RIVERVIEW CORRIDOR

# Economic Development Analysis for the Riverview Transit Corridor

## ***Draft***

## Prepared for Ramsey County and the City of Saint Paul

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RAMSEY COUNTY

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# EXECUTIVE SUMMARY

The purpose of this analysis is to estimate the projected economic development impacts of a proposed modern streetcar or arterial bus rapid transit system in the Riverview Transit Corridor in Saint Paul, Minnesota, focusing on:

- Real estate value appreciation.
- New development generated by new transit investment.

## KEY FINDINGS

*Modern Streetcar Transit System*

- The economic development value generated by a modern streetcar system over the first 20 years of operation is estimated to be $843 million. (Inflated to 2033 dollars; first-year of operations.) [1]
- The economic development analysis estimates that a new modern streetcar system would incentivize the development of an additional 2,200 housing units and 219,000-square feet of commercial space in the Riverview Corridor. It is estimated that the additional commercial space would support about 350 new jobs.

*Arterial Bus Rapid Transit System*

- The economic development value delivered by a modern streetcar system over the first 20 years of operation is estimated to be $336 million. (Inflated to 2030 dollars; first-year of operations.) [2]
- The economic development analysis estimates that a new arterial bus rapid transit system would incentivize the development of an additional 600 housing units and 60,000-square feet of commercial space. It is estimated that the additional commercial space would support about 100 new jobs.

## MODEL STUDIES AND LITERATURE REVIEW

This economic development analysis used four model studies to guide the overall methodology. Those studies analyzed economic development impacts for proposed transit projects in North Minneapolis, Minnesota; Oklahoma City, Oklahoma; Denver, Colorado; and Washington, D.C.

In addition, the research team collected data from 21 academic studies. Key findings include.

- The most significant drivers of development are supportive public policy and favorable market conditions.
- Light rail systems and streetcars have generated significant value premiums for multifamily and commercial uses.
- Bus rapid transit with dedicated lanes can create value premiums comparable to fixed rail premiums. However, bus rapid transit without dedicated lanes is less impactful.
- Results vary significantly across different metro areas and time periods.
- No study can provide definitive estimates of modality differences (for example, streetcar versus bus rapid transit).

[1] Values over the 20-year period are discounted 3% back to the first year of operations.

[2] Values over the 20-year period are discounted 3% back to the first year of operations.

## DEVELOPER INTERVIEWS AND METRO CASE STUDY

The research team also interviewed local development and economic development professionals to gain understanding on how they perceive transit infrastructure. Eight real estate developers and economic development professionals were interviewed. Key findings from the interviews follow.

- In general, developers said the fixed rail is more attractive for development.
- Sources interviewed said that bus rapid transit is growing in acceptance and has potential to drive more investment.
- In general, developers said that transit infrastructure was a qualitative factor for development.
- Several developers said that crime and perception of crime on the transit system is a disincentive to development.

## ECONOMIC DEVELOPMENT ANALYSIS METHODOLOGY

The economic development analysis provided in this full report includes:

- Background on the modern streetcar and arterial bus rapid transit proposals.
- Overview and description of the model studies used for the economic development analysis.
- Summary of the literature review.
- A review of transit-oriented development data in the Twin Cities reported by Metro Transit.
- Summary of the interviews with developers.
- Analysis of developable land in the Riverview Corridor.
- Overview of the basecase development assumptions.
- Impact projections for transit options—modern streetcar and arterial bus rapid transit.

# INTRODUCTION

Ramsey County, the City of Saint Paul, and other key stakeholders are working to develop a preferred option for transit development through the Riverview Corridor. The overall transit plan would enhance transit service through the 12-mile corridor, which would run generally along Minnesota State Highway 5 (West 7th Street), connecting neighborhoods, businesses, and employers in downtown Saint Paul, MSP Airport, and the Mall of America. The two primary transportation systems under consideration are a modern streetcar system and an arterial bus rapid transit system.

As a part of the larger analysis, Ramsey County and the City of Saint Paul engaged Perkins+Will, LOCI Consulting LLC, and Stantec to complete a review of the economic development potential that would be generated by transit development through the Riverview Corridor. The larger stakeholder planning group wants to understand:

- What are reasonable estimates of increased economic development activity based on data from similar lines in other cities?
- Where are the development and redevelopment opportunities in the corridor?
- What is the estimated overall economic development potential of the proposed streetcar project?
- What is the estimated overall economic development potential of an arterial bus rapid transit project on the same route?

The purpose of this analysis is to estimate the projected economic development impacts of a modern streetcar or an arterial bus rapid transit system in the Riverview Transit Corridor, focusing on

- **Real estate value appreciation.**
- **New development generated by new transit investment.**

Using four model studies, the research team analyzed the future fiscal impact of transit development scenarios through the Riverview Corridor. The scenarios include a base case in which future development will occur as if there was no infrastructure development and scenarios where a modern streetcar system or arterial bus rapid transit system is put into service.

This analysis includes:

- Background on the modern streetcar and arterial bus rapid transit proposals.
- Overview and description of the model studies used for the analysis.
- Summary of the literature review.
- A review of transit-oriented development data in the Twin Cities reported by Metro Transit.
- Summary of interviews with developers.
- Analysis of developable land in the Riverview Corridor.
- Overview of the basecase development assumptions.
- Impact projections for transit options—modern streetcar and arterial bus rapid transit.

## STUDY LIMITATIONS

Note that this is not a “Return on Investment” assessment. That type of study is more

comprehensive and would include a deeper assessment of the costs and benefits of each proposal. This study does not include detailed equivalent cost comparison for each proposal. It also does not evaluate benefits other than real estate value and new development. There is no analysis of direct benefits such as reduced travel times, enhanced safety, and reduced emissions. Nor is there an analysis of indirect benefits such as improved access to labor shed and regional construction benefits.

This study also only considers the economic development benefits in Saint Paul, not in the portions of the corridor in Bloomington, the Minneapolis-Saint Paul International Airport, or Fort Snelling and Bdote historic areas.

Additionally, at the time of this analysis, two different streetcar options are under consideration—one that provides a center of the street running option through a large portion of the city of Saint Paul and one that provides a side of the street running option through that same portion. While we recognize that there are differences between these two options that will impact economic development and real estate values, it is difficult to model and project these differences because of a lack of academic and case studies that can provide this level of evaluation. Therefore, this analysis does not evaluate differences between these two proposals. The estimates provided for streetcar should be considered the same for both options.

## DATA RESOURCES AND LIMITATIONS

The data in this economic development analysis are compiled from a variety of sources, including academic literature, case studies, interviews with local developers and economic development sources, building permit and property data, along with secondary demographic and economic data sources. Sources are identified in the figures.

Perkins+Will, LOCI Consulting LLC, and Stantec believe that these sources are reliable. However, there is no way to authenticate this data and information. The research team does not guarantee the data or projections, and assumes no liability for any errors in fact, analysis, or judgement. The data in this analysis includes the most up-to-date information available at the time of this analysis.

The conclusions and recommendations in this market analysis are based on the best judgements and analysis at the time of the study. The research team makes no guarantees or assurances that the projections or conclusions will be realized as stated.

# BACKGROUND

The Riverview Corridor transit project is a 12-mile planned transportation connection that will run generally along Highway 5/West Seventh Street in Saint Paul, connecting downtown Saint Paul, the Minneapolis-Saint Paul International Airport, and the Mall of America.

This transit project seeks to address the mobility needs of an area with projected employment and population growth with a significant transit-reliant population. Additionally, this project seeks to provide opportunities for economic development throughout the corridor.

This section of the report provides a brief overview of the two transit proposals considered in this analysis—the modern streetcar proposal and the arterial bus rapid transit proposal. These descriptions are for the proposals at the time of the analysis and may not reflect changes that may happen following the release of this study.

Under both proposals, the existing Metro Transit-operated 54 Bus—that currently provides service between Downtown Saint Paul, the Minneapolis-Saint Paul International Airport, and the Mall of America—would be discontinued.

## MODERN STREETCAR PROPOSAL—OVERVIEW

The modern streetcar proposal would provide a fixed-rail transit system, similar to the existing light rail system in the Metro Area, but with smaller streetcar vehicles that can operate in shared lanes with cars and trucks. The same vehicles could also operate on the same tracks as the existing light rail transit service and serve the same stations with level boarding.

The Riverview project stations would be smaller than Blue and Green Line stations but would have many of the same amenities such as heated shelters, ample lighting, off-board fare collection and signs showing real-time departure times.

Two options have been developed for the modern streetcar proposal. A brief description of the two options follows.[3]

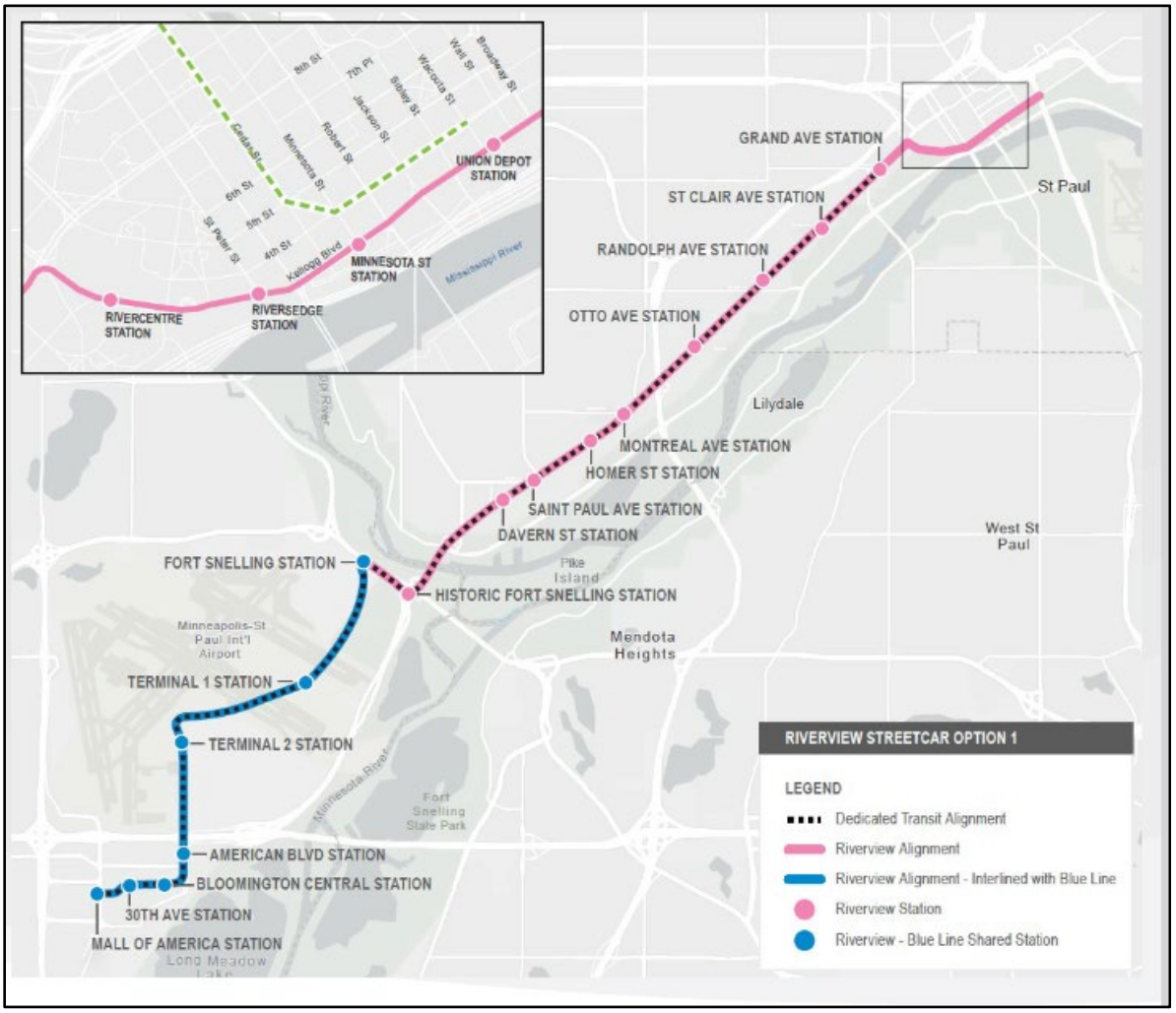
## MODERN STREETCAR OPTION 1

Streetcar Option 1 would start at a new elevated station at the Mall of America, would travel along the existing Blue Line route to the Fort Snelling station, and then exit onto new line through the Fort Snelling/Bdote historic area. The streetcar would then cross the Mississippi River at a new bridge shared with Highway 5 and covered with a new pedestrian/bikeway deck.

The streetcar would then travel along Highway 5/West Seventh Street on a dedicated center lane to the Grand Avenue station. At that point, the streetcar would travel with shared traffic on a center lane on to Kellogg Boulevard and on to the Union Depot Station.

[3] Full overview of the Modern Streetcar Option 1 and Option 2 can be found in the Policy Advisory Committee Update, January 31, 2024. https://www.ramseycounty.us/sites/default/files/Roads%20and%20Transit/Riverview/RCEPE_20240131_PAC%20presentation_final%282%29.pdf

**Map 1: Modern Streetcar Option 1**




Source: Ramsey County

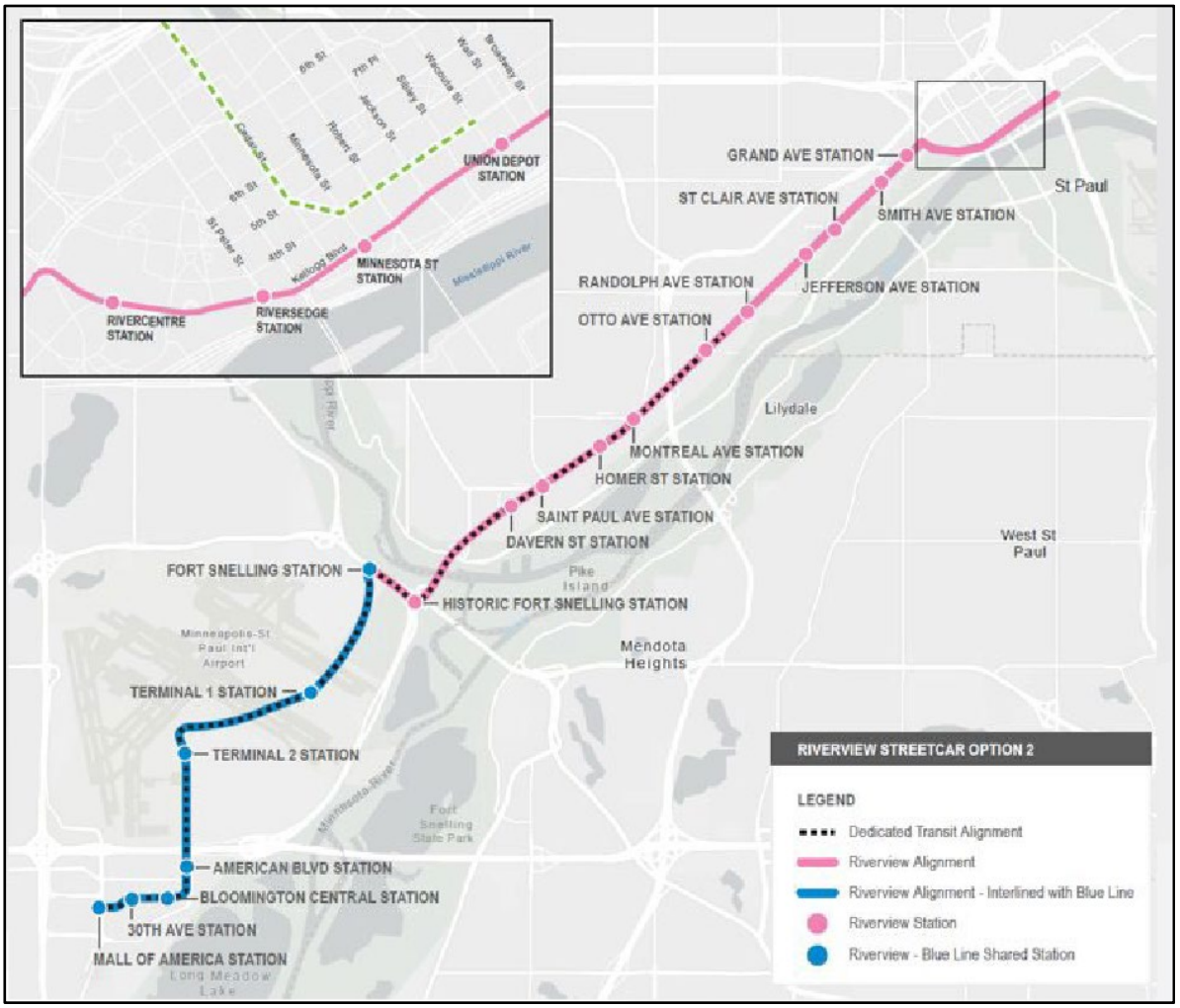
Option 1 would have 20 stations along the total route. Map 1 shows the route for Option 1.

## MODERN STREETCAR OPTION 2

Similar to Streetcar Option 1, Streetcar Option 2 would start at a new elevated station at the Mall of America, would travel along the existing Blue Line route to the Fort Snelling station, and then exit onto new line through the Fort Snelling/Bdote historic area. And, as with Option 1, Option 2 would then cross the Mississippi River at a new bridge shared with Highway 5 and covered with a new pedestrian/bikeway deck. As with Option 1, Option 2 would then travel along Highway 5/West Seventh on a center dedicated lane.

The differences between the two options start at the Otto Avenue station. At this point, Option 2 would move from a center-dedicated lane to side-running lanes. From that point on, the streetcar would operate in shared traffic along Highway 5/West Seventh and Kellogg Street to Union Depot Station.

## Map 2: Modern Streetcar Option 2




Source: Ramsey County

Option 2 would have 22 stations along the route. Stations are added at Smith Avenue and Jefferson Avenue. Map 2 shows the route for Option 2.

Figure 3 shows a comparison of the two options. The primary difference between the two options is that Option 1 would operate in the center of the street through Saint Paul and Option 2 would operate along the side of the street from the Otto Station on to the Union Depot Station. This key operational difference involves tradeoffs on speed and reliability of service, pedestrian access and safety, parking availability, vehicular movements along the street, and business access.

## ARTERIAL BUS RAPID TRANSIT PROPOSAL

The arterial bus rapid transit proposal would provide an enhanced bus service through the

## Figure 3: Comparison of Modern Streetcar Options

| | Streetcar Option 1 | Streetcar Option 2 |
|---|---|---|
| Number of Stations | 20 | 22 |
| Dedicated Lanes | ~10.1 miles or 87% | ~8.2 miles or 72% |
| Service Frequency | 10 mins/30 mins [1] | 10 mins/30 mins [1] |
| Travel Time (Westbound) | 44:02 min | 45:33 min |
| Travel Time (Eastbound) | 43:22 min | 44:49 min |
| 2040 Ridership | 11,600 | 11,200 |
| Capital Cost (2033) | $2.10 billion | $2.12 billion |
| Operation and Maintenance Cost (2023) | $34 million | $34.5 million |

1. Every 10 minutes from 4:30 a.m. to 10:30 p.m.; every 30 minutes from 10:30 p.m. to 1:30 a.m. and from 3:00-4:30 a.m.

Source: Ramsey County

Riverview Corridor.[4] Similar to the existing Red Line, A Line, C Line, Orange Line, and D Line already operating in the Metro Area, the arterial bus rapid transit system would provide:

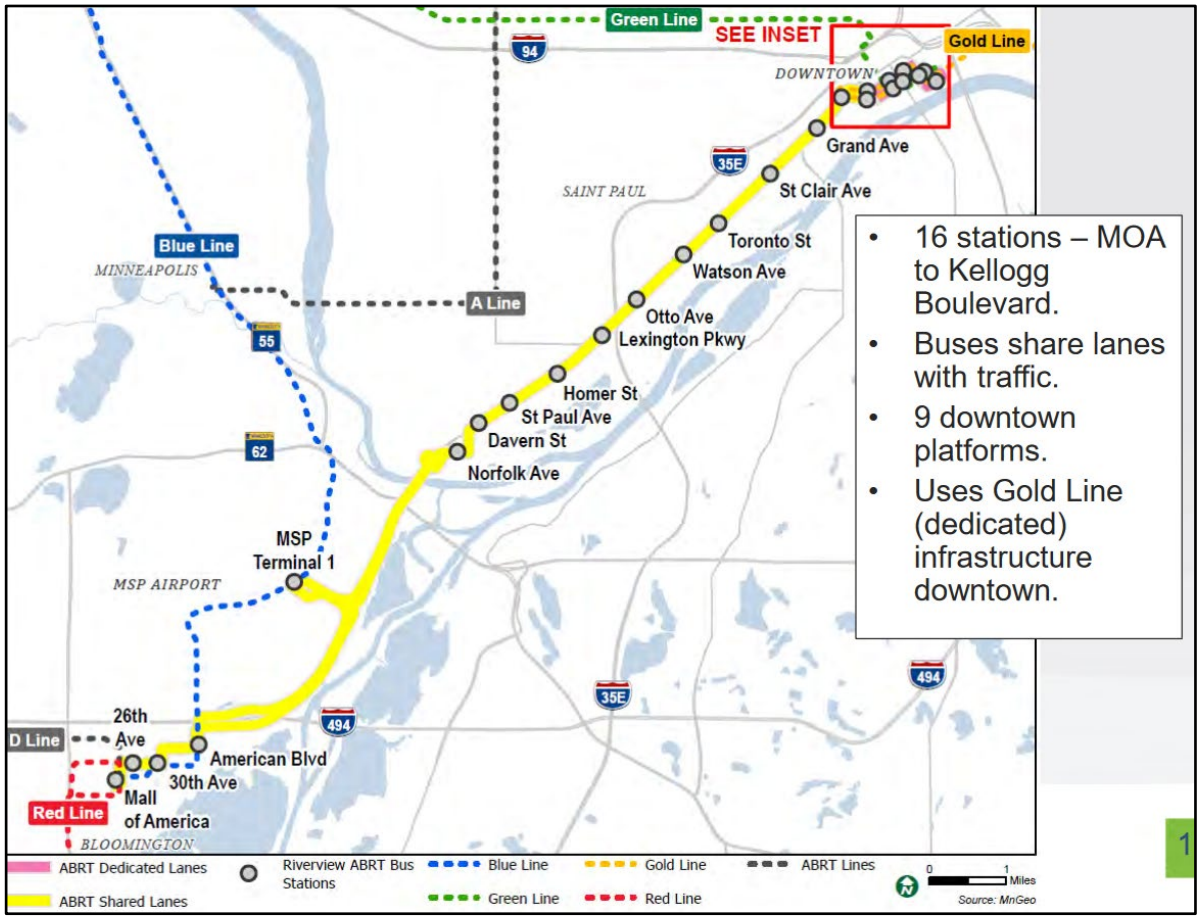
- Branded bus rapid transit vehicles.
- Pylon markers with NextTrip signs to provide current bus information.
- Enhanced shelters with heaters, lighting, emergency call and security camaras, and raised curbs for easier boarding.
- Ticket machines and fare card validators to collect all payment before riders board the bus.

The bus rapid transit buses would start at the existing Mall of America Transit Station and continue along surface streets through Bloomington. The buses would then continue on to Terminal 1 at the Minneapolis-Saint Paul International Airport along Interstate 494 and Highway 5.

Buses would enter Saint Paul over the existing Highway 5 bridge over the Mississippi River and generally travel along Highway 5/West Seventh Street to Downtown Saint Paul. Upon entering Downtown, the buses would use the planned Gold Line dedicated-lane infrastructure through the city to terminate at the Union Depot Station. Map 4

[4] Full overview of Arterial Bus Rapid Transit proposal can be found in the Policy Advisory Committee Update. February 29, 2024. https://www.ramseycounty.us/sites/default/files/Roads%20and%20Transit/Riverview/RCEPE_20240229_PAC%20presentation_V0.2_20240229_distributed.pdf

**Map 4: Arterial Bus Rapid Tranit Route**




Source: Ramsey County

shows the proposed route for the arterial bus rapid transit proposal.

Figure 5 shows a comparison of the bus rapid transit proposal with the existing 54 bus route. The proposed arterial bus rapid transit system would provide faster service and an enhanced rider experience over the exiting 54 bus route.

## STUDY CONSIDERATIONS

This analysis provides estimates for the economic development impacts of modern streetcar and arterial bus rapid transit. It does not provide estimates for the different modern streetcar options proposed. We found no model studies or academic studies that could provide the basis for making the types of estimates that would be required for the differences between the two options proposed. There are no analytic tools to conduct the level of detailed analysis that would be required to estimate the different impacts of the two streetcar options.

However, the research team recognizes that there are qualitative differences between the two options that could drive materially different economic development impacts along the corridor. From a real estate valuation and economic development perspective there are benefits and drawbacks to both options.

## Figure 5: Comparison of Arterial Bus Rapid Transit and Route 54

| | Arterial Bus Rapid Transit | Existing Route 54 |
|---|---|---|
| Number of Stations | 21 (14 new) | 26 stops (MOA to Union Depot) |
| Dedicated Lanes | ~0.52 miles or 4% | ~0.52 miles or 4% |
| Service Frequency | 10 mins/30 mins [1] | 15 mins/30 mins |
| Travel Time (Westbound) | 40:05 min | 43:00 min |
| Travel Time (Eastbound) | 39:57 min | 42:00 min |
| 2040 Ridership | 8,000 | NA |
| Capital Cost (2033) | $121 million (2030) | NA |
| Operation and Maintenance Cost (2023) | $16.8 million | NA |

1. Every 10 minutes from 4:30 a.m. to 10:30 p.m.; every 30 minutes from 10:30 p.m. to 1:30 a.m. and from 3:00-4:30 a.m.

Source: Ramsey County

Key differences between the two options include:

- **Ridership estimates.** Developers are more attracted to transit lines with higher ridership numbers. The differences between the two streetcar options are minimal.
- **Speed and reliability of the service.** Option 1 would provide more dedicated lane service and is therefore expected to be more reliable, although this additional dedicated lane is only the portion of the line between Otto Avenue and Grand Avenue. This additional speed and reliability might ultimately impact ridership and could make the transit line less attractive for new development.
- **Pedestrian access and safety.** Option 2 provides better for pedestrians along West Seventh Street. This characteristic is better for businesses and residents moving around the corridor.
- **Vehicular movements.** Option 2 would allow for more left turns for automobile and truck traffic along West Seventh Street. This feature would also be more attractive to businesses and residents along the corridor.
- **On-street parking.** Under Option 1, it is projected that about 605 on-street parking spaces would need to be removed from service. Option 2 would only see about 240

spaces removed from service.[5] Businesses and developers want to make sure there is adequate and easily assessable parking.

- Delivery loading and operations. Both Option 1 and Option 2 might require local businesses to adjust how they do on-street delivery. These changes could make the street less attractive for businesses and new development.



[5] Policy Advisor Committee Update. February 29, 2024. https://www.ramseycounty.us/sites/default/files/Roads%20and%20Transit/Riverview/RCEPE_20240229_PAC%20presentation_V0.2_20240229_distributed.pdf .

# MODEL STUDIES

The Riverview transit economic development analysis uses four model studies to provide a framework for the analysis. These studies were selected because they provide estimates of how transit developments generate additional investment and value for the community. All of the studies provide forecasts for streetcar options. Two of the studies consider options of either streetcar or bus rapid transit service. One study also considers enhanced bus service—service at a level below bus rapid transit.

Our search for model studies was not exhaustive. There may be more recent studies that we did not discover. However, we believe these studies provide good models for methodology and some additional benchmarks that can be used for the Riverview transit economic development analysis.

Descriptions of the model studies follows:

## WEST BROADWAY IMPACT STUDY

***Economic Development Impacts of Transit Alternatives—West Broadway Transit Study*** [6]
SRF Consulting Group Team
Minneapolis, Minnesota
November 11, 2015

### *Background*

The purpose of the analysis was to provide guidance on the economic development impacts of proposed streetcar and bus rapid transit alternatives along the West Broadway corridor in Minneapolis, Minnesota. The analyst team developed a financial model to evaluate the impact of streetcar and bus rapid transit alternatives on the value and pace of development as well as job creation in the corridor compared with a baseline, no-build scenario.

### *Methodology*

The methodology included an analysis of baseline development assumptions from a review of the demographic and market conditions, a literature review and case study analysis, interviews with local developers, and a forecast of impacts for different modal scenarios.

### *Zone of Analysis*

The area of analysis is 0.25 miles from the transit line.

### *Impact Estimate for Forecast*

Based on the literature and case study review, this study uses a percentage valuation above the baseline assumption for both property valuation and additional development.

The property valuation premium for bus rapid transit is estimated to be:

- Year 1: 2.5% above baseline
- Year 10: 4.0% above baseline

For streetcar, the valuation premium is estimated to be:

- Year 1: 5.0% above baseline

[6] https://www.metrotransit.org/Data/Sites/1/media/about/improvements/westbroadwaytransitstudy/economic-development-impacts-of-transit-11.11.15.pdf

- Year 10: 8.0% above baseline

The development premiums used an analysis of the capacity of available land and applied estimated development rate premiums for each of the transit proposals by property type and for sub areas along the route.

***Forecast Period***

The study uses a 25-year period of analysis.

***Findings and Conclusions***

The study projects that, over the 25-year analysis period, a bus rapid transit service would generate approximately $220 to $300 million in incremental real estate value for the West Broadway corridor over baseline conditions. A streetcar was projected to generate $480 to $640 million in real estate value over and above baseline conditions. The study also projects that over the same period, a bus rapid transit would support 1,075 new jobs along the West Broadway corridor, over and above the number of jobs under baseline conditions. A streetcar is projected to generate 2,600 incremental jobs over baseline conditions.

## OKLAHOMA CITY ECONOMIC DEVELOPMENT ASSESSMENT

### *Oklahoma City Modern Streetcar Project Land Use and Economic Development Assessment* [7]

E.D. Hovee & Company, LLC
Oklahoma City, Oklahoma
November 6, 2013

***Background***

The purpose of this report was to evaluate existing land use conditions and to quantify potential development for the modern streetcar service proposed in Oklahoma City, Oklahoma. The study provided projections for the locally preferred routing of the proposed streetcar service—referred to as the 2013 Route Framework—along with a future area of development that did not have a current route designation—referred to as the "Core to Shore" area. That area includes a portion of the city south of downtown—from the core of downtown to the shore of the Oklahoma River—that was made available for redevelopment when Interstate 40 was rerouted a few blocks south.

***Methodology***

The methodology included an analysis of baseline development assumptions from a review of the demographic and market conditions, a literature review and case study analysis, interviews with local developers, and a forecast of impacts for different modal scenarios.

***Zone of Analysis***

The primary area of analysis is 0.25 miles from the transit line. The study uses a defined area referred to as Zone A that is one block from the transit line, and Zone B that is two to three blocks from the transit line.

***Impact Estimate for Forecast***

Development is projected to occur at 4.5 times the baseline development rate in Zone A and 2.0 times the baseline development rate in Zone B. For an area of analysis that did not have a defined route, the analysis used development premium of 3.0 times the baseline rate. These impact estimates are applied to parcels identified as having development potential using an overall

[7] https://www.embarkok.com/assets/files/planning/Economic%20Development%20Assessment%20Sum_Final.pdf

development forecast for an area along with parcel specific data like improvement to land value ratio.

***Forecast Period***

The study period is 10 years.

***Findings and Conclusions***

For the 2013 Route Framework, the study projected that development along the proposed route would result in construction of up to 10+ million square feet of added commercial and residential building space, representing as much as a 50% increase in the corridor's building inventory compared to current conditions at the time. The study projected that market valuation with this scenario would increase by nearly $1.5 billion – more than doubling the valuation for the area most benefitted within three blocks of either side of the streetcar alignment. Taxable valuation was projected to increase by an estimated $150 million. For this area, the study projected that the development anticipated with streetcar would be 3.5 times the level of new development and more than 4.5 times the added assessed value as might be expected with base case expectations.

For the Core to Shore zone, the study projected that streetcar development would result in construction of close to 2.7 million square feet of commercial and residential building space, which represents an approximate three-fold increase in the corridor's building inventory compared to existing conditions. The study projected that market valuation would by $415 million – with taxable valuation up by an estimated $43 million. For the Core to Shore zone, the study projected that the streetcar investment offered the potential to deliver about three times the pace of new development and added market value than would occur if recent development trends were continued.

## COLFAX CORRIDOR IN DENVER IMPACT ASSESSMENT

### *Economic Development Impacts for Colfax Corridor* [8]

Leland Consulting Group and P.U.M.A.
Denver, Colorado
June 2013

***Background***

The purpose of study was to assist in the evaluation of the potential economic development impacts of three high-capacity transit mode choices along Colfax Avenue in Denver, Colorado—enhanced bus, bus rapid transit (bus rapid transit), and modern streetcar.

***Methodology***

The analysis includes a summary of physical, market, and demographic conditions along the corridor relevant to an analysis of economic potential, case studies of five transit systems with similar characteristics to the area, and interviews and focus groups with local and national developers.

The analysis team conducted primary and secondary case study research on other transit corridors throughout the country. Case study systems were chosen based on similarity to the Colfax study area in addition to recent experience with one of the considered transit modes: modern streetcar,

[8] https://www.denvergov.org/content/dam/denvergov/Portals/705/documents/projects/ColfaxCorridor/Colfax_EcoDevImpacts_3oct2013_draft.pdf

bus rapid transit or enhanced bus. Case study areas included:

- Tucson, Arizona – modern streetcar
- Portland, Oregon – modern streetcar
- Cleveland, Ohio – bus rapid transit
- Kansas City, Missouri – bus rapid transit
- Albuquerque, New Mexico – enhanced bus

***Zone of Analysis***

The study area was census block groups 0.5 miles to 1.0 miles from the proposed lines. Four study areas were defined representing four quarters of the line. The analysis also used 0.25-mile radii around stations as study areas. The forecasts were for the entire station study areas.

***Impact Estimate for Forecast***

Impact estimates were provided as percentage premium above baseline growth per year. The estimates were provided for both conservative and accelerated impacts. Impact estimates also varied by station area. The range of impact estimates was:

- Enhanced bus service: 1% to 4%
- Bus rapid transit: 3% to 10%
- Modern streetcar: 5% to 20%

***Forecast Period***

The forecast period was 2013 to 2035.

***Findings and Conclusions***

The analysis forecasted that Colfax station-area properties would grow in value by $2.5 to $3.5 billion in the baseline-no new transit scenario (as a result of new development and, to a greater extent, appreciation of existing development) by 2035. Enhanced bus was estimated to contribute an additional $45 million to $136 million to station area values by 2025. Bus Rapid Transit is estimated to contribute $124 million to $346 million (its wide range is due to the wide variety of possible executions of that technology, from fairly bus-like deployments to very streetcar-like investments). Modern Streetcar was estimated to contribute $275 to $664 million to station-area property value growth by 2035.

## STREETCAR IMPACT ANALYSIS IN WASHINGTON DC

***Value Capture and Tax-Increment Financing Options for Streetcar Construction*** [9]

The Brookings Institution, HDR, Re-Connecting America, and RCLCO
Washington, D.C.
June 2009

***Background***

This analysis explored potential funding options for the construction of a proposed streetcar line on the H Street corridor between the Minnesota Metro station and Union in Washington, D.C. As part of this larger financial analysis, the analysts looked at increases in real estate values and methods for capturing a portion of this increase for financing.

***Methodology***

The methodology for estimating valuation increases was based on a case study analysis of three existing streetcar systems in Portland (Oregon), Tampa (Florida), and Seattle (Washington). The case studies were chosen to maximize their applicability to the H Street and Benning Road land use and real estate conditions. The property value

[9] http://ctod.org/portal/sites/default/files/brookingsValueAddedTIF2009.pdf

appreciation in the years following the streetcar line opening and the geography along the line and at station stops which were affected by the streetcar opening was examined.

The case study analysis was then applied to an assessment of property valuations for the 2,909 land parcels along the line, including an identification of larger land assemblages which could be major catalytic projects (23 large development areas were identified comprising over a hundred parcels). Land that is non-taxable, such as those owned by local or federal governments, was not included in the analysis.

The data from this case study analysis was used for the Oklahoma study described previously.

***Impact Estimate for Forecast***

Property valuations were modeled to increase between 8% for single-family residential parcels to 68% for multi-family residential parcels, over the 10-year period.

***Zone of Analysis***

The study used a tier system with parcels closest to the stations capturing 100% of the increase in valuation and parcels farther from the station capturing between 50% and 75% of the valuation increase.

***Forecast Period***

The analysis used a 20-year development time period. However, the increases in valuation were assumed to start in year one and ramp up over 10 years.

***Findings and Conclusions***

The study projected that $400 million in property value would be created by the streetcar line. The review of the case studies found that underutilized properties close to downtown just far enough out to not be walkable to the downtown are seen as attractive to developers. The streetcar offers a powerful connection between these vacant and underutilized districts.

The analysis also found that single family type residential properties grew at a slower rate than industrial, commercial, and multi-family. Residential neighborhoods are not subject to big redevelopment changes like industrial and commercial in these case areas and therefore are not likely to change value as fast.

Finally, some commercial properties did not see increases relative to other properties such as larger parcels of vacant land. Many of the commercial land uses in these cities included gas stations, auto body shops, and night clubs that have similarities to industrial uses but had not been redeveloped because of their location or size. This kept the value increases lower than other properties like larger multi-family, industrial, and raw land properties.

# LITERATURE REVIEW

This section provides an overview of the literature review that was completed for this economic development analysis. The review included economic development impact studies for both transit corridors developments. These studies evaluated the estimated impacts resulting from transit corridors that were actually developed. Some of these studies provided data points to calibrate the Riverview corridor transit economic development impact modeling.

This review is not intended to be an exhaustive of all studies that have been completed. We focused on more recent analyses, studies with streetcar and arterial bus rapid transit systems, and/or studies that used Minnesota transit corridors.

## KEY FINDINGS FROM THE TRANSIT LITERATURE REVIEW

Figure 6 shows the review of academic studies and other analyses that examine economic development impacts of the transit lines. In all 21 studies were reviewed and documented. Citations are included in the figure. Key findings from the literature review of transit studies follow.

- **Most significant drivers of development are supportive public policy and favorable market conditions.** Several studies highlight the fact that while transit development is a significant driver of value, the regulations and supports in place for development and the overall economic conditions of an area can be more impactful in driving development and real estate value.
- **Light rail systems and streetcars have generated significant value premiums for multifamily and commercial uses.** The data from these analyses supports the belief that transit infrastructure drives real estate investment and real estate value.
- **Bus rapid transit with dedicated lanes can create value premiums comparable to fixed rail premiums. However, bus rapid transit without dedicated lanes is less impactful.** While the results of these studies have wide variations, in general, bus rapid transit does drive additional development, and systems with dedicated trafficways appear to drive greater value than those that use general traffic lanes.
- **Results vary significantly across different metro areas and time periods.** The studies are conducted over different time periods and in different metro areas, so the results have significant variation.
- **No study can provide definitive estimates of modality differences.** Comparisons of light rail transit versus streetcar versus bus rapid transit are difficult because there is a relatively small sample size of transit projects and there are significant variations across markets and time periods. These studies can provide data points to support this overall analysis. But using these academic studies to determine a preferred modality that can optimize economic development investment requires some assumptions and modeling.

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Multi Modal Analysis** | | | | | |
| **Commercial Gentrification Along Twin Cities Transitway Corridors** | 2022 | Noah Wexler and Yingling Fan. Commercial Gentrification Along Twin Cities Transitway Corridors. Center for Transportation Studies; University of Minnesota. May 2022. | The study examined how the construction and operation of Light Rail and Bus Rapid Transit corridors in the Twin Cities metropolitan area affected commercial gentrification using data on establishments providing retail, food, or personal services. | The study found evidence that the Green Line reduced sales for single-location firms and the A Line BRT slightly reduced sales and employment for the same types of firms. However, the study found the Blue Line did not have significant effects on nearby stores. Using the Green Line as a case study to examine the mechanisms of transit-induced commercial gentrification, the study found that gentrification effects are correlated with positive residential construction effects. These findings suggest that transit-induced gentrification is dependent on transit's affects on surrounding physical infrastructure. | Blue Line (Hiawatha) LRT; Green Line LRT; and A Line BRT in Minneapolis-St. Paul |
| **The Real Estate Mantra – Locate Near Public Transportation** | 2019 | American Public Transportation Association and the National Association of Realtors. The Real Estate Mantra – Locate Near Public Transportation. October 2019. | This study compares the performance of residential and commercial property sales near fixed-guideway stations with areas without public transit access between 2012 and 2016 in Boston; Eugene, Oregon; Hartford, Connecticut; Los Angeles; Minneapolis–St. Paul; Phoenix; and Seattle. | The study found rapid rail transit sheds saw the highest property value gains, followed by BRT and commuter rail sheds. Residential properties in proximity to public transit (defined as within a half-mile radius) performed better than properties farther from public transit. Between 2012 and 2016, median sales price increases near stations were 4 to 24 percentage points higher for residential properties than in areas farther from public transit. More than 43,500 occupied-units were added near transit in this time period across the seven regions. For commercial property, four of the five regions analyzed saw median sales price per square foot increases. | Seven systems analyzed--Boston; Eugene, Oregon; Hartford, Connecticut; Los Angeles; Minneapolis–St. Paul; Phoenix; and Seattle |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Multi Modal Analysis (Cont.)** | | | | | |
| **The Link between Transit Station Proximity and Real Estate Rents, Jobs, People and Housing with Transit and Land Use Planning Implications** | 2019 | Arthur C. Nelson and Robert Hibberd. The Link between Transit Station Proximity and Real Estate Rents, Jobs, People and Housing with Transit and Land Use Planning Implications. National Institute for Transportation and Communities (NITC). November 30, 2019. | The study used economic base analysis (especially shift-share) and CoStar commercial rent data to estimate the development outcomes to transit. | Key findings include: (1) market rents increase with respect to Fixed Guideway Transit (FGT) station proximity for nearly all commercial types and for all modes, except there no rent premium for BRT in the closet (0.125 mile) distance band and office responds positively only within the closets (0.125 mile) distance band from LRT stations, with rent premiums extend one to two miles away from FGT stations for many commercial types; (2) on the whole, more mature Fixed Guideway Transit (FGT) system saw gains in regional share of jobs in closer in (0,0.25 mile and 0.50 mile) distance bands if not up to the 1.00 mile distance band from transit stations—BRT being an exception in gaining share only in the nearest (0.25 mile) distance band; and (3) there are only modest gains in the regional share of population and housing before/during the Great Recession (2000-2009) bit somewhat more gains afterward (2010-2016) for all transit types except BRT. | Analyzed 17 LRT systems, 14 BRT systems, nine streetcar transit systems and 12 commuter rail transit systems |
| **Economic Development Impacts of Bus Rapid Transit** | 2016 | Andrew Guthrie and Yingling Fan. Economic Development Impacts of Bus Rapid Transit. Center for Transportation Studies; University of Minnesota. January 2016. | The report analyzed job growth within one half mile of new light rail and bus rapid transit stations implemented in the Twin Cities and peer regions between 2003 and 2010, broken down by sector are wage categories. | The study found that fixed transit infrastructure (light rail tracks or BRT dedicated guideways), total street mileage in station areas, proximity to central business districts and overall regional economic strength are associated with more station-area jobs. The researchers recommended that policymakers should include building a strong corridor identity for arterial BRT lines, promote proactive job growth along BRT lines in general, and focus on social and racial equity concerns. | Six BRT regions and nine LRT regions, along with two additional BRT lines added for more analysis |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Multi Modal Analysis (Cont.)** | | | | | |
| **Multiple Factors Influence Extent of Transit-Oriented Development** | 2014 | US Government Accountability Office (GAO). Multiple Factors Influence Extent of Transit-Oriented Development. November 2014. | The study addressed (1) the extent to which transit-oriented development has occurred and (2) how the FTA considers factors when assessing proposed projects. GAO reviewed six federally funded case study transit projects, met with stakeholders, such as local officials and developers, and interviewed FTA officials. | The study found conditions that support transit-oriented development, such as demand for nearby real estate, land available to develop, residents' support, and a transit system that provides a direct and efficient connection to jobs; challenges that hinder transit-oriented development, such as high associated costs, difficulty in obtaining financing, a difficult local-government review and approval process, an unsupportive local population, and a physical configuration around transit stations unattractive for development; and local government policies that support transit-oriented development, such as supportive zoning, planning, infrastructure investments, and tax incentives. | Reviewed case studies in Baltimore, MD; Washington, DC; Charlotte, NC; Santa Clara County, CA; San Francisco, CA; and Houston, TX |
| **More Development For Your Transit Dollar: An Analysis of 21 North American Transit Corridors** | 2013 | Walter Hook, Stephanie Lotshaw, and Annie Weinstock. More Development For Your Transit Dollar: An Analysis of 21 North American Transit Corridors. Institute for Transit & Development Policy. November 13, 2013. | The report evaluated 21 LRT, BRT, and streetcar corridors in 13 cities across the US and Canada and featured case studies in Cleveland and Pittsburgh. | Key findings: (1) Per dollar of transit investment, and under similar conditions, Bus Rapid Transit leverages more transit-oriented development investment than Light Rail Transit or streetcars. (2) Both BRT and LRT can leverage many times more TOD investment than they cost. (3) Government support for TOD is the strongest predictor of success. (4) The strength of the land market around the transit corridor is the secondary indicator of success. (5) The quality of the transit investment is the tertiary indicator of success. Of the systems analyzed, TOD investment ranged from nominal to $114 per $1 invested. | 21 systems analyzed across US and Canada |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Light Rail Transit Analysis** | | | | | |
| **Real Estate Development in Anticipation of the Green Line Light Rail Transit in St. Paul** | 2015 | Jason Cao and Dean Porter. Real Estate Development in Anticipation of the Green Line Light Rail Transit in St. Paul. Center for Transportation Studies; University of Minnesota. November 2015. | Using building permit data from the city of St. Paul, this study investigated the effects of key announcements of the Green Line light rail transit (LRT) by employing location quotient analysis and difference-in-difference models to compare building activity in the LRT corridor and control corridors. | The researchers found that the announcement of preliminary engineering had no impacts on the count and value of building permits. But the researchers found the announcement of Full Funding Grant Agreement increased the number of building permits by about 30% and the value by 80%. The study concluded that in addition to LRT investment, proactive land use planning policies, public subsidies, and public funded projects are important contributors to building activity. | Green Line LRT in Minneapolis and St. Paul |
| **The Impact of Hudson-Bergen Light Rail on Residential Property Appreciation** | 2013 | Kim and Lahr. The Impact of Hudson-Bergen Light Rail on Residential Property Appreciation. 2013. | Study of values of single-family and multifamily properties around transit line in New Jersey | Found that properties near the southern end of the line achieved an annual rate of price appreciation 17-20% higher than comparable, less transit-accessible properties. Growth premiums are negligible around stations that are already well-served by transit. Price premiums were limited a 0.25 mile radius. | Hudson-Bergen Light Rail in New Jersey |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Light Rail Transit Analysis (Cont.)** | | | | | |
| **The Hiawatha Line: Impacts on Land Use and Residential Housing Value** | 2010 | Edward G. Goetz, Kate Ko, Aaron Hagar, Hoang Ton, Jeff Matson. The Hiawatha Line: Impacts on Land Use and Residential Housing Value. Center for Transportation Studies; University of Minnesota. February 2010. | The study examines the economic and land-use impacts of the Hiawatha Light Rail Line on residential property values, housing investment, and land-use patterns. The study uses a hedonic pricing model for single-family and multi-family residential properties within a one-half mile radius of the stations. | The study found that construction of the Hiawatha Line had a positive effect on property values within station areas. The study found the effect was limited to the west side of the line; on the east side a four-lane highway and a strip of industrial land uses intervenes and eliminated any positive impact of the line. The study also found a high level of residential investment (as measured by dollar value of the investment) within station areas compared to the control area. | Hiawatha LRT line in Minneapolis |
| **Impacts of the Hiawatha Light Rail Line on Commercial and Industrial Property Values in Minneapolis** | 2010 | Kate Ko and Xinyu (Jason) Cao. Impacts of the Hiawatha Light Rail Line on Commercial and Industrial Property Values in Minneapolis. Center for Transportation Studies; University of Minnesota. June 2010. | The study analyzed the impact of proximity to Hiawatha light rail line stations on sales prices for commercial and industrial properties using aa linear hedonic pricing model on the 2000-2008 sales data. | Found that, overall, the Hiawatha Line increased the values of commercial and industrial properties within a one-mile radius of light rail stations. Authors said the study is unable to tell whether the increases along the line represent generative economic benefits or the increases are at the expense of losses in other areas in the region. | Hiawatha LRT line in Minneapolis |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Light Rail Transit Analysis (Cont.)** | | | | | |
| **Did the Hiawatha Light Rail Line Increase Single-Family Residential Property Values?** | 2008 | Adam Kent & Joseph Parilla. Did the Hiawatha Light Rail Line Increase Single-Family Residential Property Values? Center for Transportation Studies; University of Minnesota. February 2010. | The study examines the economic and land-use impacts of the Hiawatha Light Rail Line on residential property values, housing investment, and land-use patterns. The study uses a hedonic pricing model for single-family and multi-family residential properties within a one-half mile radius of the stations. | The study found that construction of the Hiawatha Line had a positive effect on property values within station areas. The study found the effect was limited to the west side of the line; on the east side a four-lane highway and a strip of industrial land uses intervenes and eliminated any positive impact of the line. The study also found a high level of residential investment (as measured by dollar value of the investment) within station areas compared to the control area. | Hiawatha LRT line in Minneapolis |
| **Land Value Impacts of Rail Transit Services in San Diego County** | 2002 | Robert Cervero and Michael Duncan. Land Value Impacts of Rail Transit Services in San Diego County. Prepared for National Association of Realtors and Urban Land Institute. June 2002 | The study used a hedonic pricing model to estimate land value premiums for properties near rail transit in San Diego County | The study found that, overall, rail transit services in the San Diego region confer appreciable land value benefits to residential and commercial properties, though relationships vary considerably by type of land use and corridor. In general, the biggest premiums were recorded for commercial properties, notably in downtown San Diego and along the Mission Valley Trolley corridor, however the largest dis-amenity effects also appeared for commercial uses as well – specifically, along the South Line and Coaster corridor. | Rail transit service in San Diego |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Light Rail Transit Analysis (Cont.)** | | | | | |
| **Commercial Property Value and Proximity to Light Rail: A Hedonic Price Application** | 2001 | Weinberger, Rachel. Commercial Property Value and Proximity to Light Rail: A Hedonic Price Application. 2001. | As study of Santa Clara property valuations around light rail. | Found that office and R&D space within a quarter-mile of light rail commanded premiums of up to 14.6% relative to other properties in the County. But the premium of transit-accessible properties was found to narrow to 5.2% in subsequent years, near the peak of the office market. Suggested that as demand increases and supply remains generally constrained, less transit-accessible properties become more attractive to office users and the premium for transit-accessible properties decreases. | Valley Transit Authority Santa Clara Light Rail Line |
| **Modern Streetcar Analysis** | | | | | |
| **Streetcars and Real Estate Rents with Implications for Transit and Land Use Planning** | 2019 | Arthur C. Nelson and Robert Hibberd. Streetcars and Real Estate Rents with Implications for Transit and Land Use Planning. Transportation Research Record: Journal of the Transportation Research Board. June 2019. | This study reports the association between real estate rents and proximity to streetcar stations based on all streetcar systems launched since 1990. | The study found that real estate rents increase the closer office, retail and multifamily properties are to streetcar stations. Results suggest that streetcar planning and associated land use planning should anticipate heightened demand for multifamily residential development near streetcar stations perhaps displacing office development to about a half mile away. Retail activities may benefit from additional level of competition for location near streetcar stations by both residential and office development. | The 14 streetcar systems that started operations in the US since the 1990s--Atlanta, Charlotte, Cincinnati, Dallas, the District of Columbia (DC), Kansas City, Little Rock, New Orleans, Portland, Salt Lake, Seattle, Tacoma, Tampa, and Tucson. |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Modern Streetcar Analysis (Cont.)** | | | | | |
| **Streetcars and Economic Development: Do Streetcars Stimulate Employment Growth?** | 2018 | Hinners, S. J., Nelson, A. C., & Buchert, M. (2018). Streetcars and Economic Development: Do Streetcars Stimulate Employment Growth? Transportation Research Record: Journal of the Transportation Research Board, 2672(8), 339–350. https://doi.org/10.1177/0361198118790096 | This study reports economic development outcomes—defined as change in employment—for areas within one-quarter mile of three streetcar stations along four lines in each of four cities: Portland, Salt Lake City, Seattle, and New Orleans | The study found that Portland's system showed strong economic development growth measured by employment growth relative to a control group followed by New Orleans. (Non-control measured employment change in the station areas ranged from -2% to 22%.)The Salt Lake City and Seattle lines, however, did not perform as consistently. Authors said the results indicate that while streetcar investment may support economic development, it is not alone a driver of employment growth. | Portland, OR – Central Loop Line; Salt Lake City, UT – S Line; Seattle, Washington – South Lake Union Streetcar; New Orleans, LA - Rampart-St. Claude Line |
| **Examining the Development Effects of Modern-Era Streetcars: An Assessment of Portland and Seattle** | 2018 | Jeffrey Brown, PhD, and Joel Mendez, PhD. Examining the Development Effects of Modern-Era Streetcars: An Assessment of Portland and Seattle. Mineta Transportation Institute. October 2018. | Study examines the development effects of streetcar investments in two U.S. cities that implemented streetcar service between 2000 and 2010: Portland and Seattle. | In Seattle, the study found a 50% more residential and commercial permits for the initial and secondary line compared to non-service areas that also received development incentives. In Portland, the study estimated that the initial streetcar corridor was issued roughly 45% more residential and commercial permits, but for the second lines, there were no significant differences found. The authors suggest that findings mean that new development is not guaranteed with streetcar development. | Portland Streetcar: North/South Line and Union Loop Line; Seattle Streetcar: South Lake Union Line and First Hill Line |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Bus Rapid Transit Analysis** | | | | | |
| **The Effect of Bus Rapid Transit on Local Home Prices** | 2023 | Justin Beaudoin and Justin Tyndall. The Effect of Bus Rapid Transit on Local Home Prices. Research in Transportation Economics. August 19, 2023 | The study estimated whether BRT is priced into local real estate by studying a BRT project in Vancouver, WA. The researchers use a difference-in-difference method with both hedonic and repeat sales estimators to test | The study estimated a 5-7% price premium for homes located within a 20 minute walk of a BRT station. Researchers found, overall, the BRT generated new real estate value that exceeded the project's construction costs by a factor of six. The study discusses how government could leverage future residential property value increases to fund construction of BRT projects. | Vine BRT route in Vancouver, WA |
| **Impacts of bus rapid transit (BRT) on residential property values: A comparative analysis of 11 US BRT systems** | 2022 | Blake Acton et al. Impacts of bus rapid transit (BRT) on residential property values: A comparative analysis of 11 US BRT systems. Journal of Transport Geography (2022). DOI: 10.1016/j.jtrangeo.2022.103324 | The study compared the before-and-after effect of BRT systems in 10 cities across the U.S on property price data from 1990-2016. | The study found that unlike traditional bus services, amenity-filled BRT routes do not generally harm property values. The results showed that three of the 11 BRT systems experienced property value increases near stations, one system experienced a decrease, and the remaining seven showed no significant changes. | BRT systems in Cleveland, Seattle, Eugene (Oregon), Oakland, Los Angeles, Kansas City, Chicago, Pittsburgh, Boston, and Miami |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Bus Rapid Transit Analysis (Cont.)** | | | | | |
| **Impacts of Bus Rapid Transit (BRT) on Surrounding Residential Property Values** | 2017 | Victoria A. Perk and Martin Catalá. Impacts of Bus Rapid Transit (BRT) on Surrounding Residential Property Values. National Bus Rapid Transit Institute; Ctr. for Urban Transportation Research; Univ. of S. Florida. July 2017. | This research analyzes the Lane Transit District's EmX BRT service (Eugene, Oregon) using econometric modeling techniques to estimate changes in property values associated with the BRT. The analysis is based on hedonic price regression analysis. | The study found that the EmX BRT system does positively impact surrounding single-family home sale prices. For 2005 single-family home sales, the price increased $823 on average for every 100 meters closer to a station. In 2010, the marginal impact increased to an average of $1,056 for every 100 meters closer to a station. In 2016, every 100 meters closer to a station adds an average of $1,128 to a home's sale price. | Lane Transit District's EmX BRT service (Eugene, Oregon) |
| **Bus Rapid Transit and Development: Policies and Practices that Affect Development Around Transit** | 2009 | Cheryl Thole and Joseph Samus,. Bus Rapid Transit and Development: Policies and Practices that Affect Development Around Transit. National Bus Rapid Transit Institute; Ctr. for Urban Transportation Research; Univ. of S. Florida. December 2009. | The study discusses development impacts along BRT corridors at selected North American sites and the policies and practices that have been implemented within each respective city that has the ability to affect development patterns around transit. | The study found that significant economic development can occur around bus rapid transit stations, with some of the case studies showing significant development. Researchers said that the development that has taken place has often been encouraged through different land use policies or practices established by local governing agencies or by other contributing organizations and that these policies and the local climate may be more of an important factor than the issue of permanence of a transit system. | BRT lines in Los Angeles, Ottawa, Boston, New York, Baltimore, and Pittsburgh |

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Source: LOCi Consulting LLC and Perkins+Will

## Figure 6: Relevant Economic Development Analyses for Streetcar and Bus Rapid Transit

| Study | Year of Pub. | Citation | Description | Key Findings | Analyzed Transit Systems |
|---|---|---|---|---|---|
| **Bus Rapid Transit Analysis (Cont.)** | | | | | |
| **Land Use Impacts of Bus Rapid Transit: Effects of BRT Station Proximity on Property Values along the Pittsburgh Martin Luther King, Jr. East Busway** | 2009 | Victoria A. Perk and Martin Catalá. Land Use Impacts of Bus Rapid Transit: Effects of BRT Station Proximity on Property Values along the Pittsburgh Martin Luther King, Jr. East Busway. National Bus Rapid Transit Institute; Ctr. for Urban Transportation Research; Univ. of S. Florida. December 2009. | Study used a hedonic regression model to estimate the impact of distance to a BRT station on the fair market value of single-family homes. | The study found decreasing marginal effects--moving from 101 to 1,00 feet from a station increases property value approximately $19.00, while moving from 1,001 to 1,000 feet increases property value approximately $2.75. Authors said that another way to interpret this result is to say that a property 1,000 feet away from a station is valued approximately $9,745 less than a property 100 feet away, all else constant (this figure is determined by summing the marginal effects for each foot of distance). | Pittsburgh Martin Luther King, Jr. East Busway |

*Review conducted in October and November 2023

Source: LOCi Consulting LLC and Perkins+Will

# METRO TOD DEVELOPMENT

Planners at Metro Transit publish an annual "Development Trends along Transit" report that reviews transit-oriented-development (TOD) activity along high-frequency transit corridors.[10] Using data from the Metropolitan Council's Annual Building Permit Survey, planners review overall development for multifamily residential, commercial, public and institutional, and industrial development since 2009.

This study provides additional evidence for potential development along transit corridors. However, this case study differs from the model studies and most of the literature review studies in that it does not provide controls that would allow the measurement of the impact above development that would have occurred anyway. Planners at Metro Transit recognize this limitation in the review.

Key findings from the 2023 report include:

- Between 2009 and 2022, permits were issued for over $44.3 billion in the region as a whole. That figure includes project completed since being permitted and ongoing projects. Of that total, developments located near high frequency transit were permitted for just under $16.4 billion, or about 37% of all permitted development.
- Of that $16.4 billion of value permitted near high-frequency transit, $10.8 billion is located within one half mile of a light rail transit station and $7.5 billion is located within a half mile of a bus rapid transit station.
- Metro Transit planners also review planned developments. In 2023, they found that the region's planned developments show the potential for an additional 36,900 multifamily units along high frequency transit, and another $10.8 billion in development value near high frequency transit.
- Planners also looked at how slowdowns in development caused by the COVID19 pandemic impacted development near transit. Planners concluded that development has been recovering relatively quickly. Planners noted that, in particular, multifamily residential development near high frequency transit has continued to make up a significant share of construction in 2020-2022.
- In 2023, the economic development analysis research team also interviewed planners who were in the process of completing the 2023 report. Planners made two additional points. First, planners said that the reliability and quality of the transit line is important in attracting new development. And second, planners said that development momentum can continue in areas beyond the initial opening of the new line because the overall system is adding additional high-frequency lines and has more coverage.

[10] "Development Trends along Transit." Metro Transit, 2023 Report. https://www.metrotransit.org/Data/Sites/1/media/tod/2023devtrendsalongtransitreport.pdf

# DEVELOPER INTERVIEWS

As a part of this analysis, the research team interviewed local development and economic development professionals to gain understanding on how they perceive transit infrastructure. These interviews provide local context to the findings from the model studies, literature review, and case studies.

Eight real estate developers and economic development professionals were interviewed. Interview participants were selected based on their experience with development projects in the city of Saint Paul and other more dense areas of the Twin Cities. Some but not all are either familiar with or have built transit-oriented development projects. The interviews were conducted by Stantec in the fall of 2023.

Key findings from the interviews follow.

## FIXED-RAIL OPTIONS VERSUS BUS RAPID TRANSIT

**In general, developers said the fixed rail is more attractive for development.**

- One developer said executives at her multifamily development company believe strongly in the benefit of locating near high quality transit overall. Further, she said, they believe there is a difference between rail and bus rapid transit, with rail being more durable and providing a superior experience.
- That same developer noted how much development occurred along the Green Line in Saint Paul as evidence.
- She also pointed out specific potential redevelopment sites along the Riverview Corridor that would see more momentum with rail versus bus rapid transit.
- One economic development professional said members of her organization generally believe that rail leads to more investment. But she acknowledged that some bus rapid transit designs can closely approximate the function and experience of rail.
- That same economic development professional said most of the members of her organization (primarily businesses) support rail projects, and that they believe transit amenities and accessibility are key to driving investment in the area. She said that streetcars can be especially beneficial for the hospitality industry because they are much easier to use than buses.
- Another housing developer said he considers all transit improvements as positive for existing developments. But rail-based transit is viewed as preferable because it is more predictable and can attract a broader base of users. When comparing streetcars to light rail transit or bus rapid transit, his company would choose streetcar every time because it is considered a premium experience and more unique. Buses can be confusing, whereas rail is much simpler and more intuitive.
- Another developer said that affordable housing is different from market-rate rental housing because it is a more transit dependent population. She said rail is especially strong in attracting affordable housing developments.
- Another developer said there is a difference between rail and bus rapid transit. Residents and businesses are more attracted to areas with rail because it is more durable and novel. He mentioned a few redevelopment sites in the Riverview

Corridor that would see more development momentum with a rail project.

- That same developer said he considers the West 7th Street corridor a good connector for the city and appropriate for streetcar. He said not a lot of neighborhoods in Saint Paul have "oomph." The West 7th Street neighborhood has "oomph."

**Other sources interviewed said that bus rapid transit is growing in acceptance and has potential to drive more investment.**

- One economic development professional said she works with companies interested in investing in the region—expansions, new locations, etc.—and she said that each company she works with tends to have a unique perspective toward transit. She said that people-centric firms tend to value transit more than other firms.
- She said that the transit-oriented-development paradigm has shifted in recent years. Employers have become more concerned with making it as easy as possible to commute to work, which has resulted in a muti-modal approach to accessibility versus strictly car or transit. As a result, many companies tend to be mode agnostic as long as transit is high functioning and high quality. She said that, since the COVID19 pandemic, attitude toward rail has fallen while attitude toward bus rapid transit has risen.
- One developer who has done projects on the Green Line said that his perceptions of development along rail have changed. He said he thinks that rail was definitely more attractive a few years ago. He said he thinks bus ridership is growing and is more attractive relative to rail. He thinks some of those issues are related to crime on the existing light rail transit lines, and it is not clear to him if this is a long-term trend.
- That same developer said he is looking at sites in Robbinsdale, which would be near planned transit investment, but his company is "50/50" on whether to keep moving forward with the project.
- One economic development professional said he considered rail corridors very strong for development. However, because of emerging issues with low ridership and crime issues, many businesses now see rail as more of a liability than as something positive. He recognized that this is probably a near-term viewpoint rather than a longer-term trend.

## HOW TRANSIT FACTORS INTO DECISION MAKING

**In general, developers said that transit infrastructure was a qualitative factor for development.**

- Developers said that discussions of the benefits of transit infrastructure tend to be points of discussion about the projects and not key financial inputs in their investment models.
- One developer said that a premium of 50% can be achieved for better transit access, specifically regular access to everyday needs. However, that developer did not elaborate on what that premium is based on or if his company used that in their decision making.

## OTHER CONCERNS

**Several of the interviewed sources said that recent crime and safety issues on transit are concerning.**

- Several developers said that crime and perception of crime on the transit system is a disincentive to development.
- One developer said that most of their developments target more affluent households and transit is more of a choice

than a necessity for them. She said that it is especially true now given safety concerns around transit. She said her company views larger transit stations to be more negative because of they attract bad behaviors. Her company prefers to consider to sites within one to two blocks of a station, instead of being immediately adjacent.

**Several sources interviewed said that they believe, aside from transit infrastructure investment, rent stabilization policies are impediments to development.**

- One potential interview source did not want to be interviewed because he said they would not consider projects in Saint Paul because of rent stabilization policies.
- Without prompting or questions about rent stabilization, three other participants mentioned the issue in the interview.

# ASSUPMPTIONS

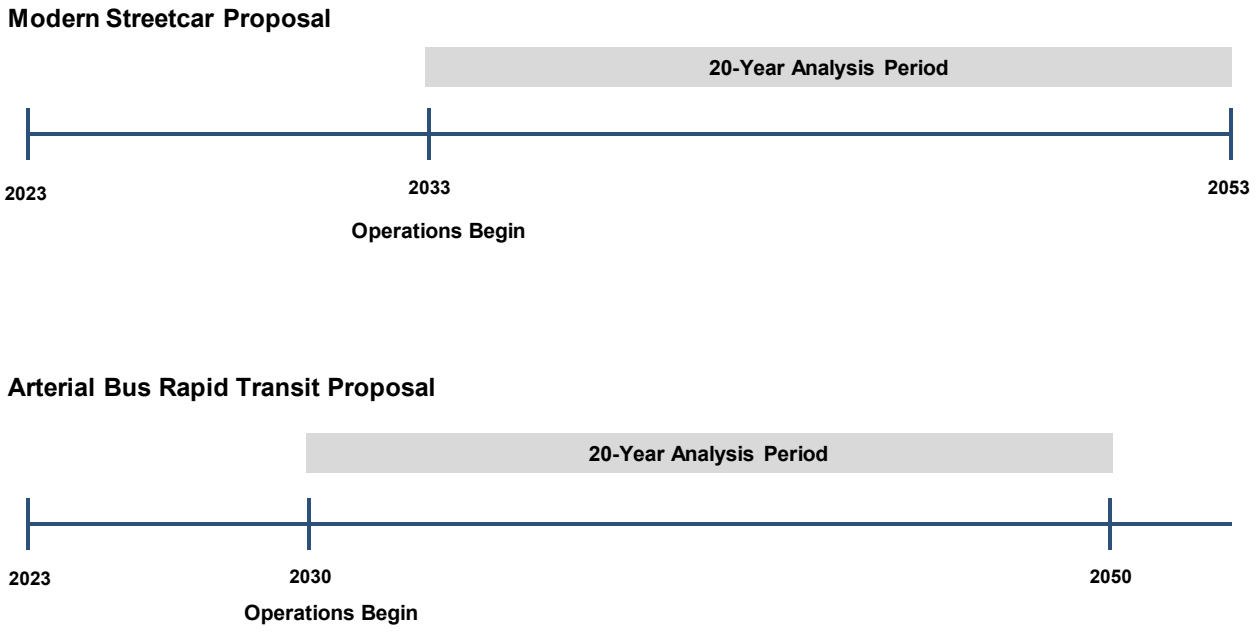
This section reviews some of the key assumptions that are used for this economic development analysis, including the time periods analyzed, inflation assumptions, and study area definitions

## TIME PERIODS FOR ECONOMIC DEVELOPMENT IMPACTS

The proposal for the modern streetcar would have the line operational in the year 2033. The arterial bus rapid transit proposal would have that line operational in the year 2030. Under both scenarios, the period of analysis for economic impacts is the first 20 years of operations. Figure 7 shows the timeline for this analysis.

In order to make these periods as comparable as possible, these two time periods analyzed are assumed to be similar. For example, it is projected that they will see the same amount of development over these periods (in other words, the development rate is assumed to be linear). Also, for comparison purposes, the amount of developable land is assumed to be the same over the periods. These assumptions are oversimplifications that allow the overall impacts for the proposals to be comparable at this higher level of analysis.

**Figure 7: Comparison of Time Periods of Analysis**



## INFLATION ASSUMPTIONS: REAL VERSUS CURRENT DOLLARS

The one area of the analysis where the different time periods become relevant is in the final reported numbers. The proposal cost estimates for the modern streetcar system and the arterial bus rapid transit system are described in current dollars. Costs are estimated in current dollars for the year in which the expenditure would be made.

In order to compare the estimated economic development benefits to the estimated overall costs of each project, the economic development impacts are calculated from the model in real dollars (2023 dollars) and then inflated to current dollars in the first operational year of each project.

The estimated economic development impact for the modern streetcar proposal is reported in 2033 dollars, and the estimated economic development impact for the arterial bus rapid transit proposal is reported in 2030 dollars. (See Page 58 for calculations.)

The research team used an inflation estimate of 3.5% per year, consistent with the costs estimate methodology.

## STUDY AREAS FOR ECONOMIC DEVELOPMENT IMPACT ANALYSIS

Consistent with the model studies and many of the studies in the literature review, the research team defined three primary geographic areas of analysis for the economic development analysis. Map 8 and Map 9 on the following pages show the study areas.

- **Zone A.** Zone A is located within 0.0 to 0.25 miles from the stations. Where eastbound and westbound stations are significantly separated, both points serve as station points.
- **Zone B.** Zone B is the area between 0.25 and 0.5 miles from the station area points.
- **Remainder of the Riverview Corridor.** The rest of the Riverview Corridor is the area between 0.5 miles and 1.0 miles from the line itself. This larger area is used to establish and project basecase development for the entire corridor.

The research team further divides the study areas into Downtown Zones and East, Central, and West Zones. Further delineation is necessary because development trends for Downtown Saint Paul are different from those in the rest of the Riverview Corridor.

The Downtown Zone would include the following stations:

*Streetcar*

- Union Depot
- Minnesota Street
- RiversEdge
- RiverCentre

*Arterial Bus Rapid Transit*

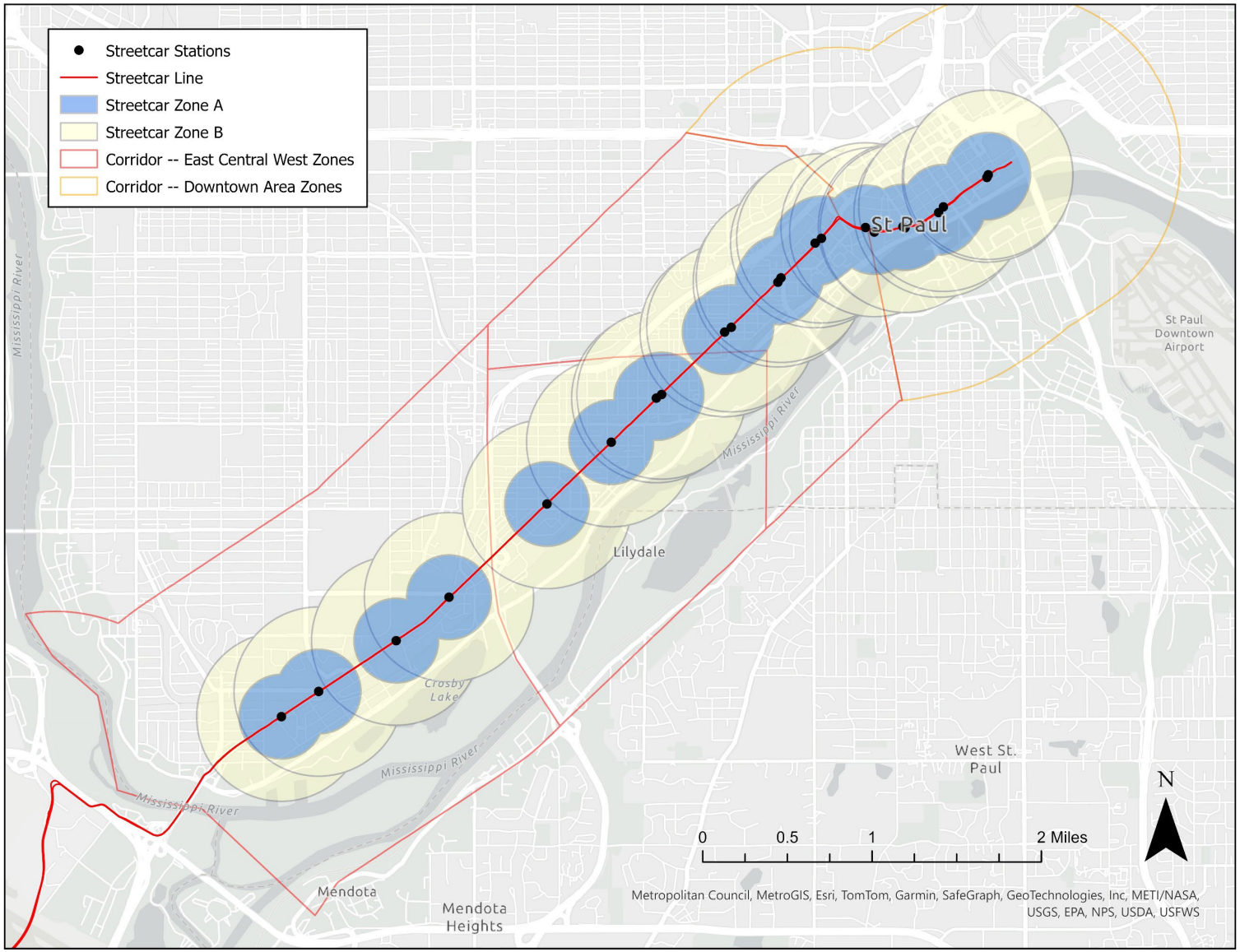
- Jackson Street
- Minnesota Street
- Washington Street
- Kellogg Boulevard

The East, Central, and West Zones would include the following stations:

*Streetcar*

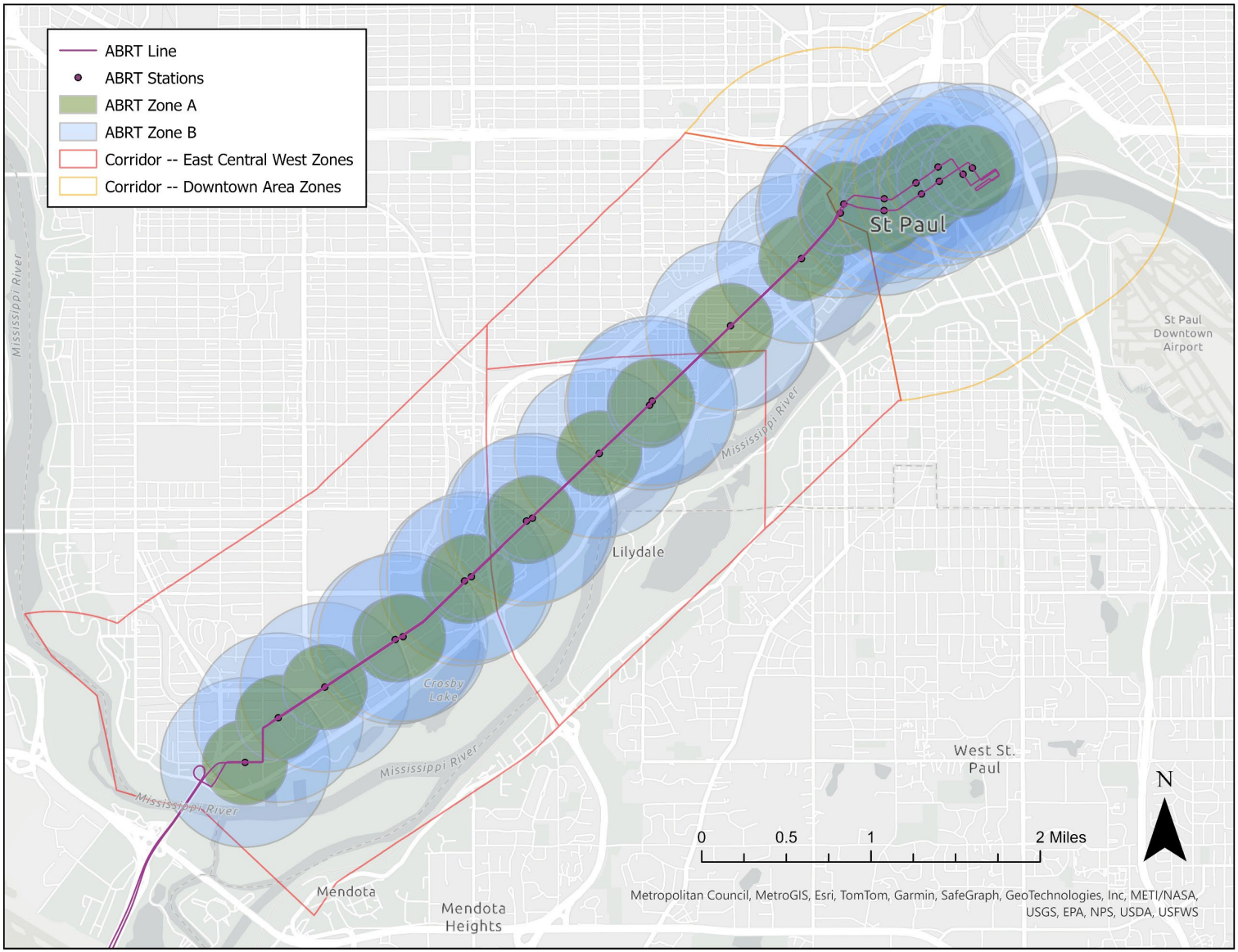
- Walnut Street
- Smith Avenue
- Michigan Street
- Jefferson Avenue
- Armstrong Avenue
- Otto Avenue
- Montreal Avenue
- Homer Street
- Saint Paul Avenue

## Map 8: Study Areas for Modern Streetcar Analysis




Source: LOCi Consulting LLC; Perkins+Will

## Map 9: Study Areas for Arterial Bus Rapid Transit Analysis




Source: LOCi Consulting LLC; Perkins+Will

- Davern Street

*Arterial Bus Rapid Transit*

- Grand Avenue
- Michigan Street
- Jefferson Avenue
- Armstrong Avenue
- Otto Avenue
- Montreal Avenue
- Homer Street
- Saint Paul Avenue
- Davern Street

## STREETCAR OPTION USED FOR ANALYSIS

Stated at the beginning of this study, it would be difficult to parse out the impact differences between the two options for modern streetcar. The options are similar in terms of the services that they would offer and overall quality of the experience. (See Page 11 for a discussion of the qualitative aspects of the two options and how they might impact economic development.)

Option 2 does have more proposed stations than Option 1. However, an analysis of overall coverages showed that the differences would not be significant.

Option 2 was selected as the base option for the streetcar because it provided slightly more Zone A coverage, which is more comparable with the arterial bus rapid transit proposals.

# DEVELOPABLE LAND ANALYSIS

In order to determine the potential for development and redevelopment in the Riverview Corridor, the research team identified parcels that could be available for development. These parcels provide the available supply of land for development and redevelopment to occur. This section provides an overview of that methodology and provides information on the developable parcels identified.

The research team used three methods to identify parcels

1. Parcels identified through the Station Area Planning process.
2. Parcels identified as undervalued.
3. Potential office conversion candidates in Downtown Saint Paul.

Map 10 shows the developable parcels identified through this process.

## PARCELS IDENTIFIED THROUGH THE STATION AREA PLANNING PROCESS

Ramsey County, in partnership with the City of Saint Paul, is leading an ongoing station area planning process for the Riverview Corridor transit project as part of the Engineering and Pre-Environmental Phase of work. [11]

The purpose of the station area planning process is to work with policy makers and local residents and businesses to identify ways to promote safe and direct station access and transit-oriented development. In general, planners focus on an area within a walking distance (0.5 miles, generally) of future transit stations.

The ultimate goal of the station area planning process is to provide a vision for each station. This community driven vision provides supportive policies for transit driven investment and identifies implementation steps for each plan.

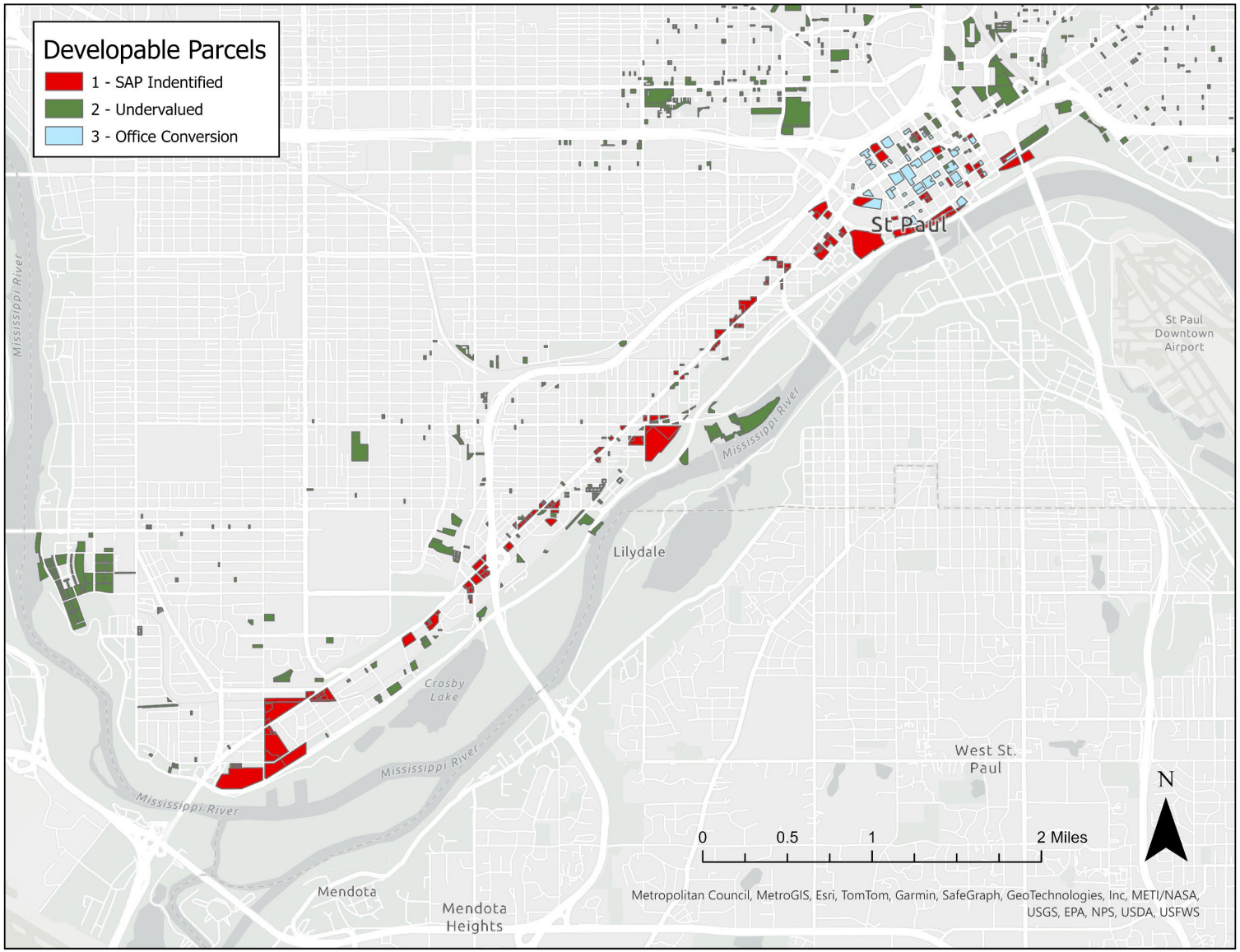
Through this process, planners and consultants compiled a list of strategic parcels that could be developed or redeveloped in the future. This list was generated through fieldwork by planners and consultants in the corridor and through community input. There are no immediate plans for the development of these parcels, and there is no coordinated activity with owners to put together long-term development plans. The research team believes this list provides a well-informed starting point for the identification of acreage for potential development.

In addition to the station area planning completed for the Riverview transit project, the research team also reviewed station area planning documents for the Green Line station area planning process completed in 2010.[12] The team focused on parcels identified in Downtown Saint Paul that have not been developed or redeveloped since that planning process took place.

[11] See https://www.ramseycounty.us/residents/roads-transportation/transit-corridors-studies/riverview-corridor/station-area-planning

[12] See https://www.stpaul.gov/DocumentCenter/Government/Planning%20&%20Economic%20Development/Planning/Green%20Line/Downtown_SAP_9.1.10_web%20pg%20intro-15.pdf

## Map 10: Developable Parcels Identified In and Near the Riverview Corridor




Source: LOCi Consulting LLC; Perkins+Will

## PARCELS IDENTIFIED AS UNDERVALUED

The research team also identified parcels in the study area deemed to be undervalued. These properties have buildings or structures that have lower value relative to the value of the land. Theoretically, these properties present a development or redevelopment opportunity for the landowner. A similar methodology was used in model studies.

The research team defined undervalued parcels as those greater than 0.1 acre with the building value to land value ratio lower than 0.5. In other words, the building value of the property is less than half of the land value. The research team spot checked several properties identified through this algorithm to confirm that, in general, this methodology provides properties with potential for investment over the study period.

(Properties owned by federal, state, and local governments, schools, and universities were removed from the data. Cemeteries, some railroad owned properties, exempt vacant park land were also removed.)

## POTENTIAL OFFICE CONVERSION PROPERTIES

The conversion of excess office space in downtowns across the country is expected to drive development and redevelopment in the future. With a workforce that is now much more likely to work from home or in a hybrid capacity, there is simply too much office space to meet this decreased demand. The research team believes that it is important to address this significant development trend that will likely impact Downtown Saint Paul.

Not all office properties are good conversion candidates, however. The research team reviewed estimates completed by the architecture and design firm Gensler. [13] [14] That firm has completed surveys of existing office buildings and estimates that only about 25% of them are appropriate candidates for conversion. The properties most likely to be converted have more shallow floor plates, form and envelop suitable for residential, and optimal ceiling heights.

In order to estimate the amount of developable acreage from excess office space in Downtown Saint Paul, the research team used office market data from Costar, a national commercial real estate data firm, to identify office properties in Downtown. The research team focused on office properties classified as B and C properties and identified 48 properties. Acreage for these properties was totaled. The research team assumes that 25% of this acreage would be potentially redeveloped over the study period.

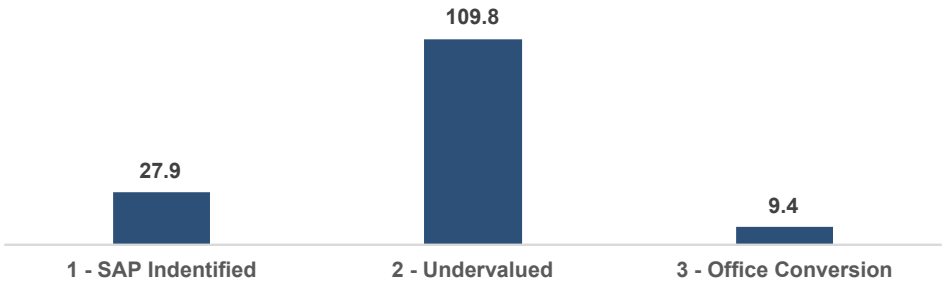
## DEVELOPABLE ACREAGE OVERVIEW

Figure 11 and Figure 12 show an overview of the developable land in the Riverview Corridor for both the Downtown Zone and the East, Central, and West Zones of the study area. Overall, about 360 developable acres are identified in the Riverview Corridor.

[13] https://archinect.com/news/article/150404529/an-updated-study-led-by-gensler-tracks-progress-of-office-to-residential-conversion-data

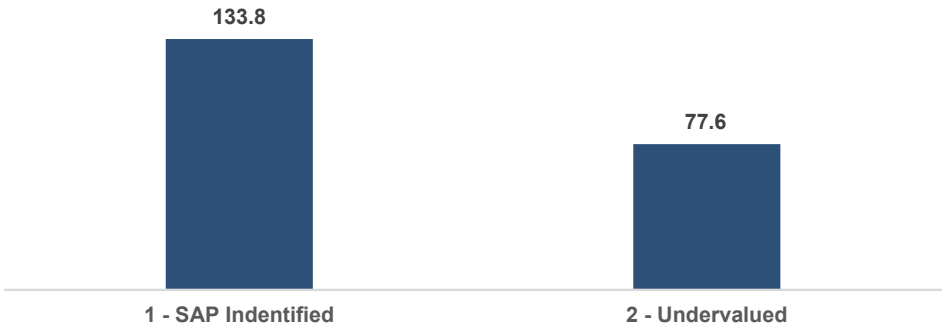
[14] https://www.gensler.com/blog/what-we-learned-assessing-office-to-residential-conversions

## Figure 11: Developable Acres Identified in Downtown Saint Paul Zone




Source: Ramsey County; LOCi Consulting LLC; Perkins+Will

## Figure 11: Developable Acres Identified in East, Central, and West Zones




Source: Ramsey County; LOCi Consulting LLC; Perkins+Will

# BASECASE DEVELOPMENT

With or without new transit infrastructure, development and redevelopment will continue along the Riverview Corridor. In order to understand the economic development impact of the transit investments alone, it is important to estimate what development would occur without the new transit.

This section describes the basecase development assumptions for the economic development analysis. Basecase development is defined as the development that is projected to occur with no new transit investment.

## MARKET STUDY UPDATE

To provide important context for the basecase development estimate, the research team reviewed and updated a market study completed in 2021. The 2021 market study quantified the depth of demand for real estate uses at station areas along the Corridor. The results of the 2021 market study were then used to inform the station area planning process.

The 2021 market study followed a methodology needed to forecast short- and long-term demand for real estate uses along the Corridor, which included the following components:

- Delineation of a Primary Market Area (PMA) and Secondary Market Area (SMA) for real estate uses along the Corridor.
- Analysis of key demographic and economic trends.
- Analysis of the competitive market and supply of for-sale housing, affordable housing, senior housing, retail space, office space, and industrial space.
- Inventory of pending development in the construction pipeline.
- Calculation of the demand along the Corridor for:
    - For-sale housing.
    - General-occupancy rental housing.
    - Affordable housing.
    - Active-adult senior housing.
    - Independent living senior housing.
    - Assisted living senior housing.
    - Memory care senior housing.
    - Retail space.
    - Office space.
    - Industrial space.

Although the 2021 market study yielded invaluable findings for the station area planning process, it was determined that too many market dynamics had significantly changed between 2021 and 2024 to rely on its findings for the basecase scenario of this economic development analysis. The significant market changes considered were the following:

- New demographic estimates and forecasts from the US Census, Metropolitan Council, and other data providers.
- The location of new station stops along the Corridor, especially in downtown Saint Paul, that resulted in a different definition of the PMA and SMA.
- The emergence of new work-from-home and home delivery patterns in the wake of the COVID19 pandemic and their impact on the demand for office and retail space.

- The emergence of a period of high inflation and increased interest rates that had not been experienced for nearly 40 years.

The update found generally comparable results as the 2021 Market Study. The update showed slightly lower demand for general-occupancy housing and slightly higher demand for senior housing. The update also adjusted demand estimates slightly higher for retail and industrial uses. The biggest adjustment from the update was in office market demand. The update included a deeper analysis of medical office uses and adjusted demand for office higher as a result.

These demand estimates are used later in the analysis to project the mix of development in the basecase and impact scenarios.

## DEVELOPMENT AND REDEVELOPMENT IN THE RIVERVIEW CORRIDOR, 2010 TO 2022

In order to estimate basecase development for the Riverview Corridor, the research team collected building permit data from the Metropolitan Council's Annual Building Permit Survey. [15] This is the same data source used by Metro Transit for their transit-oriented development study described in a previous section.

Data was collected for the 1.0-mile area around the proposed transit lines in the city of Saint Paul, for 2010 to 2022. A few large-scale projects were removed from the data set (for example, the CHS Field development) to not skew the results. For residential, only new and remodel permits are included, and, for commercial, only new and remodel projects above $5 million are included.

The research team uses average absorption of acres of land as the measure of development activity. This measure allows for the comparison to the developable land assessment discussed in the previous section.

Figures 12 through 17 summarize development by number of projects, acreage, acres per project, permit valuation, and number of units. Note that in order to account for inflation, all of the dollar values shown in the figures are shown in 2023 equivalent dollars.

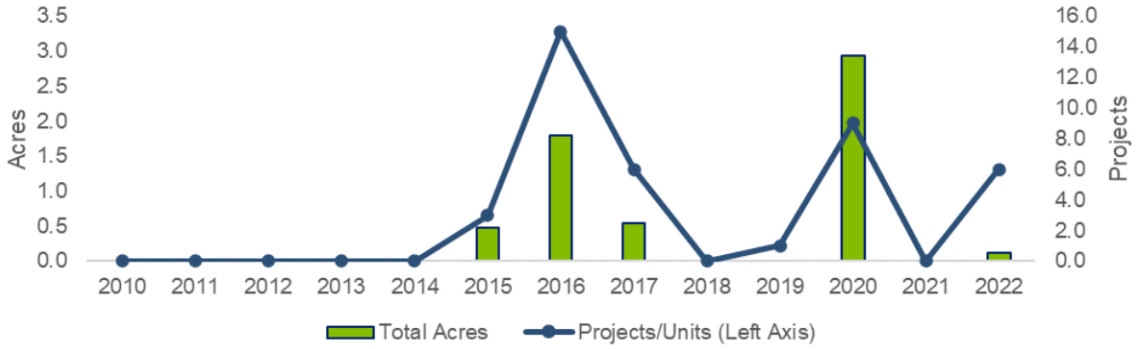
## ADJUSTMENTS TO THE ABSORPTION RATES FOR THE BASECASE

A few adjustments were required to the historic acreage absorption rates for the basecase estimate. The first one was applied to the estimates prior to addition to the development scenarios, and the second one was necessary after initial testing of the economic development scenario model described in the next section.

- First, the forecasts in the market study update show significant slowing of population and household growth in the corridor and in Ramsey County as a whole. The rate of household growth between 2010 and 2023 was 0.81% per year. Between 2023 and 2040, the household growth rate is projected to be 0.41% per year. As a result, the initial acreage per year estimates were decreased by half from the 2010 to 2022 period.

[15] See https://bldgpermitsurvey.metc.state.mn.us/About

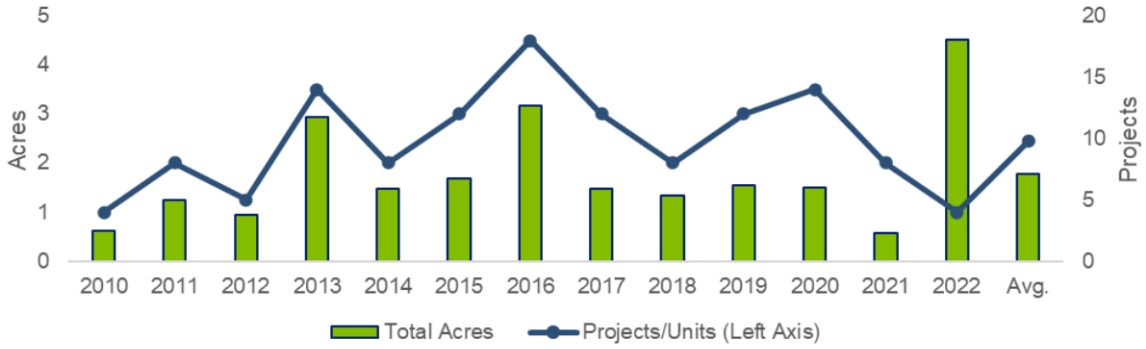
## Figure 12: Single-Family Residential Building in Downtown St. Paul Area (1-Mile Area Arround Streetcar Route), 2010 to 2022




| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Projects/Units (Left Axis) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 15.0 | 6.0 | 0.0 | 1.0 | 9.0 | 0.0 | 6.0 | 3.1 |
| Total Acres | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 1.8 | 0.6 | 0.0 | | 2.9 | 0.0 | 0.1 | 0.5 |
| Avg. Acres per Project | | | | | | 0.2 | 0.1 | 0.1 | | 0.0 | 0.3 | | 0.0 | 0.1 |
| Total Valuation ($M) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 3.9 | 1.8 | 0.0 | 0.4 | 2.2 | 0.0 | 1.7 | 0.8 |
| Avg. Valuation per Project ($M) | | | | | | 0.0 | 0.3 | 0.3 | | 0.4 | 0.2 | | 0.3 | 0.3 |

Source: Metropolitan Council; LOCi Consulting LLC; Perkins+Will

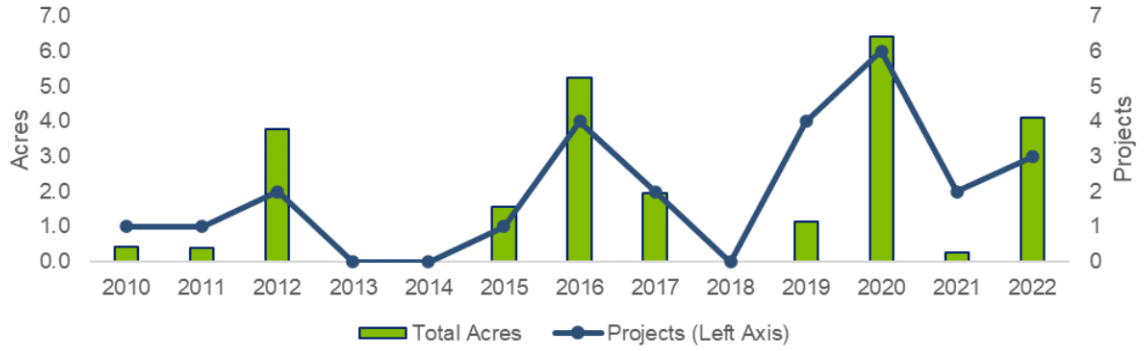
## Figure 13: Single-Family Residential Building in East, Central, and West Zones (1-Mile Area Arround Streetcar Route), 2010 to 2022




| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Projects/Units (Left Axis) | 4 | 8 | 5 | 14 | 8 | 12 | 18 | 12 | 8 | 12 | 14 | 8 | 4 | 9.8 |
| Total Acres | 0.62 | 1.25 | 0.95 | 2.93 | 1.48 | 1.68 | 3.18 | 1.47 | 1.34 | 1.55 | 1.5 | 0.58 | 4.51 | 1.8 |
| Avg. Acres per Project | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 1.1 | 0.2 |
| Total Valuation ($M) | 0.8 | 3.1 | 2.2 | 3.7 | 2.8 | 2.4 | 9.8 | 4.7 | 2.3 | 5.5 | 5.1 | 4.1 | 5.4 | 4.0 |
| Avg. Valuation per Project ($M) | 0.2 | 0.4 | 0.4 | 0.3 | 0.3 | 0.2 | 0.5 | 0.4 | 0.3 | 0.5 | 0.4 | 0.5 | 1.4 | 0.4 |

Source: Metropolitan Council; LOCi Consulting LLC; Perkins+Will

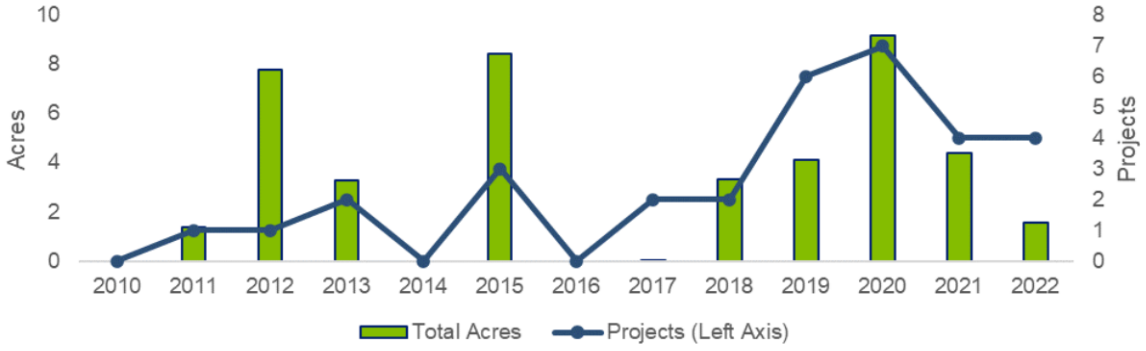
## Figure 14: Multifamily Residential Building in Downtown St. Paul Area (1-Mile Area Arround Streetcar Route), 2010 to 2022




| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Projects (Left Axis) | 1 | 1 | 2 | 0 | 0 | 1 | 4 | 2 | 0 | 4 | 6 | 2 | 3 | 2.0 |
| Units | 63 | 60 | 434 | 0 | 0 | 193 | 161 | 247 | 0 | 226 | 595 | 2 | 242 | 171 |
| Total Acres | 0.4 | 0.4 | 3.8 | 0.0 | 0.0 | 1.6 | 5.3 | 2.0 | 0.0 | 1.2 | 6.4 | 0.3 | 4.1 | 2.0 |
| Avg. Acres per Project | 0.4 | 0.4 | 1.9 | | | 1.6 | 1.3 | 1.0 | | 0.3 | 1.1 | 0.1 | 1.4 | 0.9 |
| Total Valuation ($M) | 2.2 | 7.9 | 7.8 | 0.0 | 0.0 | 37.0 | 27.8 | 19.0 | 0.0 | 31.5 | 89.6 | 2.4 | 57.2 | 21.7 |
| Avg. Valuation per Project ($M) | 2.2 | 7.9 | 3.9 | | | 37.0 | 7.0 | 9.5 | | 7.9 | 14.9 | 1.2 | 19.1 | 11.1 |

Source: Metropolitan Council; LOCi Consulting LLC; Perkins+Will

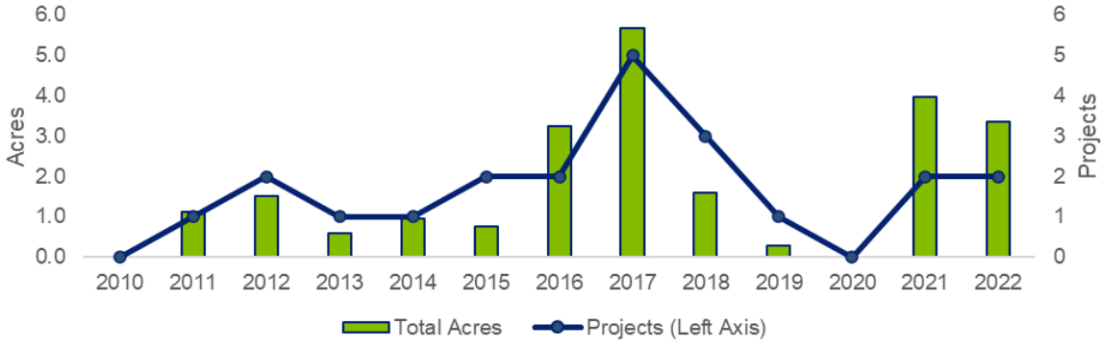
## Figure 15: Multifamily Residential Building in East, Central, and West Zones (1-Mile Area Arround Streetcar Route), 2010 to 2022




| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Projects (Left Axis) | 0 | 1 | 1 | 2 | 0 | 3 | 0 | 2 | 2 | 6 | 7 | 4 | 4 | 2.5 |
| Units | 0 | 44 | 7 | 341 | 0 | 440 | 0 | 291 | 176 | 336 | 479 | 332 | 294 | 210.8 |
| Total Acres | 0 | 1.38 | 7.8 | 3.28 | 0 | 8.43 | 0 | 0.02 | 3.3 | 4.09 | 9.18 | 4.39 | 1.56 | 3.3 |
| Avg. Acres per Project | | 1.4 | 7.8 | 1.6 | | 2.8 | | 0.0 | 1.7 | 0.7 | 1.3 | 1.1 | 0.4 | 1.9 |
| Total Valuation ($M) | 0.0 | 0.9 | 2.0 | 25.1 | 0.0 | 64.5 | 0.0 | 9.5 | 21.3 | 66.7 | 51.8 | 55.2 | 67.7 | 28.0 |
| Avg. Valuation per Project ($M) | | 0.9 | 2.0 | 12.5 | | 21.5 | | 4.7 | 10.6 | 11.1 | 7.4 | 13.8 | 16.9 | 10.1 |

Source: Metropolitan Council; LOCi Consulting LLC; Perkins+Will

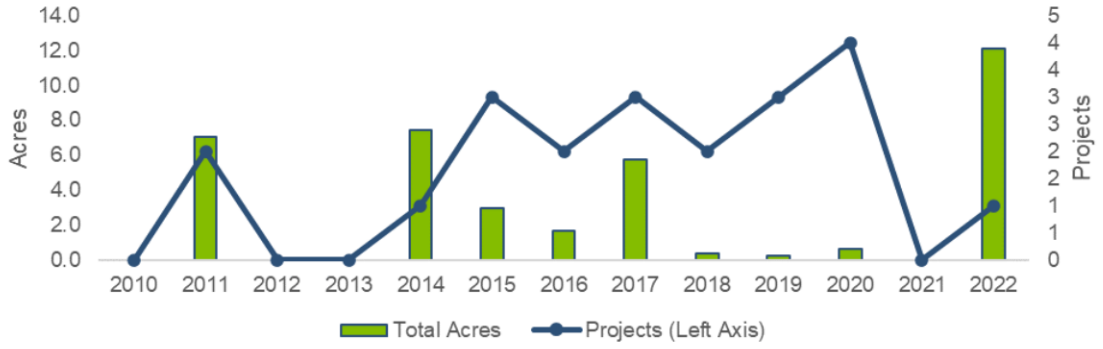
## Figure 16: Commercial Building in Downtown St. Paul Area (1-Mile Area Arround Streetcar Route), 2010 to 2022




| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Projects | 0 | 1 | 2 | 1 | 1 | 2 | 2 | 5 | 3 | 1 | 0 | 2 | 2 | 1.7 |
| Total Acres | 0.0 | 1.1 | 1.5 | 0.6 | 1.0 | 0.8 | 3.3 | 5.7 | 1.6 | 0.3 | 0.0 | 4.0 | 3.4 | 1.8 |
| Avg. Acres per Project | | 1.1 | 0.8 | 0.6 | 1.0 | 0.4 | 1.6 | 1.1 | 0.5 | 0.3 | | 2.0 | 1.7 | 1.0 |
| Total Valuation ($M) | 0.0 | 0.4 | 1.7 | 2.2 | 5.0 | 17.5 | 24.7 | 80.3 | 48.6 | 10.9 | 0.0 | 12.8 | 21.5 | 17.3 |
| Avg. Valuation per Project ($M) | | 0.4 | 0.9 | 2.2 | 5.0 | 8.7 | 12.3 | 16.1 | 16.2 | 10.9 | | 6.4 | 10.8 | 8.2 |

Source: Metropolitan Council; LOCi Consulting LLC; Perkins+Will

## Figure 17: Commercial Building in East, Central, and West Zones (1-Mile Area Arround Streetcar Route), 2010 to 2022




| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Projects (Left Axis) | 0 | 2 | 0 | 0 | 1 | 3 | 2 | 3 | 2 | 3 | 4 | 0 | 1 | 1.6 |
| Total Acres | 0.0 | 7.0 | 0.0 | 0.0 | 7.5 | 3.0 | 1.7 | 5.8 | 0.4 | 0.2 | 0.6 | 0.0 | 12.1 | 2.9 |
| Avg. Acres per Project | | 3.5 | | | 7.5 | 1.0 | 0.8 | 1.9 | 0.2 | 0.1 | 0.1 | | 12.1 | 3.0 |
| Total Valuation ($M) | 0.0 | 4.3 | 0.0 | 0.0 | 16.8 | 30.0 | 3.6 | 26.1 | 1.1 | 0.6 | 3.5 | 0.0 | 0.4 | 6.6 |
| Avg. Valuation per Project ($M) | | 2.2 | | | 16.8 | 10.0 | 1.8 | 8.7 | 0.6 | 0.2 | 0.9 | | 0.4 | 4.6 |

Source: Metropolitan Council; LOCi Consulting LLC; Perkins+Will

## Figure 18: Land Absorption in Acres Per Year for 2010-2022 Actual and 2023-2053 Basecase Estimate

| | 2010-2022 Actual | 2023-2053 Basecase Estimate |
|---|---|---|
| **Single-Family Detached Building Permit Land Absorption** | | |
| Downtown Zone | 0.5 | 0.0 |
| East, Central, West Zones | 1.8 | 0.2 |
| **Multifamily Building Permit Land Absorption** | | |
| Downtown Zone | 2.0 | 1.2 |
| East, Central, West Zones | 3.3 | 1.2 |
| **Commercial Building Permit Land Absorption** | | |
| Downtown Zone | 1.8 | 1.0 |
| East, Central, West Zones | 2.9 | 0.8 |

Source: LOCi Consulting LLC; Perkins+Will

- Second, the initial tests of the economic development scenarios required further adjustments to the basecase estimates to align with the results of the market study update and to account for the total supply of available developable land.

## BASECASE ABSORPTION ESTIMATES

Figure 18 shows a summary of basecase absorption estimates used for the economic development scenario model, with the adjustments discussed above.

# DEVELOPMENT SCENARIOS MODEL

The overall purpose of this economic development analysis is to estimate the projected impacts of a modern streetcar or an arterial bus rapid transit system in the Riverview Transit Corridor, focusing on two key components:

- New development generated by new transit investment.
- Real estate value appreciation.

This section describes the model used to estimate the value of new development generated by three scenarios.

1. Basecase scenario—no new transit infrastructure.
2. Modern streetcar scenario—basecase development plus additional development generated by the new streetcar infrastructure.
3. Arterial bus rapid transit scenario—basecase development plus additional development generated by arterial bus rapid transit project.

## ESTIMATED TRANSIT IMPACT FACTORS

The impact factors are used to estimate the incremental increase in development above the basecase development trend. The research team developed the following impact factors based on:

- Similar methodologies and factors in the model studies.
- Evidence from the literature review.
- Interviews with local developers.

Figure 19 shows the development factors used for the development scenario models.

**Figure 19: Development Capacity Absorbed by the Transit Scenarios by Year 20**

| | Zone A 0.0 to 0.25 miles | Zone B 0.25 to 0.5 miles | Rem. Of Corridor miles |
|---|---|---|---|
| Modern Streetcar Development | 1.9x Basecase | 1.1x Basecase | 1x Basecase |
| Arterial Bus Rapid Transit Development | 1.3x Basecase | 1x Basecase | 1x Basecase |

Source: LOCi Consulting LLC; Perkins+Will

## MODEL RESULTS

Figure 20 shows the results from the development scenario models for the entire Riverview Corridor. The model uses basecase land absorption estimates to forecast development on the developable land within each of the zones of analysis. The figure shows the basecase development assumption along with development scenarios for the implementation of a modern streetcar system and an arterial bus rapid transit system.

Note that valuations shown in Figure 20 are shown in 2023 equivalent dollars.

*Zoning Assumptions*

In the model, development and redevelopment is assumed to occur without consideration of the current underlying zoning of the developable parcels. The research team recognizes that this assumption is an oversimplification of the land use policy in Saint Paul. It is likely that community-led zoning policy will significantly shape development over this 20-year period, slowing

**Figure 20: Economic Development Scenario Model**

| | Basecase | Streetcar Scenario 2033-2053 | Streetcar Scenario Incremental | ABRT Scenario 2030-2050 | ABRT Scenario Incremental |
|---|---|---|---|---|---|
| **Full Riverview Corridor** | | | | | |
| Total Number of Projects | 119 | 181 | 62 | 136 | 17 |
| Acres Developed/Redeveloped | 113 | 171 | 58 | 129 | 16 |
| Total Permit Valuation ($M) | $860.0 | $1,280.0 | $420.0 | $970.0 | $110.0 |
| Increase in Est. Market Valuation ($M) | $850.0 | $1,250.0 | $400.0 | $960.0 | $100.0 |
| Single-Family Development | | | | | |
| Total Projects | 33 | 53 | 20 | 39 | 6 |
| Acres Dev./Redev. | 6 | 10 | 4 | 7 | 1 |
| Total Pmt. Valuation ($M) | $10.0 | $20.0 | $10.0 | $20.0 | $10.0 |
| SF Units | 33 | 53 | 20 | 39 | 6 |
| Multifamily Development | | | | | |
| Total Projects | 52 | 79 | 26 | 60 | 7 |
| Acres Dev./Redev. | 61 | 93 | 32 | 70 | 9 |
| Total Pmt. Valuation ($M) | $580.0 | $880.0 | $300.0 | $660.0 | $80.0 |
| MF Units | 4,500 | 6,700 | 2,200 | 5,100 | 600 |
| Commercial Development | | | | | |
| Total Projects | 33 | 49 | 16 | 38 | 4 |
| Acres Dev./Redev. | 45 | 68 | 23 | 51 | 6 |
| Total Pmt. Valuation ($M) | $260.0 | $380.0 | $120.0 | $290.0 | $30.0 |
| Square Footage | 434,100 | 653,400 | 219,300 | 494,400 | 60,300 |

Model 1.3 -- Updated February 8, 2024

Source: Perkins+Will; LOCi Consulting LLC

Source: LOCi Consulting LLC; Perkins+Will

some types of development and incentivizing other types of development.

The research team assumes that future zoning policy and land use regulation will not be significantly different from the 2010-2022 period used to establish development trends.

*Acres Developed/Redeveloped*

The basis of the scenario model is acres developed. The model uses the basecase land absorption estimates shown in Figure 18 to estimate the land absorbed by development and redevelopment over the 20-year period.

*Number of Projects and Permit Valuation*

The number of projects and permit valuation is estimated using projects per acre and valuation per acre data from the 2010-2022 permit data shown in Figure 12 through Figure 17.

*Increase in Estimated Market Valuation*

Permit valuations can sometimes be misleading because the valuation only includes the total value of the construction work—material costs and labor costs.

In order to test those valuations, the research team also looked at estimated increases in assessed market values. To provide these estimates, the research team looked at the estimated market value per acre of newer development projects completed in 2022 and 2023. Those values were then compared to the estimated market value of the developable acres to estimate the potential increase in estimated market value that could occur with a new development or redevelopment.

The research team identified 15 new development and redevelopment projects in the Downtown Zone and 23 new development and redevelopment projects in the East, Central, and West Zones.

*Single Family, Multifamily, and Commercial*

The research team used the building permit data from 2010-2022 to begin the process of allocating development activity between single-family, multifamily, and commercial development. The research team adjusted these estimates based on the results of the market study update.

The research team used the same data to estimate units per acre and square footage per acre. The assumption that these densities will carry forward into the future is somewhat conservative. It could be possible that the new transit infrastructure and associated zoning policy changes could increase units per acre and commercial square footages per acre above what was seen over 2010-2022.

*Estimating Employment Impacts*

To determine the number of new employees that would result from the estimated new development, the research team used estimates of square footage per worker from the U.S. Energy Information Administration, Commercial Buildings Energy Consumption Survey for 2018.[16] Using that data, the following square footage per worker estimates were applied:

- Retail: 1,000-square feet per worker
- Office: 500-square feet per worker
- Industrial: 1,700-square feet per worker

The research team used the forecasted demand from the market study to estimate the distribution of commercial space for retail, office, and industrial space.

[16] https://www.eia.gov/consumption/commercial/

## BASECASE SCENARIO

The first column in Figure 20 shows basecase development scenario without any new transit infrastructure investment. Stated previously, this forecast is based on development trends in the Riverview Corridor gathered from building permit data between 2010 and 2022.

In order to simplify the analysis, the basecase development trend is assumed to be the same for the 20-year development periods for the modern streetcar scenario and the arterial bus rapid transit scenario. The development trend is assumed to be linear.

Under the basecase development scenario, it is estimated that 95% of the Downtown Zone and 93% of the East, Central, and West Zones would be fully developed, assuming that the amount of developable acreage stays the same over the 20-year period. This assumption that the supply of developable land is static is conservative. The supply of developable land will increase over this period as buildings become obsolete and new development and redevelopment is required.

## MODERN STREETCAR SCENARIO

The second set of columns in Figure 20 shows the modern streetcar scenario. The first column shows total development estimated with a new modern streetcar system, and the second column shows the incremental difference over the basecase development estimate.

- The model estimates that **the modern streetcar scenario would deliver $420 million from new development and redevelopment** in incremental value over expected development in Riverview Corridor (2023 equivalent dollars). This value represents the total value over the 20-year period and is not discounted back to the first year of operations.
- The model estimates that the modern streetcar scenario would see an additional 2,200 housing units and 219,000-square feet of commercial space. It is estimated that the commercial space would support about 350 new jobs.

## ARTERIAL BUS RAPID TRANSIT SCENARIO

The next two columns in Figure 20 show the arterial bus rapid transit scenario. The first column shows total development estimated with a new arterial bus rapid system, and the second column shows the incremental difference over the basecase development estimate.

- The model estimates that the **arterial bus rapid transit scenario would deliver $110 million from new development and redevelopment** in incremental value over expected development in Riverview Corridor (2023 equivalent dollars). This value represents the total value over the 20-year period and is not discounted back to the first year of operations.
- The model estimates that the arterial bus rapid transit scenario would see an additional 600 housing units and 60,000-square feet of commercial space. It is estimated that the commercial space would support about 100 new jobs.

## DOWNTOWN SAINT PAUL ZONE AND THE EAST, CENTRAL, AND WEST ZONES

Figure 21 shows the development scenario model for the Downtown Zone, and Figure 22 shows the development scenario model for the East, Central, and West Zones.

## Figure 21: Economic Development Scenario Model for Downtown Zone

| | Basecase | Streetcar Scenario 2033-2053 | Streetcar Scenario Incremental | ABRT Scenario 2030-2050 | ABRT Scenario Incremental |
|---|---|---|---|---|---|
| **Downtown Zone** | | | | | |
| Total Number of Projects | 46 | 65 | 19 | 50 | 4 |
| Acres Developed/Redeveloped | 46 | 65 | 19 | 51 | 4 |
| Total Permit Valuation | $485.1 | $683.9 | $198.8 | $531.1 | $46.0 |
| Increase in Est. Market Value | $572.1 | $806.5 | $234.4 | $626.3 | $54.2 |
| Single-Family Development | | | | | |
| Total Projects | 0 | 0 | 0 | 0 | 0 |
| Acres Dev./Redev. | 0 | 0 | 0 | 0 | 0 |
| Total Pmt. Valuation ($M) | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 |
| SF Units | 0 | 0 | 0 | 0 | 0 |
| Multifamily Development | | | | | |
| Total Projects | 26 | 36 | 11 | 28 | 2 |
| Acres Dev./Redev. | 25 | 36 | 10 | 28 | 2 |
| Total Pmt. Valuation ($M) | $280.4 | $395.3 | $114.9 | $307.0 | $26.6 |
| MF Units | 2,206 | 3,111 | 904 | 2,415 | 209 |
| Commercial Development | | | | | |
| Total Projects | 20 | 28 | 8 | 22 | 2 |
| Acres Dev./Redev. | 21 | 30 | 9 | 23 | 2 |
| Total Pmt. Valuation ($M) | $204.7 | $288.6 | $83.9 | $224.1 | $19.4 |
| Square Footage | 201,923 | 284,673 | 82,750 | 221,057 | 19,134 |

Model 1.3 -- Updated February 8, 2024

Source: LOCi Consulting LLC

Source: LOCi Consulting LLC; Perkins+Will

## Figure 22: Economic Development Scenario Model for the East, Central, and West Zones

| | Basecase | Streetcar Scenario 2033-2053 | Streetcar Scenario Incremental | ABRT Scenario 2030-2050 | ABRT Scenario Incremental |
|---|---|---|---|---|---|
| **East, Central, and West Zones** | | | | | |
| Total Number of Projects | 73 | 116 | 43 | 86 | 13 |
| Acres Developed/Redeveloped | 66 | 105 | 39 | 78 | 12 |
| Total Permit Valuation | $372.3 | $591.2 | $218.9 | $438.3 | $66.0 |
| Increase in Est. Market Value | $279.4 | $443.7 | $164.3 | $328.9 | $49.5 |
| Single-Family Development | | | | | |
| Total Projects | 33 | 53 | 20 | 39 | 6 |
| Acres Dev./Redev. | 6 | 10 | 4 | 7 | 1 |
| Total Pmt. Valuation ($M) | $13.6 | $21.7 | $8.0 | $16.1 | $2.4 |
| SF Units | 33 | 53 | 20 | 39 | 6 |
| Multifamily Development | | | | | |
| Total Projects | 27 | 42 | 16 | 31 | 5 |
| Acres Dev./Redev. | 36 | 58 | 21 | 43 | 6 |
| Total Pmt. Valuation ($M) | $304.0 | $482.7 | $178.7 | $357.8 | $53.8 |
| MF Units | 2,286 | 3,629 | 1,344 | 2,690 | 405 |
| Commercial Development | | | | | |
| Total Projects | 13 | 21 | 8 | 16 | 2 |
| Acres Dev./Redev. | 24 | 38 | 14 | 28 | 4 |
| Total Pmt. Valuation ($M) | $54.7 | $86.9 | $32.2 | $64.4 | $9.7 |
| Square Footage | 232,225 | 368,751 | 136,526 | 273,363 | 41,138 |

Model 1.3 -- Updated February 8, 2024

Source: LOCi Consulting LLC

Source: LOCi Consulting LLC; Perkins+Will

# PROPERTY VALUE IMPACTS

The previous section reviewed estimates for new development and redevelopment generated by new transit investment. This section discusses the estimates of real estate value appreciation driven by the proposed transit infrastructure.

## ESTIMATED PROPERTY VALUE IMPACT FACTORS

Property value impacts are used to estimate the incremental increase property valuations above normal value appreciation. The research team developed the following impact estimates based on:

- Similar methodologies and factors in the model studies.
- Evidence from the literature review.

Figure 23 shows the property valuation impact estimates. The estimates assume a valuation increase in year one that continues to rise until year 10. After year 10, there is assumed to be no additional price valuation impact. In other words, the new development and redevelopment estimates from the previous section are for the 20-year period after beginning operations, but the estimated value appreciation is only modeled to occur over the first 10 years of operation.

Only Zone A is estimated to receive property valuation increases from the new transit infrastructure. Zone B and the Remainder of the Corridor areas are not projected to see any property valuation benefits.

*New Development and Redevelopment Valuation*

**Figure 23: Property Valuation Impact Estimates**

| | Zone A 0.0 to 0.25 miles | Zone B 0.25 to 0.5 miles | Rem. Of Corridor miles |
|---|---|---|---|
| **Modern Streetcar Development** | | | |
| Year 1 | 5.0% | 0.0% | 0.0% |
| Year 10 | 8.0% | 0.0% | 0.0% |
| **Arterial Bus Rapid Transit Development** | | | |
| Year 1 | 2.0% | 0.0% | 0.0% |
| Year 10 | 4.0% | 0.0% | 0.0% |

Source: LOCi Consulting LLC; Perkins+Will

Valuation estimates from new development and redevelopment projects described in the previous section are removed from this existing property estimate. In other words, for those properties that have new development or redevelopment, that new construction is considered the valuation increase. The property does not receive two benefits.

## MODERN STREETCAR SCENARIO

The research team reviewed existing property valuations for properties in Zone A for the modern streetcar proposal and applied the estimated property valuation increases.

- Based on this analysis, the model estimates that **the modern streetcar scenario would deliver $313 million in incremental real estate value appreciation** over expected value appreciation in Riverview Corridor (2023 equivalent dollars). This value represents the total value over the 10-year period and is not discounted back to the first year of operations.

## ARTERIAL BUS RAPID TRANSIT SCENARIO

The research team reviewed existing property valuations for properties in Zone A for the arterial bus rapid transit proposal and applied the estimated property valuation increases.

- Based on this analysis, the model estimates that **the arterial bus rapid transit scenario would deliver $203 million in incremental real estate value appreciation** over expected value appreciation in Riverview Corridor (2023 equivalent dollars). This value represents the total value over the 10-year period and is not discounted back to the first year of operations.

# CONCLUSIONS

The purpose of this analysis is to estimate the economic development impacts of a modern streetcar or an arterial bus rapid transit in the Riverview Transit Corridor, focusing on

- Real estate value appreciation.
- New development generated by new transit investment.

Using four model studies, the research team analyzed the future fiscal impact of transit development scenarios through the Riverview Corridor. This economic development analysis provided:

- Background on the modern streetcar and arterial bus rapid transit proposals.
- Overview and description of the model studies used for the analysis.
- Summary of the literature review.
- A review of transit-oriented development data in the Twin Cities reported by Metro Transit Case.
- Summary of interviews with developers.
- Analysis of developable land in the Riverview Corridor.
- Overview of the basecase development assumptions.
- Impact projections for transit options—modern streetcar and arterial bus rapid transit.

## KEY FINDINGS

***Modern Streetcar Economic Development Impacts***

- The model estimates that the modern streetcar scenario would deliver $420 million from new development and redevelopment in incremental value over expected development in Riverview Corridor (2023 equivalent dollars).
- The model estimates that the modern streetcar scenario would see an additional 2,200 housing units and 219,000-square feet of commercial space.
- The model estimates that the modern streetcar scenario would deliver $313 million in incremental real estate value appreciation over expected value appreciation in Riverview Corridor (2023 equivalent dollars).
- The total economic development value—the combined value of new development and redevelopment and real estate value appreciation—delivered by the modern streetcar is estimated to be $733 million (2023 equivalent dollars).
- These values represent the total value over the 20-year period and are not discounted back to the first year of operations.

***Arterial Bus Rapid Transit Economic Development Impacts***

- The model estimates that the arterial bus rapid transit scenario would deliver $110 million from new development and redevelopment in incremental value over expected development in Riverview Corridor (2023 equivalent dollars).
- The model estimates that the arterial bus rapid transit scenario would see an additional 600 housing units and 60,000-square feet of commercial space.
- The model estimates that the arterial bus rapid transit scenario would deliver $203 million in incremental real estate value appreciation over expected value

appreciation in Riverview Corridor (2023 equivalent dollars).

- The total economic development value—the combined value of new development and redevelopment and real estate value appreciation—delivered by the modern streetcar is estimated to be $733 million (2023 equivalent dollars).
- These values represent the total value over the 20-year period and are not discounted back to the first year of operations.

## ECONOMIC DEVELOPMENT IMPACT DISCOUNTED TO YEAR ONE OF OPERATIONS

The estimated values described above are not discounted to account for the time value of the benefits. Economic benefits from development occurring in year 20 are valued the same as year 1. In order to provide the best comparison of these economic development impacts to projected costs for each of the projects, the research team believes it is appropriate to discount the estimates back to year one using two discount rates, 3% and 7%. Those estimates follow.

***Modern Streetcar Economic Development Impacts***

- Discounted at 3%: $598 million
- Discounted at 7%: $481 million

***Arterial Bus Rapid Transit Economic Development Impacts***

- Discounted at 3%: $264 million
- Discounted at 7%: $220 million

Both sets of estimates above are shown in 2023 equivalent dollars.

## INFLATION ADJUSTMENT FOR COMPARISON TO COST ESTIMATES

The cost estimates for the modern streetcar proposal and the arterial bus rapid transit proposal are expressed in current dollars.

In order to better line up the cost estimates with the economic development impact estimates, the research team inflated the discounted estimates for the first-year value to the first year of projected operation for each proposal. For the modern streetcar proposal, the first year of operations is 2033. For the arterial bus rapid transit proposal, the first year of operations is 2030.

The research team used an assumed 3.5% inflation rate—the same estimate used for the cost estimates. Those adjusted economic development impacts follow.

***Modern Streetcar Economic Development Impacts***

- Discounted at 3%: $843 million
- Discounted at 7%: $678 million

***Arterial Bus Rapid Transit Economic Development Impacts***

- Discounted at 3%: $336 million
- Discounted at 7%: $279 million