Light Rail Transit Construction Impact Mitigation Strategies:

Case Studies and Recommendations for the Central Corridor

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NOTE:
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INTRODUCTION

The proposed Central Corridor Light Rail Transit (LRT) line stretching from downtown Minneapolis to downtown Saint Paul has the potential to revitalize the neighborhoods it passes through. Projected to carry nearly 43,270 passengers daily by the year 2030, the line is an opportunity for significant investment in the local economy through transportation infrastructure improvements. When completed, the increased mobility and accessibility along the corridor will provide opportunities for increased economic activity and provide existing businesses with the ability to reach new markets.

Many of the business owners along the corridor, however, are concerned about the negative impacts the construction process may bring. The proposed transit line is scheduled to begin a three year construction phase in 2010. Construction of light rail, like any large construction process, can significantly disrupt the normal business operations along a corridor. Potential impacts include the interruption of electricity and utility services, removal of sidewalks and pedestrian access points, and a diversion of automobile traffic or lane configurations. In addition, the mere presence of construction activities can often be a significant psychological barrier for customers, whether or not there is actual decrease in physical access.

Businesses of various types and sizes are located along the Central Corridor and several business districts have emerged, each with a unique mixture of retail, service, industrial, and other types of businesses. In Minneapolis, for example, the proposed alignment along Washington Avenue will pass through the Stadium Village neighborhood, a lively neighborhood catering to students at the nearby University of Minnesota. The area is home to restaurants, clothing shops, taverns, and other convenience retail stores that depend on pedestrian access for much of their business.

In Saint Paul, the proposed alignment passes through a wide variety of business districts. Towards the western end of University Avenue, many of the nearby light industrial businesses depend on large trucks to send and receive products. Several large shopping centers with both small businesses and big-box retailers are situated along the corridor. Stores such as Target, Wal-Mart, Office Max, Cub Foods, and Rainbow Foods depend mostly on accessibility via automobile with some accessibility from local bus service. Traffic diversion during construction, both intentional and unplanned, is likely to present a major hardship to these businesses.

There are many small businesses located immediately adjacent to University Avenue in Saint Paul that will be particularly vulnerable to disruptions caused by the construction process. Many of the businesses along the corridor cater specifically to the needs of immigrants and those with culturally diverse backgrounds. In many cases, these small businesses are owned by members of the community without formal training in business management and without large

capital budgets to absorb the impact of a construction season. Many of the businesses depend almost entirely on convenient storefront accessibility to draw customers.

The purpose of this report is to provide case studies from other light rail construction projects that may provide insight into the Central Corridor LRT construction process. Understanding the mitigation measures used during the construction of other recent LRT projects will provide a better understanding of the options available for use in the Twin Cities. In the next section, this report will consider the mitigation efforts utilized throughout the construction of LRT in seven cities: Portland, Seattle, Salt Lake City, Phoenix, Denver, Houston, and San Jose. For each case study, this report provides a general overview of the project characteristics and a summary of construction mitigation strategies utilized during each project. In addition, this report provides insight from project public outreach coordinators regarding the effectiveness of the mitigation strategies. The final section of this paper provides a summary and brief comparison of efforts used in the seven cities along with a set of recommendations for the Central Corridor LRT in the Twin Cities.

These seven cities were chosen because they have something in common with the Twin Cities metropolitan area. The Portland, Seattle, and Denver, and Phoenix are often considered peer cities with the Twin Cities because of their relatively similar size. Salt Lake City, Houston, and San Jose, although somewhat larger or smaller than the Twin Cities metropolitan area, were chosen because each of these systems feature a center-running alignment along an arterial street similar to that proposed for Central Corridor. For each of the case studies information is drawn from other written reports, community outreach materials, and direct communication with representatives from each transit property.

CASE STUDIES

Portland

Tri-Met began operating the Interstate MAX - Yellow Line in April 2004. The newest addition to the Portland LRT network, the Interstate line is 5.8 miles long and was constructed at a cost of $350 million. The alignment begins in downtown Portland and extends to the North with center-running alignment extending along most of Interstate Avenue. The Interstate area of Portland represents 20% of Portland's total population, but includes 65% of the African-American residents of the city. In total, 38% of the Interstate area population is represented by various minority groups, compared to 18% of the population citywide (Tri-Met 2007).

To reach out and connect with the diverse population in the area, Tri-Met sought and hired key community outreach representatives that live in or near the corridor and who represent ethnic minority groups in the area. The community outreach representatives made a special effort to interact with business owners using door-to-door canvassing and telephone call-downs in

addition to mailings and local advertisements. Tri-Met used bilingual communications to invite Latino families from schools and other organizations to meetings about the Interstate MAX project. The extra effort made by the community outreach staff led to a successful public involvement process where residents and business owners were encouraged to contribute in meaningful ways to the project. The final design includes a number of elements inspired by the public involvement process. Developing strong working relationships and trust between the outreach staff and the business organizations and area residents was a critical component of minimizing the negative construction impacts.

When construction began, 105 businesses were located along the corridor. According to Tri-Met, only 1 business failed as a direct result of construction-related disruptions, and 3 businesses relocated to another location. In addition, over 50 new businesses have been added along the corridor either during or immediately after construction (Tri-Met 2007).

Tri-Met and the Portland Development Commission teamed up with Cascadia Revolving Fund, a private non-profit community development financial institution to provide financial help to businesses affected by light rail construction. Businesses that could demonstrate construction had affected their revenues were eligible to receive low-interest loans and business consulting services. The 8-year loans offered an interest rate of 3 percent with 'interest only' payments for the first year. Loans were between $5,000 and $25,000. In addition to loans, Cascadia helped recipients to use the loans to their best advantage by offering on-going consultation on business practices such as finance, accounting, marketing, personnel and general management issues. In total, Cascadia provided over 800 hours of personalized technical assistance to 59 businesses along Interstate Avenue (Portland Development Commission 2007).

The Portland Development Commission provided a Storefront Improvement Grant program aimed to assist property and business owners in rehabilitating their storefronts. In total, 18 businesses have received Storefront Improvement grants (Portland Development Commission 2007).

Tri-Met staff used a wide range of strategies to distribute construction information to stakeholders along the corridor. Business owners were invited to attend workshops teaching business management skills and were paired with personal mentors who were skilled in giving business strategy advice to help businesses throughout the construction process. Staff attended meetings and gave presentations at a wide range of meetings including the Interstate MAX Advisory Committee, Interstate Corridor Urban Renewal Area Committee, various business associations, N/NE Portland Coalition meetings, and local neighborhood association meetings. Tri-Met Community Affairs also distributed 12 seasonal newsletters to a mailing list of 7,500 residents throughout North Portland. Tri-Met's web site included an extensive section

on Interstate MAX construction and community outreach, including an information section in Spanish (Tri-Met 2007).

Tri-Met sponsored special media and social events along the corridor to encourage people to visit the local businesses. The events received much media attention and helped draw a crowd to the construction site and the impacted businesses. Events included the Vanport Bridge dedication, the Expo Center art dedication, the First Tree Planting Ceremony, an Interstate Avenue Street Fair, an "Intersections" book dedication, and a 50% Milestone event. Similar to a strategy used in Seattle, Tri-Met sponsored a "lunch bus" program to ferry city officials and transportation workers to Interstate Avenue restaurants that were affected by the construction.

Tri-Met employed a wide range of strategies as part of the "Open for Business" program. Four community relations staff and construction supervisors had a strong commitment to initiating daily contact with each business when construction was immediately adjacent and a "no surprises" strategy provided information to business owners in advance (Tri-Met 2007).

There was also a 24 hour construction hotline with a live operator at all times. The operator had the ability to page community relations staff for after-hours issues, and over 2 dozen construction staff were available on a 24 hour basis.

Tri-Met contractors employed a construction method that aimed to minimize the amount of time the street was under construction immediately in front of businesses. Construction progressed in "reaches," each about 4 blocks long, and each phase of construction was completed in one reach before starting that phase in the next reach. In total, a period of about 8 weeks per reach was required to rebuild the outside lane and replace the sidewalks. The street and sidewalk were temporarily restored if there was ever a gap between phases of construction.

Tri-Met had a firm commitment to provide access into businesses at all times. Vehicle and pedestrian routes that would allow businesses to be accessed were open at all times. Driveway and doorway reconstruction was scheduled before or after business hours whenever possible to accommodate the needs of the businesses. At least one of the sidewalks remained open on each reach at all times.

Tri-Met provided an extensive advertising and marketing campaign on behalf of the Interstate businesses. The "Interstate Avenue is Open for Business" campaign was designed to attract customers to Interstate Avenue through advertising, direct mail, and customer incentives. Signs featured businesses names and stated, "Open For Business" or gave parking, entrance, or detour directions to businesses. Ads were placed on buses, in local papers, and flyers were distributed to customers to help in wayfinding.

Full-page advertisements featuring groups of Interstate retail businesses were used to tell stories of the businesses and their owners. Businesses were grouped with other businesses located nearby, and the placement of the advertisements was timed to coincide with the construction in front of the businesses.

Tri-Met developed a marketing campaign called "Doing Business on Interstate" that was mailed to 16,000 homes in North Portland. Special flyers were direct mailed and hand delivered in nearby neighborhoods. Tri-Met also gave away monthly passes to winners of monthly drawings from those with Interstate business receipts and placed advertisements on many local buses with information on how to access the businesses (Becklund 2007).

Multiple direct mailings to residents in the surrounding area with coupons and advertisements were successful in bringing customers to businesses. While in the process of developing the coupons, the TriMet communications and graphics staff assisted several small businesses in developing attractive logos to make the advertisements more effective (Becklund 2007).

Ann Becklund, Director of Community Affairs at TriMet believes the most important and effective aspect of lessening the impact of the construction on local businesses was providing the business owners "somebody to talk to." She stated that TriMet community affairs staff provided a "one-stop shop" for business owners to get information, express concerns, and provide feedback. TriMet provided business owners with a single point of contact and built a strong relationship of trust early in the planning process so that business owners were comfortable contacting community affairs staff with concerns. She believes that having the community affairs and public relations staff housed within the TriMet organization was critical to the project because it allowed business owners to feel as though they had an "advocate" within the organization (Becklund 2007).

Seattle

Sound Transit is currently implementing the first light rail line in the Seattle metropolitan area. The Central Link, a 15.7 mile line connecting downtown Seattle with the Sea-Tac Airport via the Rainier Valley is expected to begin service in 2009. The Central Link will travel under downtown Seattle in a transit tunnel completed in 1990 and used only by buses until 2005. Much of the alignment is either underground, elevated, or travels along the 5th Avenue Busway or freeway alignments where disruption to businesses will be minimal. The largest impact to downtown Seattle is the increased number of buses using surface streets while the tunnel is undergoing renovations. However, the Central Link follows an at-grade alignment along Martin Luther King Jr. Way (MLK) for 4.3 miles, a wide urban corridor through one of the most diverse neighborhoods in Seattle. This portion of the alignment features a center-running alignment

and the project scope includes reconstruction of the entire avenue from building face to building face.

The Rainier Valley neighborhood in Southeastern Seattle is considered a multi-ethnic community where 83% of the residents are non-white. In addition to being culturally diverse, the neighborhood is also one of the poorest neighborhoods in Seattle. Surrounding the avenue is a diverse mix of residential, commercial, and light industrial uses (CDF 2002).

As planning begun on the Central Link, Sound Transit recognized the need for an effective construction mitigation plan, especially along Martin Luther King Jr. Way. The Sound Transit web site states, "Sound Transit works hard to ease the impacts of construction on local neighborhoods and businesses. A big part of our mitigation is making sure that businesses remain open during the construction of light rail and other projects." In addition to an extensive public involvement program, Sound Transit utilized many common business impact mitigation techniques (Sound Transit Mitigation 2007).

Sound Transit's first objective was to maintain access to businesses for customers and employees. Staff worked with businesses to arrange alternate access when the usual access was blocked for construction purposes. Off-street parking for the construction workers' vehicles was provided to preserve on-street parking for customers.

"Open for business" signs were posted at businesses directly impacted by construction. The city also provided detour signs to help customers access businesses during construction. Kiosks and businesses directories were placed where appropriate. In addition, temporary public art was applied to temporary construction fencing in places along the corridor.

Sound Transit also places a large emphasis on helping to promote the businesses along the route. One of the most innovative strategies used to assist businesses along the corridor is the "Lunch Bus" campaign. Once a month, a bus shuttles Sound Transit and city employees and members of the general public to a local restaurant along the corridor. In addition to simply supporting the restaurant, the program helps to raise awareness of the construction progress and sends the message that local businesses are still operating.

Sound Transit also created a marketing campaign titled "The World At Your Doorstep" to encourage individuals throughout the Rainier Valley to shop at businesses along the LRT corridor. This campaign utilizes several advertising techniques including a web site, mailers to local residents, and flyers. As part of the campaign, each month several impacted businesses are featured in a monthly construction newsletter.

The contractor also played an important role in the mitigation process. The contractor was required to keep garbage, dust, and debris to a minimum and wash the windows of businesses in active construction areas once every three months (Sound Transit Mitigation 2007).

Sound Transit remains committed to quickly distributing up-to-date information to business owners and residents along the corridor. They have made several "outreach commitments" to the community that apply not only to construction of Link light rail, but also to Sounder commuter rail. Sound Transit has committed to provide advance notification of construction activities and to maintain a 24-hour construction hotline as a single point of contact along the corridor and as a method of communication during emergencies or unexpected circumstances. In addition, Sound Transit provides many other opportunities for those along the corridor to stay informed through regular construction meetings for impacted neighborhoods, regular written construction updates that are mailed to surrounding neighborhoods, maintaining up-to-date information on the Sound Transit web site, assisting individuals with limited English skills by providing an interpreter and translation services for written materials and community meetings, and working with businesses and residents to find solutions to construction related problems (Sound Transit Community Outreach 2007).

A Community Development Fund (CDF) officially became part of the Link Light Rail project in November 1999 when the Sound Transit Board unanimously passed a resolution establishing the alignment and station locations for the project. Public involvement in establishing the fund was substantial with several community forums and a community steering committee established in 2000. Sound Transit, King County, and the City of Seattle all contributed to the Rainier Valley CDF. The public investment in the CDF is funded primarily through a federal block grant with the balance coming from the general funds of each entity. According to the CDF, the majority of funds are revolving loans and include terms and conditions that serve as incentives for the borrower to achieve the Fund's community development goals. Eligibility for the loans and the loan terms vary depending on the degree of operation impairment experienced by an individual business.

The fund has three distinct avenues for distributing assistance:

1. Supplemental Mitigation Assistance for businesses impacted by Light Rail Construction in the Rainier Valley ($16 million) – This fund includes mitigation payments related to moving and re-establishment costs, increased operating costs, and decreased revenues. It also includes mitigation advances related to increasing working capital, tenant improvement, and equipment upgrades. The fund also provides technical assistance related to small business marketing and customer cultivation, basic accounting, and using the internet.

2. Workforce Training for Rainier Valley residents in construction related jobs ($2 million) – This program is a partnership with Seattle Jobs Initiative and is a time-limited program that will last through 2009. This program attempts to help bring residents into the workforce and monitors retention placements for 24 months.

3. Community Development Program (CDP) on-going community development lending for small businesses and real estate projects. ($32 million) – This program is a long-term revolving loan fund in which 25% of the program funds are set aside for business lending and 75% set aside for real estate lending. The Fund's Operating Plan states, "The CDF may support any project that preserves and strengthens cultural and economic diversity, long-term livability, and economic opportunity for Rainier Valley residents, businesses, and institutions (CDF 2002)."

Despite the efforts of Sound Transit to minimize the impact on local businesses, many businesses are still having a difficult time surviving the construction period. The Seattle Times reported in September, 2005, that 97 of 274 eligible businesses along MLK had received "business interruption" grants from the fund, 41 of which reported a decline in sales of 50 percent or more. Another article stated, "As of February 2006, 44 of the 274 businesses along Martin Luther King Jr. Way, where much of the line's construction is taking place, were no longer operating, despite $7.5 million in "mitigation funds" from the Rainier Valley Community Development Fund." In addition, local minority construction workers have staged rallies protesting that African Americans were not receiving an equitable share of construction work for the project.

As of March 2007, the CDF programs distributed $9.3 million and assisted 157 businesses. The workforce training program has enrolled 172 individuals, placing 109 with an average wage of $16 per hour plus benefits. The community development program has approved 3 business and 2 real estate loans with 17 more loans pending (CDF 2007).

Salt Lake City

The Utah Transit Authority (UTA) completed the first light rail line in Salt Lake City in 1999. Called the North/South Line, the alignment follows an existing rail alignment for most of the project length and is surrounded by low intensity industrial land uses for much of the alignment. The north end of the alignment, however, featured center-running track along Main Street, 700 South, and 200 West in downtown Salt Lake City. Many storefronts and locally owned businesses were located along this portion of the project alignment. Many buildings in downtown Salt Lake City have ground-floor retail businesses with offices located above.

UTA utilized relatively few business impact mitigation strategies throughout the construction of the North/South Line. Construction activities were coordinated with unrelated development occurring along the line to minimize the amount of time Main Street would be under

construction. In addition, construction activities could only take place on two adjacent blocks at any time to minimize the amount of time construction would be immediately in front of a single business. The construction period was extremely difficult for many main street businesses and nearly 30% of the businesses permanently closed during this time (Knowles, 2007).

After receiving significant criticism for the lack of assistance offered to businesses during construction, UTA and Salt Lake City were prepared to be more proactive during the next LRT expansion project. The University Line is a 2.5 mile extension of the existing line connecting downtown Salt Lake City with the University of Utah to the East. The University alignment departs from the mainline alignment on 400 South, a wide arterial running East/West with many businesses and storefronts. The project cost a total of $118.5 million and began service on December 15, 2001, nearly two years ahead of schedule. Over 100 business are located along the project alignment (UTA, 2007).

An Interlocal Agreement between the Utah Department of Transportation (UDOT), UTA, the University of Utah, and Salt Lake City provided a forum to discuss alignment and traffic issues. Salt Lake City played a key role in establishing a public forum and process that would allow residents and business owners along the project alignment to voice their concerns, especially regarding the disruption to business operations during construction.

The project was unique in that the contractor shouldered much of the responsibility of minimizing the disruption to local businesses. The public participation process for mitigating construction impacts was included as a part of the construction documents. Six months before construction began, a Community Coordination Team (CCT) was established composed of residents and business representatives from along the project alignment. The CCT included one business representative and one residential representative from each of the 13 blocks in the corridor and two at-large representatives appointed by each stakeholder agency.

The CCT was tasked with establishing a contractor evaluation incentive fee system. The construction documents mandated a minimum level of mitigation measures to be performed by the contractor, but additional compensation was made available to the contractor for performance above and beyond the minimum requirements. Each three month period, the CCT could choose to award the contractor up to $200,000 beyond the base compensation for construction mitigation activities beyond what the contract required.

The exact amount awarded to the contractor during each three month period was determined by an intricate evaluation system. First, the public was allowed to evaluate the contractor's public involvement activities. At the beginning of the project, the public was asked to complete lengthy written surveys, but this proved too time consuming and ineffective. The CCT members

also attempted to complete the forms by visiting neighborhood businesses in person. Ultimately, the CCT determined that it was most effective to hire a consulting business to administer telephone surveys to those along the corridor to evaluate the contractor's public involvement activities.

After the public had an opportunity to provide feedback, the contractor presented a self-evaluation to the CCT followed by a presentation by UTA regarding the contractors mitigation strategies. Each CCT member individually rated the contractor, and the total scores were compared to the scores provided by the contractor and UTA. The CCT executive director had the ability to make any necessary adjustments to the overall rating. Throughout the construction period, the average CCT recommendation was 89.8% of the total possible incentive compensation (Bott 2007).

The CCT was also tasked with allocating $300,000 of the $500,000 budget to implement business impact mitigation programs coordinated with the Contractor's public information staff. The CCT and the contractor's public relations consultants used the funds in four ways:

1. 4th South Bucks. The 4th South Bucks Program distributed over $75,000 in coupons (each worth $1) that could be redeemed at businesses along 400 South. The program was believed to be an acceptable way to randomly disseminate the coupons through a radio station campaign. It was anticipated that business patrons would spend additional money beyond the 4th South Bucks.

2. "Go Fourth" Radio Advertisement Campaign. The "Go Fourth" radio advertising campaign was chosen because it was determined to be an effective means of reaching the intended customer demographics of the businesses along the project alignment. The contractor's public information specialist assisted a CCT subcommittee in developing a radio campaign. The CCT developed a set of criteria used to evaluate all of the businesses along the corridor (preference was given to independent businesses) to create a priority list for radio spots. Each month, six businesses were featured on the radio. In addition, a remote broadcast featured the six chosen businesses on the 4th of each month. The radio remote broadcasts would feature prizes including Fourth South Bucks.

3. Catalyst Advertisements. Sixteen businesses were given advertisement space on the back cover of Catalyst Magazine each month. Catalyst Magazine, a local publication, was chosen because its reader demographic closely matched the radio station's demographics.

4. The CCT recognized that media coverage is often perceived as more credible than advertisements. In coordination with the contractor's public information staff, the CCT encouraged UTA and the contractor to use media events to distribute the message that

businesses were accessible during construction. Accessibility was emphasized in several media campaigns, including the "First Rail Weld" and the "Half-time Celebration."

In addition to establishing a CCT, Salt Lake City sponsored a low interest loan program available to impacted businesses and administered by the Salt Lake City Community and Economic Development Department. Loans up to $10,000 were available to businesses located within one-half block from the project alignment were eligible to apply. Applicants were also required to provide profit loss statements. In total, 19 loans were distributed to businesses during the construction period, primarily to less established businesses such as independent restaurants. Five of the loan recipients defaulted on their loan (SLC 2006).

Phoenix

The Central Phoenix LRT line, the first to be implemented in Phoenix, is currently under construction and scheduled to open for service in December, 2008. The project alignment is 20 miles in length and has a $1.4 billion construction budget. Valley Metro Rail has estimated that there are over 3,500 businesses located along the project alignment. The alignment is composed almost entirely of center-running trackway with relatively little grade separation or separated right-of-way.

The core of the Valley Metro Rail business impact mitigation plan relies on distributing up-to-date information and receiving feedback from business owners. Valley Metro uses a 24-hour, 7 day per week project hotline with a live voice during the construction period, as well as a project web site to help interact with the public during construction. Cell phone numbers and photographs of the Valley Metro Rail and Public Involvement staff are also published and made available to businesses along the corridor to help business owners recognize the outreach staff. All street closure information is made known to businesses using flyers, emails, and the project web site. Periodic construction update meetings are also used to inform business owners of future construction plans and provide an opportunity for feedback (VMR 2003).

Before construction began, Valley Metro created a Business Outreach Plan to inform business owners of the assistance that would be available throughout construction. To help prepare business owners for the upcoming disruption, Valley Metro invited business owners who have survived LRT construction in other cities to speak with the local business owners, give advice, and share lessons learned (VMR 2003).

A Community Advisory Board (CAB) for each line section is composed of business and neighborhood leaders from along the line section. The CAB is tasked with providing input to Valley Metro Rail representatives on contractor community relations to be used as a measure for contractor performance. A total of five CABs serve as the voice of the community throughout the 20 mile corridor. Monthly construction review meetings for each section are

facilitated by the public involvement coordinators. The contractor and several engineers from the Project Team are also present at the meetings. CAB members evaluate the contractor's performance using forms provided by the agency. CAB members also distribute incident report forms to all the stakeholders they represent to gain an understanding of contractor performance. CAB members use the incident report forms and personal observation to compete the contractor evaluation form. The evaluation form provides feedback regarding the contractors performance providing advance notification of construction activities, maintaining access to stakeholder properties along the light rail alignment, maintaining traffic guide and business courtesy signage, controlling dust and noise, and maintaining adequate pedestrian/bicycle crosswalks in the light rail construction zone. The resident engineer considers the evaluation submitted by the CAB in determining contractor payment (Steere 2007).

The Valley Metro Rail Construction Signage Program is another tool used to minimize the disruption to businesses along the corridor. Two types of signs are available: traffic guide signs and courtesy signs. Traffic guide signs are intended to direct traffic to the businesses. The courtesy signs may be used for advertising, marketing, or directional purposes. All courtesy signage is available to businesses within 48 hours from the time it is requested. While there is no limit to the amount of signage available, the area coordinator and business owners will work together to ensure an appropriate amount is used. This program is possible because of the assistance of the Cities of Phoenix, Mesa, and Tempe, which have temporarily waived existing signage ordinances along the corridor (VMR 2003).

To help coordinate efforts along the corridor and improve the level of service provided to business owners, the corridor has been divided into five sections, and each section has been assigned a Community Outreach Representative. This representative is responsible for interacting with all businesses located within that alignment section. This helps to personalize the process for the business owners by providing a single point of contact with Valley Metro.

Valley Metro created the Metro MAX shopping card, which can be used to receive discounts from businesses along the corridor. The program is designed to increase patronage of retail businesses along the project alignment. Businesses that wish to participate in the program are free to decide what promotional discount or special offer they wish to include in a brochure listing all of the participating businesses and their offers. Cards and brochures are distributed by the public involvement staff and by the businesses themselves. In addition, the cards may be downloaded off the Valley Metro web site.

Valley Metro also provides free pre-printed postcards to businesses along the alignment. The postcards include a space for each business to personalize the postcards, though business owners must cover the costs of custom printing and postage to mail the cards.

In addition to the business assistance programs made available through Valley Metro, each municipality through which the alignment passes (Phoenix, Tempe, & Mesa) has created additional assistance programs available only to the businesses within their jurisdiction. In addition, individual cities have engaged in additional advertising campaigns as well. The City of Phoenix created the "Shop the Line" advertising campaign with on-site radio promotions and advertising (City of Phoenix 2003).

Howard Steere, Public Involvement Manager for Valley Metro, said that loans have been available through a number of organizations, but that they have not been as successful as they would have liked. The requirements to qualify for the loans were more strict than many businesses are able to meet, and many of the businesses that need the most financial assistance are not eligible. Various banks, chambers of commerce, credit unions, and non-profit organizations like Chicanos Por La Causa provide loans for as little as $200 available to businesses along the corridor. The terms and details of the loans depend on the location and individual needs of the business.

Phoenix has focused its efforts on providing free consultations to business owners to help them recognize their strengths and weaknesses and formulate action plans to weather the construction period. Phoenix has hired a Business Advocate dedicated for this purpose, and three private sector consultants are also available at no charge to provide technical assistance with marketing, web page maintenance, workforce recruitment and development, accounting, and other technical aspects of business ownership. In addition, the Arizona State University Spirit of Enterprise Center provides business owners with a full market analysis of economic conditions to help business owners identify their target market.

Overall, Howard Steere stated that Valley Metro has not been able to do as much mitigation as they would have liked because of regulations on money received from the Federal Government, but that the City of Phoenix and other organizations were able to fill that role. The most popular and successful program utilized was the free signage. He believes that the Valley Metro mitigation program has been very successful, but that the key to success was involving the partner cities and non-profit organizations to provide assistance beyond what Valley Metro was able to provide (Steere 2007).

Denver

Denver's Regional Transportation District (RTD) has implemented light-rail transit in four waves. The Central Corridor line, completed in 1994, consisted of 5.3 miles of at-grade trackway, including a section through downtown Denver. The line features a side-running alignment along surface streets for approximately half of the distance and utilizes an existing railway right-

of-way for the remainder. While traveling through downtown, the tracks split into a one-way pair on adjacent streets.

The Southwest Corridor opened in 2000 as an extension of the Central Corridor into the southwest suburbs. The 8.7 mile trackway was constructed entirely on existing freight rail right-of-way and features only two at-grade street crossings – both on relatively low traffic streets.

The third installment of LRT in Denver was the Central Platt Valley Corridor. The 1.8 mile trackway provided access to several large venues including Auraria Campus, Invesco Field at Mile High Stadium, the Pepsi Center, Six Flags, Union Station and Coors Field. Construction of the line was completed in 2002 and was constructed almost entirely within existing freight rail right-of-way.

The latest LRT project in Denver, the T-REX project completed in 2006, added 19.1 miles of grade separated trackway located immediately adjacent to I-225. The T-REX project combined construction of LRT with a major expansion and renovation of I-225, which resulted in both the trackway and the freeway being entirely grade separated from surface streets.

Overall, most of the 35 miles of LRT in Denver are separated from traffic using overpasses or tunnels. As the alignment follows mostly existing freight rail and freeway right-of-way, there are very few street crossings. The notable exception is in downtown Denver where the LRT operates within surface street right-of-way.

Since the rail alignment follows existing rail lines and freeways for much of the alignment, the construction impact mitigation strategies utilized serve a different purpose than those in other cities. Many of the businesses impacted are larger, automobile-oriented businesses. Much of the disruption caused by construction is caused by the reconfiguration and reconstruction of freeway ramps and bridges. In general, there are very few locations outside of downtown Denver where businesses experienced construction "on their front doorstep."

At a focus group meeting, business owners said that their biggest concern was their ability to maintain and recruit employees, and decreased productivity of employees because of traffic delays. Given this context, the business impact mitigation techniques used throughout this project were focused on reducing traffic congestion so that employees and customers would not experience significant delays. One of the key strategies used by RTD was to work with the Transportation Demand Management service providers to develop educational campaigns for impacted employees, businesses, and commuters. The purpose of the campaigns was to provide information about how employees and customers could avoid traffic congestion. Special emphasis was placed on encouraging travel at non-peak hours and using alternative modes of transportation (TransOptions 2007).

RTD committed to having a single contact person for information regarding business impacts. Providing an easy way for businesses to voice concerns and ask questions with a single point of contact helped to open lines of communication between the business owners and RTD. In addition, RTD committed to providing up-to-date information using newsletters, informational materials distributed periodically to businesses, and a project web-site (RTD 2000).

Houston

The Metropolitan Transit Authority of Harris County, Texas (METRO) began construction on the Red Line in 2001 with service beginning in December, 2003. The Red line extends 7.5 miles from the north edge of downtown near the University of Houston-Downtown Campus to the southwest suburbs. The downtown segment of the alignment features a center-running alignment on Main Street. The construction of LRT included complete reconstruction of the street right-of-way. The transformed Main Street features ornamental paving materials and sidewalk furniture. Although automobile traffic is still permitted on Main Street, the reconstruction efforts aimed at transforming the right-of-way into a pedestrian friendly environment.

South of downtown Houston, the alignment remains at grade, but separates into a one-way pair on adjacent streets with side-running trackway before once again joining together to form center-running trackway. At one major intersection, the alignment, along with several lanes of through traffic, are grade separated from crossing traffic, however most of the line is at-grade.

Overall, METRO utilized a more modest set of construction mitigation strategies than the other cities discussed in this study. Much of the construction mitigation efforts were aimed at reducing the total amount of time construction would be immediately adjacent to any single business. A complex phasing plan was implemented to ensure that construction was completed in one part of the line before moving on to the next portion. In addition, traffic control plans placed regulations on when key intersections could be closed. In general, intersections were required to remain open at all times to allow access to local businesses. When intersections were closed, however, no two streets with the same directional cross traffic could be closed at the same time. When Main Street on the north end of downtown was blocked off for construction, an extra lane was added to an adjacent street to help move traffic downtown and allow access to businesses (Gulf Coast Institute 2006).

Houston utilized many of the most common mitigation techniques including “open for business” signage and wayfinding signage to ensure that customers were aware of how to access local businesses. METRO maintained an up-to-date web page to provide businesses with updates and future plans. Weekly emails, mailers, community meetings, newsletters, and small advertising campaigns were also utilized to increase awareness of construction activities.

METRO conducted individual business surveys to determine the needs of each business during construction and to establish solid communication lines. A coupon book was distributed to households along the project corridor, however the campaign was not very successful. Very few of the coupons were redeemed (Chou 2007).

Downtown Houston experienced significant hardships during the construction period of 2001-2003, but the METRO is quick to note that there were several other events aside from LRT construction that were partially responsible for the difficulties. Tropical Storm Allison (June 2001) causing $5 billion in property damages to central Houston, the World Trade Center terrorist attacks (September 2001) damaging Continental Airlines and the overall airline industry, and the collapse of Enron (December 2001) resulting in the layoff of over 4,000 employees all share some of the responsibility for economic downturn (RTD 2007).

Ernest Chou, one of the community outreach coordinators on the project, stated that the most successful strategies of the construction mitigation program were to work directly with each business along the rail construction line. The personal interaction between business owners and multi-lingual outreach staff allowed for accurate information to be distributed to business owners along the line. The line was divided into 5 sections and each section consisisted of a team that worked to address day to day issues related to construction. Periodic community meetings in the construction zone with the Community Outreach Coordinators provided additional information to business owners immediately surrounding the construction zone. METRO developed lists of business owners along the corridor by line section. Community Outreach Coordinators ensured that all businesses were contacted and identified by walking the project alignment and interacting directly with business owners (Chou 2007).

Ernest Chou also stated that METRO learned some important lessons throughout the construction process. The strategy used to perform construction in sequential segments rather than all at once was appreciated by many of the smaller businesses along the corridor. One of the most significant impacts to smaller businesses was the periodic disruption of utility services during construction. By minimizing the need for utility disruptions, and coordinating the times of disruption with businesses, the impact can be reduced. METRO also realized the benefits of using temporary asphalt walkways and driveways for improved access.

San Jose

The Santa Clara Valley Transportation Authority (VTA) in San Jose has developed an LRT system consisting of 42.2 miles of trackway with 62 stations. The system has three lines; two of the lines have 14 stations in common and one of the lines is a short, two-station offshoot of the system. The system began construction in 1985 when VTA created a downtown Transit Mall. The construction of the Transit Mall included a complete reconstruction of 1st Street and 2nd

Street from building face to building face and installing a one-way pair of side-running tracks on adjacent streets.

This portion of San Jose contains mostly two or three story buildings with ground-floor retail establishments. Although some efforts were made to minimize the construction impacts, the construction period from 1985 to 1988 was very disruptive for many local businesses. Despite using granite tiles as makeshift sidewalks during construction, storefront access was greatly impacted. The San Jose Downtown Association reports that 24 ground floor businesses ceased to operate during this period (Childress 2007).

In many respects, the construction of the Transit Mall was much more difficult than it would have been, had additional planning taken place before construction began. The project would have benefited from a plan that anticipated construction problems ahead of time and created policies and action plans to guide construction progress. A detailed construction management plan was never completed for this project, so problems were addressed as they were encountered, resulting in unnecessary delays and additional hardships placed on businesses. Confusion regarding underground utilities and building foundations caused significant delays in progress. As the VTA planned for future system expansion, it realized that planning ahead to reduce the opportunities for unforeseen delays was an important aspect of reducing the impacts on businesses.

The San Jose Redevelopment Association (RDA) funded a business loan program to assist merchants financially to alleviate the potential loss of business during the construction of the Transit Mall. The RDA contracted with the San Jose Development Corporation, a non-profit organization, to administer the loan program. Approximately 178 businesses qualified and participated in the business loan program. Qualifying businesses in the construction area secured loans by borrowing against their existing assets. The process was similar to a traditional bank loan, however RDA was the lender. Ultimately, RDA staff and merchants were dissatisfied with the program because it was administratively difficult to manage. Repayment terms differed on every loan, depending on the agreement. Because the RDA operated as the loan administrator, rather than a traditional bank, requiring the businesses to repay the loans became a difficult situation. As a result, many of the loans were not repaid, and many of the businesses ceased operations during construction (SCVTA 2003).

After the initial Transit Mall program was completed, the LRT system was expanded by extending the line north and south of downtown. South of downtown, the Green Line follows an existing freight rail right-of-way, and the Blue Line travels in the median of California State Routes 87 and 85. Traveling North, the Green and Blue lines share a center-running alignment for several miles to Tasman Drive. Here, the Green Line turns West, continuing on Tasman Drive for nearly all of the remaining trackway, and the Blue Line turns East, following Tasman

Drive and Capitol Avenue. Both of the lines feature at-grade, center-running trackway, though for several blocks, the Blue Line becomes elevated over an existing freight rail and several intersections.

Most of the businesses along the construction corridor are located in large office buildings set back a significant distance from the street in an area where parking is plentiful. There are few buildings immediately adjacent to the street, and relatively few retail businesses along the corridor. As a result, the construction mitigation strategies throughout the suburban expansions of LRT were centered on minimizing the disruption of traffic flow. VTA and the City of San Jose developed a traffic management plan that was incorporated into the construction documents prior to the bidding process. This proactive method of traffic management helped to minimize the disruption and confusion during construction. A key element of the traffic management plan involved placing adequate signage along transportation corridors to assist motorists in wayfinding.

In 2006 and 2007, VTA rebuilt the four downtown stations to raise the platform levels to allow level boarding into the new low-floor vehicles. Each of the four stations was closed for anywhere from 8 to 20 weeks. Pedestrian access was maintained into each building front, but the 300' long construction sites were still significant pedestrian barriers.

The VTA construction mitigation program supplied information to stakeholders using a three-tier system to classify stakeholders. Tier Three, referred to as the "broadcast" category of outreach, included all addresses within 30 square blocks of Downtown San Jose (about 4,700 addresses). These businesses and individuals received information at key junctures, such as start of construction, and reopening of a platform. Approximately four Tier Three mailings were distributed. With each mailing, the recipient was invited to self-upgrade to Tier Two status, if they desired.

Tier Two included interested and involved constituencies such as: news media, the Downtown Association, San Jose Convention and Visitor's Bureau, San Jose State University, other key downtown stakeholders, City of San Jose agencies, the Mayor's office and local council member's offices, VTA riders, and the transit dependent communities such as senior centers and senior housing. Tier Two parties received all Tier Three mailings, plus regular email updates. Stakeholders could request one-time presentations by VTA staff at organized meetings.

Tier One included all businesses and properties directly impacted by construction activities. In addition to Tier Two and Three benefits, Tier One received immediate and frequent access to both the contractor's Community Relations Officer and VTA Community Outreach. They received advance notice of invasive work, on-site signage announcing "Business open during

construction," and on-site signage mentioning the business by name. VTA also committed to maintaining an up-to-date website, flyers mentioning affected businesses by name, and a business support ad in the Mercury News (SCVTA Date Unknown).

VTA met regularly with downtown merchants and attended various community and business meetings. Many of the established restaurants depended heavily on lunchtime revenues and they were concerned that construction noise would provide an unpleasant dining atmosphere. VTA agreed to limit invasive activities between 11:30 a.m. and 1:30 p.m. and install acoustical barriers on the construction fences. At the same time, however, many merchants were concerned that the noise barriers were blocking sight lines into the businesses, so the barriers were taken down once demolition work was completed. Approximately half of the businesses accepted an offer from VTA to print and hang banners on the fencing advertising the businesses (Childress 2007). The construction mitigation strategy for the station reconstruction project did not include any provisions for loans, grants, or other direct financial assistance.

The construction contract called for the contractor to provide a full time Community Relations Officer who was directed by VTA Community Outreach Staff. Every Friday, the Community Relations Officer hand delivered construction updates to businesses along the alignment. In addition, VTA staff distributed the updates via email to the merchants. The in-person and email information was provided by separate individuals to provide each business owner at least two points of contact throughout the project.

To provide better assistance to the diverse background of members of the business community, all VTA information was printed in Spanish, Vietnamese, and Mandarin Chinese.

The San Jose Downtown Association played an important role in distributing information to the community regarding construction activities. Outreach staff met with representatives from the association bi-weekly to discuss construction schedules. Construction updates were distributed to over 500 downtown businesses through this association (Childress 2007).

Brandi Childress, VTA's Community Outreach Supervisor, stated that the most successful aspect of construction mitigation was face-to-face contact with business owners and stakeholders. The personal interaction and open lines of communication set the stage for conflicts to be resolved quickly. She also stated that requiring the contractor to hire a Community Relations Officer who worked under the direction of VTA staff was critical developing a strong working relationship between VTA, the contractor, and business owners.

SUMMARY AND RECOMMENDATIONS

This report provides case studies of seven agencies with light rail construction projects that may be used to inform construction mitigation measures for the Central Corridor LRT project. Each agency offers a variety of construction mitigation measures.

Devising a construction mitigation plan for the Central Corridor in the Twin Cities will not be a simple task. Although there are many similarities between the Central Corridor and other LRT alignments, there are also many differences that distinguish the Central Corridor from the projects examined here. The plan should reflect the unique landscape and economic conditions of the corridor. Use of mitigation measures that have been incorporated elsewhere could and should be considered for the Central Corridor provided they are tailored to meet the specific needs of the unique businesses along the corridor.

Howard Steere (Valley Metro in Phoenix) recommended creating the business impact mitigation strategy as soon as possible throughout the planning stage. The earlier a transit property is able to begin formulating a plan, the more effective it will be. He recommends creating strategies to be used during three distinct time frames: Some strategies are necessary before construction begins, some strategies will be successful during construction, and some strategies need to continue to be utilized after construction is complete. Before construction begins is the most effective time to reach out to business and gain their trust. It also gives businesses the ability to plan ahead and make necessary arrangements.

Table 1 presents a summary of the mitigation techniques used by agencies in the seven case studies along with a subjective evaluation of the effectiveness and popularity of each program among residents and business owners in each city. The effectiveness and popularity of each program is rated objectively from 1 to 10, with 10 being the most effective or popular. The table recognizes that certain programs may not effectively achieve the desired results, yet may still be accepted by the local community. While a certain program may not be effective at reducing the impacts of construction, it may still have value as a public relations strategy or in building ties with the community. For example, the Lunch Bus program is not perceived to be very effective at reducing the impacts of construction, but it remains a popular program in Portland and Seattle. As the Metropolitan Council develops a set of mitigation strategies tailored to the needs of the Central Corridor, it will be necessary to weigh the expected effectiveness and popularity of each program with its associated cost.

Table 1. Summary of Mitigation Techniques.

Strategy	Case Study Example	Effectiveness	Popularity
door to door canvassing	Portland	6	8
	Houston	8	8
	San Jose	8	8
Hire multilingual outreach coordinators with strong ties to the local community	Portland	10	10
storefront improvement grant	Portland	4	5
Work with Travel Demand Management service to reduce congestion	Denver	5	9
	San Jose	5	9
low-interest loans	Portland	9	10
	Seattle	4	6
	Salt Lake City	6	8
	Phoenix	4	5
	San Jose	4	4
Newsletters, mailings	Portland	3	4
	Seattle	4	4
	Salt Lake City	4	5
	Phoenix	5	5
	Denver	5	5
	Houston	5	5
	San Jose	5	5
Construction Web Site	Portland	3	4
	Seattle	3	4
	Salt Lake City	3	4
	Phoenix	3	4
	Denver	3	4
	Houtson	3	4
	San Jose	3	4
Sponsored media and social events	Portland	5	5
	Salt Lake City	6	8
24 hour construction hotline	Portland	5	6
	Seattle	5	6
	Salt Lake City	5	6
	Phoenix	5	6
	Houston	5	6

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Strategy	Case Study Example	Effectiveness	Popularity
"open for business" and wayfinding signage	Portland	6	10
	Seattle	6	10
	Salt Lake City	6	10
	Phoenix	6	10
	Houston	6	10
	San Jose	6	10
Lunch Bus	Portland	3	8
	Seattle	3	8
Phased Construction Schedule	Portland	8	9
	Salt Lake City	6	9
	Houston	5	8
Advertising and Marketing Campaigns	Portland	4	8
	Seattle	4	8
	Salt Lake City	7	9
	Phoenix	5	8
	Denver	4	8
	Houston	2	4
	San Jose	4	8
Temporary Public Art	Seattle	4	10
Require Contractor to Partly Administer Mitigation Strategies	Seattle	2	5
	San Jose	7	7
	Salt Lake City	8	8
Workforce Training Program	Seattle	5	8
Coordinate with Unrelated but adjacent construction	Salt Lake City	2	4
Contractor Evaluation Incentive Fee System	Salt Lake City	10	8
	Phoenix	10	10
Provide Business Advice and Counseling Free of Charge for Local Businesses	Portland	7	9
	Phoenix	7	9

There are several mitigation techniques that were used in most of the case studies. For example, all of the transit property case studies committed to providing up-to-date information to business owners along the alignment. Transit properties used a wide arrange of tools to meet this need including web pages, mailers, weekly meetings, monthly newsletters, and so forth. All of the properties had committed to maintaining an up-to-date web page with construction information, project updates, construction schedules, and a list of impacted businesses along the corridor.

Other common mitigation strategies include providing 24 hour telephone hotline (with or without a live voice), "Open for Business" and traffic direction signage, and providing information to businesses and residents in multiple different languages. But even as these are common strategies, they must be tailored to the specific situation and surroundings.

All of the transit properties in the case studies provided some form of advertising for businesses along the alignment, however the level of advertising varied greatly. Sound Transit and Tri-Met provided extensive levels of advertisement and discount programs. Both properties utilized the "lunch bus" strategy and even arranged events along the corridor to draw customers to the construction site. In other areas, the transit properties deferred to the local municipality to provide much of the advertisement. Salt Lake City and Phoenix had some success with providing extensive advertising campaigns using radio, newspaper, and magazine ads. The radio advertisements in particular are perceived to be both effective and popular. Although the cities assumed the lead role in administering the advertising campaign, they worked closely with the community outreach staff from the transit properties to coordinate efforts.

In all of the cases studied, direct financial assistance in the form of loans was one of the most controversial topics. Transit properties worked with local banks, cities, non-profits, and foundations to establish a loan process. It is difficult to measure the effectiveness of such a strategy, however, because examples of such programs have had mixed results. Seattle, for example, had an extensive loan program established, yet its effectiveness is challenged. Portland administered a similar program and claims more success. Howard Steere of Valley Metro provided some insight into the difficulties of loan programs. He stated that in the Phoenix region, the businesses that were most in need of financial assistance weren't eligible for the loans in the first place, and those that were often waited until it was too late to apply. Even if eligibility requirements are greatly relaxed, there will still be small businesses that will not qualify.

Steere also stated that a loan program must be tailored specifically to meet the needs of LRT construction, or it is not likely to be effective. When construction began in the Phoenix area, all three cities (Phoenix, Mesa, and Tempe) initially relied only on existing economic development loan programs already in existence in the cities. These loans proved to be too inflexible and ineffective. Early on, Phoenix recognized this and created a new program designed to meet the needs of the specific businesses along the corridor. Mesa and Tempe, however, continued to use only the already existing programs, and overall, they were not as effective.

At the same time, the San Jose experience suggests that too much flexibility within the administration of the loans can make them difficult to administer and can lead to an ineffective program. The Metropolitan Council could work closely with the Cities of Minneapolis and Saint

Paul, as well as banks and non-profit organizations in the area to create specific loan programs that are aimed specifically at LRT mitigation

All of the transit properties included measures in the construction documents requiring the contractor to perform some of the mitigation measures. In nearly all cases, the contractor was required to minimize dust, keep a clean work site, and maintain some level of access to all businesses. San Jose and Salt Lake City placed an even greater level of responsibility on the contractor. VTA in San Jose required the contractor to provide a Community Relations Officer to interact with the community, and UTA in Salt Lake City required the contractor to provide a public information specialist. Both transit agencies found these to be successful arrangements.

UTA in Salt Lake City and Valley Metro in Phoenix both utilized a program providing financial incentives to provide mitigation measures beyond what was required in the construction documents. UTA had difficulties with their program because it was a very complicated system of determining how much incentive pay was to be provided. Valley Metro, however, after reviewing the experiences of the UTA system, greatly simplified the process, making it much easier to administer. The Metropolitan Council could consider providing payment incentives to the contractor, but in order to be effective, the process must be simple.

The movement of traffic on University Avenue during construction is a major concern for many businesses. Drivers seeking to avoid congestion will likely choose to use alternate routes. Businesses that rely mostly on automobile traffic (like Wal-Mart and Target) will greatly benefit if the Metropolitan Council creates a comprehensive construction traffic management plan to inform customers and employees on how to access the businesses. In addition, traffic is likely to be greatly disrupted in downtown Saint Paul as the LRT is constructed on Cedar Street. The Metropolitan Council could look to the strategies utilized by Denver to inform those working in office buildings how to navigate downtown to avoid construction. The Metropolitan Council should create an educational campaign to inform downtown employees regarding construction activities and traffic detours.

The reoccurrence of specific strategies, however, does not appear to be related with either the effectiveness or the popularity of the strategy. For example, all of the case studies committed to maintaining up-to-date construction web sites, yet the web sites were never cited for being particularly useful or effective. Similarly, all cities were involved in some form of advertising and marketing of the businesses along the corridor, yet none of the cities claim any particular success with the programs. As mentioned previously, however, they may still have some value by improving relationships between stakeholders and the transit properties.

Ultimately, while the Metropolitan Council can look to other metropolitan regions for advice on how to create an effective business impact mitigation plan, the plan will need to reflect the

unique character of the Central Corridor. The plan should be designed to provide all of the necessary information businesses will need before construction begins and timely information throughout construction.

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