Feasibility Study
Final Report
December 28, 2001

Submitted to:

Dakota County Regional Railroad Authority

Submitted by:

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EXECUTIVE SUMMARY

Dakota County initiated a study of the Dan Patch Corridor to examine the feasibility of commuter rail within the corridor. The proposed 44-mile commuter rail route (Figure ES) starts in Minneapolis and moves west for approximately 5 miles to St. Louis Park, where it turns south and proceeds in that direction for approximately 40 miles to a terminus at Northfield Yard.

The Dan Patch Commuter Rail Feasibility Study was undertaken to:

- Study commuter rail system development to the next level of feasibility and design;
- Build on/be consistent with recommendations of Mn/DOTs Twin Cities Metropolitan Commuter Rail Feasibility Study;
- Provide more detailed exploration of commuter rail dynamics, its relation to other modes and corridor land use patterns; and
- Provide for public participation, technical advisory and policy committees.

Dakota and Hennepin Counties are actively engaged in multiple efforts to expand transportation choices in many corridors, including improved transit facilities and service in I-35W, TH 77/Cedar Avenue, the Southwest Transitway, and others. The study partners undertook the Dan Patch Feasibility Study to identify all corridor issues early.

Information had previously been developed at a comparative level between this and other candidate corridors in the 1999 Mn/DOT Twin Cities Metropolitan Commuter Rail Feasibility Study. The Mn/DOT Study was undertaken at the direction of the Minnesota Legislature to address regional traffic congestion and provide alternative transportation facilities and services. The Dan Patch Commuter Rail Feasibility Study was funded by a grant from Mn/DOT to the Dakota County Regional Railroad Authority to "complete a feasibility study to develop the appropriate environmental and engineering documents for commuter rail service".

APPROACH TO STUDY

Committees Reporting to I-35W Solutions Alliance

On behalf of the I-35W Solutions Alliance, Technical and Policy Advisory Committees were established to represent each city and county in the corridor in the development of this study. Mn/DOT's Office of Passenger Rail Transit and the Metropolitan Council also participated on the committees. The Technical Committee made its recommendations to the Policy Committee, which then reported to the I-35W Solutions Alliance. Committees met periodically throughout the study process. The project team, both consultants and committee members, participated in individual community meetings and interacted with community residents at public open houses.

Charge to Technical Project Team

The work program was designed to identify both technical and community issues needing future detailed evaluation before commuter rail service could be established in the corridor. The project team was charged with developing more specific information on station locations, projected ridership, capital and operating costs, joint operation with freight railroads, and potential community impacts resulting from implementation. Environmental issues, including neighborhood impacts, were addressed at a screening level. Potential impacts were identified as requiring study in a future detailed environmental analysis phase of the project.

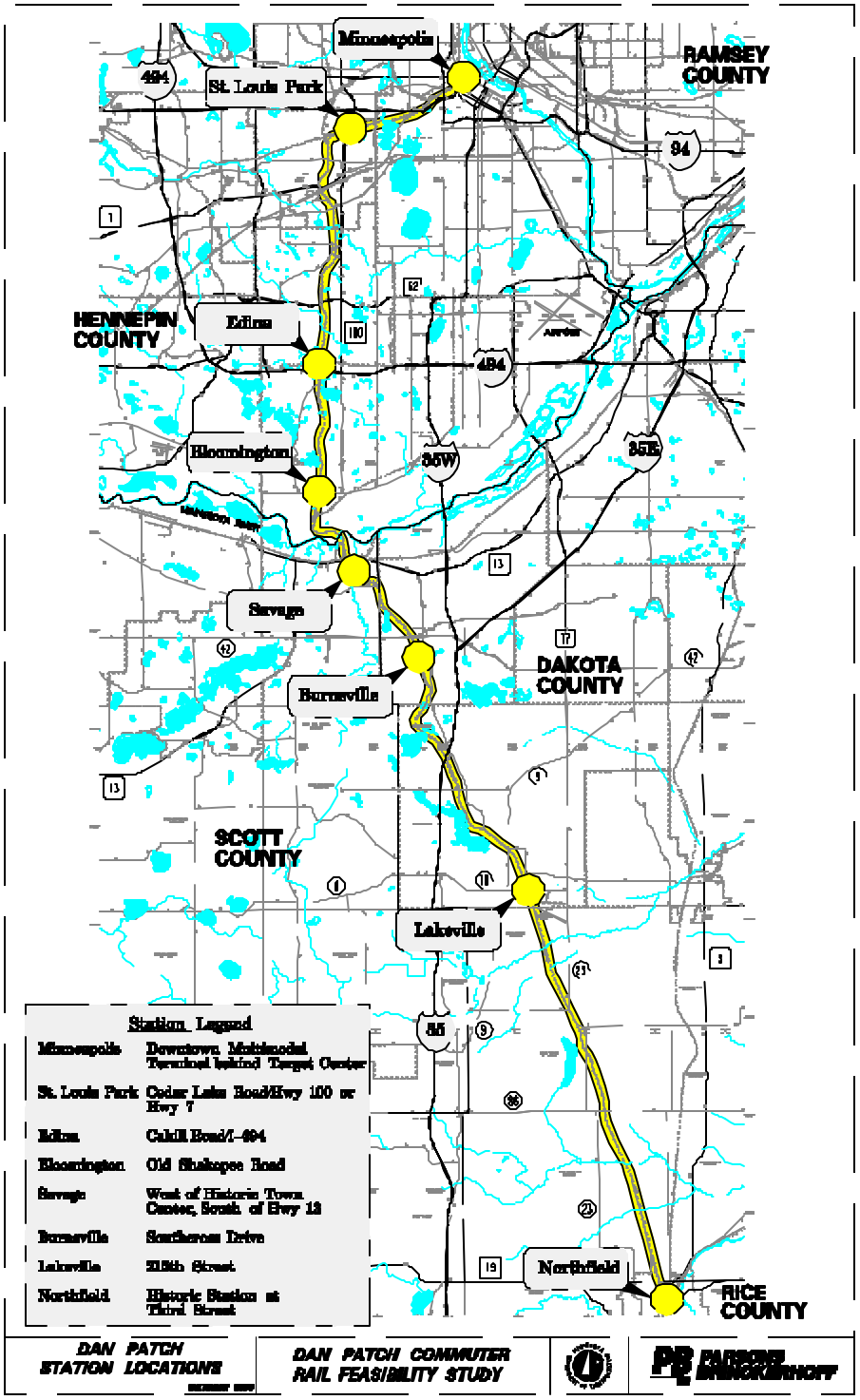
The work was also required to be consistent with the February 2000 Minnesota Department of Transportation (Mn/DOT) Commuter Rail System Plan recommendations for equipment, maintenance facilities, mitigation assumptions, and other factors.

Public Process

The work program required establishing and maintaining an open, interactive public information and involvement process. Corridor residents as well as community representatives were kept abreast of the study's work through open meetings, periodic county-wide open houses, a project website including periodic newsletters, and multiple individual meetings with corridor cities and counties.

Open Houses were publicized in news releases, direct mailings by the cities in some cases to nearby residents, in county and city news organs, and on the project website (www.danpatchcorridor.com). In addition to the public open houses, individual meetings were held with each city council or planning commission as part of publicized agendas.

Figure ES: Dan Patch Corridor Map



FINDINGS

The 100-plus-year-old Dan Patch line, owned primarily by the Canadian Pacific Railway, has been very lightly used, and at very low speeds, for many years. Re-introducing (rail corridor carried passenger traffic from 1910 – 1942) passenger rail transit service in the existing railroad corridor is technically feasible. However, corridor communities have serious concerns regarding the livability of neighborhoods and recreational facilities adjacent to the rail line, should passenger service be implemented. While the existing research on this issue was summarized and presented in the Feasibility Study, corridor communities expressed a strong wish for new information specifically comparable to the Dan Patch corridor. Further studies are needed to evaluate and address the community concerns raised through the Dan Patch Commuter Rail Feasibility Study.

Technical Findings

Findings on the technical feasibility of implementing passenger rail transit service in the Dan Patch railroad corridor are summarized below.

- Assumptions for service made for this study indicate fourteen trains/day (each train is defined as 4 to 5 passenger cars and a locomotive), running only in morning and afternoon weekday peak periods, would carry 7,500 trips/day on the 44-mile line. Of the 14 trains, 12 would run to downtown Minneapolis in the morning, and from downtown in the afternoon. Two trains, one each in the morning and afternoon, would run in the reverse direction.

- Existing railroad right-of-way is adequate to accommodate both planned freight and proposed passenger service (14 trains/day) on a single track, the existing condition.

  – Corridor right-of-way varies in width from approximately 60 to 150 feet. Most of the corridor is single track, with multiple track sections located in some industrial segments of the corridor.

  – Sections of double or passing track would be required at various locations throughout the corridor to accommodate both types of service. These sections, totaling approximately 10 miles of needed passing sidings, could be accommodated within existing railroad right-of-way.

  – Additional right-of-way would be required at stations, primarily to provide park and ride lots and dedicated bus and rider drop-off space. The amount of land needed at stations varies, depending on parking demand and local geography.

- The line would require complete rebuilding, for an estimated capital cost of $441 million in year 2010 dollars, $461 million with environmental contingency included.

  – Landscaped soundwalls for the developed portion of the corridor without desirable views to natural amenities would cost an estimated additional $20 million in year 2010 dollars.[1] Including this item results in the $461 million total.

  – There are 1662 residential parcels adjacent to the railroad tracks between Minneapolis and Northfield. Of those, 1171 are currently developed. The present value of all 1662 residential parcels adjacent to the line is $240 million. Property costs were provided by

[1] Mn/DOT will provide mitigation where state and/or Federal noise standards are exceeded. This line item has been included as a placeholder, should sound mitigation be required. This would include noise mitigation if testing indicated noise mitigation were required.

the cities. The State Legislature considered a bill in the spring of 2001 that would require acquisition of all residential property within 100 feet of the railroad right-of-way. Acquiring all residential property within 100 feet of the right of way line in the corridor is an unknown cost.

- Before fare revenue is deducted, operating and maintaining the service would cost an estimated $11.7 million annually in year 2010 dollars.

  - Fares could be expected to reduce the operating and maintenance cost to an estimated $3.3 million net annual subsidy in year 2010 dollars.

- Assuming federal funds cover 50% of the capital cost, the annual non-federal cost to construct, operate, and maintain commuter rail service over 20 years, starting in 2010, is estimated at $22.5 to $23.4 million in year 2010 dollars. This assumes the total capital cost is spread out equally over the 20-year period, and added to the annual net operating and maintenance cost.

  - Subsidy per ride is approximately $12 in Year 2010 dollars. Current Minnesota Valley Transit Authority express bus service averages a subsidy of $3.75 per ride in year 2000 dollars. Brought to 2010 at 4% inflation per year, the current bus subsidy would equal approximately $5.50 per ride in 2010.

- Station locations were identified in collaboration with the cities and approved by the cities as assumptions for this study. The station locations selected, sized as indicated by the travel demand projections conducted for this study, do not adversely impact the natural environmental features of the corridor such as lakes, creeks, and wetlands. However, locations within the railroad right-of-way where passing sidings will be needed will require future evaluation. Detailed environmental study of these areas should follow updated freight service modeling for the 2010-2020 period, to finalize the anticipated siding locations.

- An inventory of physical environmental constraints indicates the presence of:

  - 239 potential or known hazardous material sites within one-half mile of the corridor. Some of these may already be remediated.

  - 909 wetlands, ranging in size from the Minnesota River to drainage ditches within one-half mile of the corridor.

  - 340 community facilities such as schools, churches, parks and public buildings within one mile of the corridor.

FINDINGS FROM PUBLIC PARTICIPATION

Over 2,300 people attended 24 different city council, county board, neighborhood, and community organization meetings and public open houses. Of the approximately 600 people who attended the five open houses and commented on the project, approximately 70% opposed the project. Approximately 30% supported the implementation of commuter rail in the Dan Patch Corridor.

A tally of comments submitted is included as an attachment to this document. Issues reflected in the comments are summarized below.

- Degradation in the character, value and livability of adjacent residential property. Specific concerns include:

  - Increased freight rail activity should the track be upgraded to facilitate passenger transportation. Concerns include the type of freight (hazardous materials), faster, louder, heavier, and/or longer trains.

  - Increased noise, vibration damage to adjacent homes, and air pollution from more frequent activity on the track.

  - Increased traffic through neighborhoods for station access. Parking likely to spill over onto neighborhood streets.

  - Reduced safety for neighborhood residents, particularly children and pets.

  - Impact on property values. Existing research is believed to be insufficient and not relevant to the Dan Patch corridor. Specifically:

    - Acquisition of adjacent residential property should be included as a bona fide project cost, and should not be considered "optional".

    - Cost of landscaped sound barriers should also be included as a bona fide project mitigation cost and should not be considered "optional".

  - Negative impacts on natural amenities adjacent to the corridor.

- Inefficient use of public funding. Specific opinions expressed include:

  - Projected ridership is not sufficient to warrant the expenditure of public dollars. Ridership projections should be based on an actual survey of residents.

  - Improvements should made to existing regional highways, which all would use, rather than transit, which few would use. Public transit may be desirable in other cities, but is not used heavily here.

  - Assumptions are based on most people working downtown, when trends indicate the opposite is occurring.

  - Likely to end up pulling people off buses rather than from cars.

- Wrong location for a major transportation improvement. (See comment above.)

  - If rail transit must be added, it should be added within existing freeways, such as I-35W and TH 100.

  - Such a facility only benefits those at the end of the line, at the expense of those living closer to work. Hennepin County neighborhoods should not have to accommodate Dakota County travelers.

RECOMMENDATIONS

Although implementing passenger rail transit service in the Dan Patch corridor is physically possible, the real and perceived adverse impacts to adjoining land uses and the cost of improving the right-of-way and operating the system make corridor improvements impractical at the present time. Mn/DOT, the Metropolitan Council and the cities and counties within the Dan Patch corridor should first explore and promote other transit and transportation improvements.

Specific recommendations for future opportunities, evaluations and actions are described below.

Explore and Promote Other Transit Opportunities

- Re-evaluate needed high-capacity transit modes, facilities and locations following construction and operation of the Cedar Avenue Transitway, Southwest and/or Northwest Busways, and other major transit facilities planned for implementation over the next ten years.

- Seamless, multimodal transportation connections will be necessary to get people to employment. Each corridor city and the Metropolitan Council should consider developing/supporting local city and/or county circulator transit service between major employment centers and major transit nodes such as park and ride lots, bus hubs, and other current and future transit enhancements.

- County and municipal comprehensive plans should address future transit facility and service linkage with other modes, including pedestrian/bike trails. Facilities may be designed and constructed for buses in the near future, with potential future conversion to rail transit along identified corridors.

Evaluate Commuter Rail

- The Metropolitan Council Transit 2020 Master Plan identifies the Dan Patch corridor for potential development during the later half of the 2000-2020 timeframe, following Northstar and Red Rock implementation. Those two corridors are planned to be operating by 2010. Prior to pursuing the Dan Patch line, the results of the Northstar and Red Rock lines should be evaluated. Their performance and community impacts should be reported before proceeding with further technical work or environmental study on the Dan Patch corridor. Environmental evaluation of the corridor at this point would be premature, and the results outdated, for a corridor not scheduled until after 2010.

- Once Northstar and Red Rock commuter rail service is operational for one year, conduct a statistically-valid survey of Dan Patch corridor residents within the defined corridor area to determine their propensity to use a similar service.

- The current passenger rail service coordinating committee, the LRT Joint Powers Board, should continue to update all the counties with candidate railroad corridors. Updates should address the proposed bill in Congress to require more cooperation between freight and passenger rail interests.

- Investigate the impact of commuter (not light) rail transit on property values, and mitigation for potential negative impacts as well. The University of Minnesota Center for Transportation Studies (CTS) should be retained to conduct a study of comparable new rail lines such as Seattle, San Diego, and/or Dallas, to document the impact of commuter rail transit on adjacent property values.

    - Such a study should address comparable situations where existing rail lines both are and are not used for freight service.

    - Corridor communities, counties and Mn/DOT should seek funding for such a study.

Keep Public Informed

- Notify interested city officials and citizens of the conclusions of this Dan Patch Study as it completes the Feasibility Study process.

- Notify interested city officials and citizens if/when the project proceeds to a future phase of study.

Future Action

- Each corridor city should conduct land use planning for the areas around existing and proposed multimodal facilities including park and ride lots, bus hubs, and potential future rail station sites. Planning should coordinate comprehensive, traffic/transportation, economic development and residential goals for each city. Municipal planning efforts should address parking and overall traffic impacts on local and cross streets as well as access to the regional road system.

- In the future, when/if Northstar and Red Rock commuter rail service is implemented and deemed to be successful, and the region continues to develop other corridors, consider resuming study on the Dan Patch corridor, including cost/benefit analysis. The work undertaken should specifically focus on developing detailed information on community concerns raised in the current feasibility study. Other areas for study should include technical issues such as freight rail coordination, finalizing station locations and access paths and facilities, and environmental assessment of proposed station areas.

- Address overall transit service coordination with other major transit investments. Changing needs may indicate that transit corridor priorities should be reevaluated in the future, which may affect the Dan Patch corridor.

- Investigate the possibility of purchasing the line from Canadian Pacific and Twin Cities and Western (river bridge owner) for commuter rail use. The east-west connection to downtown Minneapolis is owned by BNSF, and likely would not be part of this option.

1.0 STATIONS

1.1 Location Parameters

A critical contribution that commuter rail can make is in increasing the person-carrying capacity of a travel corridor, lessening the demand for space on the highway system during peak hours. Meeting that demand drives expenditures on highway improvements, costs that escalate dramatically as space around interchanges and intersections becomes limited, as is the case already at several critical locations in the Twin Cities area. Optimum locations for stations would capture a maximum number of commuters who would otherwise drive through those heavily-used highways and intersections.

The spacing of stations along the Dan Patch alignment is influenced by opportunities for convenient access, and by the need to balance maximum ridership with minimal journey time and reasonable cost. Frequent stops might capture more riders, but every stop adds minutes to total journey time, making commuter rail less competitive with driving, and thus dissuading would-be riders. Given the characteristics of commuter trains to accelerate and decelerate, and given speed limits and other limitations of the track, minimum spacing between stations is at least two miles. There is enough flexibility in this number to make one station in each of the eight cities served by Dan Patch feasible.

1.2 Station Siting Criteria

Important determinants of the feasibility of any commuter rail line include the effectiveness of access to riders it would serve, and the impacts that service would have upon the environments and communities affected.

Factors used by the consultant team to evaluate potential station sites include the following:

- Ridership: *Would a station at this location provide useful access to substantial numbers of jobs or residents or both?*
- Access: *Is the street system, including nearby highway access, adequate to serve the station? If not, are improvements feasible?*
- Size: *Could the proposed site accommodate a long enough platform with no, or very little, curve in the rails? A platform 525 feet long is assumed; long enough to accommodate a six-car train.*
- Transit: *Could a station in this location interface with bus, LRT or shuttle vehicle service, either existing or planned?*
- Topography: *Is the track in a cut, or on an embankment that would make access difficult and expensive?*
- Parking: *Is there an opportunity to provide a large enough park-and-ride lot adjacent to the station site? Preliminary estimates of parking demand at each location add some specificity to this question.*
- Urban Fit: *Would a station in a proposed location fit harmoniously with other, established uses nearby?*
- Planned Uses: *Are there uses planned for the area that would conflict with station functions (for example, by blocking access for some potential riders)? Or might planned uses be designed cooperatively with a commuter rail station to the benefit of both?*

- Development Opportunities: *Is there developable land nearby that might be used for transit-supportive uses in the future, and does current zoning support such uses?*

- Comprehensive Plans: *Does the use of this site for a transit station conflict with or support the city's Comprehensive Plan?*

- Pedestrian Access: *All transit riders are pedestrians before and after riding the train, and many may walk to or from a final destination. Are or could pedestrian facilities be sufficient to provide safe and convenient passage for those who walk to or from the station?*

- Grade crossings: *Is there a grade crossing close to the station site? Is it gated and signalized? What hazards might it represent and what changes would be necessary if a station were located here?*

- Nearby Streets: *How would nearby streets, and in particular peak hour traffic, be affected by locating a station in this location? This is distinct from the effects of using the alignment but without a station at this location.*

- Affected Communities: *Apart from effects of the commuter line on the community as a whole, how would the specific location of a station affect those who live and work near it?*

- Train Storage and Passing: *Would train sets be stored at this station overnight or during the day? If so, what impacts would they have?*

- Special Circumstances: *Are there any special circumstances that relate to this station location that are of relevance, other than those listed above?*

1.3 Evaluation Process

Potential station locations were initially identified on the basis of known concentrations of potential users, and access to streets, transit and highways. These were discussed with city staff, both to gain a fuller understanding of the physical suitability of each site, and to understand political and social context. Sites were visited by members of the design team, and nearby alternatives were considered. The pros and cons of each were discussed with representatives of affected communities to gain fuller insight on relevant issues.

Sites were then looked at collectively, so that overlaps and gaps in service areas could be identified, and operational needs of the trains could be reviewed. Unlike light rail, commuter trains accelerate slowly, so unless stations are at least a mile apart, the train will not attain sufficient speed to make it compete effectively with auto traffic. For this reason, a generally acceptable station may have been eliminated, simply because it is too close to another, which is anticipated to command a greater ridership.

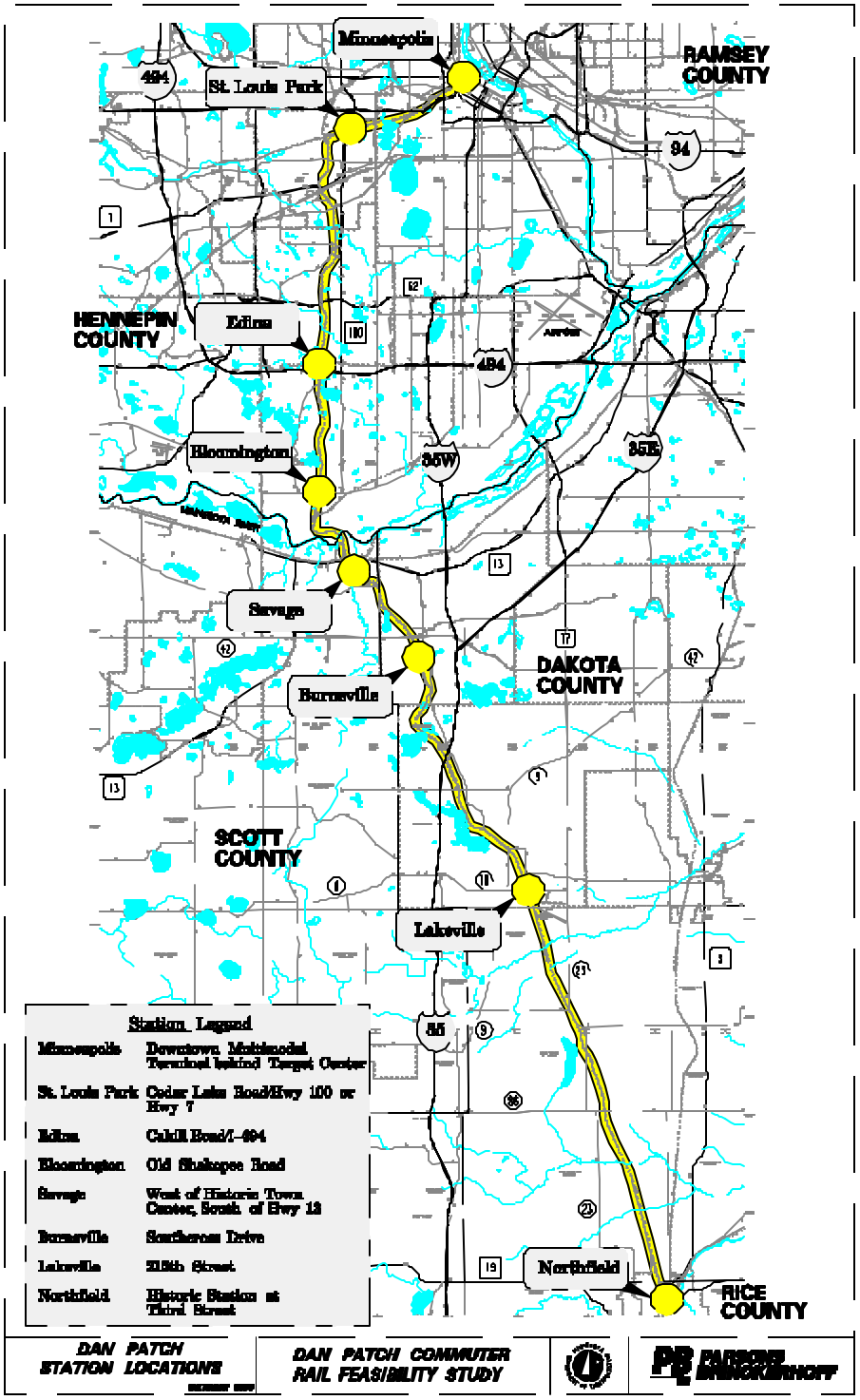
In a subsequent, more refined phase of the design process, environmental impacts at each station would be analyzed. The purpose in the feasibility study is to identify specific service elements that appear to work well, so that the Dan Patch system as a whole can be understood in sufficient detail to decide if it merits further investment in design development.

1.4 Station Locations

Station locations assumed in this feasibility study are listed below and conceptually illustrated on Figure 1-1 on the following page. Locations for feasibility analysis were approved by the communities in the corridor through their representatives on the Technical Advisory and Policy Committees.

Specific evaluations at each location are presented in the material which follows.

Figure 1-1: Proposed Station Locations



Minneapolis: The terminus station in Minneapolis is being established with the Northstar commuter rail project, and has already been located on the north edge of downtown, behind Target Center.

St. Louis Park: Two possible sites for a station were evaluated in St. Louis Park, because, while the Dan Patch alignment uses the BNSF Wayzata subdivision to enter Minneapolis, another alternative rail alignment could conceivably carry trains into Minneapolis at the north end of the corridor. This study has assumed that either proposed station location could be selected, but not both.

North: The more northerly site is on Cedar Lake Road immediately east of Highway 100. The design team has recommended that there be no park-and-ride facility at this station because of its proximity to downtown; it would be used by many to evade downtown parking fees, and would draw automobiles through highly used intersections during peak hours. The proposed station site is directly accessible from the northbound off-ramp from Highway 100. It would have good access for buses, shuttles and kiss-and-ride traffic. It is within a half mile of a major employment center to the west of Highway 100 that includes Parkdale Plaza. It would be visible from, but not directly accessible to housing to the south, being separated from it by the CP Wayzata Subdivision Mainline rail right-of-way and the Cedar Lake Trail. This alignment following the BNSF Wayzata subdivision line is consistent with that identified in Mn/DOT's Commuter Rail System Plan.

Figure 1-2: St. Louis Park North Context Map

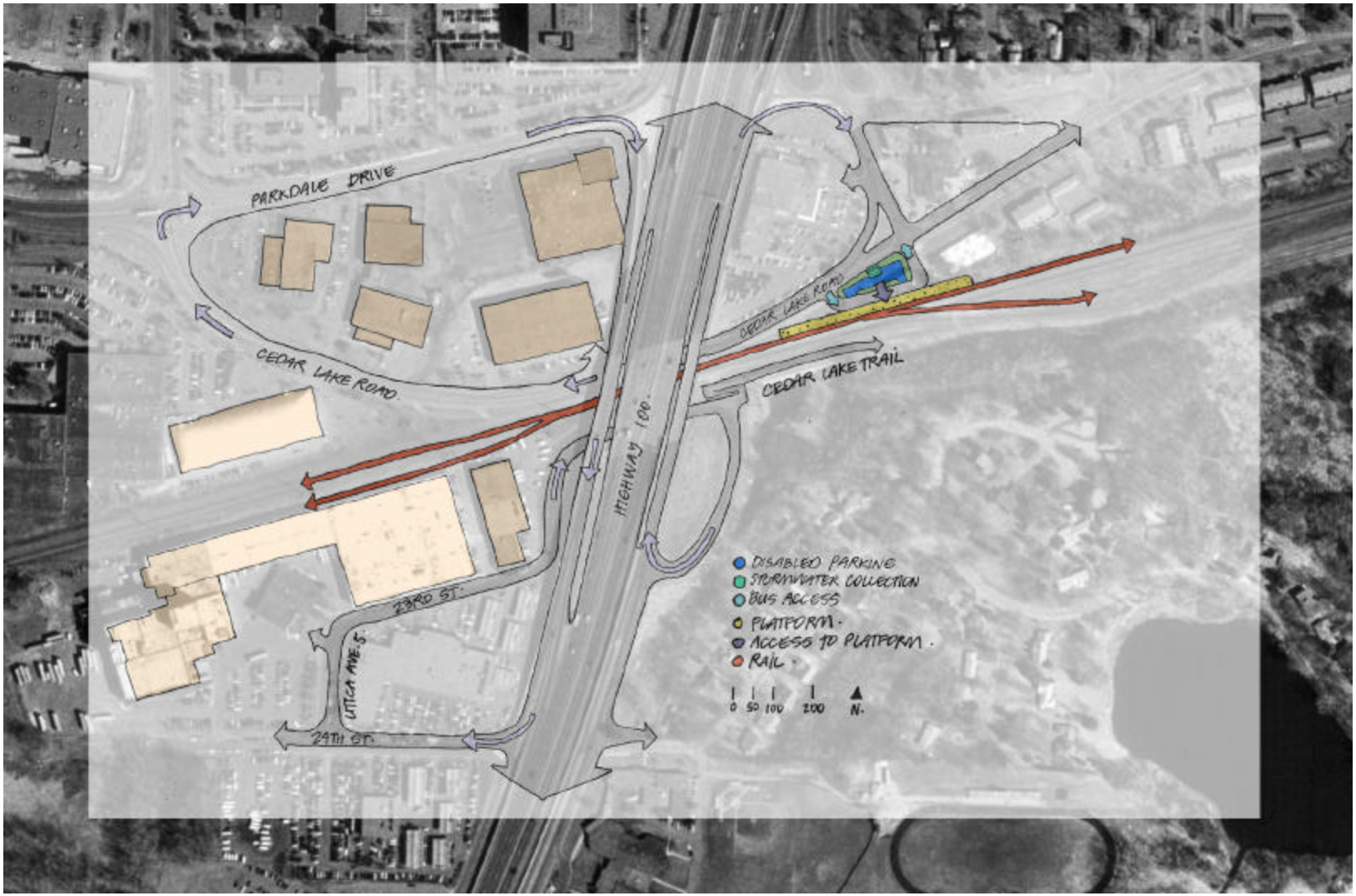


Figure 1-3: St. Louis Park North Platform Plan/Elevation

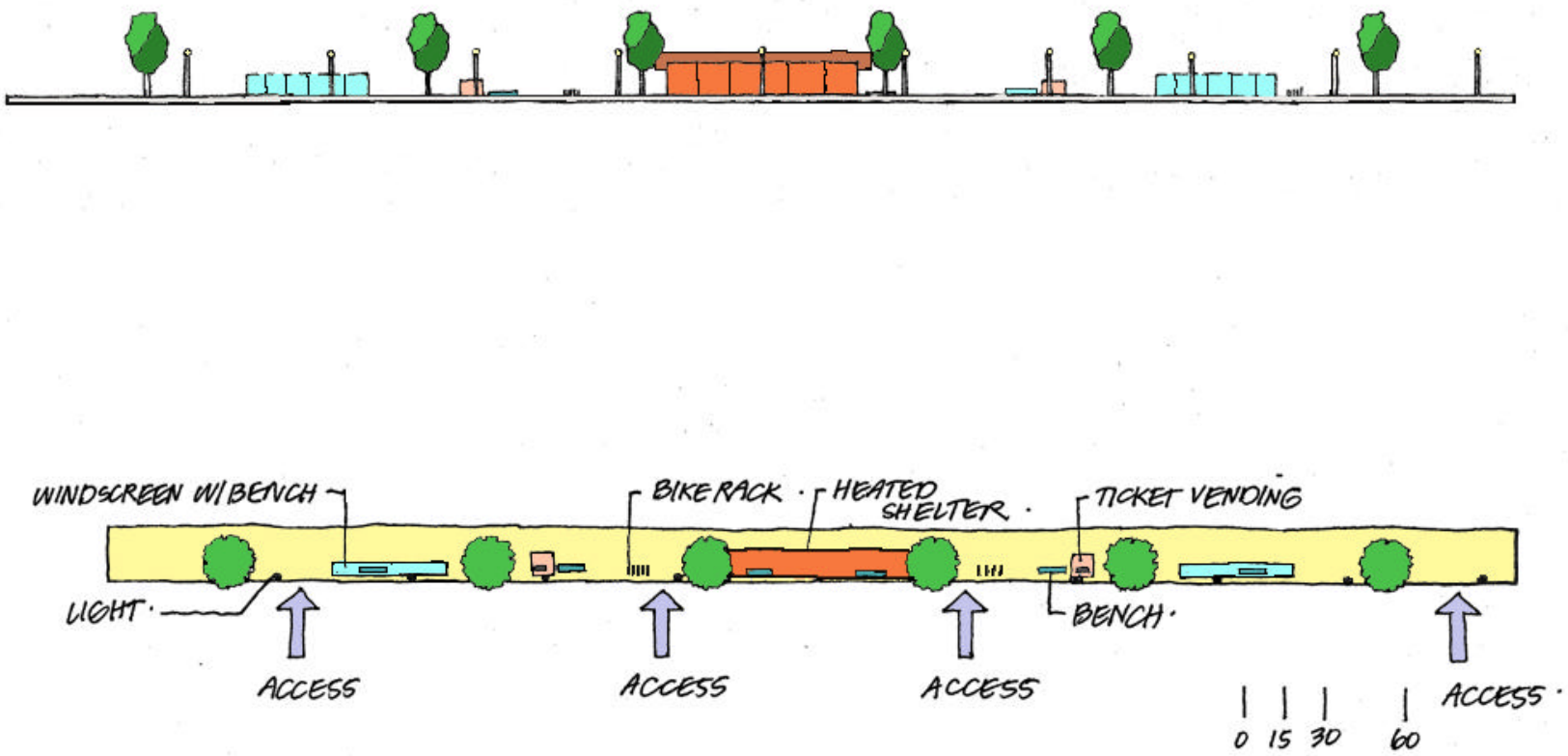
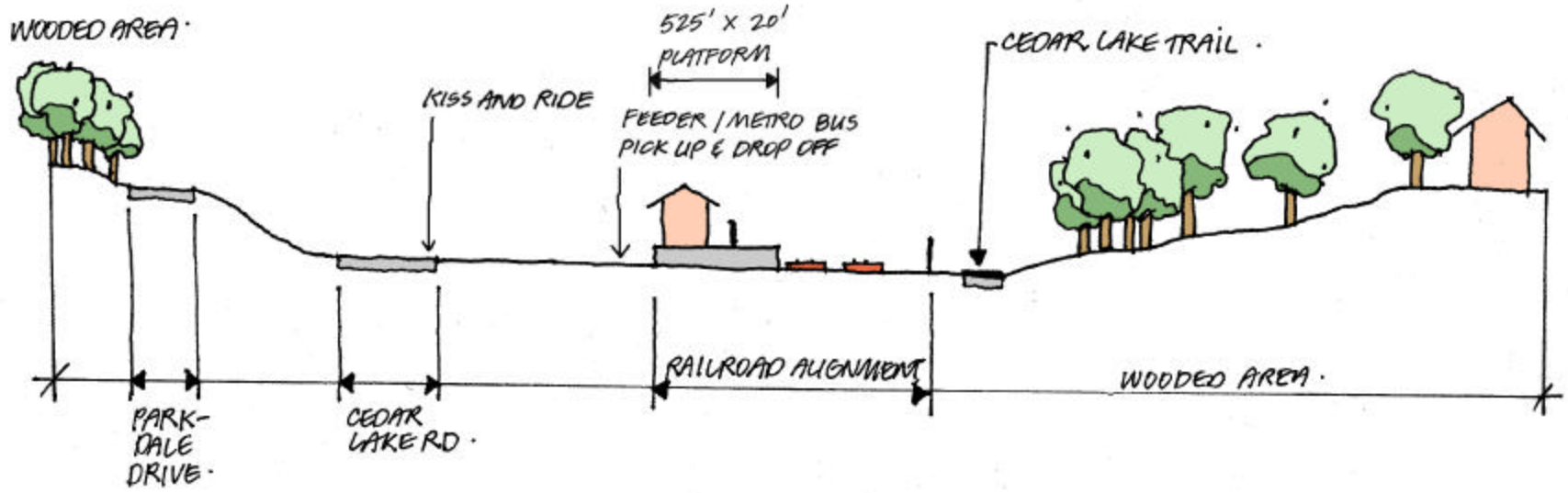


Figure 1-4: St. Louis Park North Section



St. Louis Park South: The south St. Louis station site for a station is elevated between bridges over State Highway 7 and the CP Bass Lake Spur rail right-of-way. The platform would be accessible to pedestrians from the north and south using those bridges. Passengers transferring from Highway 7 would use stairs or an elevator to reach the north end of the platform. Because of its height above adjacent buildings, the platform would be exposed to the weather, yet would be relatively invisible from the streets below. However, it would be well placed for passengers transferring between commuter rail and a planned LRT/BRT alignment in the mainline rail right-of-way. A west to north rail connection may be constructed to the west of the station site, connecting to the Dan Patch tracks at the north end of the platform. This dictates that the platform should be on the east side of the tracks, and be located south of the planned point of connection. Between this possible rail connection and Hampshire Avenue is an electricity sub-station that may be extended to the south. Despite the potential for interchange with busway or commuter rail at this location, other key criteria, including visibility, passenger comfort, easy access and operational flexibility could less easily be met at this location, given the many physical constraints to station design.

Figure 1-5: St. Louis Park South Context Map

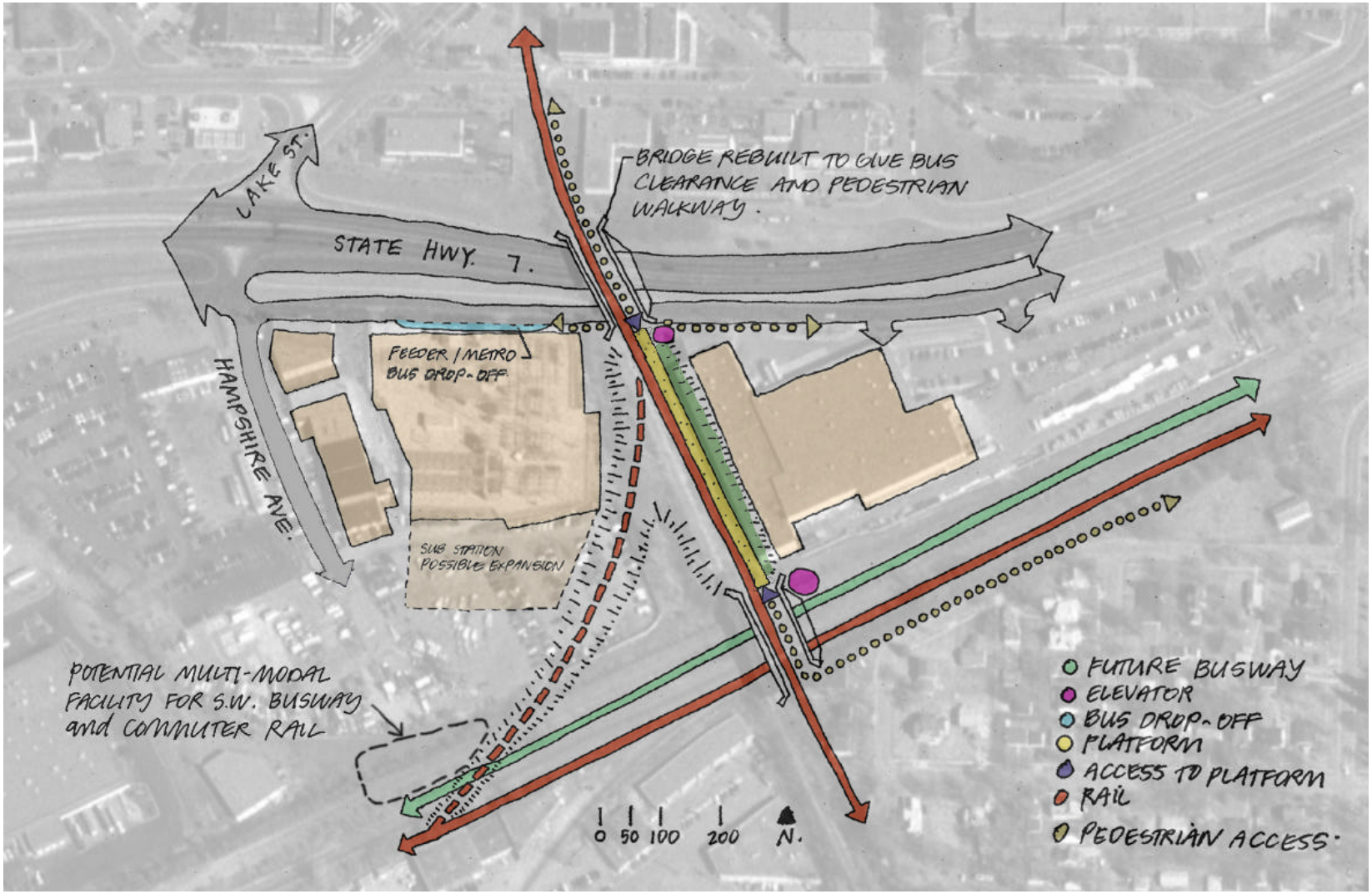


Figure 1-6: St. Louis Park South, Platform Plan/Elevation

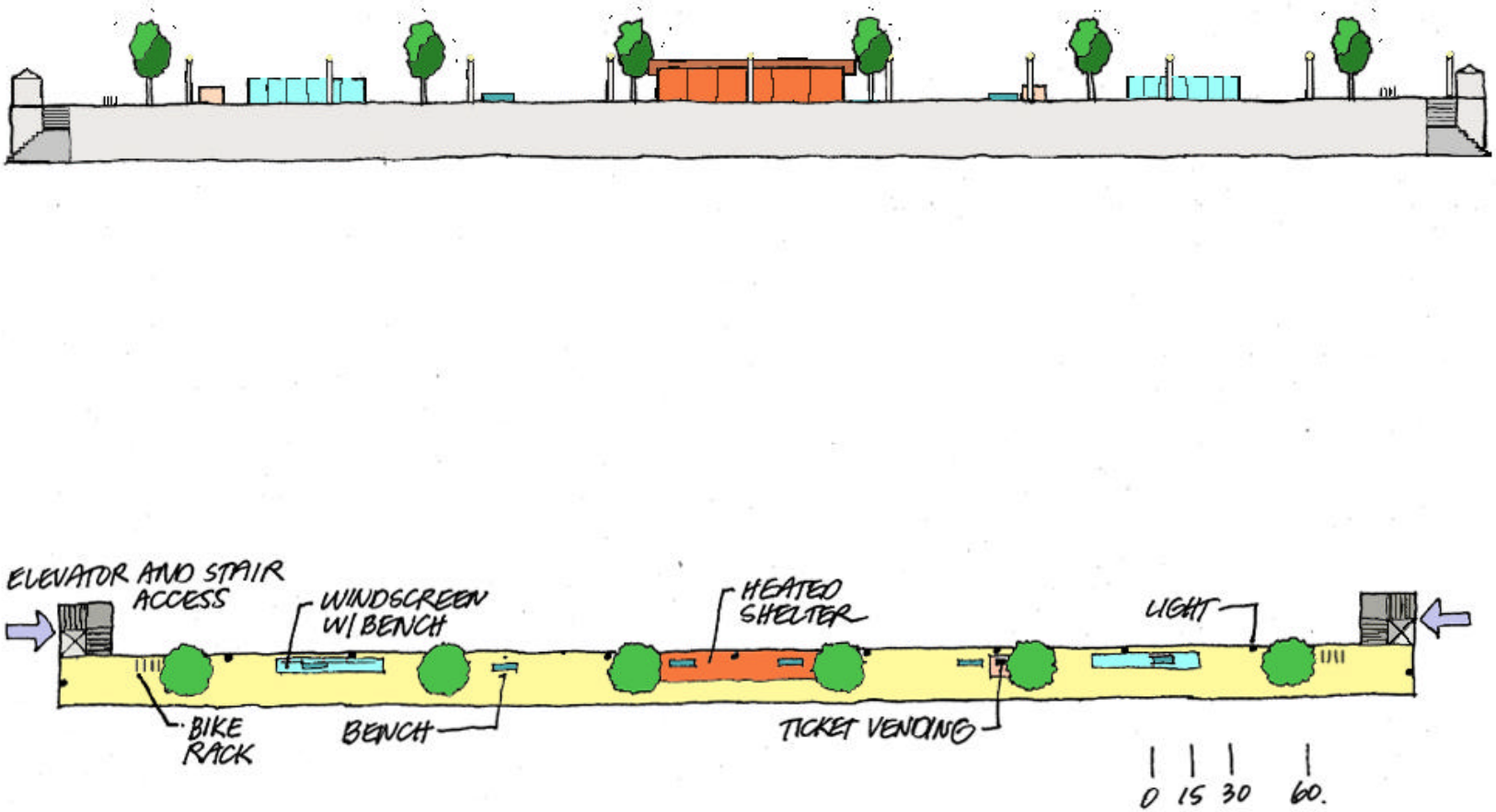
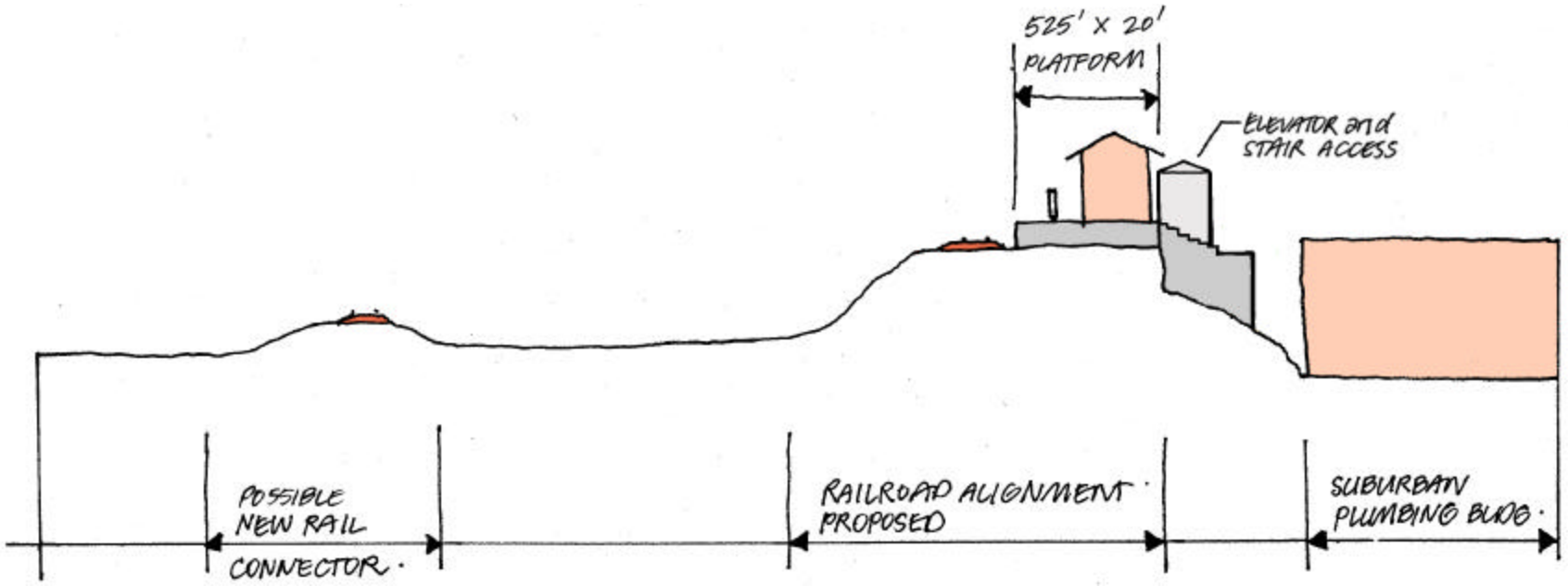


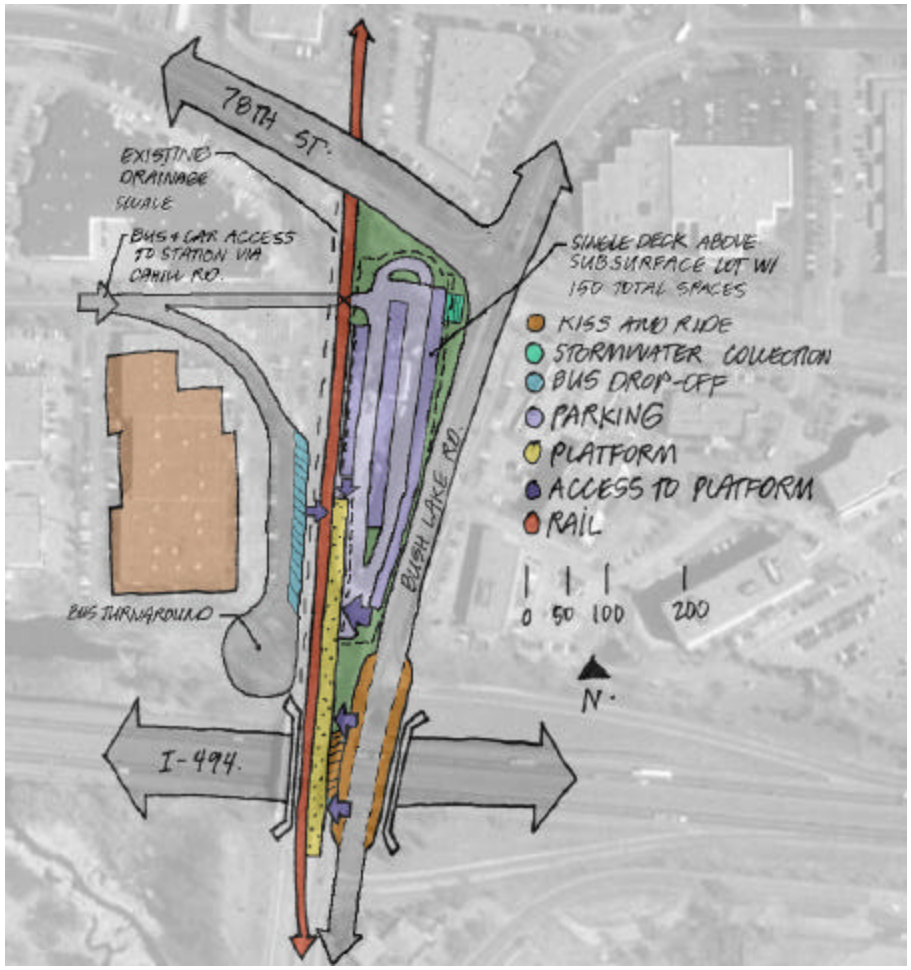
Figure 1-7: St. Louis Park South Section



Edina-North Bloomington: A station on the boundary between Bloomington and Edina where the Dan Patch line crosses the I-494 freeway would serve riders in both cities. Since approving this location for study purposes, both cities have determined that this station may have to be relocated, or access to it changed to 78th Street. Bridges over the freeway carrying Dan Patch tracks and Bush Lake Road are to be totally reconstructed with the 2003 I-494 Third Lane Project. A single structure carrying them over the freeway could incorporate part of a 525' long platform with access directly from West 78th Street. Buses, shuttle vehicles and automobiles could use a new access path from 78th Street to pick up and drop off passengers adjacent to the platform. A projected 150 park-and-ride patrons would use a two-level parking ramp immediately north of the station with an accessible route leading directly onto the platform. A grade crossing of the tracks to give direct pedestrian access to the business park immediately to the west is possible. Few other walk-in riders are anticipated at this station. It is suggested that the existing shuttle bus system that serves the business park to the northeast would be extended to include the station during commuter rail hours. Similar shuttle service could serve major population concentrations in north Bloomington.

Since this Dan Patch station location was identified, the cities of Bloomington and Edina determined that this location should be reevaluated. While proximity to the significant employment concentration on both sides of I-494 still argues in favor of a station in this vicinity, the physical space remaining and access to station platforms will need to be reassessed following the extensive reconstruction of the I-494 interchange area.

Figure 1-8: Edina/North Bloomington Context Map



Note:

1) This station location and access will require reconsideration following the reconstruction of the I-494/East Bush Lake Road/CP Rail bridge interchange area.
2) Bus and car entry via access drive is shown diagrammatically. Existing rights-of-way are not currently known.
3) Signalized crossings will need to be implemented for pedestrian crossing and car access to park and ride structure.

Figure 1-9: Edina/North Bloomington Platform Plan/Elevation

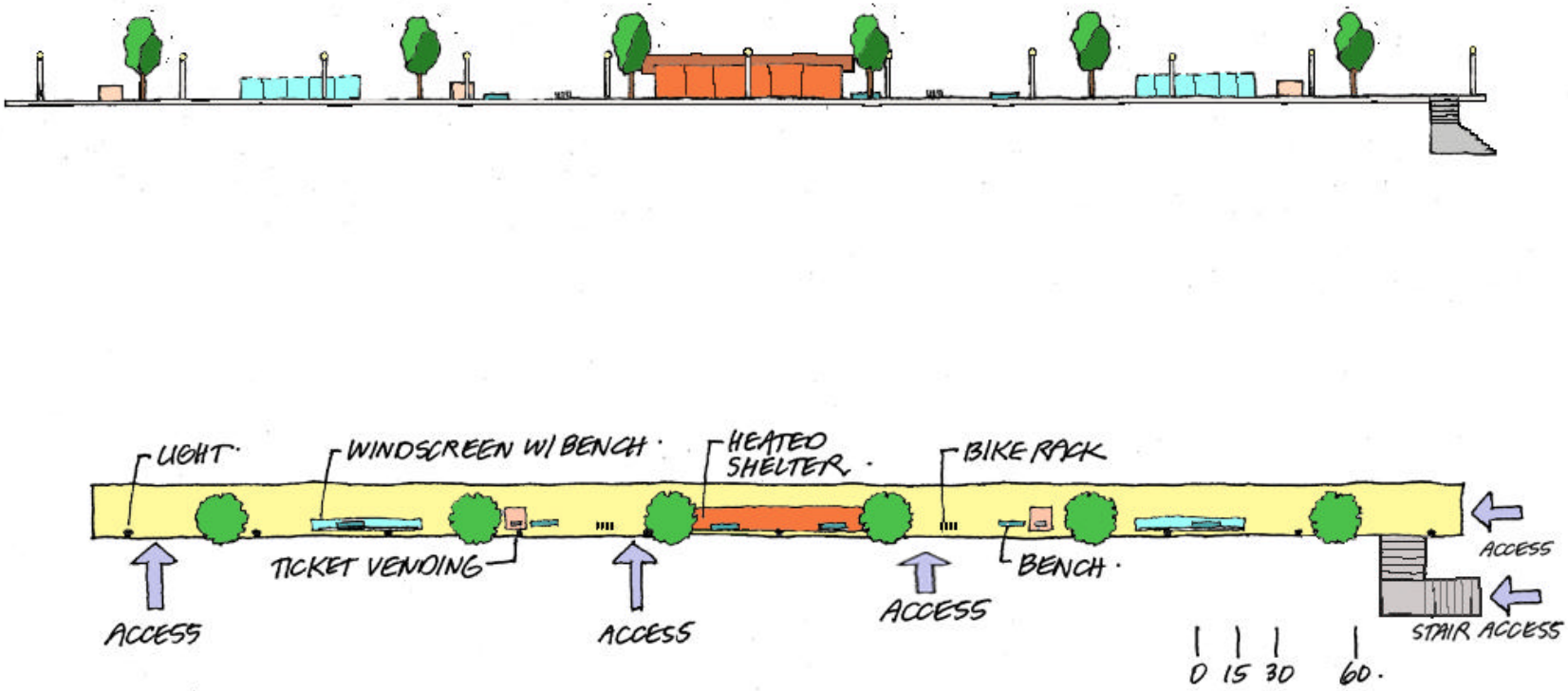
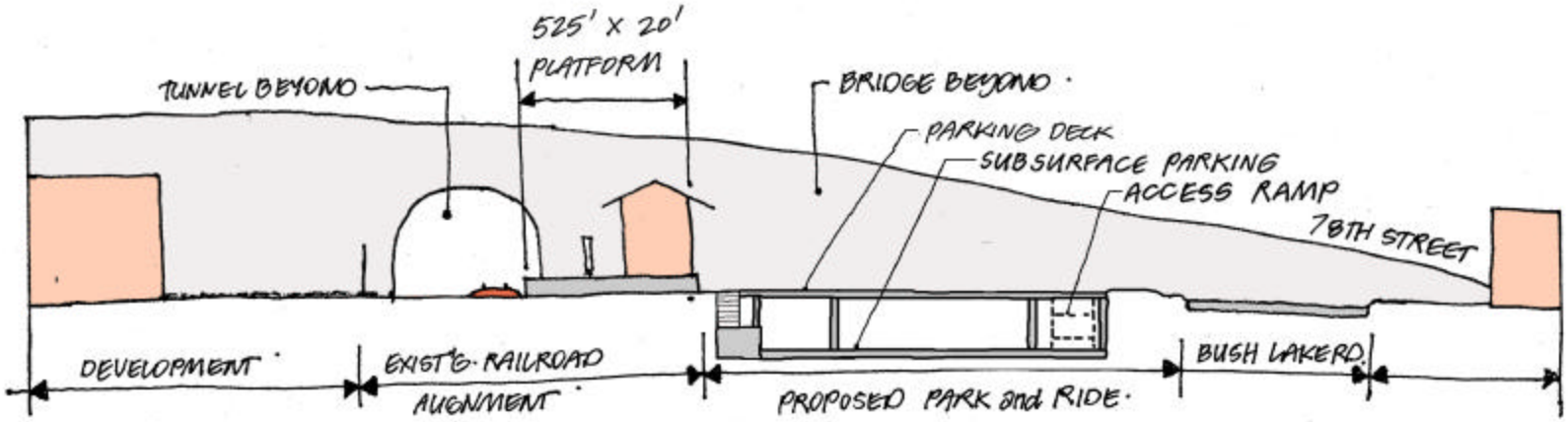


Figure 1-10: Edina/North Bloomington Section



South Bloomington: Where the Dan Patch tracks cross Old Shakopee Road, there is a concentration of light industrial development, and opportunities for siting a station are limited. However, immediately north of Old Shakopee Road is a strip of land along the west side of the tracks large enough to accommodate the platform and parking for the projected 130 park-and-ride spaces. Separate access to Hampshire Avenue from the north end of the station would relieve access demands at Old Shakopee Road adjacent to the track grade crossing. Passenger drop-off and pick-up by buses, shuttles and cars would occur on both sides of Old Shakopee Road in extra lanes constructed for that purpose. A signalized crossing just east of the tracks would provide safe passage for pedestrians.

Figure 1-11: Bloomington South Context Map

Figure 1-12: Bloomington South Platform Plan/Elevation

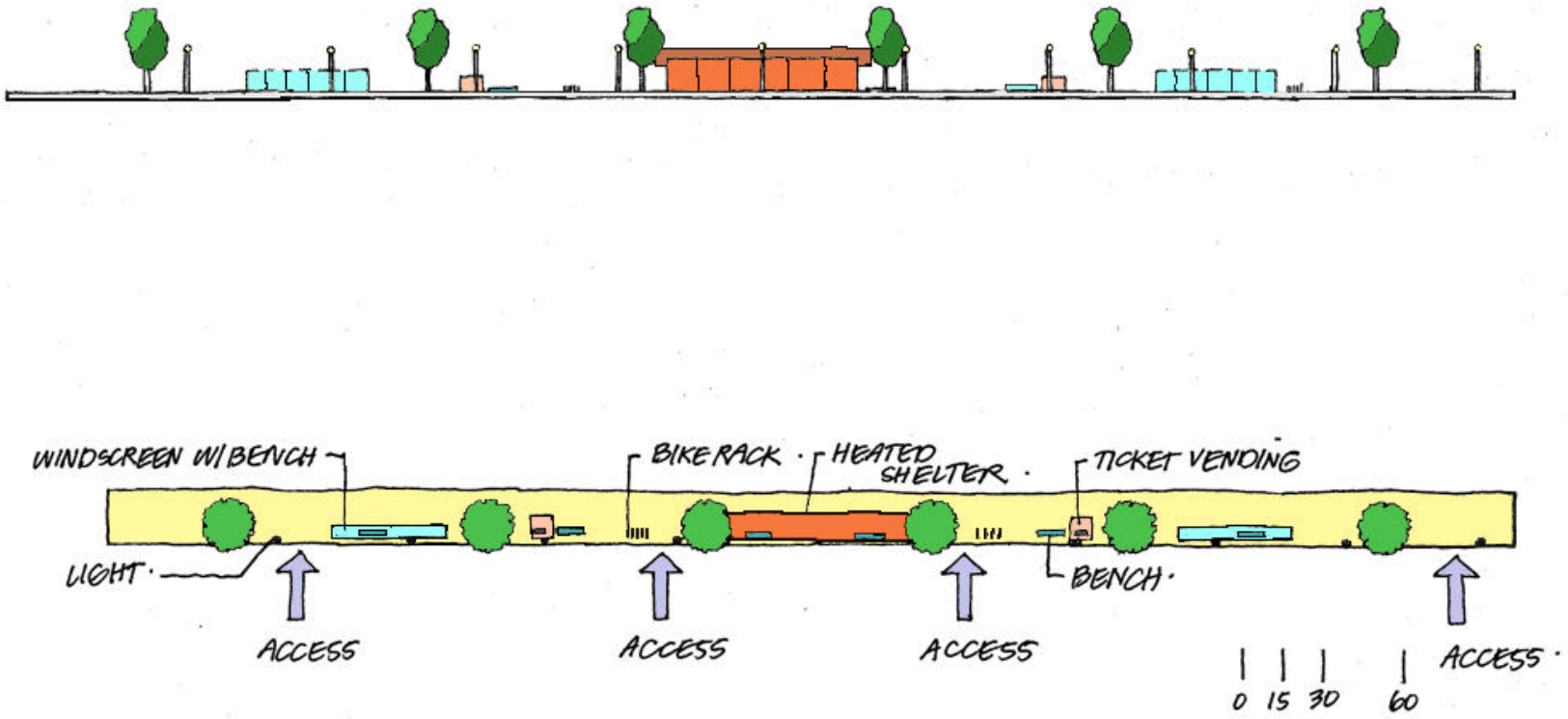
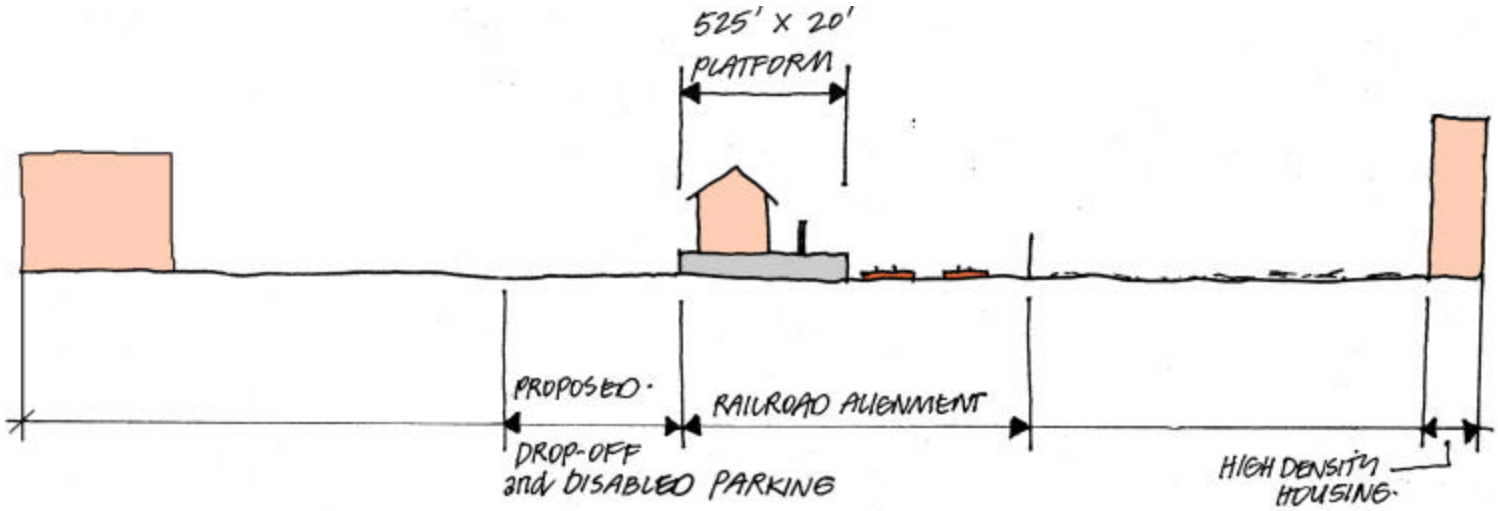


Figure 1-13: Bloomington South Section



Savage: The revitalized historic town center of Savage, the Hamilton District and one-time home of the world-famous pacer Dan Patch, is a quarter mile east of the station site, and is expected to grow towards it along the recently extended 123rd Street. This new street connects to the existing frontage road on the south side of Highway 13 west of the station. After crossing Highway 13 on a viaduct, the Dan Patch line follows a slow incline, curving to the southeast. It is on this slight curve that the station would be sited, with the north end of the platform at 123rd Street, accessible by stairs and an elevator. The south end of the platform would be less high above the ground, and would be reached by stairs and an accessible ramp. Land west of the platform, south of 123rd Street and east of Xenwood Ave. would accommodate a park-and-ride lot for the projected 430 parking spaces that would be needed. Drop-off and pick-up for passengers would be adjacent to the platform, and on the adjacent streets.

Figure 1-14: Savage Context Map

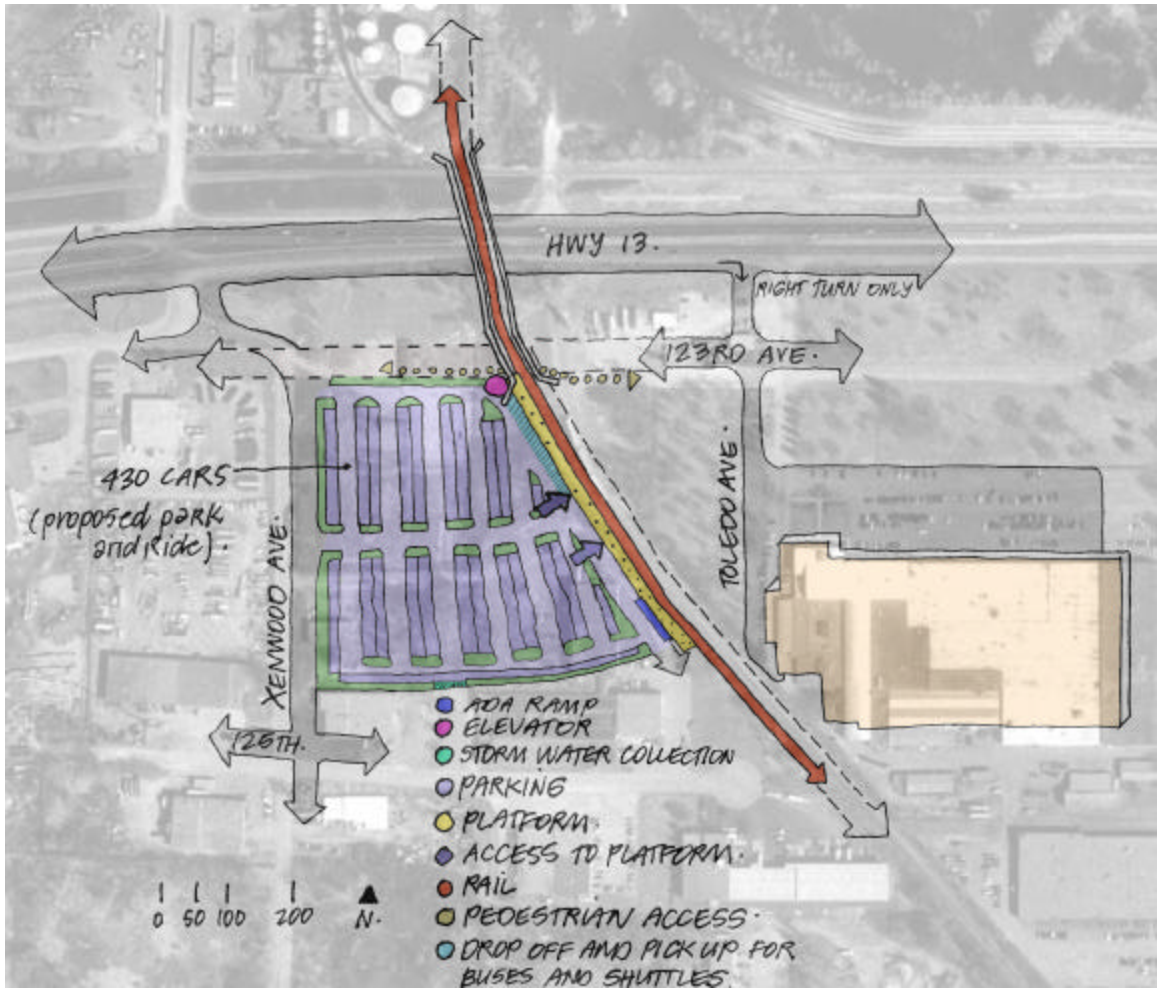


Figure 1-15: Savage Platform Plan/Elevation

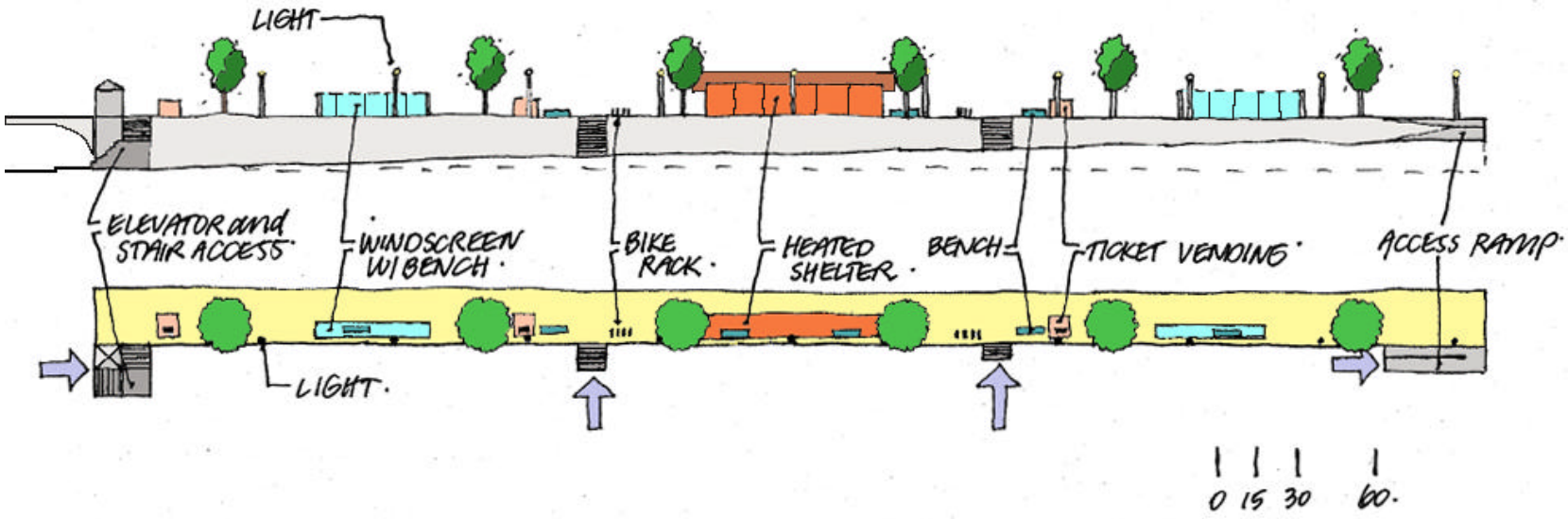
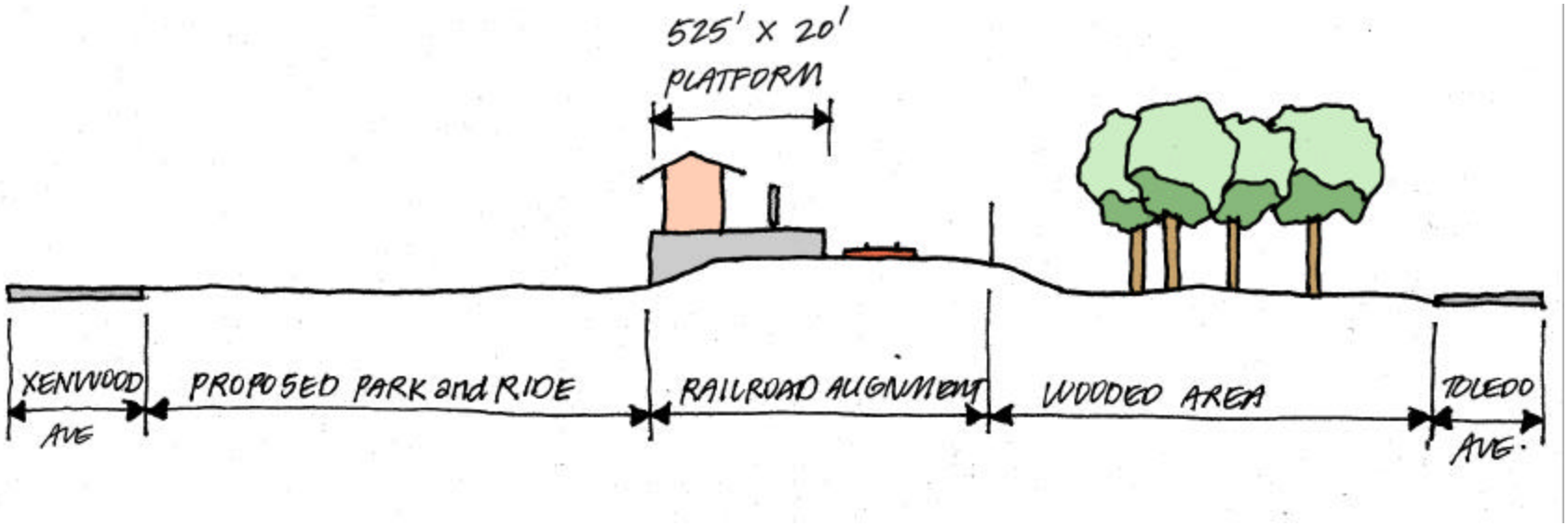


Figure 1-16: Savage Section



Burnsville: At the intersection of Southcross Drive and Judicial Road is a large tract of under-developed land adjacent to the Dan Patch alignment. Although it is near concentrations of single- and multi-family homes, its immediate neighbor is a waste transfer facility, which makes the site in question unattractive to many potential users. However, this irregular tract is large enough to accommodate what is predicted to be the line's busiest park-and-ride facility, with 1210 spaces. Buses, shuttles and cars dropping off and picking up passengers would circulate through the lot to a designated area immediately adjacent to the platform. The platform would be slightly elevated above the parking lot, with ramps and stairs providing access at three locations along the 525' long platform. All access would be off Judicial Road for optimum distribution, and to minimize conflicts with peak hour traffic on Southcross Drive.

Figure 1-17: Burnsville Context Map

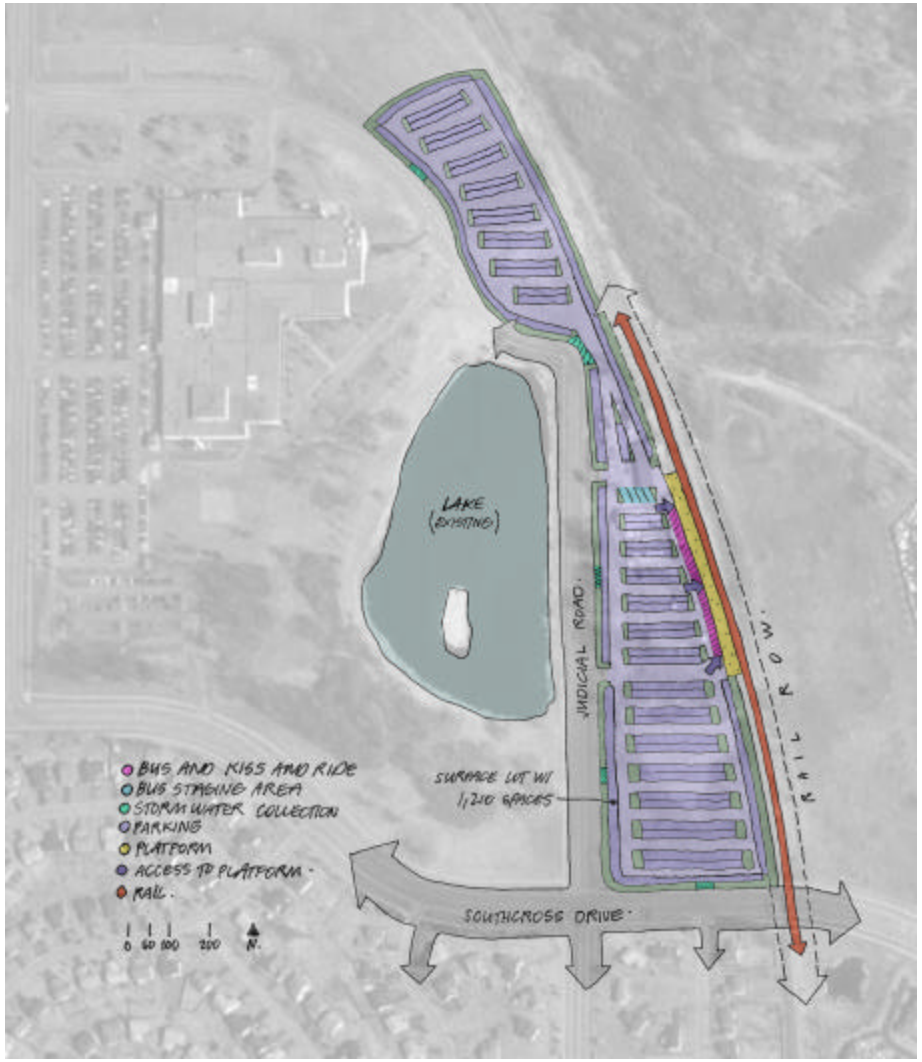


Figure 1-18: Burnsville Platform Plan/Elevation

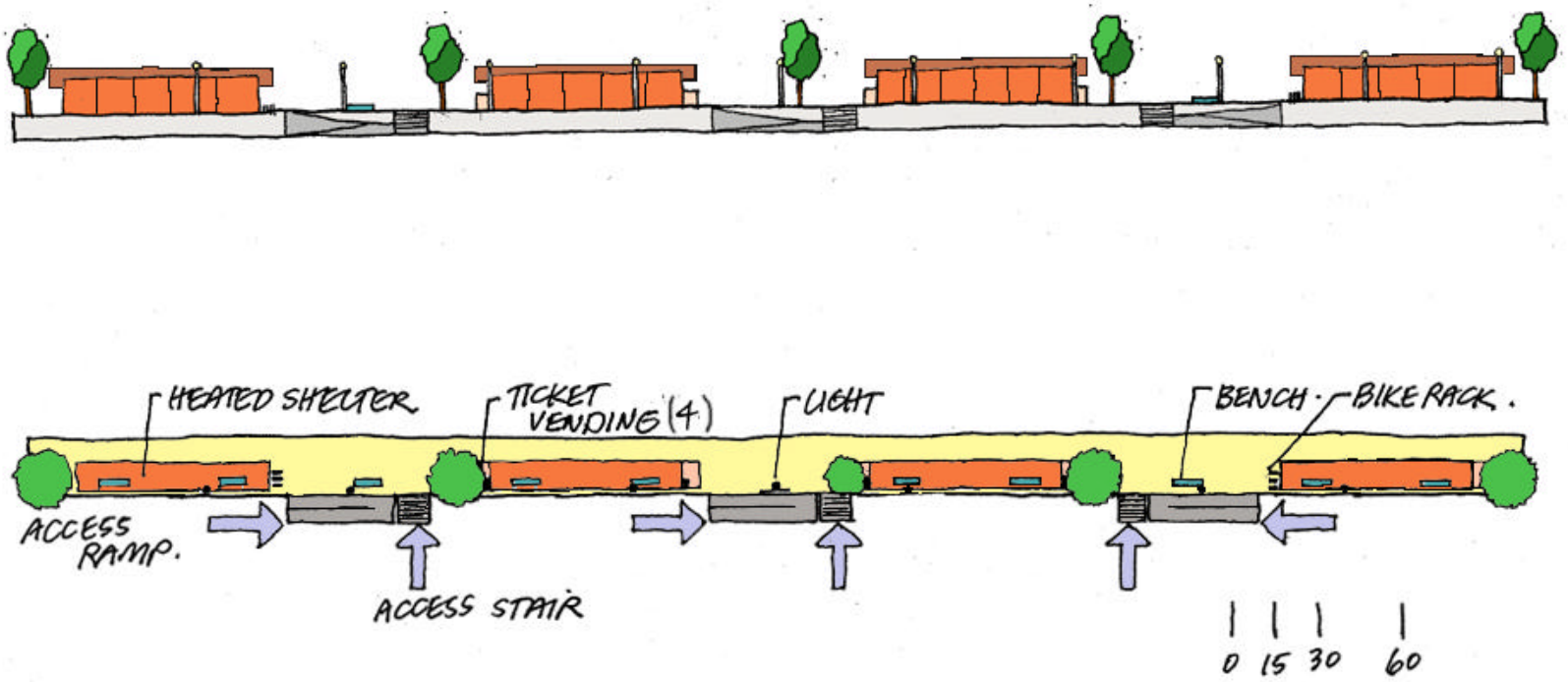
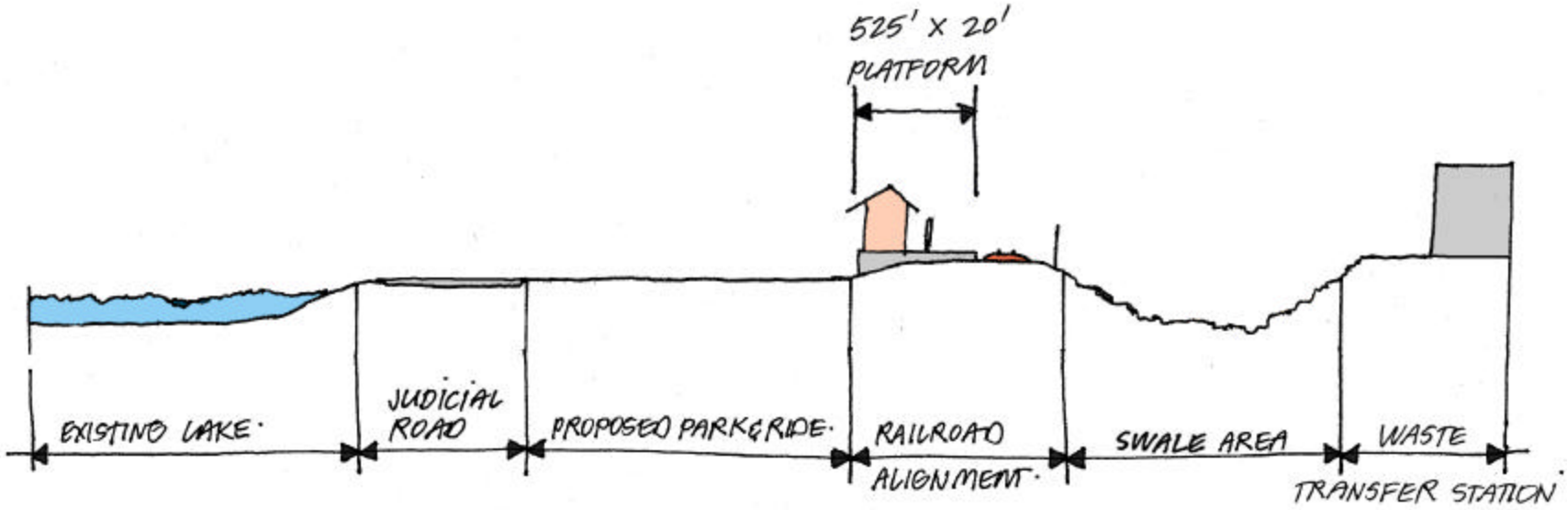


Figure 1-19: Burnsville Section



Lakeville: The Dan Patch alignment forms a triangle with 215th Street and Holyoke Avenue in south Lakeville, across the tracks from McGuire Junior High School and a soccer park. This undeveloped tract is large enough to accommodate the commuter rail station and a projected 250 park-and-ride space lot. All access to the station would be from Holyoke Ave., with buses, shuttles and cars crossing the lot to pick up and drop off passengers at the platform. The platform would be approximately level with the parking lot, making special access arrangements unnecessary.

Figure 1-20: Lakeville Context Map

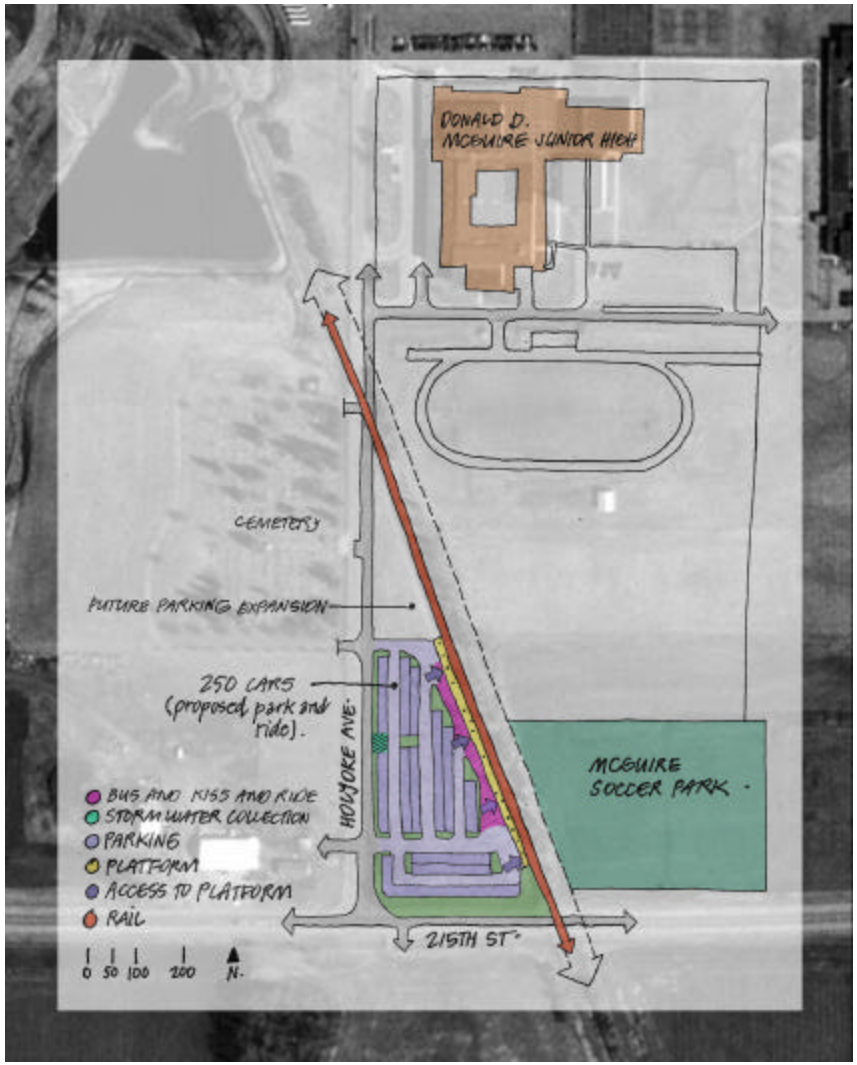


Figure 1-21: Lakeville Platform Plan/Elevation

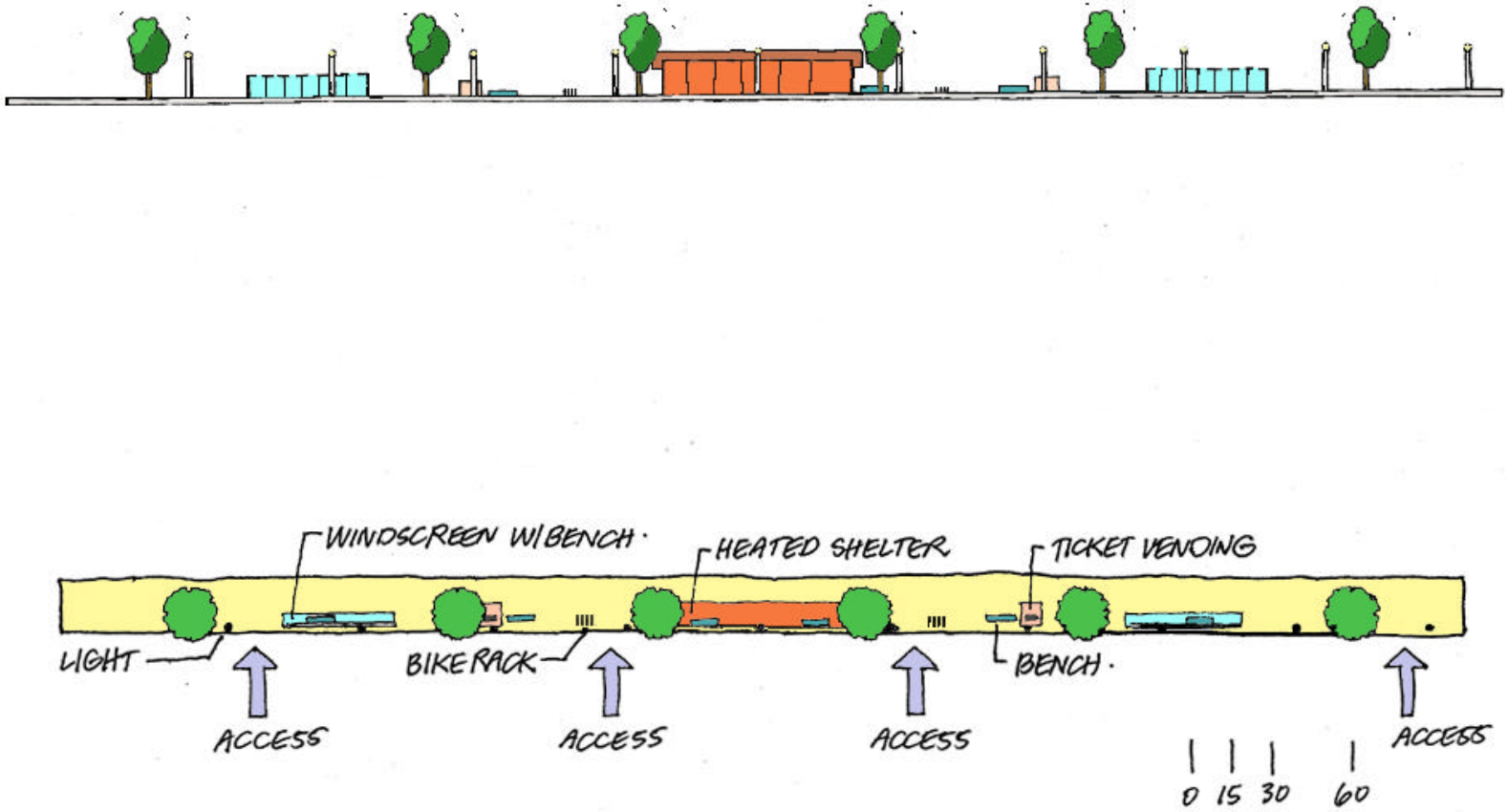
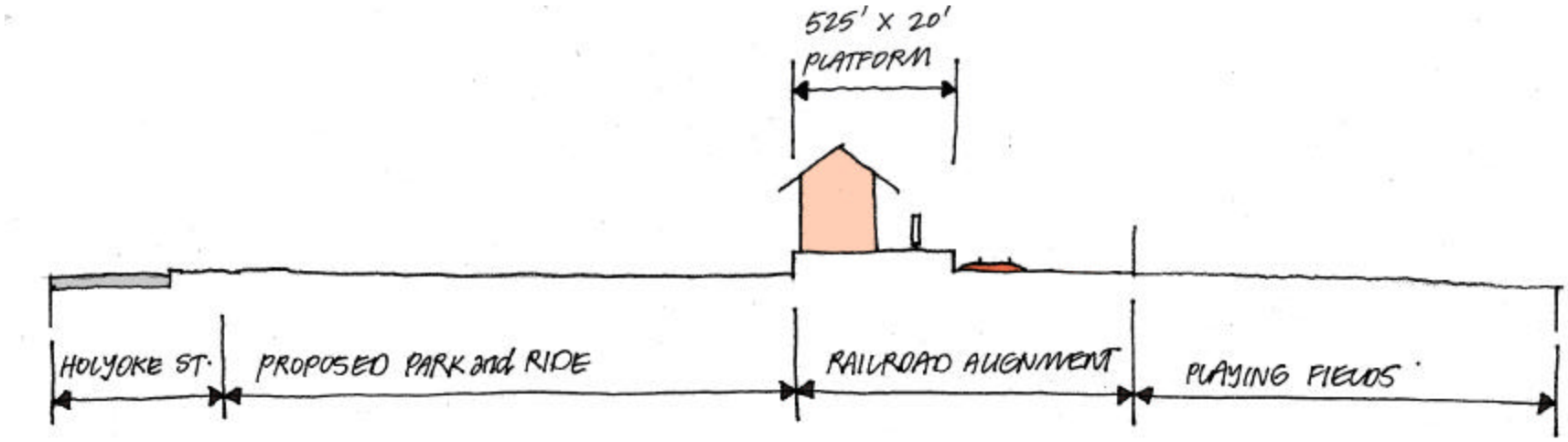


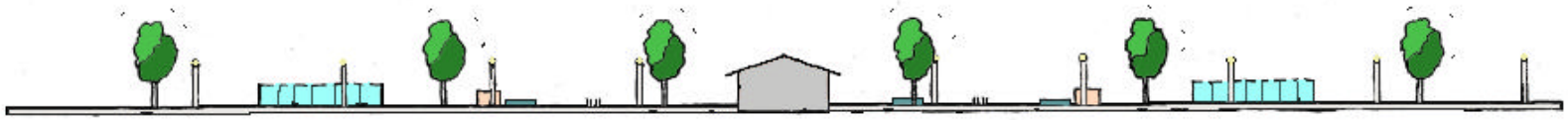
Figure 1-22: Lakeville Section



Northfield: The historic Northfield station has survived years of neglect since it ceased serving passengers half a century ago. However, it is conveniently located off 3rd Street West just west of Highway 3. Although the downtown is across the Cannon River to the east, it is nearby. To the west of the station is a healthy residential neighborhood. New commercial and residential development is planned close by. Demand for park-and-ride spaces is projected at 120, which will occupy land on both sides of 3rd Street West. Cars and small shuttle vehicles will be able to access the platform directly for pick-up and drop-off, but buses would remain on 3rd Street West. The historic station building would be refurbished, but the old platform is beyond repair, and would be replaced. It would be close to ground level, making special access arrangements unnecessary.

Figure 1-23: Northfield Context Map

Figure 1-24: Northfield Platform Plan/Elevation



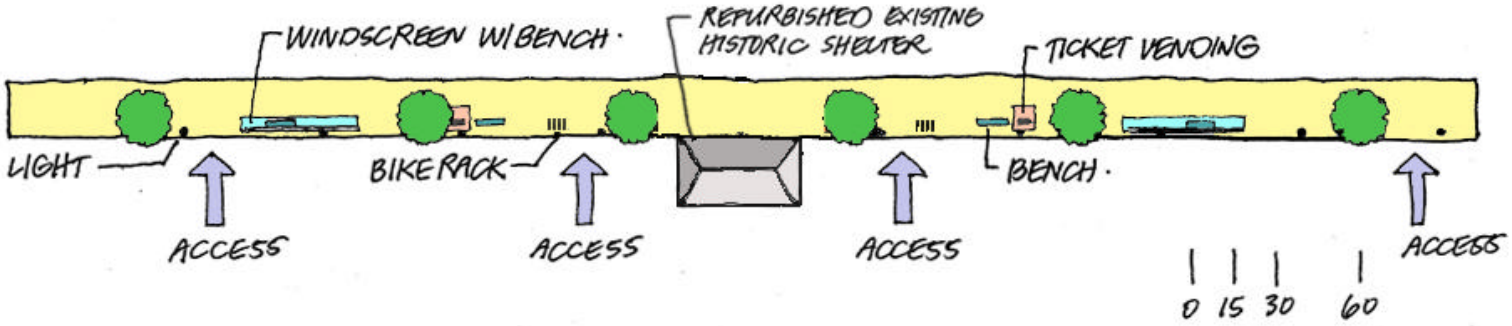
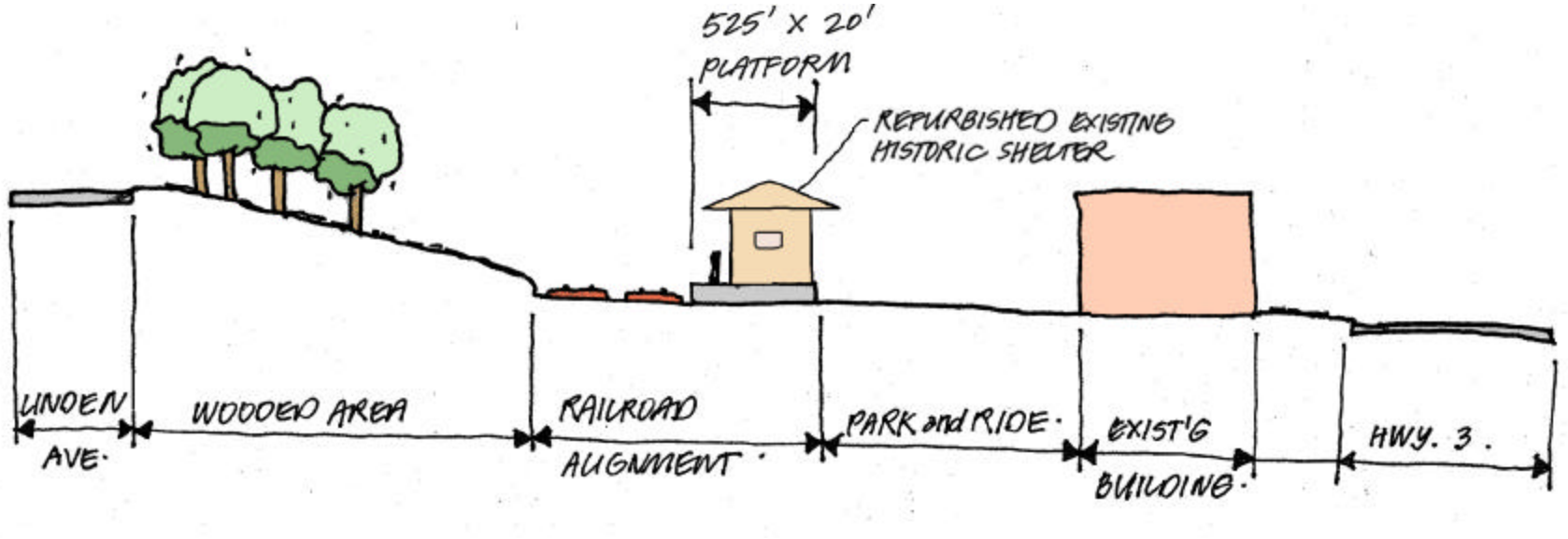

WINDSCREEN W/BENCH
REFURBISHED EXISTING HISTORIC SHELTER
TICKET VENDING
LIGHT
BIKE RACK
BENCH
ACCESS
ACCESS
ACCESS
ACCESS
0 15 30 60

Figure 1-25: Northfield Section



2.0 SERVICE PLAN

Several iterations of the service plan were prepared in the course of the feasibility study. The last of these, dated mid-April 2001, provided 14 daily one-way trips. Of these trips, 12 were in the peak direction, with the remaining pair being a reverse-commute train operating from Minneapolis to Northfield in the morning and returning in the afternoon. This round trip was timed such that a train already being used for peak period service could make both trips. Therefore, although the service plan consists of seven round trips, only six sets of equipment (exclusive of maintenance spares) were required. The timetable proposed for the opening day Dan Patch service is included in Table 2-1.

Table 2-1: Demand-Based Train Schedule

Southbound Trains - Read Down								Northbound Trains - Read Up						
Train #102	Train #104	Train #106	Train #108	Train #110	Train #112	Train #114	Station Name	Train #101	Train #103	Train #105	Train #107	Train #109	Train #111	Train #113
658	330	400	430	450	510	530	*Minneapolis CBD*	645	715	735	755	815	845	446
707	339	409	439	459	519	539	*Highway 7 or Cedar Lake Road/St. Louis Park*	636	706	726	746	806	836	437
717	349	419	449	509	529	549	*I-494/Edina*	626	656	716	736	756	826	427
723	355	425	455	515	535	555	*Old Shakopee/Bloomington*	620	650	710	730	750	820	421
735	407	437	507	527	547	607	*Hamilton/Savage*	608	638	658	718	738	808	409
745	417	447	517	537	557	617	*Southcross/Burnsville*	558	628	648	708	728	758	359
759	431	501	531	551	611	631	*Highway 50/Lakeville*	544	614	634	654	714	744	345
814		516		606			*3rd Street/Northfield*		559		639			330

NOTE: SB train 102 would layup midday at Northfield to provide the reverse-commute trip in the early PM rush period.
Five-car trains would be operated on trains 103, 106, 107 and 110; all other trains would be four-car consists.

Of the peak period service, two round trips would operate the full length of the corridor, while the remaining four round trips would operate to/from Lakeville. This meant that the capital plan had to provide two separate remote maintenance and storage facilities. A small yard would be located south of the Northfield CBD, while a slightly larger facility would be located south of Lakeville's CBD. These facilities are described in some greater detail in the Right-of-Way Limits Technical Memorandum.

Using the ridership projections developed during the course of this feasibility study, car requirements per train were determined. This was based on there being some flexibility in the type of car to be used, as well as the configuration of the car. Based on 135 passengers per car, a combination of four- and five-car trains was determined to be necessary to meet the projected ridership demand. The peak-period Northfield trips would use the five-car combination. All Lakeville-originating/-terminating trains would consist of four cars. A four-car train would be used to provide the reverse commute trips.

All trains are assumed to make all stops. A 45-second dwell is assumed at all on-line stations. The running time of the Northfield trains is projected at 76 minutes for the 44.2-mile one-way trip. Lakeville trains are projected to make the one-way 29.7-mile trip in 61 minutes. The capacity modeling effort confirmed that these were reasonable running time assumptions. Table 2-2 below shows the running times and train speeds for each of the segments. Fine-tuning of the running time and the overall schedule can be done in future study phases, once exact equipment specifications are determined.

Table 2-2: Preliminary Running Times and Speeds for Diesel-Hauled Train

Station	Elapsed Time from Mpls	Miles from Minneapolis	Maximum Speed on this Segment	Average Speed on this Segment
Minneapolis CBD	0:00	0.0 miles		
Highway 7/St. Louis Park	0:09	6.8 miles	60 mph	45.3 mph
I-494/Edina	0:19	12.6 miles	60 mph	34.8 mph
Old Shakopee/Bloomington	0:25	16.2 miles	55 mph	36.0 mph
Hamilton/Savage	0:37	19.9 miles	35 mph	18.5 mph
Southcross/Burnsville	0:47	22.6 miles	50 mph	16.2 mph
Highway 50/Lakeville	1:01	29.7 miles	60 mph	30.4 mph
3rd Street/Northfield	1:16	44.2 miles	79 mph	58.0 mph

Note: Running times based on use of F40PH locomotive hauling three cars.
Average speed for a one-way trip is 34.9 mph.
Speeds on station-to-station runs are based on right-of-way remaining within existing limits; curves would have superelevation, but no significant realignment; speeds on curves conform to FRA guidelines for degree of curvature and superelevation.

3.0 RIDERSHIP FORECASTING

3.1 Modeling Methodology

3.1.1 General Approach

The travel demand modeling used the Twin Cities regional model, maintained by the Metropolitan Council. This model is a traditional four-step model, which includes:

- Trip generation – Producing estimates of total person trips from and to each area
- Trip distribution – Producing estimates of area-to-area movements
- Mode Choice – Producing estimates of the number of auto and transit users, including commuter rail
- Assignment – Producing estimates of demand on specific roadways and transit lines.

In the model, the seven-county area is divided into 1,165 distinct zones, plus additional zones covering the North Star Line, the Red Rock Line, and Rice County which are used to estimate trip generation, and serve as representative origins and destinations. Each of these zones contains a set of socioeconomic data, including population, households, retail employment, non-retail employment and average household income. Since the town of Northfield is outside the modeled area, the network and zone system was expanded to include Northfield. Northfield census tracts and the adjacent tract in the model were included as new traffic analysis zones. Figure 3-1, repeated on the following page illustrates the corridor and indicates the proposed station locations, and Figure 3-2 illustrates this zone system.

Figure 3-1: Dan Patch Corridor Map

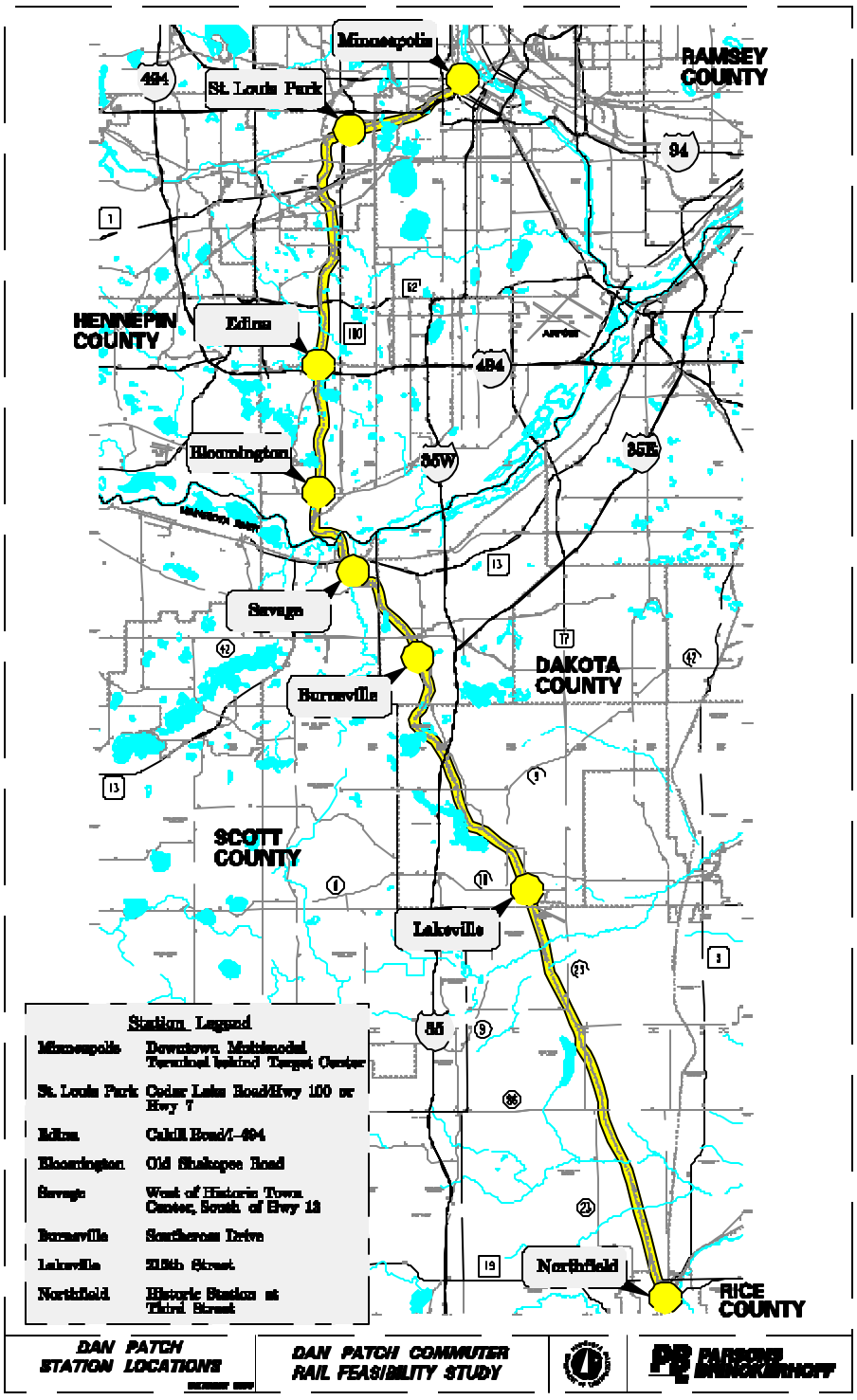
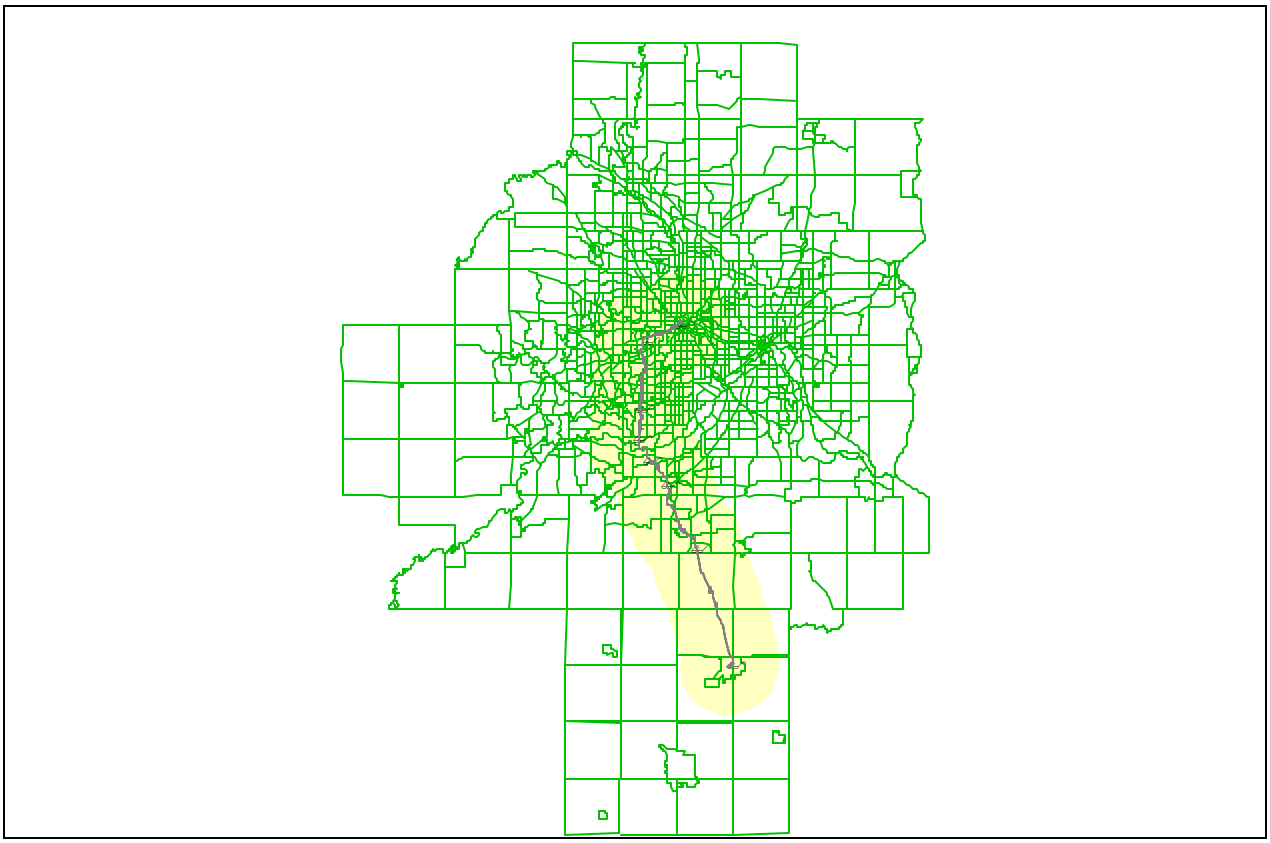


Figure 3-2: Dan Patch Corridor Traffic Analysis Zones



In addition to the zone system, the region's major highways and transit lines are also included in the model. These features are used to estimate travel time and distance between each pair of zones. In effect, the time and distance represent the level of service afforded by the system, and is calculated for both highway and transit modes. Other information, such as parking costs and auto operating costs, are also included where applicable. Parking and auto operating costs were also assumed in the model and were consistent with those used by the other Tier 1 commuter rail corridors. The average daily out-of-pocket downtown parking costs are assumed at $6.00, and auto operating costs at $0.108 (in 1990 dollars) per mile. These figures are in constant dollars assumed to keep pace with inflation to 2020.

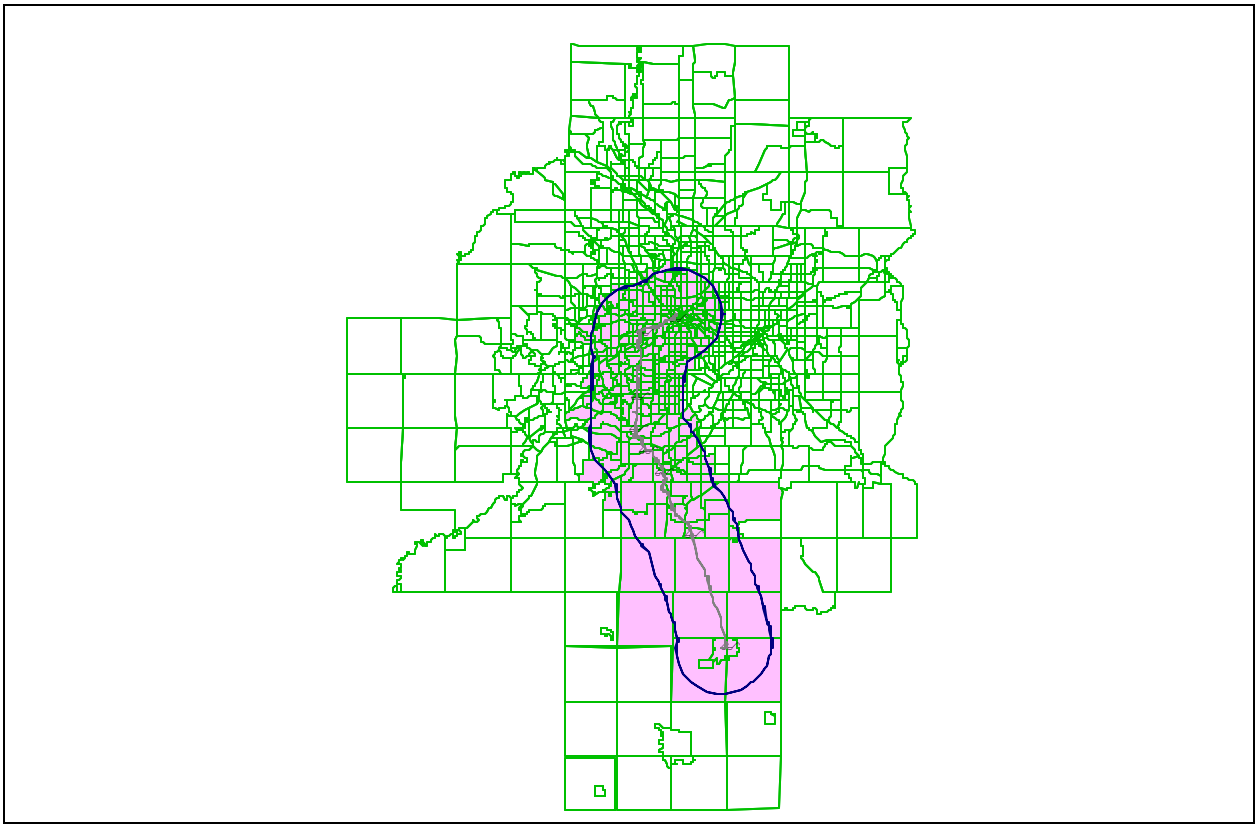
3.1.2 Corridor Population and Employment

For the purposes of the ridership forecast, the corridor has been defined as an area 5 miles around the rail alignment. Using this definition, population and employment figures were forecast for the year 2020. Table 3-1 below presents totals for Traffic Analysis Zones that are within 5 miles of the of the rail alignment. If any part of the TAZ zone was within this "buffer zone", the entire TAZ zone was included. Figure 3-2 above shows the TAZ zones that were used to determine the corridor statistics.

Table 3-1: Corridor Statistics

2020 Population	1,171,696
2020 Households	494,893
2020 Employment	918,675

Figure 3-3: TAZ Zones Used to Calculate Corridor Statistics



Modeling the Dan Patch corridor followed the modeling activities for the Northstar, Red Rock and Central Corridors, since these corridors are presumed to precede Dan Patch in implementation. The Dan Patch line is the third of the three Tier 1 corridors in Mn/DOT's Commuter Rail System Plan and the Metropolitan Council's Transit 2020 Master Plan. The lines were modeled in sequence, with each new model run building upon the assumptions (alignment, speeds, operating plans, etc) of the previous line. In this way, a comprehensive network was built up, and all modeling assumptions were consistent.

3.1.3 Service Plans and Assumptions

For both the morning and afternoon peak travel periods, six peak direction (inbound to Minneapolis CBD in the morning peak period and outbound from Minneapolis CBD in the afternoon peak period) and one reverse peak direction train were assumed. For the purposes of the model, headways or time between

trains was assumed to be 30 minutes for both morning and evening peak periods. Trains are assumed to dwell at each station for 45 seconds.

The commuter rail fare structure was based on the fare structure contained in the Mn/DOT Commuter Rail System Plan. The fare structure consists of a $2.00 base fare plus $0.75 increments for each five-mile fare zone traversed. For this line, fares were assumed to be as follows:

Table 3-2: Fares to Minneapolis CBD

Northfield	$6.50
Lakeville	$3.50
Burnsville	$3.50
Savage	$2.75
South Bloomington	$2.75
Bloomington/Edina	$2.00
St. Louis Park	$2.00

As noted previously, parking and auto operating costs were also assumed in the model and were consistent with those used by the other Tier 1 commuter rail corridors. The average daily out-of-pocket downtown parking costs are assumed at $6.00, and auto operating costs at $0.108 (in 1990 dollars) per mile.

3.2 Ridership Forecast Results

3.2.1 Daily Trips

The model results, summarized in Table 3-3 below, indicate that there would be 7,500 total daily trips on the Dan Patch line. Of these, 6,000 would be auto access/egress trips, 800 would be walking to and from the station, and 700 would be bus access/egress. The peak segment, in terms of load, would be the St. Louis Park to Minneapolis segment with a load of 7,000 passengers daily. Over 75 percent of the trips, or about 5,670, would be central business district-oriented.

Results of the model indicate that approximately 65 to 80 percent of the ridership projected on this line would be comprised of people who previously relied on automobiles.

Table 3-3: Ridership Summary

Total Daily Trips	7,500
Auto Access/Egress Trips	6,000
Walk to/from Station Trips	800
Bus Access/Egress Trips	700
Peak Segment Load (SLP to MPLS)	7,000
CBD-Oriented Trips	5,670

Travel demand on the Dan Patch line is predominantly CBD oriented, with 75 percent of trips beginning or ending in the downtown Minneapolis CBD. In addition, most trips are taken in the peak direction. That is, northbound in the AM peak period and southbound in the PM peak periods. Reverse-commute trips account for just 6 percent of all trips on this line. This is typical of commuter rail ridership, as observed in other cities, and is a result of the nature of the trips (work-related) and the primary terminus of the line.

About 18 percent of the trip on the Dan Patch line are also projected to use the North Star, Central Corridor, or Red Rock lines. Most of these trips (12 percent of the total) use the Central Corridor.

In terms of access to the non-CBD stations, the model indicates that about 80 percent are from auto, with 10 percent each from walking and feeder-bus routes. Downtown access and egress will be accomplished by walk and downtown transit bus and LRT, if the LRT is extended to the proposed downtown Minneapolis commuter rail station.

3.2.2 Boardings and Alightings

In terms of boardings and alightings, after the Minneapolis CBD station, the Burnsville station would be the most utilized with 3,800 people getting on (boarding) and off (alighting) the train daily. As summarized in Table 3-4 below, the Savage station would have 1,100 boardings and alightings, followed by Bloomington/Edina with 900, St. Louis Park with 700, Lakeville with 600, South Bloomington with 600, and Northfield with 300.

Table 3-4:
Average Daily Boardings and Alightings

Northfield	300
Lakeville	600
Burnsville	3,800
Savage	1,100
South Bloomington	600
Bloomington/Edina	900
St. Louis Park	700
Minneapolis CBD	5,700

3.2.3 Peak Train Loads

The model indicates that peak trainloads will be as follows:

Table 3-5: Peak Train Loads

Segment	Riders
Northfield to Lakeville	40
Lakeville to Burnsville	110
Burnsville to Savage	540
Savage to South Bloomington	680
South Bloomington to Bloomington/Edina	750
Bloomington/Edina to St. Louis Park	820
St. Louis Park to Minneapolis	880

3.2.4 Park and Ride Demand

Based on the model results, the greatest demand for Park-and-Ride spaces is anticipated to be at the Burnsville station with 1,210 spaces. Park-and-Ride demand is markedly less at the other station locations as summarized in Table 3-6 on the following page. An estimated 430 spaces will be required at

the Savage station, 250 at Lakeville, 150 at Bloomington/Edina, 130 at South Bloomington, and 120 at the Northfield station.

Table 3-6: Park-and-Ride Parking Space Demand

Segment	Spaces
Northfield	120
Lakeville	250
Burnsville	1,210
Savage	430
South Bloomington	130
Bloomington/Edina	150

3.2.5 Comparison with Earlier Estimates

In January 1999 Mn/DOT published the "Twin Cities Metropolitan Commuter Rail Feasibility Study". This study examined a large number of potential commuter rail corridors, and provided some initial estimates of ridership. In that study, the Dan Patch line ridership was estimated at 5,800 per day in the year 2020, compared to 7,500 for the current forecast. The difference in these estimates is due to a number of factors, including:

- Updated socioeconomic estimates
- An expanded, and more detailed forecast network
- The inclusion of the North Star, Central and Red Rock commuter rail lines

3.2.6 Feeder Bus Assumptions

For this study, feeder-bus routes were developed from existing and planned transit routes that serve the areas around the proposed stations. Typically, these routes were modified to stop at the station locations, while retaining the remaining portions of the route. Southwest Metro and Minnesota Valley Transit Authority buses would serve stations where logical, but would not be truncated. In some cases near the St. Louis Park station, where the route continued to downtown Minneapolis in an express mode, that segment of the route serving downtown was removed since the Dan Patch line would replace that service. Service frequencies of these routes were assumed to coincide with the commuter rail train schedule, so as to minimize transfer delay. New shuttle service from stations to area businesses could be anticipated by 2020, but is not assumed in the current feeder bus network. The stations provided with feeder-bus service include:

- St. Louis Park – 5 routes
- North Bloomington – 2 routes
- South Bloomington – 2 routes
- Savage – 1 route
- Burnsville – 3 routes

No dedicated feeder-routes were provided at the Lakeville and Northfield stations. Future studies will further develop the feeder-bus system, as appropriate.

Each corridor community expressed a desire to develop new or additional internal bus circulation services over the next 20 years. If commuter rail service is initiated in the Dan Patch corridor, transit linkage between rail stations and employment locations can be expected to improve. Reverse-commute, or bi-directional ridership under this scenario would be anticipated to increase substantially. A future service plan would be expected to reflect increased internal shuttle service as well as increased bi-directional train services.

4.0 RAILROAD LINE CAPACITY ANALYSIS

4.1 Coordination

A total of four railroads were involved in the Dan Patch Corridor Feasibility Study. From north to south, these were: Burlington Northern Santa Fe (BNSF); Canadian Pacific (CP); Twin Cities & Western (TC&W) and its affiliated Minnesota River Bridge Company (MRBC); and, the Union Pacific (UP). Approximately five miles of BNSF's Wayzata Subdivision would be used by Dan Patch trains, from the Minneapolis CBD station (part of the Northstar project) in the vicinity of 5th Street to St. Louis Park junction. At this latter location, the connection between the BNSF and CP would be restored and Dan Patch trains would then operate over approximately 11 miles of the CP's Minnesota Northfield & Southern (MNS) spur trackage, extending down to the north approach of the Minnesota River Bridge. At this point one mile of MRBC-owned track would be used, after which the CP Savage Spur would be used for the remaining 27 or so miles to a terminal in Northfield. For a little under the final mile of trackage in Northfield the line is owned by CP, but controlled by UP, including the provision of dispatching duties.

Operations by PGR and UP were investigated and judged not to affect the proposed Dan Patch service. PGR provides industry service for CP on a branch line called the Richfield Spur that connects to the MNS Spur at Auto Club Junction in Bloomington, and at Airlake Industrial Park in Lakeville. Interchange activity between PGR and CP is not likely to interfere with Dan Patch service trains. UP has trackage rights on about a one-mile section of the Savage Spur in Northfield. Due to the limited number of Dan Patch trains operating to and from Northfield, and the short distance that UP trains would use track that is part of the Dan Patch route, UP train service is judged not likely to interfere with Dan Patch service trains.

Coordination with the primary railroads involved was recognized to be a significant effort in the conduct of this study, for this reason contact with the rail carriers was made very shortly after receipt of notice to proceed from Dakota County. The Dan Patch Study team focused its analysis on BNSF, CP and TCWR freight train activity and requested information from each of these freight railroads concerning their present and future operations in the Dan Patch Corridor. The team requested freight train schedules and train characteristics, including train type, and typical weight, length and locomotive power used. The team requested descriptions of current operations and forecasts for year 2020 at the meeting held with the representatives of the CP and the TC&W/MRBC on July 19, 2000 at PB's office in Minneapolis. The data request was discussed, along with other topics relevant to the study.

Contact with the primary railroads involved was maintained throughout the study. Follow-up calls to the carriers were made several times in an effort to secure the required information. BNSF and TCWR provided responses for all information requested. CP provided a response for current operations, but not future forecasts. Hence, the study incorporates current CP freight train activity. This CP response is not a cause for concern since the simulation results show that growth in CP freight train activity can be accommodated in combination with the Dan Patch passenger service.

In addition, the study team developed alternative methods/sources for as much of the data as possible, so that work could continue to progress on the study. For example, train observations made during the field survey work were used to develop general train sizes and operating patterns. Multiple observations were made where possible to confirm the operating patterns of various trains/carriers.

4.2 Potential Joint Use

Consistent with the direction given in the Commuter Rail System Plan (Mn/DOT, February 2000), the provision of commuter rail service within a corridor owned and/or operated by freight carriers requires negotiations with the owning and operating railroads. The authority to negotiate terms and conditions with the railroads is recommended to be vested in a single, multi-jurisdictional public entity. Minnesota legislation gives Mn/DOT that authority and responsibility.

The study team relied upon information from the railroads operating in the corridor, plus information on corridor freight rail service from other sources, to develop the operating scenario and capital plan presented in this feasibility study. The railroad capacity modeling conducted for this project, and resultant assumptions of likely passing siding needs and therefore capital costs, is based on this information.

As time passes, operating data will likely change. Should the Dan Patch corridor progress toward implementation during the 2010-2020 time frame, future evaluation for joint use on this line will be required. At that point, more involvement by affected railroads can be expected.

The System Plan identifies eight general guidelines for negotiations between a project sponsor and affected railroads:

1. Centralize negotiations,
2. Select and empower a multi-disciplinary negotiating team,
3. Define the nature of the service to be provided,
4. Determine procurement strategy,
5. Determine the railroad's risk, liability and insurance requirements,
6. Use capacity modeling to verify capital program improvements,
7. Determine public and private benefits and costs, and
8. Negotiate a reasonable cost-sharing formula.

Future joint use negotiations will require addressing potential disagreements with the amount and location of infrastructure improvements likely to be required, including station locations.

4.3 Line Capacity Analysis

While conducting the Line Capacity Analysis, Parsons Brinckerhoff entered into confidentiality agreements with both Canadian Pacific Railway and Twin Cities & Western Railroad Company. Due to the nature of these agreements, some of the appendices referenced in the complete technical report are not included. These items have been provided to the Dakota County Regional Railroad Authority.

4.3.1 Existing Track Description

The first part of the route between Minneapolis and St. Louis Park would operate on Burlington North Santa Fe (BNSF) track from about MP 11.5 to MP 15.7. This is a portion of the BNSF Wayzata subdivision.

The second part of the route between St. Louis Park and Northfield would operate primarily on Canadian Pacific (CP) track from about MP 14.2 to MP 54. The first 12 miles of the route, from MP 14.2 to MP 26.2, is a portion of the CP MNS Spur. The last 27 miles of the route, from MP 27.2 to MP 54, is a portion of the CP Savage Spur. The "missing" mile from MP 26.2 to MP 27.2 is a bridge over the Minnesota River between Auto Club Junction and Savage (including approach tracks). CP sold this bridge and track to the Twin Cities and Western Railway (TCWR), presumably to enable TCWR access to rail-to-barge facilities at Savage. CP retains trackage rights on the property sold. (Due to the short distance of TCWR ownership, the remainder of this report treats the Minnesota River Bridge as a part of the CP portion of the Dan Patch route.)

The route starts on single track plus siding territory in Minneapolis, but almost immediately (MP 11.7) changes to single track and remains that way to the connection with Canadian Pacific (CP). The CP portion of the route is primarily single track with a few sidings.

4.3.2 Proposed Infrastructure Improvements

In order to operate passenger service, track improvements would be required on both BNSF and CP track. This study assumes that track would be upgraded to allow for the following passenger train maximum speeds within the corridor:

BNSF	
MP 11.5 (5th Street) to MP 15.7 (connection with CP)	60 mph
CP	
MP 14.2 (connection with BNSF) to MP 21.4	60 mph
MP 21.4 to MP 25.8 (Auto Club)	55 mph
MP 25.8 to MP 27.5 (Port Cargill)	35 mph
MP 27.5 to MP 33.0 (Orchard Gardens)	50 mph
MP 33.0 to MP 39.0 (Lakeville)	60 mph
MP 39.0 to MP 52.8 (Greenvale Avenue)	79 mph
MP 52.8 to MP 54.0 (Northfield Yard)	45 mph

The route would essentially remain single track, but the study assumes that the following sections of double track would be added to allow for meets, passes and overtakes.

Siding Name	Dan Patch MP	BNSF/CP MP (approx. milepost)
BNSF	MP 1.7 – MP 2.7	MP 13.7 – MP 14.7 (BNSF)
St. Louis Park	MP 5.4 – MP 6.8	MP 14.3 – MP 15.7 (CP)
Atwood	MP 11.5 – MP 12.6	MP 20.4 – MP 21.5 (CP)
Nesbit	MP 14.3 – MP 17.0	MP 23.2 – MP 25.9 (CP)
Savage	MP 18.4 – MP 21.5	MP 27.3 – MP 30.4 (CP)
Burnsville	MP 22.1 – MP 23.1	MP 31.0 – MP 32.0 (CP)
Burnsville South	MP 25.3 – MP 26.5	MP 34.2 – MP 35.4 (CP)
Lakeville	MP 36.2 – MP 37.2	MP 45.1 – MP 46.1 (CP)

(Note: the Dan Patch milepost numbering scheme was created for this analysis. It may not be recognized by BNSF, CP or other parties.)

4.3.3 Proposed Signal Operations

This study assumes that the BNSF and CP track would have new or improved signal systems to permit passenger operations at the proposed speeds. The signal system would use Centralized Traffic Control (CTC) technology or equivalent. For the simulation, a combination of approach and absolute signals at sidings was used.

4.3.4 Station Locations

The simulation study includes passenger stations at the following locations:

	Dan Patch MP	BNSF/CP MP
Minneapolis CB	0.0	11.5 (BNSF)
Highway 100/St. Louis Park	3.7	15.2 (BNSF)
Highway 7/St. Louis Park	6.8	15.7 (CP)
I-494/Edina	12.6	21.5 (CP)
Old Shakopee/Bloomington	16.2	25.1 (CP)
Hamilton/Savage	19.9	28.8 (CP)
Southcross/Burnsville	22.6	31.5 (CP)
Highway 50/Lakeville	29.7	38.6 (CP)
3rd Street/Northfield	44.2	53.1 (CP)

The station locations at Highway 100 and Highway 7 are alternate locations for a single station serving the St. Louis Park community. Therefore, the simulation study examines two scenarios: one with the Highway 100 location, and one with the Highway 7 location.

The study assumes that stations located in a double-track section will have platforms located to permit train boarding/de-boarding to/from a train on either track. Four stations are located in proposed double-track territory: Highway 7/St. Louis Park, Old Shakopee/Bloomington, Hamilton/Savage, and Southcross/Burnsville.

4.3.5 Other New Infrastructure

As part of CP track improvements, the study assumes that the new sidings and the improved existing sidings will have #20 turnouts at each end.

The study assumes that a connection would be built in the southeast quadrant at the crossing between the BNSF Wayzata subdivision and the CP MNS Spur. This connection would permit direct movements of Dan Patch passenger trains between the two rail lines.

The study assumes that the wye track at the crossing of the CP MNS Spur with the CP Bass Lake Spur is replaced by a direct connection track in the southwest quadrant of that crossing. In the absence of this assumption, the combination of passenger and freight service on the Dan Patch route is judged to be infeasible due to the long time intervals that are required when the wye is used to switch CP and TCWR freight trains between the MNS Spur and the Bass Lake Spur. The St. Louis Park Railroad Study[2] reports that this switching activity requires three hours for a 30-car train or four hours for a 60-car train.

[2] St. Louis Park Railroad Study, prepared for the City of St. Louis Park by RLK Associates, Ltd., March 1999.

4.3.6 Passenger Train Schedules

Table 2-1 in Section 2 shows the proposed passenger train schedules. Depending on the type of equipment selected, dwell times between 30 and 60 seconds may be appropriate for safe and convenient passenger boarding and de-boarding. The proposed passenger schedules contain more than sufficient slack time to permit station stops of between 30 and 60 seconds without increasing passenger train transit times from origin to destination.

4.3.7 Freight Train Schedules

The Burlington Northern Santa Fe Railway (BNSF) operates freight trains on the Wayzata subdivision. The Canadian Pacific Railway (CP), Twin Cities and Western Railroad (TCWR) and Progressive Rail (PGR) operate freight trains on the MNS Spur. The CP and Union Pacific Railroad (UP) operate freight trains on the Savage Spur.

The simulation runs existing freight trains at the times of day reported by the freight railroads. The consulting team selected operating times for forecast BNSF trains to distribute these throughout the day. Consultants selected operating times for forecast TCWR trains to enable them to load and unload at Savage primarily during daytime hours.

4.3.8 Simulation Model

The simulation analysis was conducted by ALK Technologies, Inc., using its Line Capacity Analysis System (LCAS).

5.0 PHYSICAL CHARACTERISTICS AND CAPITAL PROGRAM

5.1 Capital Program Elements

5.1.1 Right-of-Way Limits

The predecessor efforts to this study, the Twin Cities Metropolitan Commuter Rail Study and the subsequent Commuter Rail System Plan, did not consider right-of-way limits in detail. In the case of the rail study, this was due to the fact that the Dan Patch corridor was one of 19 routes being considered and compared to each other. The system planning effort was concerned with system-wide, as opposed to corridor-specific issues. The physical features of a particular line or corridor were not products of that assignment.

By contrast, this study focused on a single alignment, beginning from around 5th Street, Minneapolis on the Burlington Northern Santa Fe's (BNSF's) Wayzata Subdivision, and extending approximately 5 miles west to a junction with the Canadian Pacific's (CP's) Minnesota Northfield & Southern (MNS) Spur trackage. The purpose in the feasibility study is to identify specific service elements that appear to work well, so that the Dan Patch system as a whole can be understood in sufficient detail to decide if it merits further investment in design development. The junction between the BNSF and CP lines is grade-separated, with the CP line on a bridge over the BNSF route. The physical connection between the two railroads was removed several years ago, and would have to be re-established as part of this project. The right-of-way for that connection remains intact, though there are buried fiber optic cables routed along it.

The bulk of the Dan Patch corridor, nearly 40 miles of the overall 44-mile length, would be on the CP MNS and Savage Spur trackage, extending south to Northfield. One mile of this line, at the crossing of the Minnesota River, has been sold to the Minnesota River Bridge Company, a subsidiary of the Twin Cities & Western (TC&W). The Minnesota River Bridge Company has trackage rights over the CP from Milwaukee Junction in St. Louis Park, south to the river crossing and into Port Cargill, immediately south of the river.

A review of BNSF track charts, as well as a physical survey of the rail line, does not indicate any right-of-way problems relative to physical facilities that would have to be installed to accommodate the proposed Dan Patch commuter service. An important point to note in this regard is that any passenger rail station construction and related improvements in the vicinity of 5th Street, Minneapolis are presumed to have been made by others prior to the inception of the Dan Patch service. This is a reasonable assumption, given that the Northstar Corridor is already in preliminary engineering, and therefore considerably further advanced than the Dan Patch efforts.

CP provided track charts and right-of-way plats for its MNS and Savage Spur trackage. Review of these data, supplemented by field observations, provided a fairly complete picture of the right-of-way situation on this section of line. Additional information was provided through review of CP deed files and other data the railroad maintained in its Minneapolis offices.

A principal consideration regarding the available right-of-way was how it might affect the location of physical facilities, such as passing sidings, storage yards and stations. In the case of the CP lines, sections of passing siding were already included. Therefore, every effort was made to locate the planned passing sidings coincident with the existing sidings. Generally, these sidings were proposed for lengthening, within reasonable limits, so that trains could pass each other without coming to a complete stop, thereby avoiding the delay imposed by stopping and then restarting a train.

Depending on the station locations and schedule scenario adopted for the Dan Patch service, a section of passing siding may be required alongside the existing Wayzata Subdivision single track. The tentative location for this siding would be to the east of the bridge carrying Highway 100 over the BNSF track. Field observations in this section of line indicate that there is sufficient property between the track and adjacent installations (whether it is bridge abutments or the paralleling recreational trail, etc.) to accommodate this second track.

Yard locations were generally assumed to be located within the limits of existing railroad right-of-way. This is due to the fact that the operating plan for the line is predicated on two trains starting their operating day out of Northfield. These two trains would require only a small yard facility immediately adjacent to the existing main track. Four trains would be based at Lakeville, again operated out of a small yard alongside the main track. A variation on this is the possible truncation of the line at Lakeville, consistent with what was recommended in the Mn/DOT Commuter Rail Study. Under this plan, all six trains would be based in Lakeville, requiring a larger (wider) yard. A portion of this yard was presumed to be beyond the limits of the railroad right-of-way, so property acquisition was built into the cost estimate for this facility.

The presumption of property acquisition was also made for each of the proposed commuter rail stations on the line. With the exception of the St. Louis Park station, each of the conceptual station designs includes a park-and-ride lot, requiring area well in excess of the railroad right-of-way holdings. So, for these facilities, land acquisition costs were included in the cost estimates. The design team has recommended that there be no park-and-ride facility at the St. Louis Park station because of its proximity to downtown; it would be used by many to evade downtown parking fees, and would draw automobiles through highly used intersections during peak hours, rather than relieving intersection congestion.

5.1.2 Maintenance Facilities

The location and number of maintenance facilities depends on line length and the operating plan used to provide the proposed commuter rail service. Midday storage and servicing for the trains from each of the commuter rail routes would be done at a central maintenance facility (CMF), a concept carried forward from the Mn/DOT commuter rail study effort. This is the location that would deal with heavier repair tasks, as well, although in the early days of the area's commuter rail service, some of this work may be contracted out. This would be done to avoid investing in expensive equipment/facilities that might not be used to full capacity when there are only a handful of locomotives or cars to maintain. The maintenance facility as well as the equipping of the CMF is expected to change over time as more and more lines come into operation. As the Dan Patch line would not be the first of the commuter rail routes to be implemented, it would not be responsible for the location, construction and implementation of the CMF. On the other hand, the Dan Patch-assigned locomotives and cars will represent an additional maintenance burden on this facility, so a contribution towards the expansion of the capacity of this facility is included in the project capital cost estimates.

Overnight and weekend train storage and servicing would be done at the outlying terminal. As previously described, there are a couple of options as to the location where this would occur. The project team developed a service plan that would see two of the six trains on the line stored and serviced at a small yard site south of the Northfield central business district, along the CP line. The other four trains would operate out of a similarly-sized and equipped facility in the Lakeville area.

By contrast, the service plan developed for Mn/DOT envisioned the line extending no further south than Lakeville. This would mean that all six train sets would operate out of a single yard. As noted in the preceding section, this rearrangement is reflected in the fact that property acquisition is assumed to be required for this larger facility.

5.1.3 Stations

Station locations are described in Section 1 of this document.

5.1.4 Passing Sidings

The number and location of passing sidings required depends on the service plan, future freight operations, and station locations. Station location affects this because it has an impact on train performance in a given station-to-station segment, which affects where the trains meet ("meets"). The principal driver of the need for sidings on this corridor is the reverse commute train leaving Minneapolis during the AM peak. On the southbound trip, this train will meet five northbound trains. Similarly, when this train returns from Northfield mid-afternoon, it must then meet the first three trains of the PM peak service.

As noted previously, every effort was made to locate passing sidings where there were already sections of multiple track, or where there was available land adjacent to the existing single-track line. Examples of extended sidings include the siding immediately north of the Edina/I-494 station (railroad location "Atwood") and the siding surrounding the Bloomington/Old Shakopee station location. In this latter case, the extended siding would actually tie together two sections of existing double-track which are now isolated from each other.

Another objective in locating the sidings was to minimize the impact on existing structures. This was generally true, except for the siding to be located in Savage, which would impact structures at Highway 13, Quentin Avenue, the Credit River and Lynn Avenue. There is an advantage to the surrounding community in improving these bridges, as improvements in roadway clearance and geometry can be made at the same time. This is particularly true in the awkward arrangements in and around the existing Quentin Avenue structure.

As discussed previously, two possible locations were considered for the St. Louis Park station – adjacent to Highway 100 on the BNSF Wayzata Subdivision, and near the intersection of Highway 7 and the CP MNS Spur Trackage. If the St. Louis Park station were to be located at Highway 100 on the BNSF, the operating plan would require the construction of six sidings, with an overall length of 10.2 miles. These sidings are distributed more-or-less along the length of the line. When the St. Louis Park station is shifted to the Highway 7 location on the CP, the number of sidings drops to five, with an overall length of 9.4 miles. Making this change eliminates the need for a siding on the BNSF, and shifts the location of one of the sidings on the CP. In future studies, the locations of both sidings and stations will require coordination with the railroads.

Recommended siding locations are as identified in Table 5-1 and graphically summarized in Figure 5-1.

Table 5-1: Passing Siding Locations

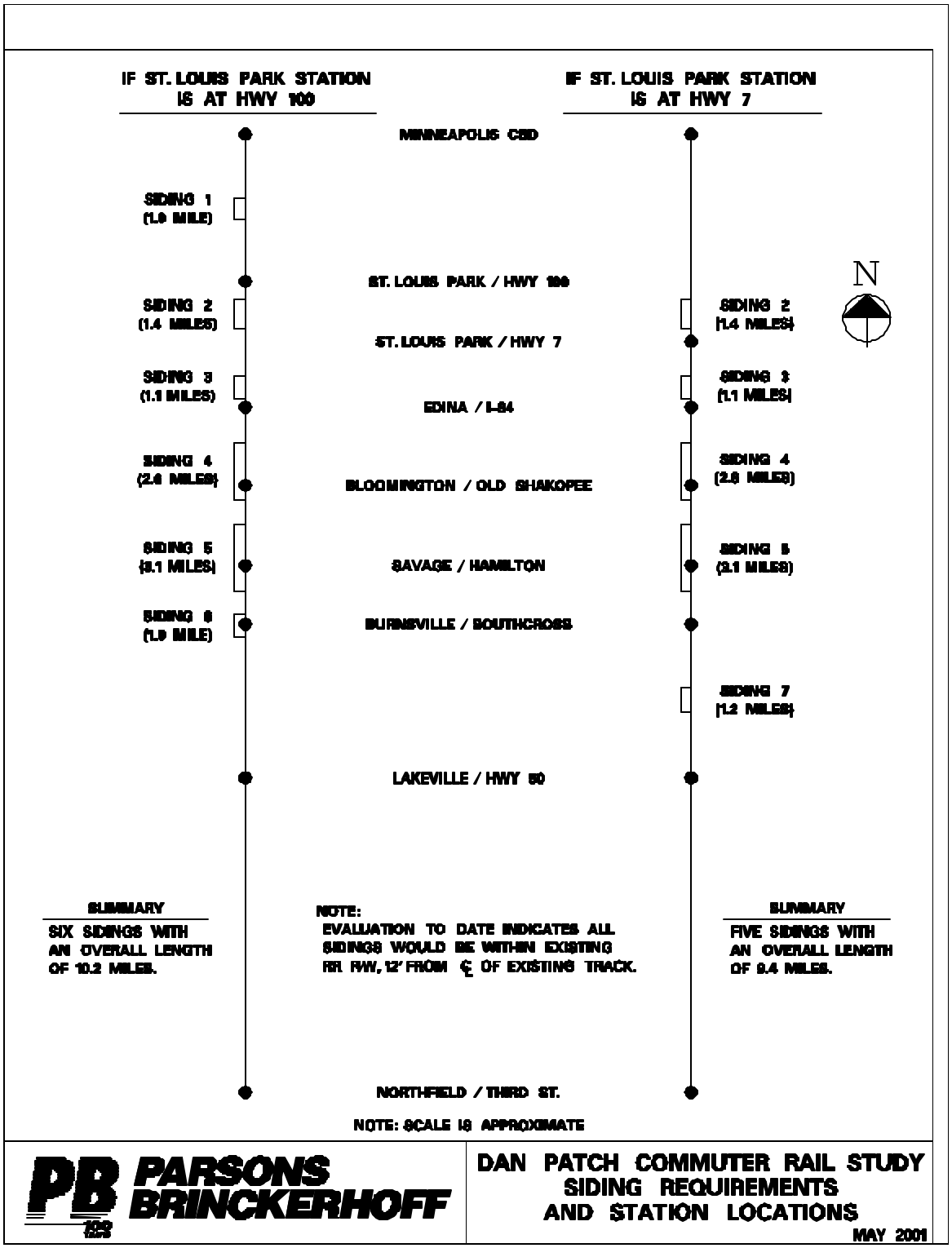
Siding Location	Approximate Mileposts (measured from Minneapolis CBD Station)	Siding Required for St. Louis Park Station Located at:
St. Louis Park on BNSF	1.7-2.7	Highway 100
St. Louis Park on CP	5.4-6.8	Highway 100 or Highway 7
Edina (70th St. to I-494)	11.5-12.6	Highway 100 or Highway 7
Bloomington	14.4-17.0	Highway 100 or Highway 7
Savage	18.4-21.5	Highway 100 or Highway 7
Burnsville Station	22.1-23.1	Highway 100
South Burnsville	25.3-26.5	Highway 7

The siding lengths depend on several factors, including restrictions to extending the siding (the underpass at 70th Street, Edina as well as the bridge over I-494 at the south end of this proposed siding location, both provide effective barriers to the extension of the siding) and whether or not a station is located within the limits of the siding (meaning that trains will be stopped, which can allow the siding to be shorter than one where no station is located and the trains would meet each other at speed). Also a factor in locating the sidings was whether or not the existing line had a siding in that general vicinity (both the Edina and Bloomington sidings are in areas where there are already sidings or multiple track sections). In at least one instance, Savage, the siding will require the reconstruction of several structures, but this is felt to be a benefit to the entire community, as this improvement will allow some extremely restrictive road geometry (Quentin Avenue) to be enhanced.

From the above table, it can be seen that siding length varies by location, and that the cost of constructing each siding will vary according to that length and the impacts on adjacent structures, inclusion of grade crossings, etc. This means that talking about an “average cost per siding” is not really a meaningful statistic. The cost elements making up the siding include: grading; environmental mitigation; extension of existing or construction of new culverts; structure costs (as applicable); grade crossing surfaces and protection equipment (as applicable); track and switches; and, signal costs. These costs are reported in the link capital cost estimate for the link in which the siding is located.

Figures illustrating estimated potential siding locations throughout the corridor, based on operating data provided by the railroads and the assumed Dan Patch service plan and station locations, are included in the Appendix.

Figure 5-1: Passing Sidings Overview



5.1.5 Signal And Communication Requirements

A review of current BNSF and CP employee timetables and rulebooks was conducted to determine the signal equipment and upgrades required on each portion of the Dan Patch corridor. The BNSF Wayzata Subdivision is equipped with automatic block signals while the CP MNS and Savage Spurs have no signals (also known as "dark territory" in railroad parlance). Given the volume of train movements projected over some parts of the corridor by 2010, as well as the need to make on-the-move meets between commuter trains throughout most of the length of the corridor, the entire 44 miles is projected to receive centralized train control (CTC) equipment as part of the commuter rail capital program.

Interlockings, or connections between tracks, are required at the ends of sidings, or at junctions with other rail carriers (such as the restored connection between the BNSF and CP lines in St. Louis Park). Where there were existing interlockings (as in Northfield where the CP and UP lines meet), these were programmed for upgrade.

Grade crossing protection on the line varies from simple crossbucks, some with stop signs, to gates with flashers and cantilevers (flasher units suspended out over the intersecting highway lanes). All public road crossings have been programmed to receive at least crossbucks, flashers and warning bells. In assessing the level of protection needed at grade crossings, surrounding buildings and land uses were determinants in the level of crossing protection identified. The current level of grade crossing protection on this line was generally assessed to be inadequate, with flashers only provided at many suburban locations. With the change in train performance (current slow-speed freight vs. potential future higher-speed commuter trains), it was felt that being conservative on the crossing protection was the best course. Therefore, the cost estimates assume that public roads striped for at least two lanes and directly serving developed areas will receive gates, flashers, and cantilevers etc. This corridor also includes several private drives or informal agricultural crossings, most of which presently have no signage marking the rail crossing. Private accesses will receive crossbucks as part of the commuter rail improvement program. One private access serving two homes is projected to be closed, the property acquired and the residents relocated.

Pedestrian crossings, adjacent to schools or other public facilities that attract a significant amount of pedestrian traffic will receive separate gate installations as part of this project. Currently, many of these crossing have no special equipment/signage.

Mention should be made of the proposed Federal Railroad Administration (FRA) rulemaking regarding grade crossing warning equipment and the possible requirement that all trains would have to provide horn signals on approach to those crossings. The only exception to the requirement for horn signals would be if the crossing had extensive protection equipment (four-quadrant gates, median encroachment provisions, etc.). This rulemaking is currently on hold as the new administration's appointments to lead the FRA are considered. There has been considerable concern throughout the country about the cost and quality-of-life impacts this ruling might have. For now, the commuter rail capital cost program does not include additional investments in response to the rulemaking.

5.1.6 Link Data

This feasibility study built on the earlier work of Mn/DOT's Metropolitan Commuter Rail Study and the subsequent Commuter Rail System Plan. Basic formats for the link data tables and capital cost tables had already been established in those studies. With the start of the feasibility study, an extensive list of railroad data requirements was developed (see the Appendix for a typical list). As noted previously, representatives of the Canadian Pacific (CP) and the Twin Cities & Western (TC&W) met with the project team to discuss these data needs and other relevant topics in mid-July 2000. The list was also transmitted to Burlington Northern Santa Fe (BNSF) and Union Pacific (UPRR) representatives subsequent to this meeting.

In addition to data requested from the rail carriers themselves, the study team also reviewed information maintained by regulatory and governmental agencies, to be used in updating and completing the picture of the current condition and operations on the Dan Patch line, as well as the future plans for the line. Some of the on-line communities shared studies they had undertaken on their own and arranged for guided tours of the corridor within their community.

Independent but simultaneous with the railroad data collection effort, a more extensive field survey of the line, concentrating on sensitive areas/communities, was conducted. Notes on conditions, equipment, operations and the surrounding area were taken and added to the link data tables. A total of more than 50 detailed field observations were made along the length of the corridor, supplemented by discipline-specific observations at key locations (a consulting team structural engineer performed a visual survey of structures on the line). Updated railroad timetable and rulebook information was also used to supersede the data collected during the Mn/DOT assignments, where appropriate. The updated link data tables are included in the Appendix. Combining the input from each of these data sources, along with field observations, allowed for the development of an updated capital plan for the line.

5.2 Capital Costs

The capital program for the Dan Patch feasibility study builds on the work done during the Mn/DOT commuter rail study. Capital costs for facilities and equipment have been tracked continuously, so updates of individual unit prices were made as required. Many of these unit prices were originally suggested by rail carriers, or have been reviewed and concurred with by the various railroads that have participated. This includes work done in the Twin Cities, as well as elsewhere in the US.

In some cases, specific pricing investigations were made relative to structures slated for rebuilding/ replacement, and for the stations on the line. An example of the updated cost estimating for this assignment includes the replacement of the approaches and bridge over the Minnesota River between Bloomington and Port Cargill. A particular concern in this instance was raising of the rail line's alignment to put it above flood levels, as was experienced in the Spring of 2001. This expenditure is warranted as the interruption of the rail service by flooding could harm the utility of the service, causing it to become unattractive to riders. While the recent flooding might be characterized by some as being an "every 100 years occurrence", the fact that it has occurred twice within the last decade warrants this additional investment.

All unit prices have been escalated by 4% per year to reflect the likely pricing in 2010. Contingencies and other allocations are consistent with those used in the Mn/DOT capital costing effort. While subject to future negotiation with railroad owners, an allocation for "railroad required improvements" is made on the same per-mile basis as was done in the earlier work, with this allocation escalated by 4% per year.

An example of the updated unit pricing may be found in the locomotives, coaches and cab cars. Recent prices were examined to determine what, if any changes, might be required in the unit pricing for the Dan Patch line. Chicago Metra commuter rail system's recent order of MPI-built locomotives at $3.1 million per locomotive is higher than other recent procurements, and it remains to be seen whether or not this unit pricing occurs on other orders or if it is unique to the Metra order. Conversely, the same agency obtained a very favorable price on its recent order of gallery-type coaches and cab cars from Nippon Sharyo. While this was a large order, it again remains to be seen if other rolling stock orders (including for different configurations of equipment) will follow this pricing trend.

The same link numbers and limits, as were used in the Mn/DOT study have been carried into the feasibility study. Station area concepts and designs and the pricing input were included as a line item in the appropriate link capital cost table.

As noted in preceding sections, the service plan developed for the line requires a combination of single-track and sections with passing tracks to allow trains to meet one another. The siding requirements in the

capital program include only trackage that is used by commuter trains. Sometimes the meet may be between a commuter train and a freight train, but this trackage is provided to ensure that the commuter rail service can be operated reliably and efficiently.

There is one improvement that requires further investigation in the context of expediting freight operations. The current track arrangement at Milwaukee Junction in St. Louis Park (between the CP Bass Lake and MNS Spurs) consists of connecting tracks and a tail track, or single-track extension to serve a customer or facilitate operations. This arrangement is operationally awkward, particularly if multiple freight trains operate over this section in a single day. The planned diversion of the TC&W trains to this route (as opposed to the current routing through the Kenwood neighborhood in Minneapolis), as well as projected traffic increases in both CP and TC&W trains would make it impossible to accommodate the expected number of movements per day over the tail track.

This is due to the fact that a train longer than the tail track would have to be split into multiple sections, with each section hauled up to the tail track and then onto the MNS Spur. The train would then have to be re-assembled on the MNS Spur before it could continue north or south from Milwaukee Junction. A train of 100 cars (2010 and 2020 traffic projections envision some trains of this length on this corridor) is estimated to require as much as three hours to negotiate the current track arrangement at Milwaukee Junction. This would impact the operation of commuter trains on the Dan Patch line, as the freights being either split or reassembled would occupy the main track on the MNS Spur. For these reasons it is assumed that the connecting track arrangement at Milwaukee Junction is improved to a direct connecting track prior to the start of Dan Patch commuter rail service. This assumption, currently under study by the City of St. Louis Park, was reflected in the computer-based capacity modeling conducted as part of this study. The cost of this improved connection is not included in the commuter rail capital program.

5.2.1 Link Costs

The capital program required to support the commuter rail service, the system of dividing the corridor into discrete segments called links, was carried over from the previous work done for Mn/DOT, consistent with direction to all the corridors to maintain consistency with the Mn/DOT Commuter Rail Feasibility Study and System Plan. The link capital cost tables are included in the appendix. Because this corridor is planned to move to implementation between 2010 and 2020, costs are given in year 2010 dollars. Link costs are separate from rolling stock (locomotives and passenger cars) and fencing. All of these components of the total capital costs are addressed in Table 5-2 below.

Table 5-2: Link Capital Costs (Year 2010 Dollars)

Link Number	Geographic Limits	Capital Program Cost (Yr 2010 $)
11	Northfield – Port Cargill	$176.7 million
60	Port Cargill – Milwaukee Junction	$102.6 million
59	Milwaukee Junction – St. Louis Park Junction	$27.0 million
65	St. Louis Park Junction – Lyndale Junction	$11.7 million
54	Lyndale Junction -- Minneapolis/5th Street	$2.7 million
	TOTAL	**$320.7 million**

The above costs include assumed right-of-way, environmental mitigation, structures, track and signal (including grade crossings) costs, as well as the station costs. They also reflect the siding program associated with a St. Louis Park station located near the Highway 7 crossing. Costs include two small maintenance and storage facilities in Lakeville and Northfield. In addition, the capital program for Link 60 includes acquisition of two residences that are isolated from the area road network, except for a private grade crossing on the corridor. While it may be possible to acquire additional land and reconfigure the surrounding property to construct a new access road to the two homes from the northernmost cross street, it was assumed that the cost of acquiring the two properties should be assumed by the Dan Patch project.

5.2.2 Optional Fencing/Sound Walls

Some capital program costs were tracked separately from the overall corridor capital program. One of these cost elements was the fencing program for the corridor. This program includes over 22 miles of right-of-way fencing and 15 miles of landscaped sound walls. The allocation of the particular type of fencing/wall to each link was approximate, based on observations of developed areas or other sensitive installations adjacent to the corridor. These costs were tracked separately owing to the fact that sound walls were not part of the commuter rail capital cost program defined in the Mn/DOT study, although locations where state or federal noise standards would be exceeded would receive mitigation. However, the project team recognized that concerns in some of the areas adjacent to this corridor would best be addressed by the inclusion of fencing/sound walls as part of the project. The estimated cost of the proposed fencing program (including contingencies and other allocations) would be as indicated in Table 5-3 below.

Table 5-3: Optional Fencing/Sound Wall Costs

Link	Right-of-Way Fencing		Sound Walls	
	Miles	**Cost**	**Miles**	**Cost**
11	13.0	$1.6 million	10.0	$13.3 million
54	0	0	0	0
59	1.3	$0.2 million	0.5	$0.7 million
60	8.0	$0.9 million	4.5	$5.9 million
65	0	0	0	0
TOTAL	22.3	$2.7 million	15.0	$19.9 million

5.2.3 Rolling Stock

Another cost item that was tracked separately was rolling stock (locomotives and cars). In this instance, this is due to the fact that these costs are for the corridor as a whole, as opposed to being allocated to any one link. The service plan (see the Updated Service Plan Technical Memo) for the corridor is based on the use of four- and five-car trains (called "consists") to meet the projected demand for service. A total of six train sets, comprising six locomotives, 20 intermediate cars and 6 cab cars, is required to maintain the proposed schedule. In addition to this, one locomotive, two intermediate cars and one cab car would be purchased to provide for maintenance of the fleet.

Using recent acquisition prices for similar rolling stock by other commuter rail operators, including escalation to likely costs in 2010 dollars, each locomotive would cost $3.9 million, each car would cost $2.1 million and each cab car would cost $2.9 million. Therefore, the total capital cost for the rolling stock required for the Dan Patch corridor would be $117.3 million (including appropriate allocations and contingencies).

5.2.4 Optional Residential Acquisition

As noted previously, acquisition other than the two residences described above is not required or assumed by the project. Corridor communities have requested, however, that project costs also include the acquisition of all residential property adjacent to the railroad right-of-way. The present assessed value of record of all residential properties in the corridor adjacent to the railroad right-of-way is $240 million, as given to the project team by corridor city staff (see Table 5-4 below). The State Legislature considered a bill in the spring of 2001 that would require acquisition of all residential property within 100 feet of the railroad right-of-way. The cost of acquiring all residential property within 100 feet of the right-of-way is not known.

Table 5-4: 2000 Adjacent Residential Parcels and Values

Total Number of Adjacent Parcels	Number of Developed Residential Parcels	Total Assessed Value of All Adjacent Residential Parcels
1,662	1,171	$239,700,000

5.2.5 Total Estimated Year 2010 Capital Costs

Total capital costs for the 44.2-mile Minneapolis – Northfield Dan Patch corridor are estimated to be $441 million without soundwalls. With estimated soundwall mitigation costs included as a contingency, or placeholder, total capital costs are estimated at $461 in year 2010 dollars.

Table 5-4: Total Year 2010 Capital Program Costs

(In Millions – Year 2010 Dollars)

Link Costs	
11 – Northfield to Port Cargill	$176.7
59 – St. Louis Park Jct. – Milwaukee Jct.	$27.0
60 – Milwaukee Jct. – Port Cargill	$102.6
65 – St. Louis Pak Jct. – Lyndale Jct.	$11.7
54 – Lyndale Jct. – Minneapolis	$2.7
Link Cost Subtotal	**$320.7**
Vehicle Costs	
Locomotives (7)	$27.3
Cab Cars (7)	$20.3
Coaches (22)	$46.2
Contingency (25%)	$23.5
Vehicle Cost Subtotal	**$117.3**
Standard ROW Fencing	
11 – Northfield to Port Cargill	$1.2
59 – St. Louis Park Jct. – Milwaukee Jct.	$0.1
60 – Milwaukee Jct. – Port Cargill	$0.7
Design/Construction Management (12%)	$0.3
Contingency (20%)	$0.4
ROW Fencing Subtotal	**$2.7**
Subtotal w/Contingency Soundwall Mitigation	**$440.7** Say $441 million
Contingency Environmental [1]	$20.0
TOTAL	**$460.7** Say $461 million
Optional Enhancements:	
Acquisition of Adjacent Residential Property 2	$240.0
TOTAL OPTIONAL ENHANCEMENTS	**$240.0**

1. Mn/DOT will provide mitigation where state and/or Federal noise standards are exceeded. This line item has been included as a placeholder should sound mitigation be required. This would include noise mitigation if testing indicated noise mitigation were required.
2. Current assessed market value, as provided by corridor cities.

5.3 Corridor Staging

While the full Dan Patch corridor evaluated in this Feasibility Study extends south to Northfield, the corridor as recommended in the Mn/DOT Commuter Rail System Plan ends at Lakeville. For a truncated corridor ending in Lakeville, the total estimated capital cost is $386 million in year 2010 dollars. The Savage to Lakeville link (Link 11A) table detailing costs in this segment is included in the Appendix, along with the full corridor link costs.

6.0 TRANSPORTATION IMPACTS

6.1 General Roadway System

The study identified the effects of implementing Dan Patch commuter rail services on both the regional and local (station-specific) transportation systems, for forecast year 2020. The general conclusion is that commuter rail service along the Dan Patch Commuter Rail Corridor will reduce vehicle demand on metropolitan highways and local streets by approximately 4,600 vehicles per day, or 1,400 vehicles during both the AM and PM peak hours.

When the total commuter rail system was considered, including Northstar, Red Rock, Central, and Dan Patch Corridors, forecasts indicate that approximately 79 percent of all Dan Patch commuters (5,967 daily riders) will access the stations in 4,900 automobiles. On a peak hour basis, forecasts indicate that 1,470 automobiles will access the eight Dan Patch stations, both during the AM and PM peak hours. This volume of vehicles can be accommodated with minor capacity improvements to facilitate local, station-specific traffic operations during the peak hours, when the highest volume of traffic is on the streets. A summary of the necessary capacity enhancements is outlined below:

- Northfield Station -- TH 3 will be improved, and no capacity enhancements beyond those already included in the improvement plan will be needed to accommodate traffic generated by the commuter rail station.

- Lakeville Station -- 215th Street will be improved, and no capacity enhancements beyond those already planned will be needed.

- Burnsville Station -- Construct a westbound right-turn lane on Southcross Drive at Judicial Road. Construct a southbound left-turn lane on Judicial Road at Southcross Drive. Install a traffic signal at the Judicial Road/Southcross Drive intersection.

- Savage Station -- Add capacity to Quentin Avenue to accommodate general traffic growth in Savage. This capacity enhancement will be needed even if commuter rail is not implemented. Construct a westbound left-turn lane on 123rd Street at Xenwood Avenue.

- Bloomington South Station -- Extend the median on Old Shakopee Road to the east from the Hampshire Avenue/Old Shakopee Road intersection and provide a median break to serve the driveway to/from the commuter rail station. Construct an eastbound left-turn lane and a westbound right-turn lane on Old Shakopee Road.

- Bloomington/Edina Station -- Consider alternative access driveways for this station to replace the proposed, concept-level driveway on East Bush Lake Road. The first alternative would be to locate the access driveway along 78th Street as close to the railroad track (as far west from East Bush Lake Road) as possible. Because of a severe grade change between 78th Street and the area proposed for the station, it would be necessary for vehicles accessing the station to enter on the second level of a parking structure.

  The second alternative would include expanding the station area so that it would lie on both sides of the CP railroad track, and providing access to the station from the west off Cahill Road. Bus circulation could take place on the west side of the track, and kiss-and-ride and park-and-ride facilities could be provided on the east side of the track. Access to Cahill Road would be gained by turning south from 78th Street.

- St. Louis Park Station -- Reconstruct Cedar Lake Road to provide turn lanes. These capacity enhancements will accommodate both general traffic and commuter rail-generated traffic, as

travel demand on Cedar Lake Road will exceed capacity in 2020, even without implementation of commuter rail.

6.1.1 System-Wide Effects

The following assumptions were used in the analysis of system-wide effects of implementing the Dan Patch commuter rail service:

- 7,500 daily riders on Dan Patch commuter rail trains in 2020
- 75 percent of daily riders will switch modes from automobiles to commuter rail
- 60 percent of commuter rail trips will occur during the AM and PM peak hours
- 1.218 person per automobile occupancy forecast for 2020

Application of these assumptions resulted in a forecast reduction of 1,400 vehicles commuting between Northfield and Minneapolis on metropolitan highways and other roads not included in the Metropolitan Highway System, during the AM and PM peak hours. A freeway can accommodate 1,200 vehicles per lane per hour at Level of Service (LOS) D during both peak hours.[3]

Results of the ridership forecast model showed that the most significant reductions in demand would occur along TH 169, TH 100, I-35, I-35W, I-35E, and TH 77. Table 6-1 presents these results.

Table 6-1: 2020 Forecast Maximum Reduction in AM Peak Hour Vehicle Trips

Location	I-35	TH 169	TH 100	I-35W	TH 77	I-35E	Total**
Northfield to I-35W/I-35E Junction	237	-	-	-	129	-	366
I-35W/I-35E Junction to I-494	-	-	-	924	14	111	1,049
I-494 to Minneapolis CBD	-	25	56	931	-	107	1,119

** Table 6-1 does not include automobile trips that would be diverted to commuter rail from streets that are not included in the Metropolitan Highway System.

Source: Parsons Brinckerhoff Quade and Douglas, Dan Patch Commuter Rail Forecast, May 2001.

6.1.2 Station-Specific Effects

The assessments of commuter rail-generated traffic impacts on streets and intersections at specific stations considered 2020 daily and AM peak hour ridership forecasts, 2020 forecast traffic on streets adjacent to the seven stations, and roadway and intersection geometrics currently planned for the affected street systems. Table 6-2 presents AM peak hour turns to/from the seven stations.

[3] Level of Service (LOS) reflects the density of vehicles comprising the freeway traffic stream, measured in passenger cars per mile per lane. LOS D, the design standard for freeways, occurs between 30 and 42 passenger cars per mile per lane and represents a condition where an average speed of 40 miles per hour or more can be safely maintained.

LOS A, B, C, and D are acceptable conditions for freeway operations. LOS E and F represent unacceptable conditions where average vehicle speed is less than 40 miles per hour and the density of vehicles in the traffic stream is so high that vehicle proximity is high and freedom to maneuver with safety is compromised.

Table 6-2: 2020 Forecast Am Peak Hour Turns To/From Commuter Rail Stations

Commuter Rail Stations	Inbound Traffic	Outbound Traffic	Total Traffic
Northfield	67	20	87
Lakeville	254	15	269
Burnsville	712	43	755
Savage	263	16	279
South Bloomington	78	5	83
Bloomington/Edina	67	4	71
St. Louis Park	103	103	206

Source: Parsons Brinckerhoff Quade and Douglas, Dan Patch Commuter Rail Forecast, May 2001.

These assessments do not represent fully detailed Traffic Impact Analyses (TIAs), which would include intersection turning movement counts and operational intersection capacity analyses. The assessments are general overviews that are based on the following assumptions:

- Two-Way Daily Roadway Capacity at LOS D:
  - 2 lanes with no turn lanes in rural environment -- 14,000 to 15,000 vehicles per day (vpd)
  - 2 lanes with no turn lanes in urban environment -- 8,000 to 9,000 vpd
  - 2 lanes with left-turn lanes -- 18,000 vpd
  - 4 lanes with no turn lanes -- 25,000 vpd
  - 4 lanes with left-turn lanes -- 34,000 vpd
  - 4 lanes with left- and right-turn lanes -- 38,000 to 41,000 vpd

Northfield Station:

The Northfield Station is proposed to be located at an existing train depot in the southwest quadrant of the intersection of TH 3 and West 3rd Street. While some trips to/from the station will use West 3rd Street, which intersects TH 19 west of Northfield, the majority of trips will access the station from TH 3.

The center section of TH 3 (from the Cannon River to the railroad bridge) is planned to be re-built in 2003 to include pedestrian and bicycle facilities, increased turning radii at intersections to better accommodate trucks, and provide for future traffic signal installation at 3rd Street. The existing configuration of lanes, which consists of two through lanes in each direction and left-turn lanes, would remain unchanged. The design improvements for the TH 3 are documented in *Summary of Findings for the Design of the Highway #3 Center Section* (Ulteig Engineer, Inc. 1997). The planned design improvements also include 3rd Street, which will be reconstructed to provide two through lanes in each direction and a designated eastbound left-turn lane.

The City of Northfield prepared a transportation plan in 1998 (SEH, Inc.), where year 2020 traffic forecasts were based on actual 1998 traffic counts. The 2020 forecast for TH 3 in the vicinity of the proposed station is 20,000 vpd. With a daily traffic volume of 20,000, LOS D can be achieved with two

lanes in each direction, with turn lanes. The TH 3 section in the vicinity of 3rd Street currently has (and will have) two lanes in each direction and left-turn lanes. Additionally, a traffic signal will be installed when warrants are met at the TH 3/West 3rd Street intersection. This indicates that adequate roadway capacity and intersection capacity is (and will be) available to accommodate the forecast volume of peak hour turns between 3rd Street and TH 3.

Lakeville Station:

The Lakeville Station is proposed to be located in the northeast quadrant of the intersection formed by Holyoke Avenue and 215th Street. The ridership forecast model indicated that the majority of traffic accessing the station will use Holyoke Avenue (north of the station) and 215th Street (west of the station).

The city prepared a transportation plan in 1999 (SRF Consulting Group, Inc.), where 2020 traffic forecasts were based on actual 1999 traffic counts. According to the plan, the 2020 forecast volumes will be:

- 5,000 vpd on Holyoke Avenue
- 12,000 vpd on 215th Street east of Holyoke Avenue
- 15,000 vpd on 215th Street west of Holyoke Avenue

According to the transportation plan, Holyoke Avenue will be classified as Major Collector, and 215th Street is a High Density "A" Minor Arterial. No improvements are currently planned for Holyoke Avenue, which exists today as a two-lane road. The transportation plan indicated that 215th Street will be reconstructed as a four-lane road with left-turn lanes by 2011.

LOS D can be maintained on a two-lane road, like Holyoke Avenue, when daily traffic volumes do not exceed 14,000. The 2020 forecast volume on Holyoke Avenue is 5,000 vpd, and the addition of traffic that will be generated by the commuter rail station will not be so high that it will cause any capacity problems. Likewise, 215th Street (particularly in view of the planned 2011 improvements) will accommodate 32,000 vpd before exceeding LOS D. The 2020 forecast daily volumes for 215th Street are 12,000 vpd and 15,000 vpd, and, again, traffic generated by the commuter rail station will not lead to any capacity problems.

In order to ensure safe and efficient traffic movements, it is recommended that a traffic signal should be installed to control traffic movements across this intersection. It is assumed that traffic signal installation at critical intersections along 215th Street is already part of the planned improvement program.

Burnsville Station:

The Burnsville Station is proposed to be located in the northeast quadrant of the intersection formed by Judicial Road and Southcross Drive. Judicial Road is currently classified as a collector street, and Southcross Drive is classified as an "A" Minor Arterial in the city's transportation plan (SEH, Inc., 1996). According to the ridership forecast model the majority of traffic accessing the station will use Southcross Drive east of the Judicial Road.

The transportation plan includes 2020 traffic forecasts that were based on 1996 actual traffic volume counts. Forecast daily traffic volumes for 2020 were calculated at:

- 3,000 vpd for Judicial Road
- 7,500 vpd for Southcross Drive from CSAH 42 to CSAH 5

- 13,500 vpd for Southcross Drive from CSAH 5 to I-35W

Judicial Road is a two-lane street, and Southcross Drive is a four-lane street. Neither street was identified for improvements in the transportation plan. As a two-lane street, LOS D can be accommodated on Judicial Road with daily volumes up to 14,000. With four lanes, Southcross Drive will be able to accommodate up to 28,000 vpd at LOS D.

While both Judicial Road and Southcross Drive provide adequate capacity for through traffic, the addition of AM peak hour turns to/from the station (712 inbound and 43 outbound) would require dedicated turn lanes, particularly a westbound right-turn lane on Southcross Drive, and a southbound left-turn lane on Judicial Road. The right-turn lane on Southcross Drive would assist with the safe and efficient movement of traffic during the AM peak hour, and the southbound left-turn lane would improve safety and efficiency during the PM peak hour. A traffic signal would also be needed, particularly during the PM peak hour, to regiment the flow of east/west traffic on Southcross Drive and create gaps to allow southbound traffic on Judicial Road to safely complete left-turn movements.

Savage Station:

The Savage Station is proposed to be located on the western edge of the Hamilton District in the southeast quadrant of the intersection formed by Xenwood Avenue and 123rd Street. TH 13, a Principal arterial, which runs east/west, parallels 123rd Street in the vicinity of the proposed station. The ridership forecast model showed that access to/from the station will largely take place on TH 13, 123rd Street, and Quentin Avenue, a north/south street that links McColl Drive and CR 42 to the Hamilton District and TH 13.

The city prepared a transportation plan in 1997 (SRF Consulting Group, Inc.) that included 2020 traffic forecasts based on actual counts. The 2020 forecast traffic volumes for TH 13 and Quentin Avenue are outlined below:

- 55,000 for TH 13, west of Quentin Avenue
- 58,000 for TH 13, east of Lynn Avenue
- 18,000 for Quentin Avenue, just south of TH 13

The 2020 forecast for Quentin Avenue was based on the assumption that CR 27 would be extended north from McColl Drive to link with TH 13. This roadway link will not be constructed, however, and, consequently an adjusted 2020 forecast for Quentin Avenue will need to include a portion of the traffic that would have used extended CR 27. The adjusted forecast for Quentin Avenue is 29,000 vpd.

With this volume of traffic, Quentin Avenue, which is currently a two lane street without turn lanes, will need to be improved to provide additional capacity. A four-lane section with turn lanes at critical intersections is recommended. These improvements, which would be required even without commuter rail, would provide adequate capacity to accommodate general traffic in the Savage area and additional traffic generated by the commuter rail station.

123rd Street is currently being realigned and constructed to run from Quentin Avenue to Xenwood Avenue. The new alignment will take 123rd Street under the existing Canadian Pacific Railroad tracks. This new alignment will serve to link what is currently a disconnected TH 13 frontage road. It is not forecast to have high through traffic volumes. Instead, traffic that will use 123rd Street will be destination-oriented.

Additionally, with 263 vehicles turning left into the station from 123rd Street, a left-turn lane at the intersection of Xenwood Avenue/123rd Street could potentially be required.

South Bloomington Station:

The South Bloomington Station is proposed to be located in the northeast quadrant of the intersection formed by Hampshire Avenue and Old Shakopee Road. A driveway providing direct access to/from the station would be located on Old Shakopee Road.

According to the transportation element of the City of Bloomington Comprehensive Plan (prepared in 2000), Old Shakopee Road is classified as an "A" Minor Arterial. Its section in the vicinity of the proposed station consists of a center median and two through lanes in each direction. Exclusive right-turn lanes and eastbound and westbound left-turn bays are provided at the Hampshire Avenue/Old Shakopee intersection. Hampshire Avenue operates as a city street.

The city's plan included 2020 traffic forecast, which are outlined below:

- 41,000 west of the proposed station
- 41,000 east of the proposed station

The ridership forecast model indicated that the majority of traffic generated by the commuter rail station would use Old Shakopee Road, and most of that would approach the station from the east. As a four-lane road with left- and right-turn lanes, LOS D capacity is in the range of 38,000 to 41,000 vpd. Because the forecast volumes are so close to the LOS D capacity limit, it is recommended that the following improvements to Old Shakopee Road should be implemented to accommodate access to/from the station:

- Extend the existing raised median east to the driveway providing access to/from the station
- Construct a median break and an eastbound left-turn bay to serve the commuter rail station
- Construct a westbound right-turn lane across the tracks to serve the station

Bloomington/Edina Station:

While the Bloomington/Edina Station would serve commuters in both Bloomington and Edina, its actual location would be within the City of Bloomington, between the CP railroad track over I-494 and East Bush Lake Road. This station site would be bordered on the north by 78th Street and on the south by I-494. As currently proposed, the station's only access driveway would be located on East Bush Lake Road, and the surface parking lot would accommodate approximately 80 cars. A one story parking deck has also been discussed, which would add 60 more parking spaces.

The I-494/East Bush Lake Road interchange will be reconstructed by Mn/DOT, and efforts have been made through the Dan Patch Commuter Rail Feasibility Study to coordinate with Mn/DOT to ensure that improvements to the interchange will not preclude the construction of a potential future commuter rail station.

The majority of traffic accessing the station during the AM peak hour, according to the ridership forecast model will be from westbound I-494. This traffic will exit I-494 at the East Bush Lake Road Exit and will turn north onto East Bush Lake Road at the ramp head. After traveling north on East Bush Lake Road for approximately 80 feet, traffic will then turn left into the commuter rail station driveway.

According to traffic counts taken by Hennepin County in 1999, the daily traffic volume on East Bush Lake Road just south of 78th Street was 13,000 vpd. Applying a 2.5 percent annual growth rate to this observed traffic volume, the 2020 forecast volume for East Bush Lake Road was calculated at 21,800 vpd.

East Bush Lake Road is a four-lane facility adjacent to the proposed station location, and LOS D can be accommodated at daily volumes up to 25,000. Consequently, the addition of left- and right-turning traffic generated by the commuter rail station would present capacity issues on East Bush Lake Road.

Issues related to the location and design of this station are outlined below:

- The driveway providing access to/from the station was originally shown at approximately 80 feet north of the I-494/East Bush Lake Road Westbound Off-Ramp, on the west side of East Bush Lake Road. In order to minimize interference with northbound through traffic movements, a northbound left-turn lane would be needed on East Bush Lake Road. Given peak hour through volumes on East Bush Lake Road, the weave distance between the off-ramp and a future left-turn lane will not be adequate for northbound vehicles to safely move from the outside lane to the left-turn lane.

- On-site circulation for the station was felt to be inadequate to accommodate transit, kiss-and-ride, and park-and-ride operations. According to the ridership forecasts prepared for the AM peak period, 117 commuter rail passengers would be expected to arrive at the station by transit in an estimated four buses.

  The longitudinal staging area required for four buses is approximately 90 feet per bus, indicating a need for a 360 foot-long tangent section. Additionally, minimum 47 foot-wide turning radii would be needed to allow buses to efficiently circulate around 90 degree corners on-site. Analysis of the concept-level, station site plan shows these minimum clearances.

  While it is recognized that peak period transfers from buses to commuter rail need not involve staging for timed transfers, and the four buses arriving at the station need not arrive at the same time, concern was expressed that the combination of buses and automobiles will lead to on-site congestion.

Two alternative solutions were considered for this station location. The first would involve relocating the access driveway from East Bush Lake Road to West 78th Street. The location of the driveway along West 78th Street should be as far west as possible from East Bush Lake Road. A traffic signal, which already exists at the West 78th Street/East Bush Lake Road intersection, would serve to control the flow of through and turning vehicles.

Because of a severe grade change between 78th Street and the area proposed for the station, traffic using the 78th Street access driveway would have to enter at the second floor of the station's parking structure.

The second alternative would involve expanding the station to include both sides of the CP track, with bus transfer operations on the west side of the track, and kiss-and-ride and park-and-ride operations on the east side. The expanded station could be accessed from an existing driveway off Cahill Road or directly from a future driveway off 78th Street on the east side of the railroad track. Both of these access routes would require easements across private property.

The entire I-494/East Bush Lake Road/railroad bridge interchange area is currently in design for reconstruction. The location for a shared Bloomington/Edina station may have to be reconsidered as final design for the area is determined. The two cities will need a clearer picture on remaining available land and local access paths before this station can be developed more than conceptually in a future project phase.

St. Louis Park Station:

The St. Louis Park Station is proposed to be located on Cedar Lake Road, immediately east of TH 100. Because of its proximity to downtown Minneapolis, the St. Louis Park Station is not proposed to include park-and-ride facilities. It was forecast, however, that 103 vehicles would access the station in the AM peak hour. This volume of vehicles would consist of 103 inbound vehicles and 103 outbound vehicles, operating as kiss-and-ride vehicles. According to the ridership forecast model, the majority of this traffic would access the station from TH 100, with southbound traffic exiting at Parkdale Drive, and northbound traffic exiting at Cedar Lake Road.

Cedar Lake Road is a two lane commercial street, without on-street parking, immediately east of TH 100. While it serves commercial uses that are adjacent to TH 100, its character changes from a commercial street to a residential street, moving east from the proposed station location. According to the city's traffic engineering department, the daily traffic volumes on Cedar Lake Road, both east and west of TH 100 are 10,500 vpd. A 2.5 percent annual growth rate was applied to these volumes to derive 2020 forecast volumes of 16,800 on either side of TH 100.

These daily traffic volumes, which would occur by 2020, even without commuter rail, would require the city to improve Cedar Lake Road so it could accommodate higher traffic volumes. This is particularly true. As a two lane road, with left-turn lanes added, Cedar Lake Road would be able to accommodate general traffic and additional traffic that would be generated by the commuter rail station.

6.2 Multimodal Linkage

All but two of the commuter rail stations are located within the (former) Twin Cities Metropolitan Transit Taxing District: Minneapolis, St. Louis Park, Edina, Bloomington, Savage, and Burnsville.[4]

Transit providers operating in the corridor are Metro Transit, Minnesota Valley Transit Authority, and Southwest Metro. The catchment area is defined by a six mile-wide swath on either side of the corridor. Pending ridership forecast results, which will identify mode of arrival-specific, commuter rail trip productions by Traffic Analysis Zone (TAZ), the six mile area is thought to be the maximum distance a feeder bus rider will travel to access a commuter rail station.

6.2.1 Issues

There are three issues to address in the analysis of potential commuter rail station/transit interface opportunities. First, for those cities with a proposed commuter rail station, where transit services are provided, there is the issue of modifying existing transit routes so that they can operate as feeder routes to the commuter rail station.

The creation of feeder bus services to commuter rail stations offers opportunities to:

a) eliminate some express bus services between suburban communities and Minneapolis, and
b) increase ridership by serving commuters who will ride trains to locations not currently served by buses; e.g., Lakeville and Northfield.

The second issue is providing feeder bus service in Lakeville, a community that is both within the former Metro Transit Taxing District and the commuter rail station/feeder bus catchment area, but without transit services. The third issue is providing feeder bus services in Eden Prairie and Shakopee, two communities that are within the catchment area and the Southwest Metro service area, but where

[4] Remaining Dan Patch commuter rail stations are located in Lakeville and Northfield. No transit services are provided in Lakeville, and demand-responsive, dial-a-ride services are provided in Northfield.

Southwest Metro does not provide service to the nearest commuter rail stations in Bloomington and Savage.

These situations potentially present opportunities for:

a) expansion of transit services into Lakeville and
b) cooperative agreements between communities to facilitate the expansion of Southwest Metro services into Bloomington and Savage.

6.2.2 Transit Provider Responses

Transit providers (Metro Transit, Minnesota Valley Transit authority, and Southwest Metro) were asked the following questions:

- Would you be willing to modify existing routes to operate as feeders to commuter rail stations?
- What are the obstacles to such modifications?
- What are the opportunities and negative impacts that would arise from such modifications?

Key points from discussions with the providers are presented below.

Metro Transit

Metro Transit is open to considering routing and schedule changes to the appropriate routes in order to support commuter rail. The service area map is illustrated on Figure 8-2.

Downtown Minneapolis Station:

Metro Transit provides service near the proposed stations in downtown Minneapolis, St. Louis Park, Edina, and Bloomington. Metro Transit is in the midst of a major service redesign for St. Louis Park (and Minnetonka and Hopkins). A draft plan is now before the Metropolitan Council; approval of the plan is expected shortly.

St. Louis Park North Station:

Routes 9, 59 and 607 (future) provide service in the area near this station, with service to downtown Minneapolis. Current Route 8 will be eliminated in the transit redesign.

St. Louis Park South Station:

In the proposed service redesign for St. Louis Park, four Metro Transit routes (#17, 67, 604 and 605) will provide bus service within two blocks of the proposed station. The City of St. Louis Park is considering a transit facility several blocks east of this station.

Edina Station:

Routes 587 and 588 provide service in the area near this station, with each route offering three daily express buses to and from downtown Minneapolis during the morning and evening rush hours. Route 28 provides non-express service near the Edina station to downtown Minneapolis. Route 540 provides local service near this station and the Edina Industrial Area.

Bloomington Station:

Routes 44C and 551 (basically reverse-commute routes) provide service in the area near this station. Each route has three daily buses to and from downtown Minneapolis during the morning and evening rush hours.

Minnesota Valley Transit Authority

The MVTA service area is comprised of Burnsville, Savage, Prior Lake, Apple Valley, and Eagan. The system offers regular-route, flex routes, and express and reverse-commute service. It operates daily (Monday through Friday) trips to and from downtown Minneapolis. Given today's level of congestion, travel times range from 25 to 57 minutes, depending on location. MVTA is in the process of changing its routes and schedules.

MVTA would be willing to alter routes and/or schedules to connect with commuter rail stations. Implementation of commuter rail services could result in fewer MVTA buses to downtown Minneapolis and would present MVTA an opportunity to redesign service in the western part of its service area. At this time, MVTA sees few problems associated with the changes. In the current scheme, however, there does not appear to be much time efficiency gained by connecting to or using the proposed commuter rail line.

Savage Station:

MVTA Routes 35N, 35R and 35V offer daily (Monday through Friday) express routes to downtown Minneapolis. These routes collect passengers in the area near the Dan Patch station in Savage. The express buses drop off/collect passengers in the downtown core along Marquette Avenue and 2nd Avenue and the Gateway Ramp. The longest trips (from Prior Lake) are scheduled at 57 minutes and the shortest trips (from Savage park & Ride) are scheduled at 44 to 47 minutes.

MVTA Route 421 offers local "flex" service in the area near the Dan Patch station in Savage and could serve as a feeder to that station.

Burnsville Station:

MVTA Routes 35N, 35T, 35Y and 37W offer Monday through Friday express service from to downtown Minneapolis; all routes pass through the Burnsville Transit Station.

MVTA Routes 424, 425 and 431 routes collect passengers in the area near the Dan Patch station in Burnsville.

Edina Station:

MVTA Route 431 offers local "fixed" service near the Dan Patch station in Edina (at 76th Street and France). Route 431 serves Apple Valley, Burnsville, Bloomington and Edina.

Southwest Metro Transit (SWM)

The SWM service area includes Eden Prairie, Chaska and Chanhassen. SWM offers regular-route and reverse-commute services. It operates 80 daily trips to and from downtown Minneapolis. Given today's level of congestion, travel times average approximately 35 minutes. The system is close to capacity during the morning and evening rush hours. SWM is in the process of discontinuing its service to the Mall of America.

Generally, there is agreement that commuter rail could attract some riders in the area, but there are also questions as to whether people would prefer to travel to the east in a feeder bus and transfer to commuter rail.

SWM offers no bus service in communities where Dan Patch commuter rail stations would be located. SWM planners, however, commented that they would be open to exploring arrangements where service could be provided that would connect with the commuter rail line. The nearest SWM connections to the Dan Patch line would be the I-494/Bloomington Station (approximately 7 miles from the SWM park-and-ride facility in Eden Prairie, near TH 5/TH 212) and Savage Station (approximately 10 miles from a SWM park-and-ride facility in Shakopee, at TH 101/Spencer). Future SWM service to the I-494/ Bloomington Station may require buses to have special access privileges along I-494.

7.0 ENVIRONMENTAL AND COMMUNITY IMPACTS

7.1 Environmental Screening

Dan Patch trains would operate within existing, primarily active, freight railroad right-of-way. Their impact on surrounding natural and community features is expected to be minimal. As part of the Feasibility Study, screening activities were conducted to identify sensitive environmental features which could potentially be impacted by commuter rail implementation in the corridor. Areas evaluated for potential impacts are summarized below.

7.1.1 Wetlands

Within one mile of the railroad right-of-way, 909 delineated wetlands were identified. These wetlands vary in size from small ponding areas to the Minnesota River. Analysis indicates that none are located immediately adjacent to the proposed station locations. Should the corridor proceed to further development, the exact location of needed passing sidings should be tied down, and those areas evaluated further for impact on wetlands within the current single-track railroad right of way.

The Appendix contains maps illustrating delineated wetlands in the corridor.

7.1.2 Contaminated Sites

An inventory and assessment of known or potential contaminated sites was conducted. The geographic scope of the screening was a one-mile radius on either site of the corridor for non-underground storage tank sites and a quarter-mile radius for underground storage tank sites. In total, 239 sites were identified in the inventory: 145 non-underground storage tank sites and 94 underground storage tank sites. The assessment examined the locations of the sites to measure proximity to existing track, proposed station locations, and proposed passing sidings. Analysis indicates that none are located immediately adjacent to the proposed station locations. Should the corridor proceed to further development, the exact location of needed passing sidings should be tied down, and those areas evaluated further for proximity to contaminated sites.

The Appendix contains maps identifying recorded sites.

7.1.3 Community Facilities

Approximately 340 community facilities such as schools, churches, parks and public buildings are within one mile of the corridor. Dan Patch commuter rail service would include safety improvements at grade crossings throughout the corridor.

The Appendix contains maps identifying locations of community facilities.

7.1.4 Noise and Vibration Impacts

This section of the report documents findings from a literature review that was conducted to learn about noise and vibration impacts of commuter rail operations in the United States. Noise and vibration impacts are directly related to the following factors:

- Speed and volume of rail transit trains;
- Design and condition of commuter rail vehicles;

- Distance between noise and vibration sensitive receivers and the trackbed;
- Commuter train wheels and condition of the track, engine idling, and operation of the horn;
- Mitigation effects of noise barriers; and
- Classification of soils or other covering materials as either hard or soft cover.

Each of these factors was addressed to determine how it would contribute to noise and vibration impacts along the Dan Patch corridor. The analysis of noise and vibration impacts did not include actual monitoring activities, which would be conducted if the proposed project were to reach the level of preliminary engineering and an Environmental Assessment/Impact Statement (EA/EIS).

Speed and Volume of Commuter Rail Trains

Speed:

Freight trains operating within the Dan Patch corridor (Northfield to Minneapolis) currently operate at speeds that range between 10 and 25 miles per hour. By comparison, the most recent service planning analysis places the estimated average, overall corridor speed for the Dan Patch line commuter trains at 35 miles per hour. This average speed is not indicative of high speed commuter rail operations, though the speed of commuter rail trains varies by segment and is estimated to reach a maximum speed of 79 miles per hour, for an average of 58 miles per hour in the longest segment, between Lakeville and Northfield.

Average speed is dependent on a number of factors, which are listed below:

- Distance
- Line haul speed between stations, which is dependent on alignment and track characteristics (including alignment curvature and presence or not of siding tracks to allow faster trains to pass slower ones)
- Number of stations where trains stop and dwell time at stations
- Grade crossings or other restrictions

Volume:

Depending on the segment of track within the corridor, the volume of freight train traffic ranged between 0 and 12 trains per day in 1993. Field observations indicated that the length of the trains currently varies from a single locomotive hauling three or four cars to over a mile long. Based on information provided by the railroads, the current frequency of freight trains ranges from:

- 0 trains between Lakeville and Savage;
- 3 to 5 trains per day between Savage and St. Louis Park; and
- as many as 30 trains per day between St. Louis Park and Minneapolis.

The volume of commuter rail trains is currently planned to be 14 trains per day (seven inbound and seven outbound, one of which will operate in the reverse commute direction). Commuter trains at the service

levels assumed for this study would consist of a locomotive and five cars, operating during peak travel times, assumed as 6 to 9 AM and 3 to 6 PM.

Design and Condition of Commuter Rail Vehicles

Although the volume of trains operating in the corridor will increase with the addition of commuter rail, the impacts of commuter rail trains, compared to those of current freight trains, are fewer and less noticeable. Some of the distinguishing characteristics and impact differences are outlined in Table 7-1 below:

Table 7-1: Comparison of Commuter and Freight Trains and Operating Characteristics

Commuter Rail Trains	Freight Trains	Impact Difference
Commuter train consists of a locomotive and five passenger cars, approximately 500 feet long, are assumed for this study.	Freight trains operating in the corridor, typically averaging 30 cars in length, have also been observed to be up to a mile (5,280 feet) long.	Commuter rail trains have less impact at grade crossings and shorter exposure times to stationary features such as residences.
Rail passenger cars, though not lightweight, are lighter than freight cars. Passenger cars are constructed to carry people and provide a smooth ride.	Freight cars are constructed to carry heavy loads.	Less noise from the wheel to track interface with commuter rail trains.
Commuter rail locomotives can be built to emit less exhaust.	Freight locomotives emit comparatively more exhaust.	Passenger rail locomotives can be equipped to be cleaner than freight locomotives.
Commuter rail trains are time-sensitive and typically operate at faster speeds than freight trains.	Freight trains are comparatively slower, on track segments and at street crossings.	Commuter rail trains are exposed to stationary features for a shorter period of time.
Commuter rail vehicles are regularly inspected and maintained to ensure passenger comfort.	Cost efficient freight operations are not concerned with comfort. Consequently, inspections and maintenance activities are conducted on a schedule that is determined by the FRA.	Commuter rail vehicles are maintained to provide high levels of comfort and to minimize noise and vibration impacts to riders.

Source: Biko Associates, Inc.

Distance from Structures and Residences

The State of Minnesota has established minimum horizontal clearance for railroad operations. The state specifications require a minimum clearance of 8 feet between the outside edge of the track and the nearest structure. Field review for the Dan Patch Commuter Rail Feasibility Study indicated that no structure or residence is out of compliance with state specifications, although two residences in Edina are accessed solely by a driveway that cuts across the track. This study assumes acquisition of these residences.

The current direction taken for planning commuter rail service in the corridor is to upgrade/replace existing track in its current location. Therefore, planning to-date assumes that the commuter rail alignment would adhere to state specifications. For particular and isolated segments of the alignment, passing sidings or additional track will need to be constructed. Wherever this is the case, State of Minnesota specifications would apply, and structures and residences that are within the minimum clearance would be acquired.

Commuter Rail Train Noise

Noise impacts from trains primarily result from: 1) the wheel to track interface; 2) idling, and 3) the horn (warning whistle). By far, the horn has the greatest impact. Because of the characteristics of commuter rail trains, compared to those of freight trains, these impacts are not as severe with commuter rail operations. These three sources of noise are discussed below.

Wheel to Track Interface:

Wheel to track noise comes from two sources: 1) wheels going flat and 2) wheels running over the gap between two adjoining rails. By comparison, wheels on passenger cars are "trued" more frequently than wheels on freight cars. This extra maintenance effort is performed to ensure a comfortable ride for passengers. Track maintenance would also be conducted to a higher standard in order to ensure that competitive travel times can be maintained.

To ensure a comfortable ride for passengers, adjoining rails on commuter rail alignments are welded to eliminate the gaps. Resilient rail fasteners, resilient rail ties, ballast mats, and floating slabs are mitigation measures that can help to control ground-borne noise and vibration.

Idling:

Locomotives are noisy when they idle. Idling can be eliminated by constructing passing sidings or double tracks, allowing faster trains to overtake slower trains, or trains approaching each other to continue without requiring one to pull over and idle while the other passes.

Horn:

The FRA issued a proposed rule on January 13, 2000 that stipulates situations under which train horns do not have to be sounded at highway/rail grade crossings. The rule states that horns must be used at every crossing unless one of three conditions or exceptions are met: a) the train operates at no more than 15 miles per hour and the crossing is "flagged" properly; b) the train operated at 15 miles per hour along a city street, with proper signage; or c) when designated "quiet zones" are established with supplementary or alternative safety measures incorporated at a crossing. The referenced supplementary safety measures (e.g., four-quadrant gates and median barriers) may cost in the range of $250,000 to $300,000 per crossing. This rule is currently on hold.

FRA standards specify that the horn must be at minimum 96 dBA, 100 feet in front of the train, while the train is in a stationary position. Studies have shown that because the horn on locomotives may be located behind the exhaust stack, it must be blown at 105 dBA or more at its source to meet the specifications. This is because the exhaust stack effectively blocks the forward movement of sound from the horn and additionally disperses sound laterally.

Horns on commuter locomotives have typically been retrofitted to the front or cab roof of the locomotive to address this problem. Results have shown that the horn can be blown at a lower decibel level (101 dBA to 102 dBA) at its source and still meet FRA specifications, while sufficiently reducing lateral dispersion. Another possibility would be to use a wayside warning horn that is directed along the cross-street, minimizing noise dispersion throughout the surrounding neighborhood. However, the FRA has yet to indicate its acceptance of this approach.

Mitigating Commuter Rail Noise and Noise Standards

The purpose of noise barriers for trains is the same as the purpose of noise barriers that are constructed along highways. Preventing wheel and brake noise from reaching sensitive receivers such as residential, school, and park land uses requires that the barriers are constructed at the edge of shoulder or at the property line of the affected sensitive receptor. The use and location of wayside noise barriers would need to be feasible and reasonable to be considered as an appropriate mitigation. Mitigation is feasible if the barrier provides 5 dBA or more in noise reduction to the affected receptor, and if the cost per shielded dwelling unit is considered reasonable.

The wayside noise barriers for rail operations are typically 4 feet to 6 feet high and are located at the edge of shoulder or at the property line of the affected receptor. Wayside noise barriers have been proven to provide a 5 dBA to 10 dBA noise reduction, depending on the height of affected receptor. Mn/DOT does not currently endorse the use of noise barriers on commuter lines. However, the Dan Patch Commuter Rail Feasibility Study presents them as a mitigation option.

Barriers are indicated where land use-specific noise standards are exceeded. Table 7-2 below, presents State of Minnesota noise standards.

Table 7-2: State of Minnesota Noise Standards

Noise Area Classification	General Land Use Type	Sound Level (dBA)			
		Day (7 AM to 10 PM)		Night (10 PM to 7 AM)	
		L50	L10	L50	L10
1	Residential	60	65	50	55
2	Commercial	65	70	65	70
3	Industrial	75	80	75	80

Source: Minnesota Rules Parts 7010.0010 to 7010.008

In addition to meeting State of Minnesota standards, the commuter rail trains must meet Federal regulations, which state that sound levels produced by rail cars moving faster than 45 miles per hour, must not exceed 93 dBA at a distance of 100 feet from the centerline of the track. (49 CFR Part 210.)

Additionally, the Federal Transit Administration (FTA) has developed criteria for assessing noise impacts related to commuter trains. The standards provided in the *Transit Noise and Vibration Assessment* (FTA, 1995), are founded on documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. According to the scale, the increase in noise level that a transit project is allowed to change the overall environment is reduced with increasing levels of existing noise. The FTA Noise Impact Criteria groups noise-sensitive land uses into the following three categories:

Category 1: Buildings or parks where quiet is an essential element of the intended purpose.

Category 2: Residences and buildings where people normally sleep and where nighttime sensitivity is assumed to be of utmost importance.

Category 3: Institutional land uses with primary daytime and evening use.

Two levels of impact included in the FTA criteria are summarized below:

Severe: Severe noise impacts are considered "significant" as this term is used in the National Environmental Policy Act (NEPA) and implementing regulations. Noise mitigation will normally be specified for severe impact areas unless there is no practical method for mitigating the noise.

Moderate

Impact: In this range, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors include predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor/indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.

A table describing allowable, cumulative noise level increases was prepared and issued by FTA, based on these definitions. The first column in the table shows the existing noise levels, and the remaining columns show the commuter rail-related increase in noise levels that would result in either a moderate impact or a severe impact. Thus, if under Category 1 and 2 land uses, the existing noise level is 45 dBA, commuter rail operations would be able to add 7 dBA without triggering a moderate impact. If 8 dBA were added, a moderate impact condition would exist, and if 14 dBA were added by commuter rail operations a severe impact condition would exist.

Table 7-3 below, shows that as existing noise levels increase, the amount of the allowable increase in the overall noise levels caused by the rail transit project decreases.

Table 7-3: Allowable, Cumulative Noise-Level Increases

Existing Noise Exposure (dBA)	Category 1 and 2 Land Uses (dBA)		Category 3 Land Uses (dBA)	
	Moderate Impact	Severe	Moderate Impact	Severe
45	8.0	14.0	12.0	19.0
46	7.0	13.0	12.0	18.0
47	7.0	12.0	11.0	17.0
48	6.0	12.0	10.0	16.0
49	6.0	11.0	10.0	16.0
50	5.0	10.0	9.0	15.0
51	5.0	10.0	8.0	14.0
52	4.0	9.0	8.0	14.0
53	4.0	8.0	7.0	13.0
54	3.0	8.0	7.0	12.0
55	3.0	7.0	6.0	12.0
56	3.0	7.0	6.0	11.0
57	3.0	6.0	6.0	10.0
58	2.0	6.0	5.0	10.0
59	2.0	5.0	5.0	9.0
60	2.0	5.0	5.0	9.0
61	1.9	5.0	4.0	9.0
62	1.7	4.0	4.0	8.0
63	1.6	4.0	4.0	8.0
64	1.5	4.0	4.0	8.0
65	1.4	4.0	3.0	7.0
66	1.3	4.0	3.0	7.0
67	1.2	3.0	3.0	7.0
68	1.1	3.0	3.0	6.0
69	1.1	3.0	3.0	6.0
70	1.0	3.0	3.0	6.0
71	1.0	3.0	3.0	6.0
72	0.8	3.0	2.0	6.0
73	0.6	2.0	1.8	5.0
74	0.5	2.0	1.5	5.0
75	0.4	2.0	1.2	5.0

Source: *Transit Noise and Vibration Assessment*, FTA, 1995.

An extensive study conducted in Encinita, California (Noise Assessment of North County Transit District Passing Track, Mestre Greve Associates; February 3, 1997), included noise monitoring of commuter rail trains along line haul track segments and while idling. The study was conducted to identify noise impact reductions that would occur with construction of passing sidings. The study documented the following commuter rail noise levels at three locations. The results indicate how commuter rail train noise can be dissipated to acceptable levels over distances.

Table 7-4: Examples of Noise Dissipation Over Distances

Location	Noise Level Contour Distances (Feet) Between Track and Sensitive Receiver		
	60 dBA	**65 dBA**	**70 dBA**
1	198'	92'	43'
2	81'	38'	17'
3	198'	92'	43'

Source: Noise Assessment of North County Transit District Passing Track, Mestre Greve Associates; February 3, 1997.

7.1.5 Ground-Borne Vibrations

Background

Ground-borne vibration is a small but rapidly fluctuating motion transmitted through the ground. The vibration can be quantified in terms of mechanical motion of the medium through which it is perceived. The magnitude of vibration is usually measured in terms of velocity and/or acceleration and reported in terms of the root-mean-square (RMS) velocity level in decibel units (VdB).

The FTA has developed impact criteria for acceptable levels of ground-borne vibration. These criteria are based, in part, on the following:

- The threshold of vibration perception for most humans is approximately 65 VdB. Levels in the 70 to 75 VdB range are often noticeable but acceptable, and frequent levels greater than 80 VdB are often considered unacceptable.
- There is a relationship between the number of events and the degree of annoyance caused by vibrations.
- For commuter rail systems with limited operations during the peak commute hours, limits for acceptable levels of residential ground-borne vibration are usually set at 80 VdB.
- Ground-borne vibrations from any type of train operations will rarely be high enough to cause any sort of structural or even cosmetic damage to buildings. The only real concern is that the vibration will be intrusive to building occupants or interfere with vibration-sensitive equipment.

7.1.6 Case Study

A study conducted for Southern California Regional Rail Authority Metrolink (Sound Level and Seismic Level Survey; February 1996) included seismic monitoring activities to measure ground-borne vibrations from 24 commuter rail trains. Monitoring was conducted at 40 feet and 20 feet from the centerline of track. Results showed that at 40 feet, ground-borne vibrations were below the threshold of human

perception, and at 20 feet vibrations were in the range of 40 to 60 cycles per second, which is just above the perception threshold.

The study states, "These ground vibrations [at 20 feet] could be sensed by a person, but are of such a low level and high frequency, that they would not have an effect on a low rise structure. A low rise structure, such as a house, has a whole structure motion frequency in the range of one to 10 cycles per second. In this range of frequencies, the highest vibration measured was 0.00001 meters per second. The threshold for structural damage (.02 meters per second) is 2,000 times higher than the measured vibration. Throughout the measured frequency range, the highest vibration level noted at 40 feet was 0.00031 meters per second, which is less than the threshold for human perception."

It should be mentioned that the leading research on ground-borne vibrations has been conducted in California, where geological conditions (soil structure and ground response characteristics) are different from those in Minnesota. In California, soils are typically classified as hard ground covers that would serve to propagate vibrations further and faster than comparatively softer ground covers that one would find in Minnesota. Ground-borne vibrations have been successfully mitigated by improving the trackbed with resilient rail fasteners, resilient rail ties, ballast mats, and floating slabs.

7.2 General Conclusion

The general conclusion from the literature review is that commuter rail operations can generate noise and ground-borne vibrations. The literature indicates, however, that Federal Railroad Administration (FRA), the Federal Transit Administration (FTA), and the State of Minnesota have developed noise standards that are designed to regulate noise levels and noise exposure. Exceedances of the noise standards will require mitigation to protect sensitive noise receivers from excessive noise.

It is also concluded that, at least on a preliminary basis, it is doubtful that state or federal noise standards will be exceeded by commuter rail operations in the Dan Patch corridor. This is due to the proposed, relatively low frequency of commuter rail trains when combined with the already low use of the corridor for freight operations.

7.3 Community Impacts

7.3.1 Property Value

A literature review was conducted to determine how commercial and residential property values have historically been impacted by rail transit operations in the United States, Canada, and England. The overall conclusion drawn from the review is that rail transit operations "...increase property values, and the amount of the increase depends on the specifics of the city, the system, and local land use policies, and can range from no increase to a substantial increase" (Stanger 1999).

Several articles have been written to document studies on impacts to commercial and residential property values that result from rail transit operations. The studies have been conducted on different rail transit technology perspectives *(including commuter, rapid, and light rail)* and have been based on different methodologies *(e.g., capitalization theory of value, hedonic price modeling based on cross-sectional data, and longitudinal data on property value changes over time)*. The lack of a standardized perspective and methodology, plus location-specific factors, makes it difficult to compare the results of one study to another and contributes to some of the contradictory results that have been reported over the years. Nevertheless, it is the general conclusion of all the research and analysis conducted since 1984, that rail transit positively impacts commercial and residential property values in the vicinity of rail transit stations and does not negatively impact commercial or residential property values between stations. Exceptions to these general findings have been documented, however.

7.3.2 Positive Impacts on Property Values

Whether discussing commuter rail, rapid rail, or light rail, the operating characteristics that contribute to increased property values are the same. These largely relate to the ability of rail transit to improve accessibility to the location where the transit station is located. Accessibility refers to the reduction in transportation time or enhanced access from one relatively large area or set of residential sub-markets to and from travel origins and destinations in other area (Gruen 1997). As a result of improved accessibility, businesses that can expand their customer base to include commuters, consider locations in proximity to transit stations to be highly desirable. Likewise, commuters (both apartment residents and single family home residents) find proximity to transit stations to be a convenience they are willing to pay for (Figure 7-1).

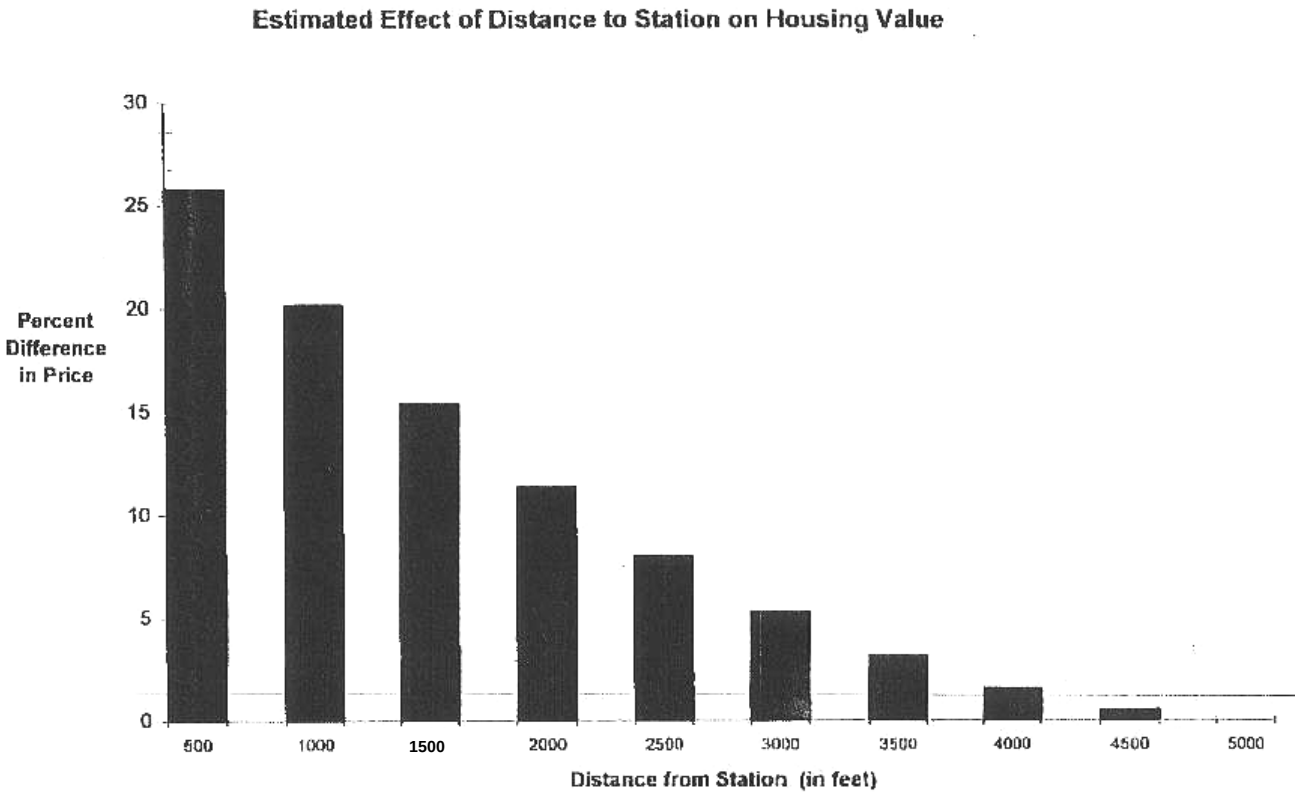
Commercial Property:

Commercial space was found to have an additional $31 increase in mean sale price per square foot over the mean sales price of a comparable control group outside the rail corridor, between 1980 and 1990. The rail corridor was defined as one-half mile on either side of the track (Fejarang et al. 1994).

A citywide analysis in Atlanta found that improved access was translated into increased commercial property values, as the price per square meter of property decreased by $75 for every meter from MARTA (rapid rail) stations (Nelson 1998).

A citywide analysis of over 2,800 commercial properties in Washington, DC, found that increased access was a major factor that influenced commercial property value. The study found that the price per square foot decreased by approximately $2.30 for every 1,000 feet further from a Metro (rapid rail) transit station (Federal Transit Administration 2000).

Figure 7-1



Source: Gruen 1997

A 1994 study conducted along the MBTA's (commuter rail) Fitchburg line included all communities that fell more than 50 percent within an area approximately 10 miles from the line. The study was conducted to determine property value impacts on residential properties and focused both on areas near stations and areas between the stations. Results showed that single-family residences located in communities with a commuter rail station had a market value approximately 6.7 percent greater than those that did not (Armstrong 1994).

Research conducted in 1990 showed that single-family home values declined by $1 to $2 per meter distance from BART (rapid rail) stations in Alameda and Contra Costa Counties (Landis et al. 1995).

A 1997 study conducted in the Chicago area that included data from 1,300 single-family homes concluded that whether located in lower- or higher-income neighborhoods, proximity to CTA (rapid rail) and Metra (commuter rail) stations positively affects the value of single-family homes. All other factors equal, home prices decline as distance from a station increases. For example, a home 500 feet from a station has a value 26 percent greater than a comparable home a mile away. This relationship is statistically significant (Gruen 1997).

With a study area defined as a one-mile radius from BART's (rapid rail) Pleasant Hill station, average home prices declined by approximately $1,578 for every 100 feet distance from the station (Lewis-Workman 1997).

- The following factors contribute to the positive impacts on commercial and residential property values in the vicinity of rail transit stations:

- "the level of transit service;
- congestion on the region's streets and freeways;
- the design of the station; and
- transit-supportive land use policies" (Lieberman 1995).

The "level of transit service" relates to characteristics of the rail transit system itself and other supporting transit systems are integrated with rail transit to increase accessibility to transit stations and enhance rail transit's efficiency, effectiveness, and economy. Obviously, as the level of congestion increases on streets and highways, more commuters will opt to use transit instead of their automobiles.

"Single family residential property values are sensitive to the quality of station design. Some studies have indicated that the value of homes within walking distance of a station would suffer if the station were noisy, had spillover station lighting" (Lieberman 1995), and did include an adequate traffic circulation plan. On the other hand, there are numerous examples of rail transit stations that have been designed with sensitivity to neighborhood concerns. This is why "the majority of studies show that home values have increased with proximity to the station" (Lieberman, 1995).

A local jurisdiction's transit-supportive land use policies were viewed to be an important component that can influence/control development patterns that sustain and positively impact property values. The research indicated that three areas of interest should be considered when developing transit-supportive land use policies:

- "involving the community in plans and designs and operations of the station;
- ensuring that noise levels generated by rail transit operations do not impact nearby residences; and
- minimizing the impact of increased pedestrian and auto traffic on quiet residential streets" (Lieberman 1995).

Presented on the following pages are photographs of different land uses along the New Jersey Transit commuter rail line, which operates between communities in northern New Jersey and New York City. The photographs show residential, commercial, and mixed use (commercial/residential) land use immediately adjacent to commuter rail tracks, both at station locations and along line-haul segments.

7.3.3 Negative Impacts on Property Values

Two studies found rail transit has the potential to negatively impact property values. Studies indicate the value of commercial property is rarely, if ever, negatively impacted by rail transit operations. However, when commercial values have fallen, factors other than rail transit are contributors; e.g., an oversupply of commercial space (Gruen 1997).

Near transit stations, the property values of residences, typically within walking distance of the station, are negatively impacted where transit stations are poorly designed. Nuisances that affect property values are: parking spills that over to residential streets, excessive traffic that circulates on residential streets, excessive noise from traffic, and lighting from the parking area that spills over to nearby residences (Nelson and McClesky 1990).

Between stations, along line-haul segments of track, as much as a 20 percent decrease in residential property value was found for residences within 400 feet of MBTA's Fitchburg line, which shares tracks

with active freight service (Armstrong 1994). In a study of the CalTrain commuter rail system, it was concluded that the negative externalities associated with being extremely close to an at-grade rail transit line were not necessarily capitalized into home values, where homes within 300 meters (325 feet) of the CalTrain track sold at a discount of $51,000 in 1990 (Landis et al. 1994).

According to Landis, "... the CalTrain system did not generate property value benefits similar to those of the BART system because CalTrain offered limited accessibility benefits. Compared to CalTrain, BART had a superior level of transit service and greater parking capacity. In addition, the negative impact observed in areas close to the station was believed to have been caused by the high noise levels generated by the CalTrain service. CalTrain was described as being much louder than the BART system. The CalTrain trackbed is minimally separated from adjacent uses, and given that the CalTrain train cars are not specifically designed for quiet operation, this is not a surprising finding."

According to Armstrong, "The fact that both freight rail service and commuter rail service operate upon the Fitchburg line... makes it difficult, if not impossible, to accurately differentiate between the two separate sources of proximity impacts. Therefore, the findings concerning the effects of commuter rail-generated proximity impacts, independent of freight rail proximity impacts, are inconclusive."

The referenced studies are the only ones that discuss decreases in property values for residences located between stations. All other studies cite either no impact or a positive impact.

8.0 FINANCIAL ANALYSIS

This section summarizes the costs of the proposed rail service along the Dan Patch corridor and provides information on how its construction and operation might be funded under current federal, state and local programs and practices. Private and innovative funding techniques are also discussed. This document is not intended to be a specific proposal of how the project would be funded, but rather a discussion of possible sources and funding mechanisms, which decision-makers can use to evaluate feasibility and develop reasonable funding plans.

All costs are given in 2010 dollars unless otherwise noted.

8.1 Operating and Maintenance Costs

There are two types of costs involved in building a new rail transit line: capital costs and operating and maintenance costs (O&M costs). Capital costs are one-time expenditures to build up the system. These include improvement/installation of tracks, environmental mitigation, construction of stations and other structures, installation of crossing signals and barriers, construction of yard and shop facilities, and the purchase of rolling stock and fare collection equipment. Engineering design and construction management costs are not included.

Ongoing O&M costs include costs for operating the system, including labor, administration, fuel, materials required for operation and basic maintenance, rent on any leased properties, publication of maps and schedules, and so forth.

The estimated capital cost for the project is $441 million. A contingency estimate of $20 million for noise mitigation (sound walls, etc.) has been added to some of the funding scenarios presented in Section 1.7, which could bring the total project cost to $461 million. At this time, without a study confirming the need for noise barriers, the Federal Transit Administration (FTA) and the Minnesota Department of Transportation (Mn/DOT) do not approve of the inclusion of these costs in the project cost estimate.

Annual O&M costs are estimated at $11.7 million (year 2020). After fares and other revenue are deducted, net annual O&M costs are estimated at $3.3 million (year 2010). Further information on the assumptions behind these estimates is available in Section 5.

Table 8-1 below shows the proposed fare structure in 2001 and 2010 dollars[5].

Table 8-1: Fare Schedule

Station	Fare to Minneapolis Central Business District (2001 dollars)	Fare to Minneapolis Central Business District (2010 dollars)
Northfield	$6.50	$9.25
Lakeville	$3.50	$4.98
Burnsville	$3.50	$4.98
Savage	$2.75	$3.91
South Bloomington	$2.75	$3.91
North Bloomington	$2.00	$2.85
St. Louis Park	$2.00	$2.85

[5] An annual inflation rate of 4.0% is assumed for 2001 through 2010.

These fares were used as inputs, along with many other factors, for the travel demand model. This model projected that on the average weekday in 2010, 7,543 trips would be made using the Dan Patch rail corridor. Due to the distribution of these trips (few $6.50 trips from Northfield, many less expensive trips from other stations), and also to the fact that some travelers will be transferring from other rail or bus lines, the average fare among Dan Patch riders was found to be $2.94 ($4.18 in 2010 dollars). This amount, multiplied by the 7,534 estimated daily riders & annualized using a factor of 255[6], yielded an estimated annual revenue figure of $5.6 million in 2001 dollars ($8.0 million in 2010 dollars).

8.1.1 Discounted Fares

Many commuter rail lines throughout the US offer discounted monthly or weekly passes, as well as discounts for seniors, students and handicapped individuals. Currently, the Metropolitan Council offers three kinds of discounts: senior (65+) and youth (6-12) half fares, discounts for persons with disabilities, and SuperSaver card discounts for monthly passes and advance purchases. Senior and youth discounts do not apply during rush hours. Advance purchase discounts range from ten to twenty percent off the regular adult fare.

As with other commuter rail systems, most riders along this corridor would be expected to use monthly passes. For the financial analysis, the fare schedule shown above is therefore assumed to be the cost to a rider using a discounted monthly pass. Ridership was projected in the travel demand model based on this assumption as well. It is further assumed that the revenue impact of those riders that pay full fares would offset the discounted fares of handicapped users, senior and youth off-peak fares would not apply to service in this corridor, as no off-peak (mid-day and evening) operations are planned.

In sum, after careful consideration, a net adjustment of zero was made to the $8.0 million revenue assumption to account for discounts and special fares.

8.1.2 Other Income Sources

Other potential sources of operating income include parking charges at the park-and-ride lots, and advertising revenue.

Parking Charges

At this point it is assumed that parking will be free at all park-and-ride lots on the corridor. In general, parking charges, like any other cost of travel, will act as a deterrent to use of the transit system. On the positive side, parking charges can help fund the construction of parking garages where needed, as well as maintenance and safety patrols at the stations. Parking charges can also rationalize the use of spaces where there is high demand for them. Parking charges would encourage “kiss-and-ride” (where riders are dropped off at the station by another driver), and will discourage non-users from using the park-and-ride lots as free local parking.

Advertising Revenues

Advertising revenue is difficult to predict, but is unlikely to be a major source of operating revenue for this system. Advertising revenue depends on ridership, the characteristics of the riders (where they live and shop, what their income levels are), and where the train travels (if external advertising will be used).

In 1998 and 1999, the Metropolitan Council Metro Transit Division took in over $3.5 million annually in “advertising and other” revenues. This amounts to around seven percent of passenger fares.

[6] An annualization factor of 255 was used to account for the fact that there are about 250 non-holiday weekdays in a year, and that holiday ridership on commuter rail lines is usually substantially lower than average weekday ridership.

With the higher fare-per-rider expected for commuter rail, the Mn/DOT Commuter Rail System Plan assumed that advertising revenues equal to five percent of fare revenues could be generated by commuter rail. Using this assumption, total advertising revenues on the Dan Patch corridor are estimated at around $400,000 annually.

8.1.3 Summary

Total annual operating revenues are therefore estimated at $8.4 million per year in 2010 dollars (including farebox and advertising revenues). This amount would cover 68.7 percent of the $11.7 million annual O&M cost.

8.2 Funding Programs and Practices

This section and the next ("Potential Local Funding Sources") both build on work presented in the C*ommuter Rail System Plan Financial and Institutional Issues* report done for Mn/DOT in 1999. This report looked at funding issues for a commuter rail system in the Twin Cities metropolitan area, as well as governance and railroad negotiation issues.

8.2.1 Federal Capital Funding

There are a number of federal grant programs available to support the implementation of rail service along the Dan Patch corridor. Some of these sources could contribute a substantial share of total project costs, others have limited funding available, and/or are targeted to specific areas (such as railroad crossing safety), and would only be used as part of a larger funding package.

Potential Major Federal Funding Sources

- Section 5309 New Starts Program: an FTA capital program that funds new fixed guideway systems (heavy rail, light rail, commuter rail, busways, etc.) and extensions of these systems in metropolitan areas. In FY 1999, $896 million was appropriated nationwide.

- Surface Transportation Program (STP): a formula program through which funds are allocated to states and metropolitan areas for transportation capital projects, including highways and transit facilities. Minnesota received $115 million in FY 1999.

- National Highway System (NHS): a Federal Highway Administration (FHWA) formula program that provides funding for improvements to rural and urban roads that are part of the National Highway System (NHS). Under certain circumstances, funds can be used for transit. Minnesota's apportionment in FY1999 was $89 million.

- Interstate Maintenance: an FHWA formula program for resurfacing, restoring, rehabilitating, and reconstructing most routes on the Interstate System. Up to half of a state's apportionment may be transferred to NHS and/or STP programs. Minnesota's 1999 apportionment was $75 million.

Other Potential Federal Funding Sources

- Section 5307 Program (FTA): FTA's urbanized area formula program through which funds for capital replacement and expansion (e.g., replacing buses as they age out, or expanding a bus fleet) are distributed to transit operators and states. In FY 1999, $25.6 million was apportioned to Minnesota.

- Congestion Mitigation and Air Quality (CMAQ): A formula program administered by FHWA and FTA whose primary purpose is to fund projects that reduce vehicular emissions in air quality non-attainment areas. In FY 1999, $19.4 million was apportioned to Minnesota and its transit agencies.

- Section 130 Grade Crossing Program: a program that funds highway/railroad grade crossing safety improvements (e.g., improved signals or barrier systems). In August 2001, Minnesota had $100,000 in unobligated funds in this program

- Job Access and Reverse Commute Grants: competitive grants for transportation services that connect welfare recipients and other low-income persons to employment and support services. In FY 1999, $75 million was available nationwide. Not more than $10 million per year may be used for reverse commute activities.

Three of the four major funding sources listed above (STP, NHS and Interstate Maintenance) are directed to MN/DOT from the Federal Highway Administration (FHWA). In most circumstances, these funds require a twenty percent match from the state or local government.

The decision to utilize FHWA funding for a transit project would largely be up to Mn/DOT and other state decision-makers. In past years, for example, some STP funds have been use to build transit hubs in the Minneapolis region. FHWA funds are currently programmed into the State's financially-constrained twenty-year long range transportation plan. In the Twin Cities metropolitan area, transportation is covered in the Transportation Systems Plan) (TSP). The Dan Patch rail project is currently included in Mn/DOT's Metro Division 2020 TSP, but is unfunded Diverting these funds to the Dan Patch Corridor would likely require reducing or removing funding for already-programmed transportation projects throughout the state. .

There are also Federal restrictions on using some of the FHWA funds for transit projects. To use National Highway System funding, for example, a transit project must serve the same corridor as a fully-controlled-access NHS road, must improve the highway level of service, and must be proven to be more cost effective than a highway improvement.

The New Starts funds, unlike most FHWA funds, are not granted to the states, but are usually granted directly to the provider of the proposed transportation services. FTA funding for the Twin Cities region goes to the Metropolitan Council, for example.

New Starts funding is not awarded by formula, but through a grants process. Fixed-guideway projects throughout the nation compete for this funding every year. New Starts funding can provide up to 80 percent of the capital cost of a project, however, funding for recent New Starts projects is almost uniformly less than that. In fact, one of the criteria which the FTA uses to select projects for funding is the extent of local financial commitment. As a current example, it was assumed that FTA funding for the Hiawatha rail project would cover 50 percent of project costs.

TEA-21, the Transportation Efficiency Act for the 21st Century, identified several specific New Starts criteria, which the FTA must consider in its decision to approve a project for this funding source. While there are no specific standards for these criteria, each plays a part in the decision of FTA to direct its limited funds to a particular project. The criteria include:

- Local financial commitment (proposed local share of capital costs and the strength of the capital and operating financing plans)

- Mobility improvement (for example, travel time savings and number of low-income households served)

- Environmental benefits
- Cost effectiveness (incremental cost per new transit passenger in the forecast year)
- Transit-supportive land use and future patterns (existing land use, transit-supportive corridor policies and zoning regulations near transit stations, tools to implement land use policies, and performance of land use policies)
- Other factors (local transportation planning, programming and parking policies, etc.) are in place as assumed in the forecasts; project management capability, and additional factors relevant to local and national priorities and relevant to the success of the project.

It should be added that decisions on the allocation of New Starts funding are ultimately made by Congress through the annual appropriations process. Each project that is scheduled to receive funds is specified in the Appropriations Bill for that year, along with the amount of the grant. This bill is then enacted by Congress and signed by the President. Because of this, political considerations can also be a factor in helping or hindering a project from obtaining New Starts funding. Under Congressional rules, the appropriations committees are supposed to limit their New Starts earmarking to projects that have previously been authorized.[7] The Dan Patch Corridor was not among these projects.

8.2.2 Federal Funding for O&M Costs

In urban areas over 200,000 in population, there is limited federal funding available to support transit operations costs. Some of the federal programs listed above can be used to support operations, including the Job Access and Reverse Commute grants, and CMAQ funds, but these funds are usually targeted. The Job Access and Reverse Commute grants are used for connecting low-income neighborhoods with jobs in urban and suburban areas, CMAQ grants are more flexible, but are often limited to short-term programs, and are rarely used as ongoing sources of transit subsidy. (Examples of short-term uses of CMAQ funds include increased transit services in road construction areas to relieve traffic congestion, or subsidization of half-fares during high-ozone days.)

FTA's Section 5307 formula funding can also be used to support "capital maintenance" in addition to capital replacement of buses, stations, and other facilities. Examples of capital maintenance for rail include the overhaul of rail vehicle engines and the rehabilitation of station structures. Section 5307 funds can not be used to support daily operations or routine maintenance.

None of these sources could be used as a major annual source of transit operating funding. The FTA over the past decade has made it a policy to reduce transit systems' dependence on federal sources for operating expenses, and has slowly lowered its level of operating subsidy to urban transit systems.

8.2.3 State Funding

The state funding for the Hiawatha project was approved by the Legislature in two initiatives: $40 million approved in 1998, and $60 million in 1999. These funds are in addition to the $17.3 million in in-kind contributions from the State (primarily for right-of-way). As part of the 1999 legislation, no further capital contribution to the Hiawatha LRT project will be provided by the State.

The State can play a role in providing funding for Dan Patch in a number of ways:

- Directing Federal Funds - Mn/DOT could utilize FHWA "flexible funding" categories, described above, to fund transit projects.

[7] "Commuter Rail System Plan financial and Institutional Issues," Mn/DOT, November 30, 1999.

- Use of Existing State Funds – With approval from the Legislature, state sales taxes, motor vehicle taxes, or other revenue sources could be re-directed to fund transit capital projects. The State could also contribute funds to the project from general revenues, or from bonds backed by general revenues (which was the source of the State's $100 million contribution to the Hiawatha corridor rail project).

  One example of an existing State revenue source that could be used as a dedicated fund for transit projects throughout Minnesota is the motor vehicle excise tax. Currently this tax generates $400 million statewide each year, and it goes into the general fund.

- Creation of New Revenue Sources – The state could increase an existing state-wide tax, or create a new tax, and dedicate the proceeds to transit projects. One example would be an increase in the state sales tax rate. The Statewide sales tax yielded $3.1 billion in 1998. If increased, it is estimated that each 0.1% increase in the sales tax rate would yield $48 million annually.

- Legislative Approval of Local Taxes - The state has the power to enact a regional sales tax, and to set maximum levy limits for county and local governments to increase the property taxes collected. Funds from these sources could be used for transit projects within the specified taxing district.

  A discussion of local taxes, some of which would require state approval, is presented in the following section.

8.2.4 Local Funding

As with State funding, there are many ways in which the involved local governments and agencies can fund rail transit. These include the use of existing funding sources, and the possibility of creating new sources.

For transit agencies, dedicated funding sources are generally preferable to having annual appropriations from general funds. Annual appropriations are subject to last-minute changes and are less stable and predictable than, for example, a dedicated portion of sales or property tax revenues.

8.2.5 Current Transit Funding

Current funding for the Metropolitan Council's Metro Transit division comes from farebox revenues, local property taxes, State general funds, and miscellaneous revenues.

Farebox revenues account for about a third of operating costs. In 1998, fares amounted to 36 percent of operating costs, and in 1999 the percentage was 35 percent. A fare increase took effect in July 2001, which should increase revenues somewhat.

Metro Transit's single largest source of funding comes from the Metropolitan Council's property tax, which generates more than $70 million annually. In 1999, $62.5 million went to Metro Transit from this source.

State funding comes from general appropriations. State funding has grown rapidly over the past five years. Appropriations for the 1996-7 biennium were $89 million. The figure for the following two biennial periods was $98.7 million and $109.9 million.

Miscellaneous revenues amount to less than four percent of total operating expenses, and include interest income, FTA funds used for capital maintenance, the short-term use of CMAQ funds for fare discounting programs, and other minor revenue sources.

These funding sources have been growing over the past few years, and are expected to grow in the future. A detailed analysis done for the Hiawatha LRT projected that, even allowing for three percent annual inflation in the cost of existing transit services, the yearly surplus would, by 2010, grow to over $28 million. This analysis assumes a five percent annual increase (a ten percent biennial increase) in transit appropriations from the State of Minnesota. A five percent increase in revenues from the current property tax levy is also assumed. While this is larger than the assumed three percent rate of inflation, population is projected to grow by close to two percent per year over this period, so the property value growth is driven largely by inflation and population growth, not by projections of commercial development or a real increase in the value of existing property. This forecast is viewed as conservative for financial planning purposes.

With the net additional cost of running Hiawatha service estimated at around $16 million (also in 2010 dollars), a $28 million surplus would leave $12 million available for further transit expansion if only existing funding sources were used.

The Dan Patch corridor's $3.3 million in net O&M costs[8] could thus theoretically be covered using existing funding sources. The funding needs of other potential rail corridors (the Northstar, Central Corridor, and Red Rock corridors, for example) would also need to be considered.

While the State has shown commitment to transit in both its biennial increases in operating subsidies and its promise of $100 million for the development of the Hiawatha LRT, a discussion of new local funding sources is warranted in the event that state funding falls short of projections.

8.3 Potential Local Funding Sources

The lead agency for the Dan Patch corridor rail project is the Dakota County Regional Railroad Authority (DCRRA), acting as fiscal agent and study manager for the corridor. Potential funding entities include the Dakota and Hennepin County Railroad Authorities (HCRRA), Scott County, and the Cities of Minneapolis, St. Louis Park, Edina, Bloomington, Savage, Burnsville, Lakeville and Northfield. Rice County, although not officially participating, could be added to the list of potential funders as well.

Each of these jurisdictions could raise funds in a number of ways. Two of the more common transit funding sources are discussed below in a regional context. This analysis was done for the *Commuter Rail System Plan Financial and Institutional Issues* report done for Mn/DOT in 1999, which looked at funding issues for a rail system in the Twin Cities metropolitan area.

8.3.1 Property Tax Funding

The seven metropolitan counties are authorized through their regional railroad authorities to impose levies on real estate of up to a maximum of 0.04835% of market valuation. These revenues would be used to pay for capital and/or operating expenses of passenger rail services. Table 8-2 below, compares the maximum potential levy to 1998 collection levels in each county.

Table 8-2: Potential Property Tax Revenues Authorized through Regional Railroad Authorities

County	Market Valuation	Potential Levy	1998 Levy
Anoka	$10.64 Billion	$5.15 Million	$700,000
Carver	3.30 Billion	1.60 Million	0

[8] This represents the $11.7 million O&M cost, minus projected farebox and advertising revenues of $8.4 million.

Dakota	15.79 Billion	7.62 Million	75,000
Hennepin	56.57 Billion	27.35 Million	0
Ramsey	18.25 Billion	8.82 Million	0
Scott	3.58 Billion	1.73 Million	0
Washington	9.10 Billion	4.40 Million	200,000
Total	$117.22 Billion	$56.67 Million	$975,000

Source: Mn/DOT's *Commuter Rail System Plan Financial and Institutional Issues*. November, 1999.

Based on 1998 market valuation, there is a potential for over $50 million in new annual property tax revenues if the public and their elected officials in each county feel that it is needed to support rail projects. As the Dan Patch rail line would serve Hennepin, Dakota and Scott Counties, it is likely that these three counties would contribute to the operating expenses of this rail line. The annual revenue potential from this tax source for those three counties totals $36.6 million.

8.3.2 Sales Taxes

Sales taxes are one of the most common ways that local governments in the US support transit operating costs. A regional sales tax could be enacted in some or all counties in the Metropolitan Council jurisdiction. It is estimated that a one percent sales tax could generate $332 million for the region as a whole.

8.4 Private Funding

Although it should be expected that the bulk of the project would be funded by some combination of federal, state and local government sources, there are other funding sources that can be tapped to support capital and/or O&M costs.

Donation or Development of Privately-Held Right-Of-Way

Privately-held land may be used to provide space for transit stations or park-and-ride lots, or even to provide bicycle pathways or weather-protected pedestrian paths to a transit station. These donations or improvements can benefit both the transit system and the donor. Transit systems and their riders benefit from improved connections to businesses or residential districts. Donors can benefit from the improved accessibility to their properties, or by the increase in pass-by patronage that a station or park-and-ride lot could bring to a commercial site.

Advertising and Sponsorship Opportunities

While a baseline estimate of advertising revenue was already discussed in the Fare Revenues section, it is possible that these revenues could be enhanced. While some methods of advertising may not comply with zoning codes or aesthetic standards, there are many ways to sell advertising space besides the traditional poster-sized ads inside rail passenger cars. These include advertising outside or inside stations, on the exterior of passenger cars, billboards along the rail ROW, or newer methods, such as the two-line digital displays used in DART commuter buses in Dallas, Texas, which display news, sports and trivia, with advertising messages in between.

More aesthetic sponsorship opportunities exist as well, including "adopt-a-station" programs, where a simple plaque acknowledges the company that is paying to keep the site clean, or to plant flowers, maintain landscaping, and so forth. Small-scale advertising, including printed ads on schedules and fare cards, are another way to boost the private-sector share of transit funding.

Joint Development Opportunities

Joint development is a way to utilize private capital in the construction of transit facilities, and also to increase the ridership of a rail system (thus enhancing the usefulness of the system, as well as farebox revenues). Common joint development projects include the development of apartment buildings or other high-density residential development at or near transit stations, and the creation of transit stations that are part of an office building or retail center. Frequently cities offer tax breaks or other incentives to developers to make the most of transit station areas, particularly in underdeveloped neighborhoods.

The most elaborate examples of joint development are downtown stations where rail passengers exit through a commercial mall on the bottom floor(s) of an office building. The transit connection helps the office uses by providing easy access to the workforce and reducing the need for parking (a relatively low-rent use of a downtown building's lower floors). The constant flow of transit users and office employees keeps the retail uses healthy, and transit users benefit by having a station that is weather protected, and is generally better-maintained and more aesthetically pleasing than other stations.

Less-intensive development is also possible, including small shopping plazas set up near park-and-ride lots to serve commuter needs (e.g., dry cleaning or oil-change businesses), or suburban office parks built around transit stations.

Another way for transit systems to benefit from the increase in value that train stations can bring to a station area is for the transit agency to be given ownership of nearby properties. This is most appropriate where the existing station-area properties are vacant or abandoned. In this way the transit agency can directly benefit from the sale or leasing of these properties to developers. Similarly, transit agencies could be given land-use powers over station-area property (or a new zoning designation could be created for these locations), such that new development would be encouraged to be transit-oriented, and might be required to pay an infrastructure fee or have a portion of their property taxes diverted to the transit agency.

Tax Increment Financing

One option for obtaining funds for infrastructure improvements without increasing taxes is called tax increment financing (TIF). The concept behind TIF is a belief that civic improvements (such as a new rail station) will lead to an increase in the value of nearby properties. This increase in property value should lead to an increase in property tax revenues. A TIF district sets aside this increase in tax collections into a special fund that can be used to cover debt payments on (past) bond-financed improvements, or to cover future improvements.

For example, if a municipality sets up a TIF district for a retail area near a new rail station, the increased property tax revenues that would result from the expected increase in property values (as transit brings in more customers to the retail businesses) can be given to a TIF authority and dedicated to station maintenance. In this way property tax revenues to the municipality (based on the original, pre-rail property values) are not affected, no tax rates have been increased, and yet there is a dedicated, ongoing source of funds available to cover station maintenance. Ongoing station maintenance should also help to keep up property values, keeping the TIF funding stable over the long run.

Revenue streams from TIF districts can be used to guarantee bonds to cover station construction, rehabilitation or other small-area capital improvements (e.g., improved street lighting). TIF districts can also be set to expire after these bonds or other financing instruments are retired.

TIF revenues legally can be used only for improvements that benefit the TIF district (not for system-wide improvements). TIF districts are usually not large sources of revenue, and may not be reliable, particularly in the early years of a project. The low level of expected revenues results from two factors: the relatively small base (since TIF funding comes from just the incremental increase in a district's property values, not the total value of the properties), and the unpredictability of property values. Only if property values increase will any money flow into the TIF. Property values are dependent on a number of factors in addition to accessibility, and it is possible, particularly if the economy turns down, that no money would flow into a TIF district fund for many years.

Public Improvement Districts

Also known as Business Improvement Districts (BIDs), these are another possibility for private sector participation in transit funding. This mechanism allows a new tax to be imposed in a specific district, usually on businesses, the proceeds of which would be used exclusively for improvements or services to that district (for example, more frequent street cleaning services or improved frontage roads). As with TIFs, this financing mechanism would not be a large source of funding due to the limited base, but could be used for low-cost capital or operating expenditures (such as station maintenance).

BIDs require the support of local businesses. The argument that a well-maintained transit station or station area improves business opportunities can help to obtain this support.

One potential benefit of PIDs and BIDs is that general tax revenues are not required to pay for improvements that largely benefit only a small part of a municipality.

Discussion of Fares as a Revenue Source

There are two issues to consider when setting fares for transit. One, of course, is to have a source of operating revenue. The other is cost-effectiveness. Fares exhibit what economists call price elasticity – the higher the cost of a ride, the fewer rides people will take, such that a ten percent increase in the fare price will not lead to a ten percent increase in fares collected. This places a natural limit on fare revenues, such that no system in North America is able to cover its operating costs 100 percent with farebox revenues. Farebox revenues typically cover 30 to 40 percent of O&M costs in US public transit systems (or higher for commuter rail systems).

While it may appear fair and wise to make fares as high as possible to maximize user fees and reduce the burden on the general taxpayer, there are other factors to consider. The reasons for investing in transit infrastructure are more than just serving individual riders. These other goals include air quality, reduction in traffic congestion, access to jobs, increased roadway safety, economic development, and a range of other quality of life goals that would benefit all residents and employers in a region. When fares are set so high that choice riders decide to use their cars, and the transit-dependent decide to stay home, then the capital investment in transit would be wasted, as buses, rail cars and other expensive infrastructure sits unused or underutilized, yielding few of their promised benefits.

8.5 Financing Techniques

Once funding sources are identified, different financing methods can be used to reduce costs or to spread payments out over a longer period of time. The most common financing technique is the use of bonds, but there are other techniques as well, which can help lower transit costs.

8.5.1 Debt Finance

One way that state and local governments fund expensive capital projects is by issuing bonds. This allows the jurisdiction or agency to borrow a large sum in a project's construction year(s), and spread the costs out over the longer term of the project's useful life. In this way, the years in which taxpayers must pay for an improvement are more closely tied to the years in which they receive the benefits of those expenditures.

Current interest rates for municipal and state bonds are less than six percent for a 20-year bond. At this rate, a $1 million expense would be converted to a 20-year stream of payments of $87,200 – an amount much easier for any government agency's annual budget to handle.

8.5.2 Innovative Financing Techniques

- The FTA promotes the use of innovative financing in the hopes of reducing the cost of providing transit infrastructure. The Innovative Financing program encourages the application of a wide variety of established and newly-emerging financing techniques, commonly used in other sectors of the economy, to transit. These include: Certificates of Participation (COP), a type of leasing arrangement to issue debt secured by the value of rail vehicles or facilities. The COP investors become the temporary owners of the vehicles or facilities and then "lease" them back to the transit agency. The lease payments by the transit agency are similar to payments for loans, where after the lease period, the debt is retired and ownership reverts back to the transit agency.

- Cross-Border Leases are similar to COP, but by transferring ownership across national borders, favorable tax rules in other nations can make the arrangement more attractive (and would therefore lower the cost to the borrower).

- Joint Development Opportunities with the private sector (examples are described above under Private Funding).

- State Infrastructure Banks are a type of revolving loan fund for transportation projects. Minnesota's infrastructure bank is described in Section 12.5.6 below.

8.5.3 New Matching Flexibility

Several provisions in TEA-21 provide greater flexibility to states, MPOs, transit agencies, and local governments in satisfying the non-federal matching requirements of a project. These are described below:

- Matches can now be made on an overall project life basis (not just by project stage), so that not all match funds would need to be committed in the construction years.

- Some STP matches can be made at the annual program (multiple project) level.

- Matches can include the fair market value of land towards the non-federal share (for example, the donation of rail right-of-way). The valuation of donated public property is subject to approval by FTA.

- Federal funds from agencies other than FTA and FHWA can serve as the match for enhancement projects.

- Funds appropriated to federal land management agencies or to the federal lands highway program can be used as a match for certain projects.

8.5.4 TIFIA

The Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA) provides Federal credit assistance for major transportation investments (transit and non-transit). The program uses secured loans, loan guarantees, and standby lines of credit to meet a project's financial needs throughout the life cycle of the project.

Highway, transit and intermodal projects are eligible if they meet the following criteria:

- Projects must cost at least $100 million, and the amount of credit assistance may not exceed 33 percent of eligible project costs.

- Project must be included in the State Transportation Plan and the State TIP

- Financing must be repayable, in whole or in part, from tolls, user fees, and other dedicated sources (which may include general obligation pledges or corporate promissory pledges, but not a pledge of Federal funds)

Selection criteria include the extent to which a project would generate economic benefits, leverage private capital, promote innovative technologies, and meet transportation objectives.

The level of benefit of this program to the Dan Patch Corridor is unknown. As noted above, TIFIA will only guarantee up to 33 percent of project capital costs. In addition, there is national competition for this assistance: total credit subsidy available nationwide in FY2000 was $90 million (covering $1.8 billion in credit).

Railroad Rehabilitation and Improvement Loan Fund (RRIF)

RRIF is administered by the Federal Railroad Administration (FRA). It is a revolving loan and loan guarantee fund which can be used to acquire, improve, or rehabilitate rail equipment and facilities, including track, to develop or establish new intermodal or railroad facilities, or to refinance existing debt for such projects.

Nationwide, the aggregate unpaid principal amounts cannot exceed $3.5 billion. FRA gives priority to projects that enhance safety, enhance the environment, promote economic development, are included in state transportation plans, promote US competitiveness, and preserve/enhance service to small communities and rural areas.

8.5.5 Grant Anticipation Revenue Vehicle (GARVEE) Bonds

A GARVEE bond refers to any financing instrument for which principal and/or interest is repayable with future Federal-aid highway funds. The debt is issued in anticipation of the receipt of federal aid grants in subsequent years.

To be eligible for GARVEE bonds, a project must be approved by FHWA as an advance construction project and as a Federal-aid bond issue project. At the time of project authorization, the State must elect to seek reimbursements for bond issue costs in lieu of construction invoice costs.

The GARVEE bond concept can be applied in two ways:

- A "direct" GARVEE bond in which federal assistance directly reimburses debt service paid to investors in a debt-financed federal-aid project.

- An "indirect" reimbursement, whereby federal funds reimburse expenditures on other federal-aid projects and the State DOT subsequently uses a portion of those funds to pay debt service on the debt-financed project. In this case, the debt-financed project need not be a federal-aid project.

8.5.6 State Infrastructure Bank/Transportation Revolving Loan Fund

The State Infrastructure Bank (SIB) concept is basically a revolving loan fund created as a means of stretching transportation dollars. It is a mechanism through which states can leverage funds for projects that require additional funding, but which might be delayed or unfeasible using traditional financing mechanisms alone. In effect, the SIB acts like a commercial bank, providing loans and credit enhancements for transportation projects. Once the loans are repaid to the SIB, the funds are recycled, and used to finance another set of transportation projects.

As with the other debt financing mechanisms described above, utilization of the State Infrastructure Bank would not eliminate the need for state/local funding. It is a financing instrument which would enable the state and/or local governments to spread out the capital costs of the project for up to 30 years, and to obtain a lower interest rate than might otherwise be available.

Minnesota was approved as a "SIB" state in 1997, and was approved to receive $4 million in federal incentive funds. The state legislation that was enacted that year was known as the Transportation Revolving Loan Fund Act (TRLF Act), and thus the Minnesota SIB is known as the TRLF. Additional funds have since been added such that since 1997, the TRLF has approved more than $121 million in financial assistance for transportation projects in Minnesota.

There is precedent for using the TRLF for transit projects. Approximately $4 million from the TRLF was used to leverage a $17 million bond issue for the Metropolitan Council. The resulting $21 million was used to fund approximately 53 transit capital projects ranging from bus purchases to park-and-ride lot construction. Interest rate on the loan is 2.71 percent (much less than the 5.5 percent interest rate on most municipal bonds).

According to federal law, SIBs can use both State and Federal funds to provide the services listed below for transportation projects:

- Loans

- Credit enhancements (including loan guarantees)

- Interest rate subsidies

- Leases

- Debt financing securities

- Other debt funding mechanisms as approved by the Secretary of Transportation

8.6 Funding Scenarios

Table 3, which follows the expenditures described below, illustrates eight potential funding scenarios for the Dan Patch corridor. The assumptions used are explained below.

8.6.1 Capital Costs

There are two sets of scenarios; four scenarios assume that the capital cost will be $441 million (the base construction cost estimate). The other four (otherwise identical) scenarios add in a $20 million contingency estimate for the construction of environmental mitigation sound barriers as part of the project.

8.6.2 Capital Funding

Federal Funding

Although federal funding levels can vary (New Starts grants can cover up to 80 percent of a project's capital costs), a fifty percent share was deemed a reasonable and conservative assumption given experience with other cities' recent New Starts projects.

State Funding

Four different funding levels were assumed for each scenario. A 50 percent share of the capital costs, a 25 percent share (equal to $110 million, which is close to the $100 million the state promised for the Hiawatha Corridor), a $50 million share, and no State funding was assumed for Scenario 4.

Other Share

The metropolitan, city, and/or county governments are assumed to pay for all remaining funding needed. This "other share" can also come from private sources.

The State-versus-Other split for capital and O&M costs is the only factor differentiating the four scenarios.

Annual Cost of Bonds

As explained in the debt finance section, when bonds are used to fund a project, the construction expenses can be converted into annual debt payment amounts (much like a mortgage converts a large one-time house payment into a stream of monthly payment amounts). It was assumed that the bonds used for the project would be 20-year bonds at six percent interest. (Although lower interest rates are currently available, a six percent rate was felt to be more in line with the four percent annual inflation assumption.)

8.6.3 Operating Funding

Federal Share

Federal funding for operations and maintenance costs is expected to be minimal in 2010, based on current trends.

State Share

State share was assumed at twenty percent for Scenarios 1, 2 and 3, and at zero for Scenario 4. In 1998, the State share of Metro funding was 19 percent. It is not clear whether funding would continue at this level if there is major system expansion. The Commuter Rail System Plan report assumed that State funding would increase at five percent per year (regardless of total system need).

Other Share

As with the capital funding, the other share is whatever else is needed to cover expenses. Sources for this funding include farebox and advertising revenues, in addition to metropolitan, city, county and private sources. Fares and advertising revenues are subtracted out from the "other share" in the last line (Total Net Annual Non-Federal Costs).

8.6.4 Annual Revenues

Farebox revenues and advertising are discussed in Section 1.2, Fare Revenue. Advertising is assumed to be five percent of total farebox revenues.

8.6.5 Summary

The Total Net Annual Non-Federal Costs are summed from the rows above, with farebox and other revenues subtracted out. Federal costs are not annualized because these funds are usually granted as needed (without the use of debt finance).

Table 8-3: Funding Scenarios Dan Patch Revised Cost Scenarios

All dollar figures are in thousands of 2010 dollars unless otherwise specified.

					With Noise Mitigation Contingency			
	Scenario 1 (Highest state funding)	**Scenario 2** (High state funding)	**Scenario 3** (Med. state funding)	**Scenario 4** (No state funding)	**Scenario 1** (Highest state funding)	**Scenario 2** (High state funding)	**Scenario 3** (Med. state funding)	**Scenario 4** (No state funding)
Capital Costs								
Construction Cost	441,000	441,000	441,000	441,000	441,000	441,000	441,000	441,000
Contingency Assumption for Noise Mitigation					20,000	20,000	20,000	20,000
Total Capital Cost	**441,000**	**441,000**	**441,000**	**441,000**	**461,000**	**461,000**	**461,000**	**461,000**
Federal Share (at 50%)	220,500	220,500	220,500	220,500	230,500	230,500	230,500	230,500
State Share	220,500	110,250	50,000	-	230,500	115,250	50,000	-
Other Share (remainder)	-	110,250	170,500	220,500	-	115,250	180,500	230,500
Annualized Capital Costs								
Interest rate	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Term of bonds (in years)	20	20	20	20	20	20	20	20
Annual Debt Service for State Share	**19,224**	**9,612**	**4,359**	**-**	**20,096**	**10,048**	**4,359**	**-**
Annual Debt Service for Other Share	**-**	**9,612**	**14,865**	**19,224**	**-**	**10,048**	**15,737**	**20,096**
Annual Operations & Maintenance Costs	**11,700**	**11,700**	**11,700**	**11,700**	**11,700**	**11,700**	**11,700**	**11,700**
State Share	2,340	2,340	2,340	-	2,340	2,340	2,340	-
Other Share	9,360	9,360	9,360	11,700	9,360	9,360	9,360	11,700
Total Annual Non-Federal System Costs	**30,924**	**30,924**	**30,924**	**30,924**	**31,796**	**31,796**	**31,796**	**31,796**
State Share	21,564	11,952	6,699	-	22,436	12,388	6,699	-
Other Share	9,360	18,972	24,225	30,924	9,360	19,408	25,097	31,796
Annual Revenues								
Farebox Revenues	8,040	8,040	8,040	8,040	8,040	8,040	8,040	8,040
Advertising	402	402	402	402	402	402	402	402
Total Revenues	**8,442**	**8,442**	**8,442**	**8,442**	**8,442**	**8,442**	**8,442**	**8,442**
Total Net Annual Non-Federal Costs	**$ 22,482**	**$ 22,482**	**$ 22,482**	**$ 22,482**	**$ 23,354**	**$ 23,354**	**$ 23,354**	**$ 23,354**
State Share	$ 21,564	$ 11,952	$ 6,699	$ -	$ 22,436	$ 12,388	$ 6,699	$ -
Other Share	$ 918	$ 10,530	$ 15,783	$ 22,482	$ 918	$ 10,966	$ 16,655	$ 23,354

NOTES:

FTA and MnDOT do not approve of the inclusion of noise barriers as a project cost without a study confirming the need for noise barriers.

"Other" Costs could be covered by county, metropolitan, city or private sources, or (most likely) a combination thereof.

It is assumed that O&M costs would not be covered by federal funds (Federal funds are generally intended for capital expenses).

Total annual *net* O&M costs (O&M minus farebox and other revenues) are $ 3,258,000 .

Using the assumptions outlined above, total annual non-federal costs for the project would be $22.5 million per year (or $23.4 million per year if $20 million were needed for noise wall construction). Depending on the amount that the state takes on, metropolitan, city, county, and/or private sources would likely need to come up with anywhere from $1 million per year to $23.4 million per year.

A note on bond financing: although the bond payments shown should end after twenty years, it should not be assumed that the system will be substantially cheaper in 2030. With track repair, major station maintenance, and rolling stock rehabilitation or replacement required at various intervals, some level of capital expense will be constant throughout the life of the system.

8.7 Cost-Saving Measures

Once final design has been completed for the Dan Patch corridor, there will likely be a number of ways to reduce the system's capital and operating costs. At this early stage, however, many items have not been specified, and any recommendation for specific savings would be premature. Cost estimates were made based on assumptions used in the Mn/DOT capital costing effort, along with updated information on the cost of locomotives and passenger cars. Contingency factors were also added to account for potential unknowns regarding environmental factors, right-of-way acquisition, and other changes. Keeping this in mind, a few general concepts for cost savings can be discussed.

One option to reduce construction cost is to begin with a less comprehensive system. Park-and-ride lots can be built new and designed with landscaping, digital screens displaying when the next train is due, and perhaps comparing transit travel times to real-time estimates of driving times to downtown. Or, they can be shared with nearby shopping centers. Commuter rail stations can be very simple (concrete platforms with lighting and an open-sided shelter for inclement weather), or complex (fully enclosed and climate-controlled, including space for concessionaires, public art, and unique features designed by an architect working individually with each community). In any system, there can be good reasons to spend more on stations and rolling stock, including attracting more drivers off of the road, safety concerns, economic development of the area surrounding each station, and the ability to attract private funding and public interest. Expensive materials used to build stations can also last longer or be easier to maintain in the long run.

Another option is to purchase rolling stock or other equipment in co-operation with another transit agency. Like many other products, rail car manufacturers offer volume discounts, particularly if the cars ordered have similar specifications (interior design, seating type and arrangement, etc.). Co-operation on purchases is not an uncommon practice, and can also include the exercising of other transit agencies' options on purchasing contracts.

The purchase of used or rehabilitated equipment is another possibility for reducing the up-front cost of locomotives and passenger cars.

Because the Dan Patch corridor is shared with freight users, further cost-savings opportunities exist for both capital and O&M costs. For track upgrades and maintenance, cost-sharing arrangements could be negotiated with freight railroads. In addition, some maintenance of the rail rolling stock could be contracted out to the freight operators. Particularly in the early years, when few major repairs would be needed, this could save on labor, training, and equipment purchases.

9.0 PUBLIC INVOLVEMENT

Throughout the course of this feasibility study a great deal of attention and effort went into promoting public participation in the study process. Concerned citizens were encouraged to express their opinions regarding commuter rail along the Dan Patch Corridor by returning comment cards and e-mails, attending community meetings, communicating their concerns through their elected officials or directly to Dakota County representatives.

Information was distributed to affected corridor residents via mailings from individual jurisdictions, press releases, local newspaper articles and notices, and the corridor website.

Over 2,300 people attended 24 different city council, county board, neighborhood, and community organization meetings and public open houses. Of the approximately 600 people who attended the five county-wide open houses and commented on the project, approximately 70% opposed the project. Approximately 30% supported the implementation of commuter rail in the Dan Patch Corridor.

9.1 Committees

Two committees were established to facilitate two-way discussion during the study. Both committees assisted DCRRA with discussion, review and comment on the methodology, analysis, and results of the consultant team's work.

Technical Advisory Committee

The Technical Advisory Committee (TAC) was comprised of representatives with technical backgrounds from each of the corridor cities. Meetings of the TAC were held on the second Wednesday of every month at locations rotating between the cities north and south of the Minnesota River which divides the Dan Patch Corridor. Table 1 shows the dates, times, and locations of the TAC meetings.

Table 9-1: Technical Advisory Committee Meeting Dates

Date	Time	Location
July 11, 2000	1:30 – 3:00	St. Louis Park City Hall
August 9, 2000	1:00 – 2:30	Lakeville City Hall
September 13, 2000	1:00 – 2:30	Penn Lake Library
October 11, 2000	1:00 – 2:30	Savage City Hall
November 8, 2000	1:00 – 2:30	St. Louis Park City Hall
December 13, 2000	1:00 – 2:30	Burnsville City Hall
January 10, 2001	1:00 – 2:30	Cancelled
February 14, 2001	1:00 – 2:30	Cancelled
March 14, 2001	1:00 – 2:30	Cancelled
April 11, 2001	1:00 – 2:30	Savage City Hall
May 9, 2001	1:00 – 2:30	Bloomington City Hall
August 8, 2001	1:00 – 2:30	Burnsville City Hall

Policy Committee

The Policy Committee was primarily made up of senior staff and other representatives of elected officials from each of the eight affected cities and three counties. The Committee met approximately every 3 months through the beginning phases of the study, and more frequently through the project's conclusion. Actual meeting times are presented in Table 2.

Table 9-2: Policy Committee Meeting Dates

Date	Time	Location
July 11, 2000	4:30 – 6:00	St. Louis Park City Hall
September 13, 2000	4:30 – 6:00	Penn Lake Library
December 13, 2000	4:30 – 6:00	Burnsville City Hall
April 11, 2001	4:30 – 6:00	Savage City Hall
May 9, 2001	4:30 – 6:00	Bloomington City Hall
September 6, 2001	4:30 – 6:00	St. Louis Park City Hall
October 11, 2001	4:30 – 6:00	Dakota County West Service Ctr

On October 11, 2001, the Policy Committee accepted the final findings and recommendations, sending them on to the I-35W Solutions Alliance. The Alliance accepted the findings and recommendations on October 18. Dakota County Regional Railroad Authority accepted the final findings and recommendations on October 30. Following DCRRA board action, the findings were forwarded to the Minnesota Department of Transportation.

9.2 Meetings with Corridor Communities

Member of the Parsons Brinckerhoff team began meeting with representatives from each of the eight affected cities shortly after commencement of the project. Each city, through its Technical Advisory Committee members, was budgeted 8 hours of total meeting time with the consulting team, and could plan this time in the manner they felt to be most beneficial. The cities were given suggested ways to spend their consultant time, including:

- An Office Session with the City Engineer, public works staff, City Planner, Surveyor, City Administrator and community development staff for the purpose of reviewing zone maps, comprehensive plans, community development ideas, redevelopment opportunities, right of way maps, and potential areas of concern

- An Interview with City Officials to find out their position on commuter rail, their constituents' position, and to identify potential areas of concern

- A Field Visit to problem areas, developed areas near potential stations, areas with opportunity for development, and passing siding locations

- A Workshop including neighborhood representatives, a Chamber representative, local business leaders, local institutions, and representatives of civic institutions to clarify information, provide background, explain the purpose of the study, and identify areas of potential concern

Members of the Parsons Brinckerhoff team also met with representatives from Hennepin County and Dakota County, as well as Canadian Pacific and Twin Cities and Western Railways.

9.3 Open House Meetings

Open house meetings were held throughout the course of the Feasibility Study (see Table 3). Five of these were county-wide open houses. The first round of open houses was held after completion of the corridor community meetings. The Cities of Burnsville and Edina hosted these open houses which were attended by more that 250 area residents. The open houses allowed residents of the impacted communities a venue to review and comment on the corridor alignment, existing freight train operations within the corridor, and alternative station locations. The Burnsville open house focused on the Dakota and Scott County segments of the alignment and potential station location sites in Savage, Burnsville,

Lakeville and Northfield. The Edina open house focused on the Hennepin County portion of the alignment and potential station location sites in Minneapolis, St. Louis Park, Edina, and Bloomington.

Table 9-3: Public Open House Dates

Date	Time	Location
		Round 1
September 20, 2000	5:00 – 8:00 pm	Burnsville
September 21, 2000	5:00 – 8:00 pm	Edina
		Round 2
May 30, 2001	5:00 – 8:00 pm	Bloomington
May 31, 2001	5:00 – 8:00 pm	Lakeville
June 20, 2001	7:00 – 9:00 pm	Burnsville
		Round 3
October 18, 2001	5:30-6:30 pm	Bloomington
November 5, 2001	5:30-6:30 pm	Savage
November 13, 2001	6:30-7:00 pm	Northfield
November 19, 2001	5:30-6:30 pm	Burnsville
November 20, 2001	6:00-7:00 pm	Edina
November 26, 2001	6:00-7:00 pm	St. Louis Park
November 29, 2001	8:00–9:00 am	Minneapolis

Staff from each of the affected cities, the Metropolitan Council, Dakota County Regional Railroad Authority, and the Parsons Brinckerhoff consulting team was present at county-wide open houses to hear community concerns and respond to questions. City staff was present at individual city open houses as well.

Comment cards were distributed to county-wide open house attendees. The first round of open houses generated 142 written comment cards and e-mails. Seventy percent of respondents were opposed to commuter rail along the Dan Patch line while thirty percent supported the idea. Specific comments included frustration with the length of the planning process and its resulting impact on their property values as well as concerns about noise, vibration and safety. Other comments included concerns about impacts to natural and built features along the corridor, including wetlands, parks, schools, and pedestrian and bicycle paths.

The second round of open houses held in Bloomington, Lakeville and Burnsville were well-attended. Over 360 people signed in, and it is estimated that an additional 120 attended but did not sign the register. The City of Bloomington generated the most visitors with 42% of those in attendance.

A tally of comments received is included in the Appendix. Principal concerns are summarized below.

- Degradation in the character, value and livability of adjacent residential property. Specific concerns include:
  - Increased freight rail activity, should the track be upgraded to facilitate passenger transportation. Concerns include the type of freight (hazardous materials), faster, louder, heavier, and/or longer trains.
  - Increased noise, vibration damage to adjacent homes, and air pollution from more frequent activity on the track.

  - Increased traffic through neighborhoods for station access. Parking likely to spill over onto neighborhood streets.

  - Reduced safety for neighborhood residents, particularly children and pets.

  - Impact on property values. Existing research is believed to be insufficient and not relevant to the Dan Patch corridor. Specifically:

- Acquisition of adjacent residential property should be included as a bona fide project cost, and should not be considered "optional".

  - Cost of landscaped sound barriers should also be included as a bona fide project mitigation cost and should not be considered "optional".

  - Negative impacts on natural amenities adjacent to the corridor.

  - Inefficient use of public funding. Specific opinions expressed include:

  - Projected ridership is not sufficient to warrant the expenditure of public dollars. Ridership projections should be based on an actual survey of residents.

  - Improvements should made to existing regional highways, which all would use, rather than transit, which few would use. Public transit may be desirable in other cities, but is not used heavily here.

  - Assumptions are based on most people working downtown, when trends indicate the opposite is occurring.

  - Likely to end up pulling people off buses rather than from cars.

  - Wrong location for a major transportation improvement. (See comment above).

  - If rail transit must be added, it should be added within existing freeways, such as I-35W and TH 100.

  - Such a facility only benefits those at the end of the line, at the expense of those living closer to work. Hennepin County neighborhoods should not have to accommodate Dakota County travelers.

9.4 Newsletters

Three newsletters were prepared and placed on the project website. The newsletters followed each round of public open houses. Each focused on topics developed since the previous edition.

9.5 Web Page Development

A project website, www.danpatchcorridor.com, was developed as a tool to disseminate information about the project to interested parties. Upon entering the website, the user can navigate to 6 separate pages of project information.

- "About the Study" – Corridor description (including location, rail line description, and current transit options in the corridor), corridor map, and study description, with links to municipal, Mn/DOT and Metropolitan Council websites

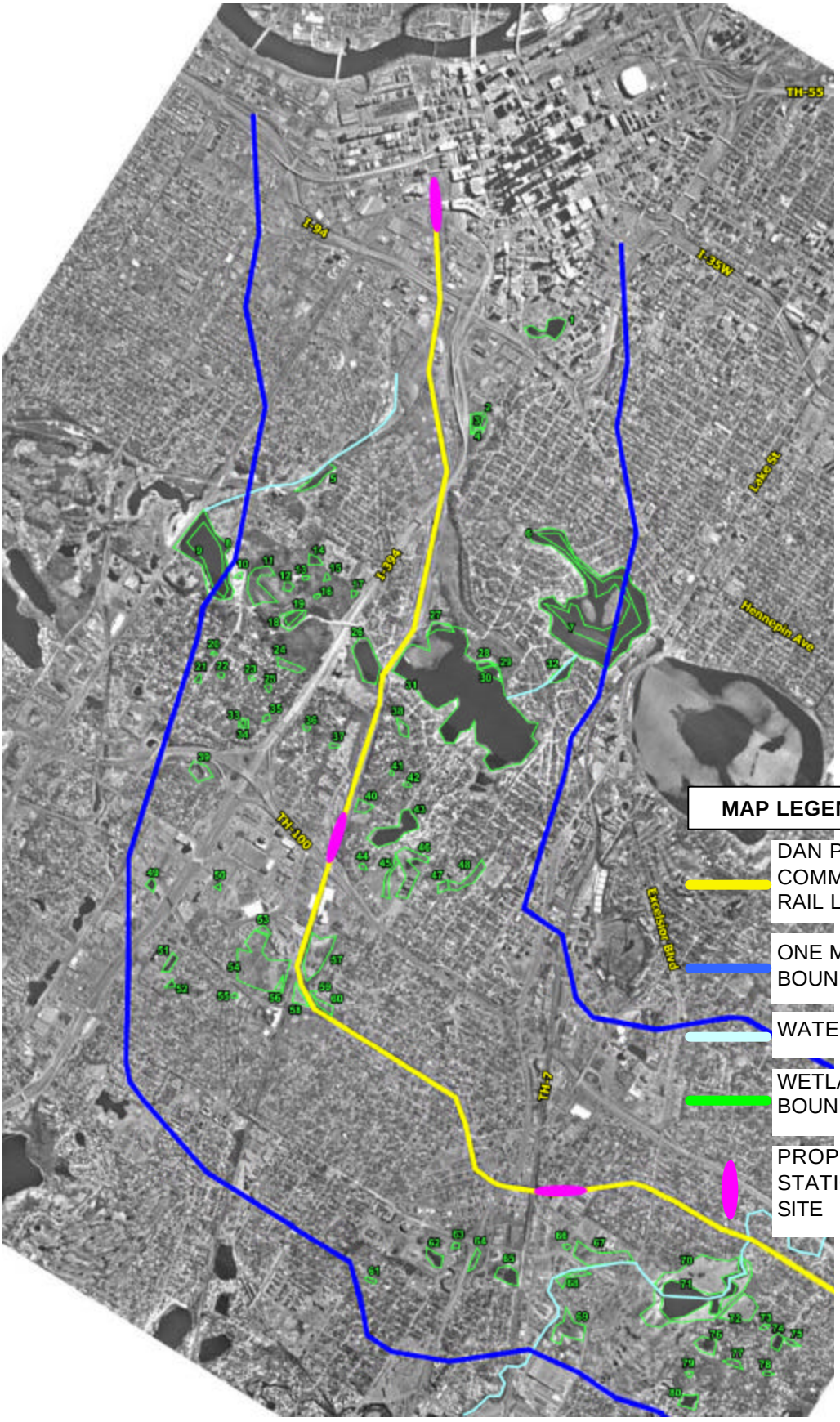
- "Project Information" – Open house presentation materials, project newsletters, open house comments, and station locations
- "Frequently Asked Questions" – Questions and answers about commuter rail along the corridor
- "Get Involved" – Project contact information
- "Study Committee Members" – Listing of Policy Committee, Technical Advisory Committee, and I-35 Solutions Alliance Executive Committee members
- "Links" – Links the user to websites for Apple Valley, Northfield, Bloomington, St. Louis Park, Burnsville, Edina, Dakota County, Lakeville, Hennepin County, Minneapolis, Scott County, Metropolitan Council, and the Minnesota Department of Transportation

The website was updated periodically throughout the project.

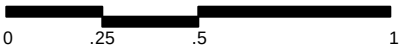
APPENDICES

A. Tally of Public Comments
B. Potential Siding Locations
C. List of Requested Railroad Data
D. Updated Link Tables
E. Wetland Maps
F. Contaminated Site Maps
G. Community Facility Maps

Appendix E: Wetland Maps



MINNEAPOLIS - ST LOUIS PARK AREA WETLANDS



Data provided by the U.S. Fish and Wildlife Service's National Wetland Inventory – Map source: Metropolitan Council, 1997