is a need for a model that addresses corridor development problems. In his presentation, Professor Kriz showed a model with five interrelated major areas of concern with regard to the corridor planning process. These include:

- How do citizen preferences define constraints and opportunities?
- How do economic impacts provide a stream of benefits and costs?
- Which financing options provide for potential implementation?
- Which design elements yield consistent, efficient, effective transportation and land use systems?
- What governance structures may limit or enhance opportunities for development?

Among the five elements, Kriz emphasized the financing options. Traditional funding is subject to problems such as declining federal funds for new starts, state funding concentrated and constrained local funding. Innovative financing options can be used to finance projects when traditional funding is not available. Examples of innovative financing are Denver’s Transportation Expansion Financing Package. In the end, Professor Kriz talked about the obstacles to innovative financing in Minnesota. He raised the following questions to the roundtable:
• Can we build support for use of innovative financing?
• Are funding sources responsive enough to changes in population?
• Is the planning structure sufficiently strong to coordinate a major multi-jurisdiction project?
• Is the political will present to fund transportation projects at the expense of other items?

Panel: Twin City Transit Corridors

• Connie Kozlak, Manager, Transportation Systems Planning and Programming, Metropolitan Council
• Sandra Vargas, County Administrator, Hennepin County
• Dick Stehr, Division Engineer, Minnesota Department of Transportation
• Peter Lambur, IBI Group, Vancouver

This panel focused on the topic of achieving sustainable growth objectives through the integration of infrastructure development with land used planning. The Hiawatha Corridor and, more specifically, the new Hiawatha Light Rail Line, provided the case study basis for a review of the issues and suggested policy recommendations for the future transportation corridor development.

Peter Lambur began the session with a presentation highlighting the benefits of LRT and characteristics of transit orientated development (TOD) followed by an overview of key issues identified through interviews with projected stakeholders. Project resourcing, leadership/accountability, and communications were among the most commonly cited issues impacting the potential for corridor development as an integral component of a region’s sustainable vision. Mr. Lambur observed that the two solitudes of engineering and land use planning are a contributing factor to the disconnects frequently encountered in corridor development projects throughout North America. He concluded his presentation with recommendations summarized from stakeholder/interviewee suggestions for improvement. Working from strengths towards improved outcomes, panel members were presented with the following broad strategic directions for comment and discussion.

• Integrate the livable communities/TOD vision with the infrastructure development process.
• Coordinate communications between project providers in support of an open and transparent planning and development process.
• Provide sufficient resources for planning and development initiatives.
• Create a comprehensive marketing strategy that links transit ridership objectives with urban neighborhood re-vitalization/development potential.

Ms. Kozlak brought up the Hiawatha project in how it sat idle for years. When the money actually became available, the planning reacted to the short timeline allowed for the project. If planning had been able to proceed during the entire period in which the project was discussed, it would have been better prepared when funding was approved.
Mr. Lambur concurred, and added that ongoing dialogue with corridor communities is an essential ingredient to effective land use planning and should be initiated at the earliest stages of the route/alignment/station location process. Moreover, the design process should recognize the public consultation function as more than just a due diligence exercise. Time is required to cultivate community buy-in and move from the initial concept state to zoning ordinances that support TOD.

Mr. Stehr brought up the key lessons learned from the Hiawatha project. He commented that there was a process of defining the available options, but there was uncertainty about how the bids would come in. With a fixed dollar amount and a variable project scope, the set of options sometimes had to be cut. He stated that an important lesson is that we should have undertaken more of a marketing effort to make sure people understood how the options and scope were broken down.

Mr. Stehr also brought up the importance of timelines. Timing to start projects and complete a project as funds become available can be difficult.

Ms. Vargas commented on the opportunity for more for community involvement if local entities do not perceive that the agenda is already set. She stated that the project could have been packaged as a Hiawatha Corridor Project instead of just a LRT project. The role of the different jurisdictions could have also been defined up front. There was good citizen participation, but at that point in the project, the budget was already set. Therefore, the project was unable to respond to the public’s concerns.

Ms. Kozlak pointed out that this situation (Hiawatha) is a good example of the benefits of acquiring adequate right-of-way area. If more ROW could have been acquired, there would be a better opportunity to place supplemental uses in close proximity to the corridor. She also mentioned it was unfortunate that planning for Hiawatha station areas was not done sooner. If it had, additional ROW could have been purchased and a joint development may have been possible with a lower overall cost and with better results for LRT and the development.

**Facilitated Discussion, Key Points and Questions**

The audience was led through a discussion by Darryl Anderson of the Minnesota Department of Transportation, on the issues and questions raised by the opening panel. Audience members were asked to write down research questions and post them on topic boards. A summary of these issues and questions are attached to this document.

**Closing Panel: Elected and Appointed Officials**

- Carol Flynn, Former Minnesota State Senator
- Mary Hill Smith, Board Member, Metropolitan Council
- David Jennings, CEO, Greater Minneapolis Chamber of Commerce
- Peter McLaughlin, Hennepin County Commissioner
Lee Munnich, Senior Fellow and Director of the State and Local Policy Program, and moderator of this panel, started off the panel discussion by asking the members to help us understand the political obstacles to corridor planning.

Senator Flynn kicked off the discussion with: “Follow The Money.” She argued that only when you have enough money will things start to happen. In addition, most people do not understand the gas tax and its designation to be used for roads only. The only recent change in transportation funding has been the reduction of license fees, which only took dollars away from roads and replaced them with more discretionary dollars. She questioned how we were going to fill this gap in funding, when transportation is low on the list of priorities.

Senator Flynn also commented on the fact that rural legislators are starting to realize that is they want the rural areas to be productive; they need the Twin Cities to be productive and act as a hub for the rural marketplaces.

Commissioner McLaughlin countered Senator Flynn by stating that several recent polls in the metro area have clearly indicated that transportation is a priority. It was not the number one issue for decade; crime and education were, but it is number one today.

He continued by explaining the complexities of transportation planning and emphasized the need to recognize the legitimate voice of the community in responding to a big system, in this case transit, intruding on their home turf. He then shared a story about unintended consequences.

A staff member of his had received a call from a constituent who lived near the Midtown Greenway. The Greenway is a project that is modifying obsolete railroad tracks into a pathway to be used for recreation and as a spur to reinvestment on adjacent land. The last remaining use of the railroad tracks had been to transport grain to and from grain elevators located along the Greenway. The elevators had recently been purchased by the Hennepin County Regional Rail Authority; grain deliveries had stopped. This constituent was complaining that pigeons had taken over his bird feeder because there was no longer any spilled grain along the railroad to feed them. And he wanted the Commissioner to fix it!

Therefore, Commissioner McLaughlin warned that no matter how well a project is planned and embraced by the general public, there may still be local resistance and aversion to change that needs to be dealt with if projects are going to succeed.

Commissioner McLaughlin then discussed the use of design build as it pertained to the Lake Street LRT station. By changing the proposed design of the station, a million dollars could be saved. Neighbors, however, who had participated in the development of the initial design fought this change and won. The builder demanded $3 million to return the station to the original design, a loss of approximately $2 million. Care must be taken when using design/build to protect the community's and the owner's interests. If not, the
design/builder will exercise excessive control that could jeopardize community support or cost the project excessive amounts of money.

He also commented on the fact that transit does not have a sufficient constituent base to work with. Transit is still viewed as a system for the poor and urban residents. Therefore, we need to draw upon community organizations to create and disseminate a vision to fill this void. These organizations can massage issues that arise a lot easier than the government can.

Mr. Jennings commented that all issues are related. He pointed out the dangers of focusing on one issue and not looking at the big picture. The public does not see transit as a separate issue in their life. It is part of it.

He went on to state the key to transportation corridor development is governance. He argued the rivalries that exist between municipalities are holding us back because the Twin Cities are now in a market of competing regions. He said local ideology focusing on competition between cities and counties needs to shift to one that unifies the region. The region will then be able to compete as a whole against other regional markets. To accomplish this, Mr. Jennings argues that we need an individual that can articulate transportation needs to the public.

He also commented on how transportation has become a critical factor to the business community. No longer are taxes their primary concern, because the issue of getting to and from work is increasingly problematic.

Ms. Smith started off by stating that the biggest challenge in corridor planning is working with the cities along the corridor, because they are the ones who have the power to enact and enforce zoning. Because of this problem, she believed we should look to the Hiawatha project, which had a community advisory council to help facilitate the process.

She also underscored the importance of having a strong leader to create a vision, but that the vision created should be able to adapt to local issues. She stated that it is important to counter obsolete stereotypes about what is being proposed. An example of this is affordable housing. People have a negative image in their heads about what affordable housing looks like, when in reality, it is indistinguishable from regular housing.

**Wrap Up: Tom Horan**

Professor Horan summarized the comments and recommendations of the roundtable.

- Take a network approach
- Embrace citizen views
- Consider the full range of transportation options
- Address linkages, dedicating funding is a defining element for consistent planning implementation and accountability
- Leadership-Vision, “a next generation” system using best practices
- Design from the pedestrian up
Solidify public/private partnerships
Commitment to the best technology for efficiency, safety and emissions.

The roundtable concluded with thanks to all participants, and a reminder of the upcoming events in which researchers will address issues and concerns raised at the roundtable through case study research. The case studies will be presented at a forum in the spring of 2002, with the entire study due for completion by the end of 2002.

**Summary of Topic Boards from Facilitated Discussion**

**Comments on issue board (Governance)**

- Partnership required
- Institutional cooperation & communication
- Climate of cooperation among government units
- Need for integrity between plan & implementation
- Schrieber amendment
- ‘Special rules for transit/ LRT’
- Design & build needs still to be about design
- Legislative lacks balanced perspective
- Legislative micro managing
- Livable communities tool useful to incentive local TOD
- Our regional economy is in competition with nationally & internationally
- Current government structures are misfit
- Transportation is all about governance
- Capitalize on community organizations; e.g. Seward Redesign
- Role & power of private sector
- Coordinated zoning
- Lack of leadership
- Highly articulate leader to (champion) the vision
- How to educate legislators?
- 1) Vision
  2) Development in existence plans
  3) Develop political will
- (sent in later): More legislators should participate

**Comments on issue board (Finance)**

- How to get money for non transportation items
- Tight targets & deadlines
- Money for infrastructure (roads, rails)
  Needs to include money for planning
- Flexible & stable funding source
- E.g.: 5% foundation for community building
- Sell value to public to get funding
‘The next generation of investment’
Get this truth out: highways are nearly 50% subsidized [TRG study]
Definition of ‘highway purposes’
Dedicated highway funds

Comments on issue board (Design)

- Vision insufficiently articulated
- Vision insufficiently followed through on
- Lack of advocacy for broad vision
- Aging of baby boomers equals need to walk, etc.
- Vision should dictate budget
- Express vs. <stops> → need to articulate vision
- Design should be part of good planning
- Social justice goal to guide vision
- Parking limitations via security concerns (9/11)
- Security & national security implications (9/11)
- Transit right of way on highways with transit links to centers (shopping/business, etc.)
- Capitalize on technology for transit (ITS type stuff)
- Tail (transportation) is wagging dog (community)

Comments on issue board (Economic Impact)

- Economic viability of development
- Can transit corridors be job corridors?
- Development models for mixed use / multi-modal
- How do you develop a public/private partnership in a community (largely residential) corridor?

Comments on issue board (Citizen Preferences)

- NIMBY
- Correlate transit technology with neighborhood acceptance
- What is the new (coming) travel technology
- Education needed on all forms of transportation- bike/ ped/ transit (Carol Lezotte)
- Citizen acceptance of transit, pedestrian, and bike
- Education needed on safety of bicycling/ walking (Carol Lezotte)
- Engage good citizens to be a part of the solution
- Give people choices

Comments on issue board (Other)

- Transportation corridors not only transit corridors
  Always supply pedestrian/ bike facilities
• Business and labor could de-fang the transit VS highways debate
• Transportation is not a separate issue (DJ)
• 9/11 implications:
  $5/gal gas? (Carol Flynn)
  Price control? (Gary Barnes)

Comments on issue board
(Marketing/Education/Outreach/Advocacy)

• Congestion is #1
• MN CofC also has transportation as #1 priority for 2002 session
• Business/ CofCs are credible early advocates
• Mpls. CofC
  Businesses
  Transportation = #1 or #2 priorities
  Tax relief not in top5
• Plans need to make sense to public
  Government must be honest & open
• Resistance to change my neighborhood + Distrust of government, MnDOT, Planners
• Transit needs a broader political/ advocacy base
APPENDIX G: Proceedings from June 7th 2002 Case Study Conference on Urban Transportation Corridor Development

State and Local Policy Program

Proceedings from A Case Study Conference on Urban Transportation Corridor Development

June 7, 2002

UNIVERSITY OF MINNESOTA
THE HUBERT H. HUMPHREY INSTITUTE OF PUBLIC AFFAIRS
Introduction

On June 7th 2002, the State and Local Policy Program (SLPP) of the University of Minnesota’s Hubert H. Humphrey Institute of Public Affairs hosted a case study conference on Urban Transportation Corridor Development. Designed as a continuation of a roundtable held in October 2001, the conference is part of an eighteen-month study of national and international best practices of urban transportation corridor redevelopment, sponsored by Hennepin County and the Federal Transit Administration. The overall objective the study is to develop a greater understanding of the successful development and implementation of corridor redevelopment projects, which will inform a proposed strategic financing, implementation, and management plan for corridors in the Twin Cities area.

The discussions on the case study conference were centered on the role of governance, citizen participation, financing, economic impacts and design of several case study corridors, and convened more than 100 participants representing academia, policy makers, and a wide range of public, neighborhood and business interests. The event offered opportunities for participants to learn national and international practices of transportation corridor development.

Ottawa Bus Rapid Transit (BRT)

Lee Munnich, Director of State and Local Policy Program, began the day with a brief welcome and description of the objectives for the day. Mr. Munnich noted especially the roles of Congressman Martin Sabo, the Federal Transit Administration and Hennepin County in making this conference possible. Following the welcome, Frank Douma, Research Fellow at the Humphrey Institute, gave a short overview of the research project, also noting the assistance of the University of Minnesota’s Center for Transportation Studies and the Minnesota Transportation Alliance.

Tom Horan, Associate Professor at the Claremont Graduate University, then introduced the keynote speaker, Mr. Hank Dittmar, president of Great American Station Foundation, who made a speech on transit oriented development. This was followed by presentations
of findings offered by the project investigators. After that, Minnesota Senator Satveer Chaudhary (DFL – Fridley) offered his perspectives for transit and other corridor development in the Twin Cities in lunch presentation.

The afternoon sessions included presentations from case study areas. Representatives from three of the case studies, Denver’s T-REX, San Diego’s managed lane on Interstate 15, and Ottawa’s busway system, shared their experiences on corridor development practices. The remainder of the day was a reaction discussion led by Hennepin County Administrator Sandra Vargas and Hennepin County Commissioner Mark Stenglein, who noted the need for leadership and vision to create new interjurisdictional relationships that would allow future corridors projects to become reality.

**Keynote Presentation**

“Transit Oriented Development: Capitalizing on an Opportunity” Hank Dittmar, President, Great American Station Foundation

Mr. Dittmar gave a speech discussing the opportunities and challenges related to transit oriented development (TOD). He began with a discussion on the opportunities and key attributes transit can bring to people. Transit can guide growth and development, if one works hard at it from both the transit and the land use sides, and that the result can be improved ridership, enhanced livability, and reduced household expenditures on housing and transportation for persons living in transit oriented communities. It is also effective in generating investment and attracting new economy business.

Mr. Dittmar began by introducing four different subsequent historical models of development around transit. In the early 20th Century the pattern was the “Streetcar suburb,” or “development oriented transit,” where transit providers developed residential areas to support line extensions. These developments were mixed-use, and of moderate density. Then next pattern was “auto-oriented transit,” symbolized by park and rides that were served by express buses. These developments were largely single use residential, and park and rides served to agglomerate car tips from these areas into nodes more easily served by buses. The third pattern was “transit-related development” where the focus was maximizing the revenue generation possibilities of land owned by the transit operator, rather than creating ridership. The results of this often was office parks that yielded significant lease revenue, but were better served by car than by transit. The final phase is “transit-oriented development” that is similar to the streetcar suburb in its development pattern, and also focused on increasing ridership. However, given the wide range of TOD currently underway, a better definition is needed than simply focusing on the transit operations.

Mr. Dittmar addressed this issue by further defining TOD in terms of outcomes, design, scales and other characteristics. A functional definition of TOD is “it is development that occurs within ½ mile of transit stop, and is linked to a grid of walkable and bikeable streets. It contains a rich mix of land use and housing types. It has appropriate treatments of parking and densities.” Besides the functional definition, Mr. Dittmar also defined TOD focusing on outcomes perspective, which center around location efficiency,
expanded mobility, shopping and housing choices, and financial return and value recapture.

To better interpret his idea, Mr. Dittmar provided cases in five regions and evaluated status of TOD in those areas: Atlanta, the San Francisco Bay Area, Chicago, Denver, and Arlington County, Virginia. He then discussed the prospects and barriers related to the transit development in each area. He closed his presentation with a summary of the following challenges and opportunities to Transit Oriented Development in general:

- **Challenges to TOD**
  - Lack of a common working definition
  - No guidelines for ensuring location efficiency
  - Tension between node and place
  - More complexity, time, uncertainty, costs
  - Fragmented regulatory and policy environment
  - TOD alone does not drive real estate development: special actions needed to ensure affordability, mixed income, especially in low income neighborhoods.

- **The opportunity:** A national intermediary to bring TOD to scale, ensuring that tools are in place to create stable mixed income, and mixed use communities that capture the advantages of location efficiency for families, communities and regions.

One of the neighborhood transit zones in the United States

Mr. Dittmar took questions after his speech:

**Question:** (from Mr. Steve Mahowald with Metro Transit) Could you speak a little bit to some of the deals that Arlington cut with neighborhood?
**Answer:** They actually cut the deal to preserve the neighborhoods and to investing and updating neighborhoods infrastructure and amenities. They provide things such as parks, sidewalks, streets, and street trees, in exchange for the concentration of development density. They didn’t do it through TIF district, or formal dedication of the revenue from the TOD, but the economic development around transit is around 60% of all the revenue coming into the County now. So in a real sense, what happened was a dedication of the revenue into preserving those neighborhoods.

**Question:** (Barb Lickness from the Neighborhood Revitalization Program) How would a neighborhood or a group working with a particular transit stop to determine what would be the proper level of density for that area? What are the determining factors?

**Answer:** That was actually in one of the chapters in the book – the role of the community and TOD. The first challenge is to defining what the community is. Because in a lot of places, we’ve seen cities’ transit agencies work with community development corporations and say those are the communities only to find that they are not. I said a lot about TOD, but I didn’t get into the actors in transit oriented development. But in every place, it’s typically the government which has land use control, the transit agency and probably the community development infrastructure – a set of actors do community development, and then the neighbors around the stops. At some points that’s where we see the need for public interests innovation, or a public interests role in transit oriented development, which is to help these parties to come together to achieve some consensus on what needs to happen.

**Question:** (Jim Dustrude from Mn/DOT) I appreciate your points on the cost of parking and how that overloads transit. It seems to me there’s a tremendous untapped synergy in using shopping center parking lots for parking rights, but it would require for the best synergy to take place for shopping center to be developed under a slightly different template than they are being developed now. Have you seen anyone who’s worked on or come up with something that might approximate the template that would accomplish that?

**Answer:** The congress of new urbanism is coming out a new book called “from gray field to the green field.” It’s about the opportunities to convert dead and dying shopping malls into new communities. Parking in Florida is a good example of shopping, and mixed use conversion of old traditional shopping mall. If you get underneath the ITE trip generation and parking standards, you will discover there are one or two developments that form the basis for a whole standard. Yet when we try to do TOD parking standards, the need for research gets like this. So we’re actually trying to take that on. We try to look at the synergy not only between shopping and transit use, but between housing and transit use. Figuring out how to share parking use and reduce costs is one of the outcomes we really see.

**Question:** What evolves out of the Atlanta Scenario? Did the government authorities learn lessons from that and how they went forward?

**Answer:** The most recent project was Lindbergh(?). They’re going to do a couple of great big buildings, and huge parking deck and regional shopping center at high densities
and auto-oriented parking standards. I think that project is an interesting to see. It is a big commitment to transit in Atlanta region.

**Question:** (Tom Maze from Howard R Green Co.) Most of the things you addressed are oriented to place, location, density, development and other types of things with regards to transit oriented development. It seems to me there’s a whole other dimension that needs to be examined, such as trip making behavior, the OD table, particularly in this region you have such diverse OD pattern, which would be one of your challenges on the list. But that is not a challenge in your list. I’m wondering why it was not.

**Answer:** It was actually. One of the key things we needed to work on was the role of transit in the regional network and the function between the place and the region. The whole reason we are doing Taxonomy as well is to characterize these places within the metropolitan structure. That’s supposed to place a structure and it’s a trip making structure. So I agree.

**Question:** In your Arlington example, you cited limiting the width of the freeway. How and who were able to limit that process?

**Answer:** That was truly a case of exceptionalism. But it was one of the big fights of 1970s. It was part of the whole battle over the construction of the freeway system in Washington DC. That worked for 20 years. It works long enough for Arlington County to put its development amatory in place and to secure its economic future. Unlike the other counties in this area, which did not push to get transit urban density or remain mixed income community. But a mixed income community has lots of jobs, good job-housing balance, lots of high level amenities, and very strong tax base, and high level of services for residents in the Washington region. So the freeway fight was part of it but I don’t think it’s the only ingredient of success.

**Question:** (John Bonsall) I live in a Transit Oriented Development and it was a very successful one. I’d like to comment that it is not just transit service, it’s also that the neighborhood is provided parking behind the shopping front that allowed the main street attract people from several miles away. And that is stimulated commercial development along the street which could not be supported by the neighborhood itself. It is therefore adding that value into the neighborhood. So it’s not just transit, it’s parking as well.

**Answer:** I agree. In creating transit oriented communities, what we’re doing is to finding a different role for the automobile but not getting rid of the automobiles. You have to park people who come to transit, you have to park people who come to shop. You need the auto to provide the additional booth. But you don’t need to give the street to the car. You don’t need to give the street scape and side walk and everything else to the cars. You need to put the cars in a place when they fit harmoniously in the neighborhoods. So, I totally agree.

**Question:** (Steve Orison, HNTB) I was interested in the degree to which rail systems and transit stops around rail systems dominate the research talking about we’ve been labeled as a sprawl city of the nation. Speakers come and say we shouldn’t look at Los Angeles, we want to look at the problems coming from low densities. What is the future
for the Twin Cities area. We still have density issues. What about TOD when we’re still using bus systems?

**Answer:** I think the question in terms of successfully building development around buses is to think about the neighborhood scale, the neighborhood transit zone. Part of the taxonomy that I talked about was a key piece of that. To do that, you need to give preferential treatment to transit vehicles of automobiles running in the mixed traffic. That’s absolutely the bottom line to having any success. The bus needs to outperform the cars for people to ride it with any frequency. If you get that happening, then you can increase headway levels on bus to the point where people don’t have to wait an half hour to catch the bus, which they haven’t reached up here.

**Presentation of Findings**

*By research study team: Mara Krinke, Ken Kriz, Frank Douma, and Jeff Miller*

The panel was introduced by Moderator Lance Neckar of the University of Minnesota’s Department of Architecture and Landscape Architecture. The panelists were Ms. Mara Krinke of ICF Consulting, Mr. Frank Douma of the University of Minnesota’s State and Local Policy Program, Mr. Ken Kriz of the University of Minnesota’s Humphrey Institute of Public Affairs, and Mr. Jeff Miller of the University of Minnesota’s Design Center for American Urban Landscape. Their presentations will be summarized individually below.

*Mara Krinke, "Citizen Participation in Urban Transportation Corridors"

Ms. Krinke first discussed her working definition of “transportation corridors.” She went on to point out that corridors often cross jurisdictions, include different modes, and are developed/improved over different phases. Proper coordination is essential to address these factors. Ms. Krinke then discussed criteria for evaluating citizen participation efforts. These criteria included the following issues:

- involvement of residents
- involvement of business interests
- formalized structure of involvement
- degree of commitment from participants
- different approaches to citizen input used
- phase of citizen involvement (planning, construction, use)
- citizen input shaped results
- technology effectively used in assessing and incorporating citizen input

Ms. Krinke discussed five case studies from the perspective of effective citizen participation: Denver (T-REX); San Diego (I-15 managed lanes); Ottawa busway system; Boulder, Colorado system; and the Minneapolis Greenway project Citizen panel. The lessons learned from these case studies can be summarized as follows:
Long-term participation in a community is helpful—build relationships and trust.
Citizen panels can provide in-depth participation from a limited group representing a broad range of interests at relatively low cost.
As much as possible, work with existing local groups and networks.
Use of citizen participation early in the process helps shape the project design to meet community concerns.

Professor Ken Kriz, “Urban Transportation Corridors: Finance and Economics”

Professor Kriz introduced his remarks by emphasizing the importance of financing considerations to any large project, including transit corridor projects. He discussed sources versus uses of funding for transit projects. He addressed current difficulties with funding for transit projects, including declining federal funds for new starts, and constraints on state and local funding. Professor Kriz also pointed out that the full economic value of a project is not limited to those areas immediately connected to a corridor project, but flow outwards, generally decreasing with the distance from the facility. Because of these difficulties, it is important that financing for transit projects be innovative and effective.

Professor Kriz identified five key evaluation criteria for financing plans:

- **Financing accelerates project completion**—if the financing approach helps to expedite project implementation, this minimizes inflation premiums that must be incurred.
- **Financing structure produces full values capture**—it is best to assign financial responsibility according to who benefits, by how much, from a given project.
- **Financing creates a simple and easily understood stream of costs**—it is important that the public understands why a given project is being undertaken, as well as the relationship between the costs of the projects and its associated benefits.
- **Financing enhances project control**—reliable streams of cash flow enable project managers to more fully and effectively plan for project completion.
- **Financing takes into account operating costs**—one should not focus only upon capital costs when designing financing plans.

Professor Kriz then applied these criteria to the financing of the Ottawa busways and the Denver T-REX case studies.

Frank Douma, “Urban Transportation Corridors: Governance Issues”

Mr. Douma began his remarks by discussing the “Homevoter Hypothesis,” (Fischel, 2001) which focuses on the fragmented nature of local governance in the United States, stating that locally homogeneous constituents tend to form small local governments in an effort to protect their interests. This makes regional planning, as is often required for

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transportation corridors, problematic. Mr. Douma suggested that corridor planning requires effective multi-jurisdictional cooperation, as well as coordination across levels of government (e.g. local, county, state).

Mr. Douma discussed the need to use existing organizations for corridor planning and development, but it is important to set up structured relationships between organizations appropriate to the given project’s needs. He discussed a model which creates a taxonomy of inter-government coordination models based upon degree of resource involvement on one axis and degree of power sharing on the other. Mr. Douma then used T-REX in Denver to discuss the types of agreements that can be used to codify the necessary agreements, such as a Memorandum of Understanding between local governments, an Inter-Governmental Agreement (IGA) between RTD and CDOT, and an Interagency Agreement between FTA and FHWA.

Mr. Douma also discussed the approach used in Ottawa to promote regional planning and service delivery. The City of Ottawa now encompasses the greater Ottawa area, including the central city and the associated suburban areas. This approach would be difficult to implement (and perhaps not legally possible) in the United States.

The lessons learned for the Twin Cities are:

- Assemble representatives of affected cities, private interests, and other jurisdictions EARLY.
- Identify funding opportunities and challenges.
- Develop appropriate governance structures and agreements.
- Review the theoretically possible option of increasing the authority of the Metropolitan Council by having directly elected councilors.

*Jeff Miller, “Metropolitan Transportation Corridors—Design Perspectives”*

Mr. Miller began by defining "corridors," pointing out that different organizations have somewhat different perspectives on transportation corridors. He suggested that a given corridor includes not only the actual roadway/transitway, but a significant area surrounding the infrastructure. He suggested that to effectively design corridors, it is necessary to create relationships between a) transportation infrastructure, b) land use/local settings, and c) the natural environment.

Mr. Miller pointed out examples of design considerations and criteria:

- Traffic congestion (level-of-service)
- Transit ridership
- Residential and employment densities
- Mix of land uses
- Environmental quality
- Pedestrian access to amenities
- Citizens perception
Mr. Miller discussed the County State Aid Highway 81 (Hennepin County) corridor project as a case study. He has worked on this project as a member of the Design Center for American Urban Landscape. Hennepin County assessing the option of making this corridor a busway and implementing comprehensive upgrades to the design and feel of the area. The goal would be to transform an old federal inter-city highway linking Minneapolis to points north and west (historically this roadway was US Highway 52) into a sub-regional corridor of districts, walkable centers and greenways. The corridor would be transformed from a highway to more of a boulevard, and existing natural features would be accentuated.

Mr. Miller also provided an overview of a number of other corridor design case studies outside the Twin Cities, including San Diego I-15 managed lanes, Denver T-REX, Boston Southwest Corridor, and others.

In summary, Mr. Miller provided some "lessons learned" for corridor design in the Twin Cities:

- Understand each corridor's scale and long-term functions within the metro structure.
- Corridor vision should encompass the transportation route and the surrounding areas.
- Align the transportation design with the desired corridor development character.
- Corridor design should balance the needs of the regional transportation and local placemaking.

After all four panelists had given their presentations, the floor was opened for questions from the audience. During this session, panelists addressed questions on topics including the following:

- In matching benefits to costs (Ken Kriz presentation), how to define benefits
- The appropriate use of GARVEE bonds
- The affect of the design-build approach on public involvement efforts
- Project impacts on financial ratings of units of government
The remainder of this session was for the audience members to ask questions:

**Question:** (for economic impact) Your last slides have some percentages in terms of roughly 60% return right adjacent to the corridor. Is that the amount of revenue the transit system will recapture from the increased tax base of development above those that subsidize and continue to pay for that transit?

**Answer:** (Professor Kriz) First of all, the number (of 60%) is only a hypothetical number. But the important part is trying to assess what the impact is going to be. How the benefits are realized are: through direct use of benefits; through people having reduced travel time; reduced stress; new development; and better development patterns; There are also benefits that accrue to jurisdictions as a whole through better land use, better planning, and through increased employment growth in the region. That radiates outward and was in the larger circle. You should realize that there’s a benefit gradient that emits outward. In Maple Grove, we do realize there’s small benefit from the Hiawatha Light Rail project. We should have participated at least a little bit in building the system now. Maybe we shouldn’t have to pay for the operating cost. But certainly we should be expected to bear some of the burden for the capital cost of having that type of infrastructure improvement in place.

**Question:** (for economic impact) You have a couple of examples in innovative financing of the use of GARVEE bonds to pay for highway improvements. My impression about the GARVEE bonds is that a lot of states pursue GARVEE bond financing highway not just to advance construction but also to avoid raising the money they need to raise. And ultimately the debt service will be paid back from funds that may have otherwise gone to maintenance of the state highway system. Are you trying to address that as well?
Answer: (Professor Kriz) GARVEE bond is a type of financing that has been extended in transit. It essentially takes existing cash flow as streams of federal grants. You issue bonds based on your future cash flows. Kind of similar to what you do in the mortgage of your house. You’re borrowing based upon the cost right now. Now GARVEE bonds have been pitched by the FTA, and by a lot of places as a way to not only save yourself money in terms of construction cost, but also as access to get something financed that otherwise you couldn’t do through pay-as-you-go financing. What you have to realize is that anything you borrow now has to be paid in the future, unfortunately; otherwise it’s called a grant. So you borrow upon your future stream of federal grant cash flow. You no longer have that amount of money in the future to do other things. This is where I talked about having to take account of not only operating cost implications but also future interest payments. In a lot of areas, people do it to get around having it paid for by themselves. In that case the citizens have to understand that. This gets back to my notion of simple and easily understood stream of costs.

Question: (Design - build) If you’re working on citizen participation kind of activities, I wonder if you could talk a little bit about the pros and cons of design-build, and how you can reconcile the process: if the devil is in the details and we take that discussion out because of a design-build approach for financial reasons. Do we also take out citizen participation?

Answer: (Ms. Krinke) One way to not get around to the mandated citizen participation requirement but to get citizen participation when you’re looking at design and build prospect—which moves very quickly and does not leave a lot of time for all of the debates and focus group that are part of a good citizen participation process—is to let them generate the motivation for the project, and let the project be born out of the citizen interest either through a regional plan or some sort of larger planning process.

Professor Ken Kriz: I realize that if you change things under design and build, you have to pay a premium, so there might be a trade off in that sense. But at certain points, I would like to see the citizen participation move out from the process, so that we start more with the overall regional plan, and have more idea of what we want to accomplish before we start debating about alignments.

An audience member then added: But the details are really detail. It is the PE (engineering) level detail not the land use and planning detail. The stuff you don’t know about gets into the real process of design. One of the discussions we have is they want to know everything up front and four or five different alternatives. So we say no we cannot do that but we will commit to you that we will have these detailed discussion.

Professor Kriz: There are trade offs. One of the reasons we want to highlight these things is that there are trade offs that have to be made. Certainly we don’t want to sacrifice citizen participation, however we have to realize that in that case there’s cost of citizen participation.

Mr. Douma: In Denver’s case, there were certain elements of designing and building the corridor that were very amenable to the design-build process. There are other elements, such as station design, if not station location, that are not so amenable to design build.
Setting a design and build contract needs to recognize which elements are appropriate and which are not.

**Question:** It sounds like good, precise, collaborative, timely designing and planning of corridors makes economic sense. There’s been a struggle to find and define and measure what that economic sense is. I want to mention a Moody’s bonding presentation I heard, when they talked about the criteria they used in rating bonds. I was really struck about how it all added up to a grade, and the type of criteria they used were things like “was there a local controversy or not,” “was there guaranteed revenue source or not,” “did it look like the project’s going to be delivered on time or not.” And the more it met the kind of characteristics, the higher bond rating it got and presumably the lower interests rate. I was wondering, on a specific instance where a good, thoughtful, timely design makes economic sense in terms of dollar saved or the general propositions of that financing scheme. And how that can change if there’s a delay.

**Answer:** (Professor Kriz) Take as example of GARVEE bonds, or GANG bonds as they are called in the transit field. They are rated in large part based upon the federal participation of the program. But usually there has to be some kind of evidence that if the federal government cuts money for the program, the state and local government have to be willing to step in and provide back up funding. You cannot show that if you have controversies every five minutes about what the Lake Street station’s going to yield, and what’s going to happen in this area. The presence of good, effective, regional and local planning is great service. Moody’s does take into account of management; they are called management factors or political factors in rating a bond. It’s very much a relevant issue.

Mr. Douma: Go back to one of the governance criteria: what level of agreement needs to be demonstrated. Assuming all the other propositions and discussions are correct, this is where putting forward a MOU and other intergovernmental agreements before going forward is in the corridor’s best interests.

**Question:** I am wondering if there’s any data that supports what the acceptance and readiness to use a new development transit system are when you have heavy or very involved citizen participation from the beginning or throughout the process as opposed to maybe not so much citizen participation. Is there data that supports that systems are used quicker when citizens along there are involved heavily as opposed to when they’re not?

**Answer:** (Ms. Krinke) I suspect that the answer is yes. There’s also the kind of conflict between what people say they will do and then what they do afterwards. Sometimes there’s a gap in between those things, so these could probably turn you wrong--no citizen participation, no interests, probably not a lot of use.

Professor Neckar: I think there’s some emerging data on the degree to which there’s business participation up front and the speed with which things happened.

**Question:** (Professor Neckar) The question relates to the way in which your project has started to expose what have perhaps been conceived as externalities by departments of transportation. I’ve been very interested in the environment particularly. To what degree
is it possible to measure the costs and benefits, and what kind of the time ingredient are we talking about that measurement. There’s also a question on the governance side of who measures and how it’s then reported in the media. Seems to me these are very thorny questions that we really need to address.

**Answer:** (Mr. Miller) One of the key things that came out of the highway 81 corridor is that the pedestrian access along the corridor for transit in general and how to get that into the equation much earlier than usually happens. So far that’s been a difficult conversation to get it started, so people see the road is not crossable now; if you make it possibly bigger and busier, it’s still not going to be crossable, how do you approach that?

Professor Neckar then commented: Thanks. I want to add one comment that one of the externalities really can add to the corridor study is related to water. This is a situation where we have 110 different water authorities. Essentially, managing individually water resources that are sustaining our growth. Its the ground water resource and most of suburban communities. It’s kind of unmeasurable resource in many ways. And I just encourage people to think about these. This is something should come on your screen at some point.

Professor Kriz: One of the things become very important is what scale of governance do we want and what is the outcomes that come out of different decisions. The Twin cities metropolitan area is very unique because of the fragmentation of decision making process. As one can see from some of the other case studies, the ability of a strong regional government ought to motivate some of these large projects. In economics, the book answer is that who says what the benefits and costs are, decides. There’s bias toward local control but there are strong externalities that go from one decision in one area to another jurisdiction and calls for greater participation by some kind of regional governance structure. Just from the economics side, you can see where there are at least benefits from having stronger regional governance.

Mr. Douma: As for the questions of who measure the benefits, it probably should not be the transportation agency or someone with a vested interest. A regional government might demonstrate some level of independence. Moody’s might demonstrate an even greater level of independence and I think you need to get the market place as measuring point.

One audience member commented: It’s just an observation from having been involved for a few years. First somebody has to be accountable. The trouble with accountability system is that, the greater the consequences of the accountability, the fewer volunteers you have.
Lunch Presentation

Minnesota State Senator Satveer Chaudhary

In 2000, Senator Chaudhary became the first Asian Indian senator in American history. Senator Chaudhary serves on a number of committees, including the Transportation Committee, of which he is vice-chair.

Lunch Presentation – by Minnesota Senator Satveer Chaudhary

Senator Chaudhary discussed his disappointment with the 2002 legislative session, in that he felt that important transportation issues and needs were not addressed. For example, state funding for the North Star line, a proposed commuter rail line between downtown Minneapolis and St. Cloud, was not approved. Senator Chaudhary expressed frustration that this was the last year that a federal match would be available for this project, thus a great opportunity has been missed.

Senator Chaudhary stated that the Senate had put forward a comprehensive transportation bill that would have included a significant transit component and would have been funded, in part, by an increased state gasoline tax. However, this bill was rejected in the House of Representatives. Senator Chaudhary stated that discussions regarding transit at the state legislature are framed within the context of the Hiawatha LRT line. This complicates moving ahead with non-LRT initiatives.

Senator Chaudhary said that he was not hopeful regarding the prospect of transit getting adequate funding in the near future due to the current makeup of the legislature. He encouraged those in the audience to be more aggressive to get politicians to support
transportation needs of the 21st century. He listed various initiatives that he thinks need serious consideration in the future, such as a potential bus rapid transit (BRT) line between the downtowns of Minneapolis and St. Paul, and congestion road pricing.

At the conclusion of his prepared remarks, Senator Chaudhary took questions. He was asked whether the completion and operation of the Hiawatha line in 2003/04 will help with transit initiatives in the future. He responded that this depends on the success of this line. He added that the Hiawatha line was not the first choice for LRT regarding maximum ridership (the first choice had been in the I-35 W corridor south of downtown Minneapolis, but this was not implemented because of right-of-way constraints). In response to another question, Senator Chaudhary indicated that he did not feel that the increased gasoline tax will fare any better in the next legislative session, even though there will not be as much the re-election pressure then as there was during the most recent session. He said that it is the current makeup of the legislature which is the key issue, not necessarily the position in the election cycle.

Presentation from case study areas

Moderator: Professor Ken Kriz
Denver: Jerry Nery, Functional Lead Coordinator, T-REX
San Diego: Dave Schumacher, Senior Transportation Planner, M.T.D.B
Ottawa: John Bonsall, McCormick Rankin International

Presentations from case study areas captured experiences and lessons learned in planning and development of 3 transit corridors: the T-REX project in Denver, the I-15 “managed lane” in San Diego, and the busways in Ottawa, Ontario, Canada. Professor Kriz moderated the presentations, noting issues of financing and economics in urban transit corridors. In particular, he raised the question of problems in declining federal funds for new projects and constraints on state and local sources to invest large and diverse group of transportation corridor developments. Professor Kriz stated that innovative measures in financing were important for producing full value capture and enhancing performance of transportation corridor projects. As examples, he described several national and international projects that used innovative tools of financing development and maintenance.

Then Professor Kriz led discussion on economics of transportation corridor investment. He emphasized user’s convenience, direct economic advantages, external benefits and positive impact on transfer. According to Professor Kriz’s views, transportation corridor projects should be evaluated in terms of:

- Land value and employment effects
- Changes or impact on modal choice
- Spatial externalities
- Land use effects.
**T-REX (Denver)**

The Transportation Expansion Project (T-REX) serves to replace an outdated and aging transportation system with a new modern highway and light rail (LRT) corridor in the Denver, Colorado metropolitan area. Jerry Nery, the light rail engineering manager for the project, described T-REX as unique in that it provides multiple agency coordination, uses a multi-modal approach and employs the design-build construction concept.

Aiming at minimization of inconvenience to the public, T-REX integrated highway infrastructure with safety and operational improvements and expansion of existing light rail. Mr. Nery provided visual examples of how T-REX will address growing congestion, scarce land resources, and increasing concerns about the impact of current transportation on the environment.

![Typical Light Rail on I-225 median on Denver T-REX project](image)

Mr. Nery also discussed Regional Transportation District’s (RTD) proposal to finance a Rapid Transit Network (RTN) in Denver called *FasTracks*. According to his presentation, Colorado is proposing to increase its sales tax 0.4% in the RTD area to cover costs associated with completing a network of transit corridors, HOV parking, SOV and HOV lanes on highways. Because of the increase in revenue the tax would yield, Mr. Nery stated that *FasTracks* would achieve buildout in ten years.

**I-15 Managed Lane (San Diego)**

Dave Schumacher, a Senior Transportation Planner with the Metropolitan Transit Development Board (MTDB) in San Diego, discussed California’s perspectives and experience in transit corridor development. He focused on the I-15 Corridor, characterized by suburban land use patterns with long travel distances. Under pressure of existing congestion and need for transit alternatives, California’s local officials were able to exploit the excess capacity on these lanes and address the perception that the HOV lane on I-15 was underutilized by creating the FasTrak program, which implemented a
variable toll for SOV use and using the revenue to add Bus Rapid Transit (BRT) into service on the corridor. The FasTrak program will be incorporated into the proposed twenty mile Managed Lanes/Bus Rapid Transit project now in preliminary engineering. This project will include the construction of direct access ramps to the BRT stations, which will be open to transit vehicles, carpools and FasTrak users. Several pictures from I-15 sites demonstrated innovative solutions elaborated by the project engineers.

Mr. Schumacher pointed out that community involvement played a central role in the success of I-15 corridor development. Focus groups, intercept surveys, stakeholder interviews, telephone surveys allowed building strong support for managed lanes concept and discovering common attitudes among all user groups in many issues, including equity. Qualitative and quantitative research tools also helped to design services (walkability in communities, safe stations, comfortable seating, Internet plug-ins in buses) that will attract a broader group of riders in corridor’s transit.

Distinctive design, color, and graphics will provide a unique identity for Transit First in San Diego

Mr. Schumacher also discussed MTDB’s Transit First Strategy, which outlines a 20-year strategy for the further development of transit in the San Diego region. The strategy is based on extensive market research that gained a better understanding of the attributes transit will need to embrace if it is to be an attractive alternative to those currently not using transit. Some of these attributes were expected (e.g. need for flexibility and speed, and the need for personal safety), while other offered new insights (e.g. the quality of the walking environment, and interior design of a transit vehicle). Six different market segments were identified, each of which has different travel needs. According to Mr. Schumacher, Transit First Strategy included four elements:

- Community Design
- Traffic Management
- Customer Experience
- Funding
Along with political and public support, increased regional collaboration was an important ingredient in gaining support for adoption of the Transit First strategy. Implementation of Transit First will be an ambitious undertaking, one that will depend on continued agency coordination and a regional commitment to increased funding for transit.

**Busways/BRT (Ottawa)**
Mr. John Bonsall, a representative of McCormick Rankin International and former head of OC Transpo, Ottawa’s transit provider, spoke about Ottawa busway history. Since the 1970s, Ottawa has expanded its busway system to accommodate growing demand for transportation. The planning process for the system involved determining a feasible and environmentally sustainable network that supported land use intensification. Along with that, Ottawa implemented the necessary supportive policies through regional coordination.

BRT was selected as the rapid transit technology for the city based on cost comparison, which revealed lower cost of capital and operations for BRT instead of LRT. The Ottawa BRT proposed a range of solutions to suit different needs and facilities. Well-designed bus stops and use of ITS technologies served to make BRT service successful and popular among all population groups. The system currently has 200,000 boardings each day, and as many as 10,000 passengers per hour per direction. Though the total cost of developing BRT was $420 million, it was cheaper to invest this amount of money than doing nothing in the city’s current growth patterns.

**Ottawa BRT – Integrated stations**
Mr. Bonsall emphasized that the successful practice of Ottawa was transferable to other cities. As an example, he described Brisbane, Australia’s project that added BRT to a system that already includes commuter rail, regular route bus networks and ferry service. Built on the Ottawa experience, Brisbane’s BRT transportation network integrates and
complements the existing rail network. The Brisbane BRT also included ITS technology. Ridership grew 50% in the first year.

Mr. Bonsall concluded that:

- Ottawa’s experience was transferable
- Investment into busway development could increase transit mode shares
- BRT was cost effective for low density areas
- Busway and rail systems can be integrated to operate within one multi-modal rapid transit system.

**Structured Interview and Discussion**

**Question:** What are the most important things we have to consider in building transportation corridors in Twin Cities?

**Answer:** (John Bonsall) I think that there must be a common perception, particularly among political leaders, regarding transportation priorities. It happened in Ottawa and Brisbane. In these projects, resistance and a desire for alternatives to freeway transportation issues existed on the political level. There were people who showed leadership in solving the issues.

Dave Schumacher: I agree with John. I would add that multiagency cooperation is an asset in San Diego. Presentation of a united front (regional authorities, transit and highway agencies) on corridor development made the public excited about the I-15 project.

Jerry Nery: I have to agree with John and Dave. In Denver, we have to build political consensus, to meet continued demand for transportation solutions.

**Question:** What are project’s relationships with state government in respect to funding? To what degree has the levy of sales tax in region or county made your project autonomous in decision-making?

**Answer:** (Dave Schumacher) Unfortunately, I may not be the best person to answer this question. We receive revenue from a half-cent sales tax. This gives flexibility to match outside funding sources and to take certain measures in corridor development. Down the road, we will need support from local government if we continue pursuing transit-oriented goals. At the present time, we do not have sufficient funding for the I-15 corridor and have used every opportunity (for example, bonds) to get money for it. We have specialists who deal with grant issues as well.

**Question:** What part of the project did not work and can be avoided, if we implement similar corridor projects?

**Answer:** (Dave Schumacher) Flexibility and ability to adapt is required in corridor building because of constantly changing conditions. If I look back to original scope of
the I-15 Project, I would say that it differs from that of the ongoing project. It is important to realize that corridor process is evolutionary. Learning best practices helps significantly in corridor building issues. Plagiarism is a wonderful thing in our industry.

Jerry Nery: I would like to add that Minneapolis has the situation similar to Denver’s before building transportation corridors. Success of the local LRT project is important in gaining sufficient level of support for future projects in Twin Cities. If people see wide use of transit in corridors, they will vote for it.

John Bonsall: When we selected BRT as primary transit service, we were very cost-conscious and used a utilitarian approach in design. This approach was not accepted by authorities. We went back to change our design plans. Proper design that conforms to primary quality standards was important in gaining support of policymakers in BRT implementation.

**Question:** What would be your recommendation on the political leadership side in implementing or extending your projects in current economic climate? Would there be adjustments?

Answer: (Jerry Nery) In Denver, transportation projects have created several thousand jobs and contributed to economic development. Over the next ten years, we are expecting to create ten thousand jobs and hope that it will stimulate the economy. Based on project results, voters will make decisions regarding prospective transportation plans.

Dave Schumacher: I might say that there is no need to sacrifice the long-term vision to solve short-term problems. Our budget is $17 million dollars. Next year we are going to cut services and raise fares. Despite the fact that economy goes up and down, we have to pursue our ultimate goals. You have to continue planning the project even though it may take longer to complete.

**Question:** We have seen that not many multi-modal projects gained support. It seems that I-15 Corridor was self-selected. Regarding Denver’s project, there must have been some other options. Here we struggle with deciding which transportation project has a priority. What were selection criteria in your state? Were there any competing projects?

Answer: (Jerry Nery) Many matters depend on policy agendas of elected officials. Eight years ago, we planned the T-REX corridor project. Private support existed to build transit in the corridor, but the project implementation required federal subsidies, which require an EIS. This delayed implementation of the original T-REX project. In the meantime, we went ahead and started to build the Southwestern corridor, a nine-mile extension of our central corridor. This proved to be successful—ridership increased from 24,000 to 36,000 in three years. It helped us to go forward with T-REX project, including highway widening.

John Bonsall: We implemented a busway system because in fact we did not have to invest in improving the infrastructure in all parts of the region at the same time. While we had some priorities, they were short-term. A two or three-year period, or even a ten
year period, was not a long time of waiting for something in some areas. We used this
criterion (the ability to incrementally implement) to select technologies. We have been
able to prove that BRT was a better and faster way to provide effective use of land and
existing infrastructures.

Dave Schumacher: The I-15 Corridor project was self-selected and politically powerful.
In terms of showcase projects, we have five corridors for implementation. We do not
know which projects will be realized. We will work on environmental and engineering
issues in the next fiscal year. We will see where the chips fall. I think that ideas need to
be flexible and open because things change. Projects need to have support from
community groups and political leaders. One Congressman is helping us obtain $10
million and would like us to spend it in one the corridor projects.

**Question**: In St. Paul, we have been implementing corridor transit projects with use
of regular surface vehicles. We have thought about improvement of infrastructure.
**From your project’s experience, do separated, higher speed and exclusive lanes
help? Do these lanes provide significant improvements?**

Answer: (John Bonsall) Yes, presence in the streets, frequency of services, and good
infrastructure are important factors. In delivering something different from long-distance
rapid transit, you have to emulate strong presence in the streets. In Brisbane, there was
very little speed improvement in the previous express services, but presence in streets and
people’s awareness about the soon arrival of the bus enhanced the level of reliability. If
you can emulate that service level, you should be able to improve transit through
implementation of exclusive lanes. You have to also think about use of signal priority
lanes and high-capacity buses.

Dave Schumacher: You can look at good case studies from MetroRapid and Wilshire
Boulevard Corridor projects. Buses run every two-three minutes in peak hours. By
implementing signal priority lanes, they have worked toward an ultimate vision that
incorporates the attributes of infrastructure improvement on a short-term basis. These
corridors are hugely successful. People perceived the slight changes in attributes as
major improvements in bus service. This provided political and public support, which
lead to real plans in transferring this experience to 26 other bus lines. These projects
have websites where you can get reports about results of their work.

**Question**: We have faced opposition to bus service because of emission and noise
issues. How have you dealt with these issues?

Answer: (John Bonsall) Back in the 1970s, we explained that if we achieve our
objectives, we would reduce emissions significantly. In any event, the corridor’s transit
vehicles generate a very small portion of emission of harmful substances compared to
volume of emission from car use.

Dave Schumacher: California has very strict requirements to diesel fuel though it has
become cleaner over last years. Issues of increasing use of hybrid and CNG-powered
buses need to be addressed in California. However, it does take time to deploy emerging
pollution reduction technologies.
Jerry Nery: In Denver, we have 16 street shuttles and a fleet of 30 vehicles serving 40,000 – 50,000 riders daily. These vehicles operate on hybrid engines generating electric power (60-70 horse power). There are no harmful emissions or engine noise.

**Question:** What suggestions would you make on selecting equipment to fit tight urban architecture?

**Answer:** (Dave Schumacher) As you have seen in pictures from my presentation, we match vehicle size with type of service and specifics of area. We will also deploy a magnetic guidance system that will help the large vehicles into narrow streets. This system also helps us conform to ADA standards.

**Question:** What are operational changes in winter conditions?

**Answer:** (John Bonsall) Taking into consideration the severe winter weather in Ottawa, we designed the busway to suit the climate. We built drainage systems, for example.

**Question:** Have you observed any decline in automobile use by households after implementing these projects? Have you studied the economic impact of transit corridors on neighborhoods?

**Answer:** (Dave Schumacher) TOD does not aim at elimination of car use in neighborhoods. We have not considered the sharp decline in use of personal cars as the ultimate goal in our I-15 project. TOD’s vision is to reduce incentives to get a second or third car and encourage wider use of transit.

John Bonsall: In Ottawa, we do not have real numbers on impact. However, if you look at average income level and car ownership in Ottawa, these numbers are typically smaller than in other parts of Canada and the US.

Jerry Nery: In Denver, we measure VMT (vehicle miles traveled), which is always increasing. Households are changing; two people are working and doing other chores besides commuting from home to work. As Dave said, TOD serves to cut VMT and create accessible and proximate home and work places.

**Reaction panel**

- Sandra Vargas, Hennepin County Administrator
- Mark Stenglein, Hennepin County Commissioner

Frank Douma, Research Fellow in the State and Local Policy Program, and moderator of this panel started the session by introducing Hennepin County Commissioner Mark Stenglein and Hennepin County Administrator Sandra Vargas.

Starting from a background introduction of the district he represented, which is heavily dependent upon on public service, Commissioner Mark Stenglein commented that the
county has long been involved in transit and is a natural body of government to be involved in public transit. With 45 cities in Hennepin County, they need to get together, and it is important to think broad and big.

Commissioner Stenglein also commented that now we came to transit needs. He firmly believes in fixed guideway transit. He mentioned the efforts of the North Star corridor advocates to bring commuter rail from St. Cloud to Minneapolis and commented that the effort was a fight against the legislature. When people argued that commuter rail was too expensive, they neglected the big picture of commuter rail connecting our region together, and did not see the reality that when you have commuter rail transit interconnecting with LRT to the airport, it effectively brings the ticketing counter of the airport to St. Cloud.

He continued that despite the visions of commuter rail, despite the fact that we have money, it is still not an easy thing to go through and promote transit. The county needs help to get there. However, Hennepin County is committed to doing these things and with talented people it is working on that. It is an exciting time to see some visions are materialized.

Starting with a comment on the discussion about the difficulties in bringing light rail to Minnesota, Ms. Sandra Vargas talked about the debates on the different kinds of vision for community among Hennepin County Commissioners. She emphasized that vision and leadership were two components that she heard distinctly from the conference presenters, which are really important to the quality of life for then community.

Then Ms. Vargas commented on how the professional staff reacts to the vision. There are gaps in understanding of vision between top staff and the support staff. In large organizations, not everybody knows the purpose of corridor projects, and that needs to be
understood. Everyone throughout the organization, not just the top staff, should be
focused on a clear vision they work on.

Additionally, the staff has the responsibility of developing the right relationships with
other jurisdictions. There ought to be a seamless relationship between the city of
Minneapolis and Hennepin County. If we don’t have the relationship in place at the time
that the vision comes forward, it will be much harder to execute.

She continued that the public is less concerned about who provides the service, but rather
that the service works. Consequently, a seamless system of transportation is needed, with
options to go along with that. Then Ms. Vargas raised a question on the current
conditions here: “There is a fair amount of pain in traffic congestion, but is the pain level
high enough for transit to become another option?” This is critical regarding how we
frame the issue; how we think about the problem, especially with the deadlock we
currently have among the policy makers at the state. Social service providers need to
move the low-income people to where the jobs are generated out in the suburbs. She
thinks the suburbs have recognized the economic value of moving work force out to
them, so tangible benefits with a sense of urgency has to be the way to go.

In conclusion, Ms. Vargas commented that if we put the right kind of vision and
leadership in place and work with the community, we’ll be right on track.

The remainder of this session was for questions. Lee Munnich, Director of the State and
Local Policy Program, reacted first with a comment that maybe part of the solution is for
political leaders to stand up and take the responsibility. He stated that transportation
decisions are a lot harder than worrying about the fallout from a particular vote. It calls
for a lot of groundwork.

Commissioner Stenglein agreed that comments and raised the example of the Humboldt
Greenway redevelopment project where the Hennepin County Board went through the
legislature to get permission to go beyond the scope along the designated areas.
Commissioner Stenglein also raised the example of Lowry Avenue where he is working
to turn it into a place of higher density--good homes where middle income and low-
income people are able to live in the same neighborhood. These are very challenging
efforts but the ultimate realization of its completion will be exciting.

One panelist commented that the large number of government units we have here are still
an issue. He suggested that county regional rail authorities and the Met Council as
potential solutions but thought the promise of regionalism in Met Council is not
necessarily being realized anymore. We have overlapping membership in Met Council,
we’ve lost some metropolitan perspectives. It is also a concern in Hennepin County,
which has one fourth of the state’s population.

Commissioner Stenglein responded that he doubted LRT would have become a reality
without the efforts of Hennepin County’s regional rail authority. As for what happened
to the Met Council and where we can go as a county or as a group of counties,
Commissioner Stenglein thinks it is going to be the counties binding together with a joint
powers agreement.
Ms. Vargas also made comments on regionalism. When one thinks of the fragmentation of our system, it is almost impossible to get anything done. That is why the political leadership has to be there. Leaders have to take stands and make hard decisions even in the face of public opposition. There have to be longer term thinkers and committed people to these communities through a regional strategy. Each group doing their own thing will sub-optimize the whole system.

Another panelist, noting San Diego’s case about how the design of transit should be marked driven, commented that we really have to deliver what people want. If we are able to do that, there would be enough people to push the politicians so that the local politicians would have to follow behind the leadership by the Counties. He then raised a concern on the success of the Hiawatha Corridor. People want to see development along the corridor. There are real opportunities to do development there, but there don’t seem to be the resources, yet the line has to succeed to get better transit financing from state capital.

He then defined resources as public space around the station, reconfiguring a street, finding money to relocate inappropriate land use next to the station, building higher density, housing. However, he felt that there was not enough money in the foreseeable future to address these needs and that there was no priority in Minnesota for the allocation of tax credits and other financing based on the proximity to transit system. He thought that some of the other infrastructure in other areas of community development area is not in place.

Ms. Vargas reacted to this comment by saying that Hennepin County’s strategy of integrating transit, affordable housing and community work, is an example of thinking about the vision in a holistic way. The money piece is very hard. Hennepin County has an affordable housing plan that is looking at transit as one of the issues, and it is working with the United Way in the Family Housing Fund, so all the things are coming together. There’s not a lot of money, but there is some, and the commissioners are committed along with the staff to figuring out how to get where we need to go.

Commissioner Stenglein then added some comments that once LRT is put into use, the biggest challenge is not to gentrify that area, but rather keep it affordable and improve the setting for those people that already live in that area.
APPENDIX H: Proceedings from December 11, 2002 “Findings”
Roundtable

Introduction

On December 11, 2002, the State and Local Policy Program of the University of Minnesota’s Humphrey Institute of Public Affairs (SLPP) hosted a roundtable discussion at the Holiday Inn Metrodome Minneapolis. The purpose of the roundtable was to present findings from the urban transportation corridor development study, to propose draft recommendations for applying the lessons learned to local corridors, and to collect feedback on the findings and recommendations. The event was organized as a roundtable to provide a forum in which representatives from government agencies, non-profits and businesses could share and reflect on the research teams findings, while also discussing their potential to be applied on a local scale.

The half-day event began with a keynote address from Michael Setzer, the General Manager of Metro Transit. This was followed by a presentation of the lessons learned by the research team by Tom Horan of the Claremont Graduate School. Frank Douma and Wenling Chen then presented on how the findings of the study relate to three local corridors in the Twin Cities.

A reaction panel: Susan Haigh, Ramsey County Commissioner; Mary Smith, Board Member, Metropolitan Council; former Senator Carol Flynn. The panel was moderated by Ann Forsyth, Director of the Design Center for the American Urban Landscape, and was designed to offer a unique dialogue of pertinent issues related to corridor planning in the Twin Cities. The day was concluded with a wrap-up of the day’s primary discussion points by Gary Erickson, Assistant County Administrator, Hennepin County.

Keynote: Mike Setzer (General Manager, Metro Transit)

The State of Transit:

Setzer is continuously struck and pleased by what a good job Metro Transit does. It does not have the labor/management problems and bureaucratic inefficiencies/problems that other major systems have. It has more support from the business community and elected officials than other major cities.

Setzer follows up on a Ted Mondale comment, “Transit is not a transfer payment; it is an economic investment.” The point here is that 80 percent of trips on transit in the Twin Cities are work trips. Moreover, two-thirds of those people going to work have cars which they COULD use, but don't, so transit allows people to get to work in ways which do not pollute and do not add to congestion, etc.

Commuters want faster trip times. This is something which Metro Transit has to address. They are doing this with a number of approaches. In the fall of 2003 Metro Transit will have Smart Card Fare payment. This is where you don't have to stop and put money in a fair box, but simply wave your card past an electronic reading element. This will speed
Metro Transit currently uses a system on some routes that enables riders to pay their fare at the end of the ride rather than at the beginning. This also helps speed up boardings and routes.

Metro Transit is able to use many miles of bus-only freeway shoulder lanes. Metro Transit and Mn/DOT have coordinated to establish 200 miles of these lanes during peak times in the Twin Cities--this is far more than any other metro area in the US. This provides an exclusive transit way without large capital investment. Speed limit is 35 MPH, but when everyone else is going 5 MPH, it is pretty good.

Two High Occupancy Vehicle (HOV) lanes (I-394 and I-35W). A limiting factor for ridership in I-394 busses is not the system/service itself, but lack of park-and-ride capacity, he feels.

Metro Transit uses bus-only lanes downtown--this is a very extensive system, relative to most US cities.

**Current Projects**

LRT is on time and on budget. It is currently 2/3 finished. The consultants estimate 20,000 to 25,000 riders per weekday (average) on LRT--he thinks there is a good chance it will be higher than this.

Metro Transit is in the preliminary planning phases of a bus rapid transit (BRT) system on 81 from Minneapolis to Rogers. For this project they are looking at dedicated bus lanes, queue-jumping measures, signal prioritization, and off-bus fare collection.

Metro Transit is putting together a GPS tracking system which will help manage the fleet with real time information regarding things such as accidents, congestion, etc. The information gained from this system will help them optimize route schedules.

Metro Transit is in the middle of a major Bus Service Re-Design project. A part of the effort here is to make the system more efficient for all users. For example, they are looking at decreasing the number of stops on certain lines. This may make getting to a bus stop somewhat more inconvenient for some riders, but will allow average speeds to increase significantly for all riders. Also they are looking at reducing some of the branching (service will become more "corridor-like"). Branching is high access but also slows down service quite a bit. They have completed and implemented the Re-Design work in Sectors I and II (northeast quadrant of metro radiating out from downtown St. Paul), and ridership has increased significantly since those measures were implemented.

Partnerships are key to successful transit. Examples are Metro-Pass (employers contribute to discount on monthly bus passes--Metro Transit got 4.5 million rides from Metro-Pass last year), "Transit Works", and "U-Passes" (30 percent of U of M students buy and use U-Passes).
Metro Transit has developed strong business partnerships with groups such as the Downtown Council. Metro Transit has also developed strong ties with different levels of government, such as Hennepin County (LRT) and Northwest Corridor Partnership.

**Finance**
Setzer discussed funding. He said that the funding for Metro Transit services is approximately: 1/3 farebox; 1/3 MVET (Motor Vehicle Excise Tax); 1/3 general state revenues/funding. Setzer understands that transit will have to be part of the solution to the existing huge deficit--funding for transit will be cut. However, he thinks it is shortsighted to fund only according to the business cycle or temporary state budget situation.

Setzer said that Metro Transit views their service as a "retail business"--they have to continue to try to acquire and maintain advantages over "the competition" (such as SOVs).

**Findings and Recommendations of the Research Team:**

*Tom Horan, Claremont Graduate School*
*Frank Douma, State and Local Policy Program*
*Wenling Chen, State and Local Policy Program*

Tom Horan gave an overview of the major findings and recommendations of the study (which is detailed in the executive summary). They are:

1. Get to know for whom you are planning, and meet them on their terms.
2. Tailor the five components to meet local conditions.
3. Recognize priorities can change as scale changes
4. Have a champion
5. Do not let present economic conditions affect a future vision.
6. Do not let a technology or a design drive the planning process.
7. Connect with regional transportation planning and funding process
8. Do not be afraid to amend local zoning if necessary.

Included in the presentation of Point 5 was a proposal for a small sales tax to provide a dedicated source of transit funding. This was received with an unexpectedly high amount of support within the room. Other discussions centered on Point 6, in that some attendees were in favor of letting design/technology lead the planning process. The research team responded to this comment by pointing out the scenario that developed in San Diego. San Diego has a predominantly LRT based transit system, but rather than assume that LRT would be the best solution to the I-15 problem, planners took a step back and came up with an innovative solution that saved them millions.

This was followed by a presentation by Frank Douma and Wenling Chen on how the findings and recommendations could be applied to three corridors within the Twin Cities Region. The three corridors were: Cedar Avenue, Lowry Avenue and the Southwest Corridor. (A detailed description of each corridor was handed out at the conference.)
Panel Discussion

Moderator: Ann Forsyth, Director, Design Center for the American Urban Landscape, Department of Landscape and Architecture, University of Minnesota
Susan Haigh, Ramsey County Commissioner
Mary Smith, Board Member, Metropolitan Council
Carol Flynn, Former State Senator

Carol Flynn started off the discussion by making the following points about each corridor:

- The southwest corridor has several advantages, including the ability to establish a reverse commute. Businesses have already come forward in support of the idea.
- Cedar Avenue should consider adding a Hot Lane (Value Pricing) proposal. It would raise money, and encourage transit and carpooling. BRT can be used in conjunction with it, and it wouldn’t create a Lexus Lane. Ordinary people could save time and therefore money. An example included the saving of time when picking up the kids from daycare.
- Lowry Avenue could really make a difference when it is combined with the redevelopment of area, including the Holman project.
- None of these projects will happen without financing. 2/3 of the operating budget for transit is in jeopardy.
- When rural people question the funding of empty buses, ask how many cars go by their farms.

Susan Haigh started off by asking the audience: “How many people have contacted their legislator in support of transit financing?” A few raised their hands. “If they don’t hear, it’s not important.” She then detailed the Minnesota Ride’s proposal.

Minnesota Ride’s: Four Components:

1. One-half cent sales tax on metro
2. Six cent gas tax
3. New license tab schedule
4. Transit and road referendum

Other major points made by Haigh:

- There needs to be a balance between transit and roads…because we need both.
- Working with the Central/University Avenue project has reinforced the complexities of corridor development.
- We need business coalitions for all corridors because 80% of the users need them to get to work.
- There is no good economic time [for transit investment]. Just because we are faced with short term problems can not override our need for investment
• Our greatest challenge is trying to develop a regional need, while also balancing that need with the local needs. Example: more stops locally, means poor service regionally.

Mary Smith initiated her remarks by saying that this might be the first all female panel she has ever seen.

• We need to move away from the hub and spoke system of transportation/transit planning because people are not moving that way. We need east west, and north south movement in all of our suburbs. We need flexibility.

Ann Forsythe began her remarks by speaking to the conceptual differences corridors have.

• Corridor can be thick or thin. Referring to the economic effects of a corridor that can extend very far from the corridor in some places, and not very far in others.

She then commented on the different concepts transit creates.

• LRT is fixed—because people see tracks and think they are permanent and then make decisions to locate based upon these perception. In reality transit is changing all the time.
• Buses are less certain. People perceive them as less concrete.

Q & A:

**Question:** We have so many corridors but very limited resources. How do we make a choice, and what organizational structure do we need, particularly for high capital costs like LRT?

Susan Haigh: LRT is not the answer for every corridor. There are only some instances in which LRT will be the right investment. It depends on density, and number people we can move and the type of private investment that follows the fixed capital investment. We need to look at the investments that follow these transit corridors.

Mary Smith: There is a difference between long term and short term goals. LRT may be acceptable depending upon how we develop in the future.

Carol Flynn: You can’t get very far with a legislature that is in opposition to all transit.

Alan Lovejoy: Within corridors there are different needs. You need different supportive transit services within each corridor. However, the legislature often looks at them with a broad brush. It’s not one size fits all.
Linda Koblich: Have just come from Salt Lake City. One of the lessons learned there was that people need to be able to bring bikes on the LRT. Also security is a big issue at station location.

Response: LRT will incorporate bikes users. We have also given special attention to station design and issues of security.

Tom Horan: A previous study stated that residences located along a greenway are the market equivalent of having an extra bedroom so there are positive externalities to be located along a corridor.

Susan Haigh: Improving relative values isn’t always a good thing in the eyes of everyone. Renters may think that a redevelopment project is going to price them out of their home. More research is needed as to whom these projects displace.

Comment: I found it interesting that the Met Council selected the Southwest Corridor. It has already gone through an extensive study in the early ‘80’s. I hope this study was created in conjunction with the previous ones.

Gary Erickson: Yes, the current study builds on the original study. There are a few changes, but we are using the same consultant.

Mary Smith: There is an editorial on the Southwest Corridor this morning. 71% of the people support LRT.

Mary Smith: Our transit system has a high fair recovery rate. This may not continue in the future with the use of LRT, and could become a major problem.

Susan Haigh: Referendums may be a vehicle for people to have input into the major investments. When people realize that there is a local benefit, they vote “yes” to referendums.

Comment: Infrastructure design and investment can be social engineering. How does this enter into play?

Mary Smith: Not a big a problem in this location. Isn’t only giving one option as to how to get to work also social engineering? Giving people choice is good.

Susan Haigh: People are right to challenge whether or not our investments are cost effective-they need to be.

Tom Horan: One of the interesting things about corridors is that they cut across many different corridors. It raises the issue; the people in wealthy communities need to realize that things that happen down the street are affecting them.

Comment: If in the end we build a system in which there is only one bus system coming into north Minneapolis we will have a problem. Each corridor needs to be given the same treatment and the same level of service.
Comment: Referendums are the only way our elected officials can avoid their responsibilities. When we talk about a seven county sales tax are we not raising broader problems? Shouldn’t we be looking a statewide sales tax?

Susan Haigh: The amount of revenue from metro wide tax would be adequate to cover investments; we were not representing rural Minnesota, we didn’t want to speak for them.

Frank Douma: The study team looked at a metro tax because we recognize that people will only vote for something they see a local benefit from.

Comment: Political competition, does it make sense for transit supporter to caucus before we got to the legislature? Or is the discussion good?

Susan Haigh: We need to keep coalitions together and support regional solutions to our problems. People in Washington don’t want to work out our problems. We need to go to them unified to gain funds.

Wrap Up: Gary J. Erickson, Assistant County Administrator, Hennepin County

Development of Infrastructure Investment:

- We need to learn more about what infrastructure can do to spur development.
- This is more than a transportation issue; it is an economic development issue.

Financing:

- Association of Minnesota Counties is proposing a 5-cent gas tax

Regional Vision:

- We need to get away from a hub and spoke system and utilize the reverse commute.
- How to get suburbs to support long term financing? We need to show them how they could use and benefit from it.

Match Mode to the Market:

- We need to have a priority mode, but alternative modes need to be considered throughout the process. Decisions are forever, things can change.
- The First true BRT line in Minnesota needs to be unique. If it looks, smells and feels like a bus we have a problem.
- However, we need to balance how much we try to make BRT look like a train. The closer it looks, the closer the price is to LRT.
General Comments:

- New legislators need to be educated on what’s important.
- Transit needs to be for everyone. 80% are work trips. Transit needs to be a fundamental part of this region.