Twin Cities
Highway Mobility Needs Analysis

TAC
July 7, 2021

Consulting Team:

SRF Consulting Group
Sambatek, Inc.
Texas A&M Transportation Institute (TTI)
Associated Consulting Services (ACS)

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Project overview

- The Minnesota Department of Transportation (MnDOT) and the Metropolitan Council are developing a performance-based approach to mobility investment on highways in the Twin Cities
- This approach
  - Sets a **highway mobility target**
  - Estimates a 20-year capital **investment need** on metro-area state highways

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Target recommendation

Use a Twin Cities Highway Mobility target of 40-hours of annual delay per person to calculate MnDOT's 20-year investment needs on the state highway system

Target Value	40-hours annual delay per person
Change from 2018	↓ 10%
Change from 2040 base	↓ 25%
20-year cost	$4 to $6 billion

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Planning Context

- Twin Cities highway mobility
  - Requires coordinated, collaborative planning at the local, state, and federal levels
  - Is not currently guided by a performance target
  - Helps to make strategic decisions based on data and to focus limited resources on the highest priorities

Transportation Policy Plan 2040 Investment Priorities for Highway Mobility

1. Travel Demand Management (TDM)
2. Traffic Management Technologies
3. Spot Mobility (Lower Cost/High Benefit) (e.g., roundabouts or turn lanes)
4. MnPASS
5. Strategic Capacity Enhancements (e.g., new interchanges or lanes)

These investment principles were used throughout the project and contributed to the positive outcomes that were identified.

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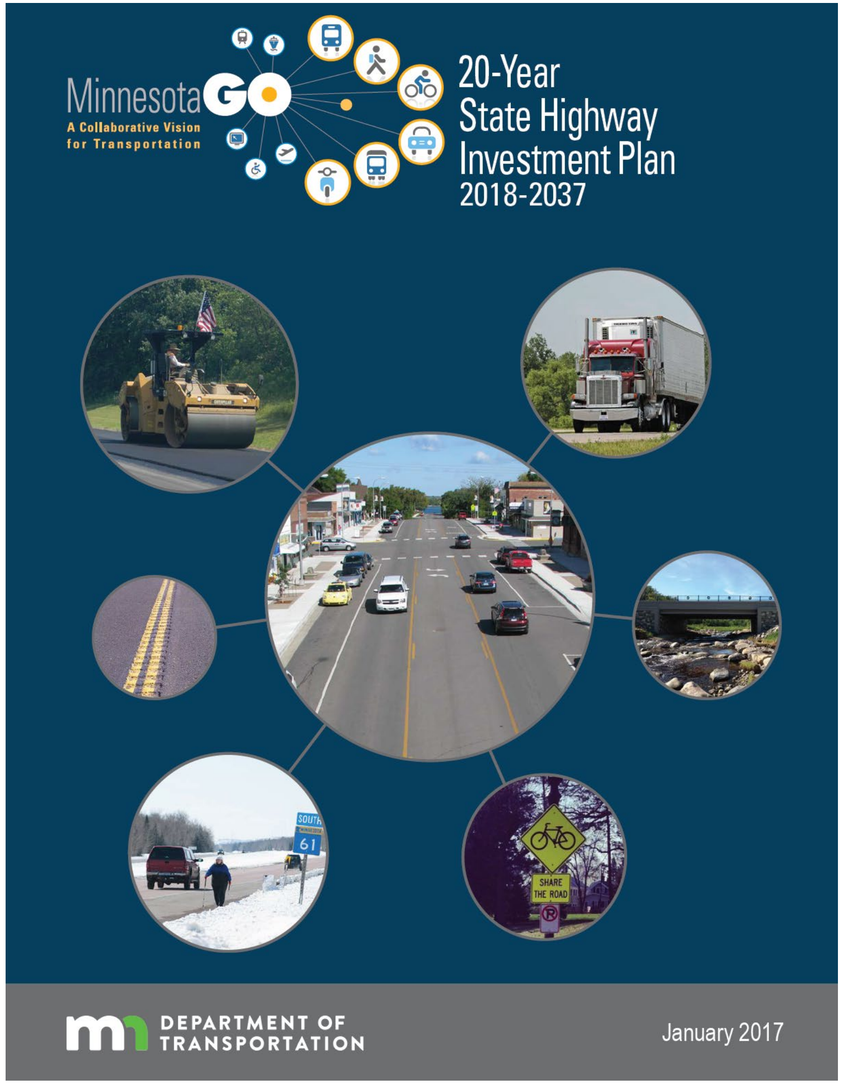
Connection to Regional Solicitation

- Metro cities and counties have assisted in the planning and partial funding of highway mobility projects on MnDOT's system.
- Since the Regional Solicitation redesign, 10 different cities and all 7 counties have been awarded funding for highway mobility projects on MnDOT's system (primarily new interchanges).
- Typically, the Regional Solicitation pays 1/3 of the project cost, the local city/county 1/3, and MnDOT 1/3.
- The Regional Solicitation helps make these locally-led, multi-agency, partnership projects possible.

Minnesota State Highway Investment Plan (MnSHIP)

- Sets direction (i.e., spending targets) for capital investment on the state highway system for a 20-year period
- Measures used to define need and project outcomes under alternative spending levels



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MnSHIP Investment Categories

Investment Category	Performance Measure
Pavement Condition	Share of system with Poor ride quality
Bridge Condition	Share of bridges in Poor condition
Roadside Infrastructure Condition	Share of other assets (e.g., culverts, signs, etc.) in Poor condition
Accessible Pedestrian Infrastructure	Share of sidewalks, curb ramps and signalized intersections meeting ADA standards
Traveler Safety	Traffic fatalities; serious injuries; fatal and serious injury crash rates
Twin Cities Highway Mobility	TBD

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Assign measure goals

Why measure system performance in terms of delay per capita?

- Simple
- Relatable at the regional, corridor, project and person-level
- Responsive to MnDOT/Met Council highway investment strategies
- Supportive of economic analyses
- Captures the extent to which highway mobility contributes to broader transportation goals

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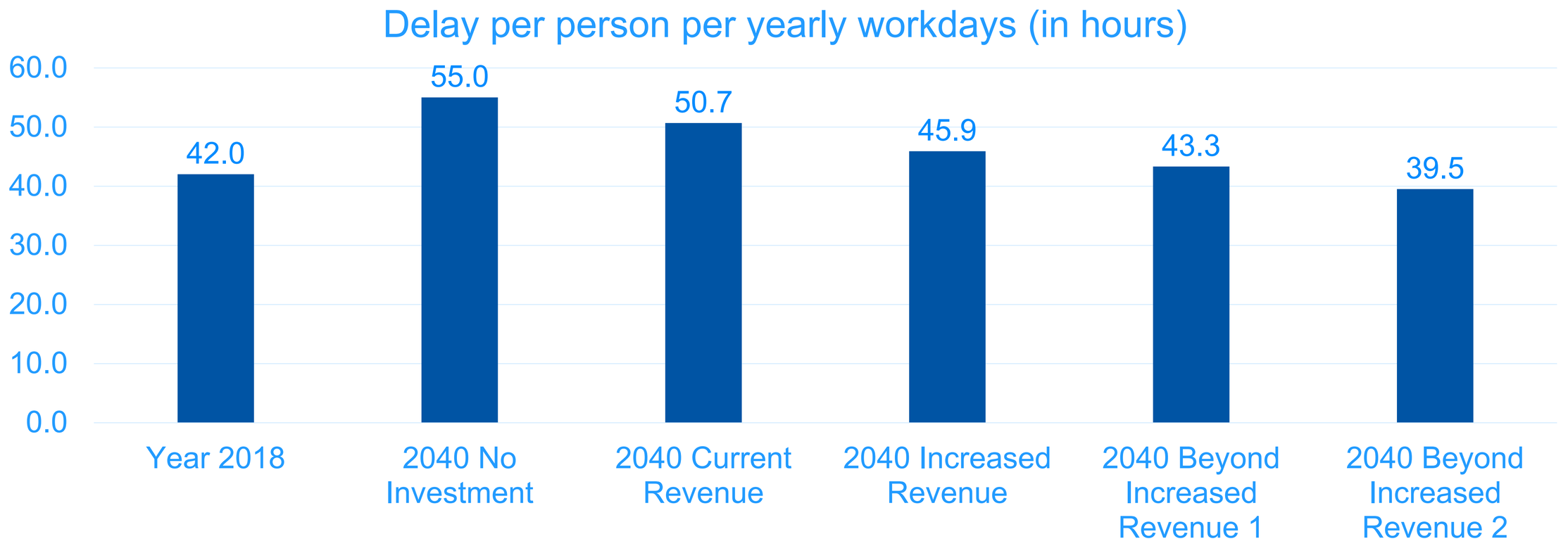
Modeled Results – Average Annual Delay



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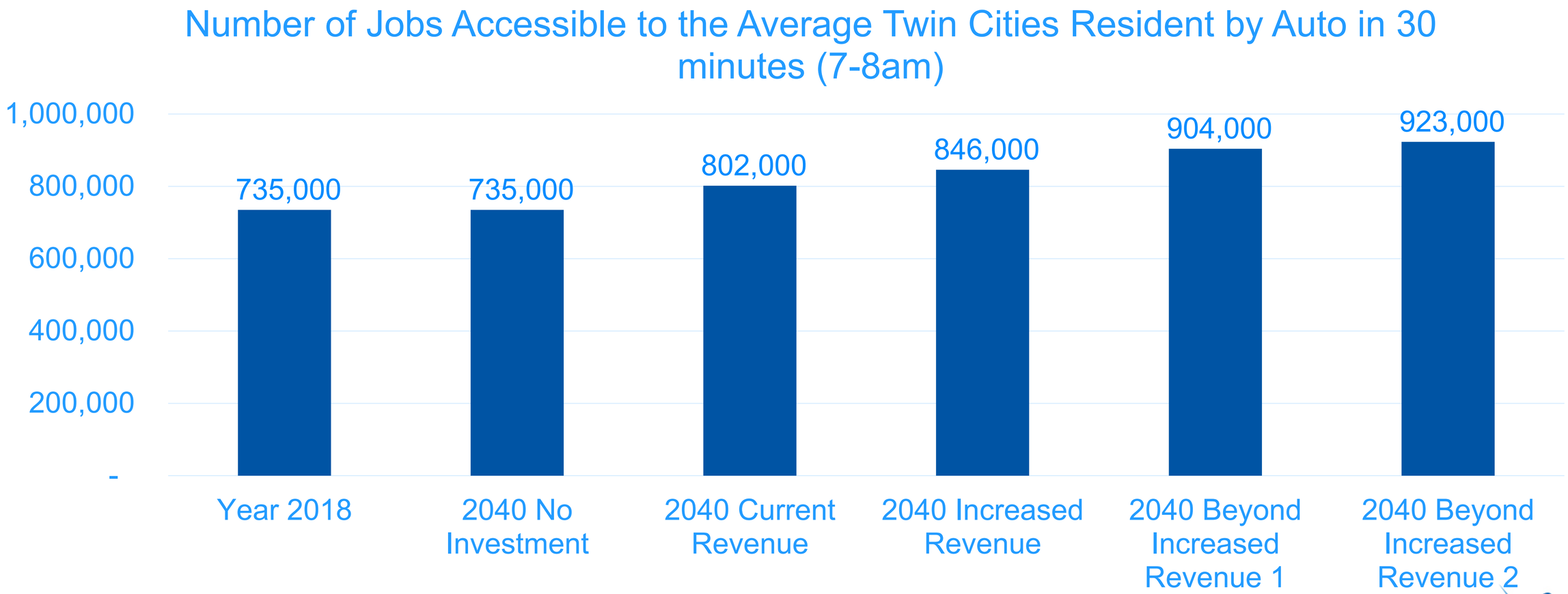
Modeled Results – Job Access



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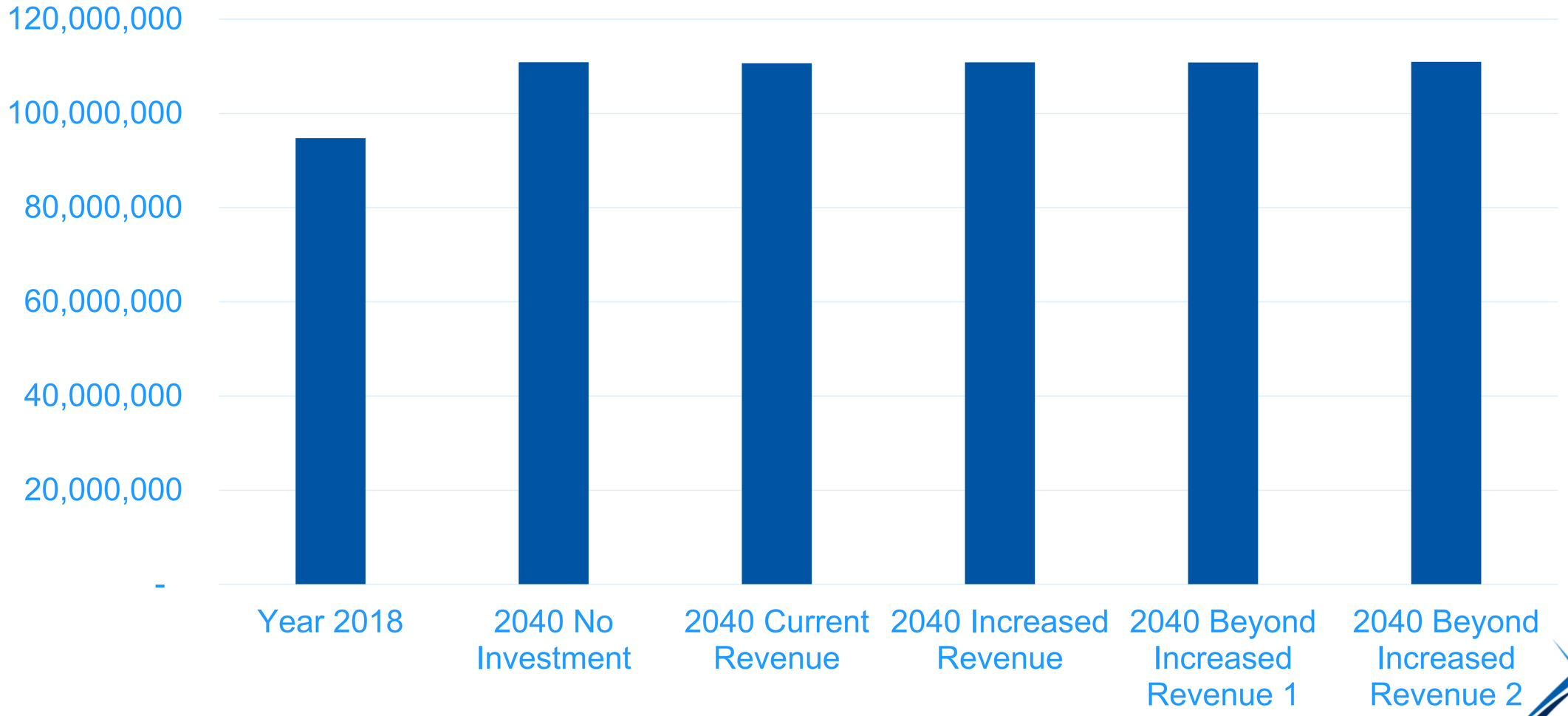
Modeled Results – Vehicle Miles Traveled



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Vehicle Miles Traveled 2040 Modeling

- Follows methodology used in the 2040 Transportation Policy Plan (TPP).
- Population growth (+500,000 more people by 2040) is the primary driver of VMT.
- Accounts for some level of induced demand (e.g., an interchange is built and now a person can reach a new job two miles further away in the same amount of time as before the improvement).
- Uses 2040 regional land use allocations by city as approved by the Met Council and shown in approved, local comprehensive plans.
- Holds 2040 land use constant.
- Modeling uses EPA's MOVES model for assumptions for the rate of EV adoption and future fuel efficiency standards as it relates to emissions.

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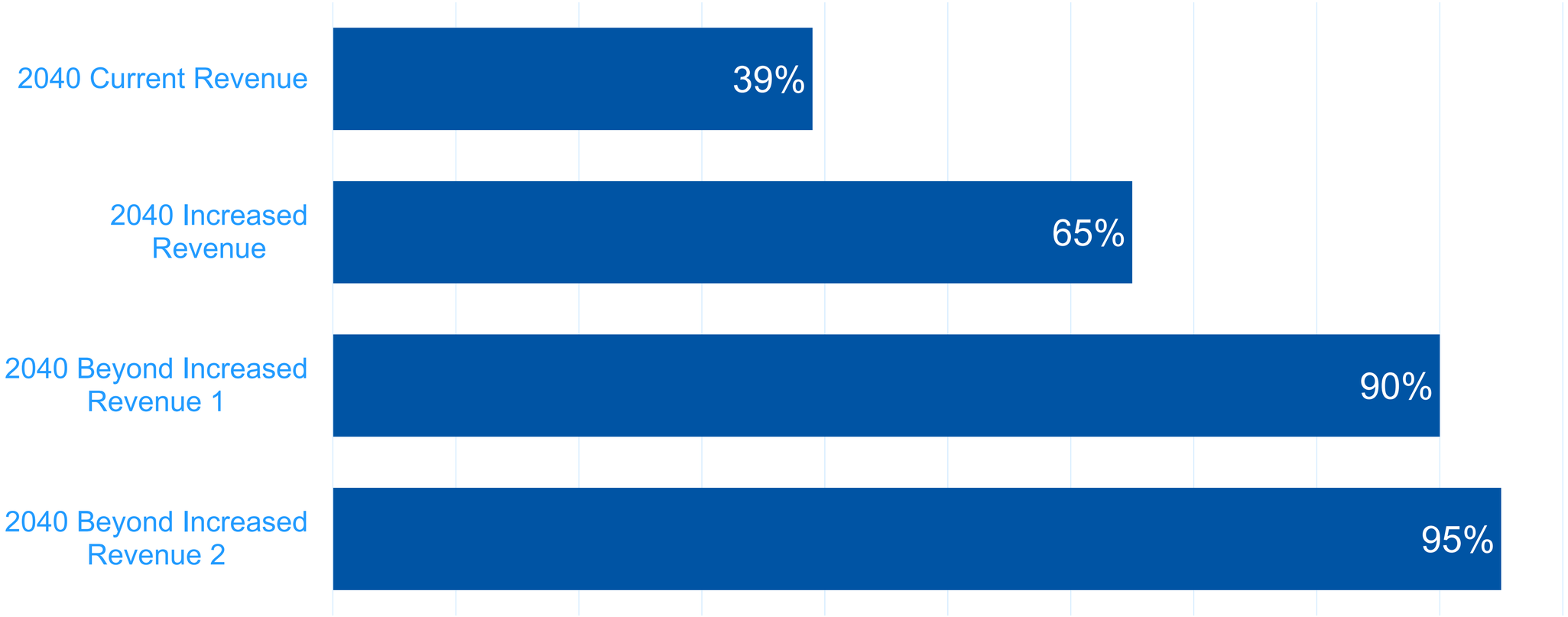
Freight Bottlenecks Improved



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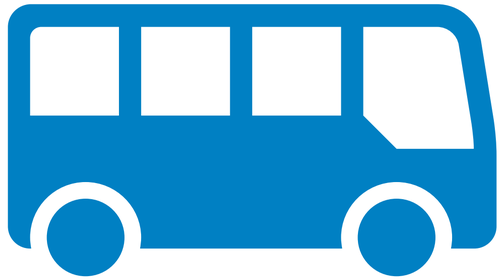
Equity analysis

- How does job access of equity populations change under each funding scenario, in absolute terms and in relation to the region as a whole?
  - The number of additional jobs accessible due to the highway mobility investment was similar across income, race, and ethnic groups.
- What is the impact of each funding scenario on transit delay?
  - Transit delay decreased as highway mobility investment increased.



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Telecommute Sensitivity Analysis

- Illustrative examples developed to understand outcomes at different levels of telecommuting
- Identify mobility needs with 15%, 25%, and 35% telecommuting
  - Pre-COVID, 5% of workers telecommuted at least one time per month.
  - Peak of COVID, 35% of workers telecommuted at least one time per month
- Increasing telework participation reduces the need for capital investment to meet the performance target

Twin Cities Highway Mobility Target Recommendation

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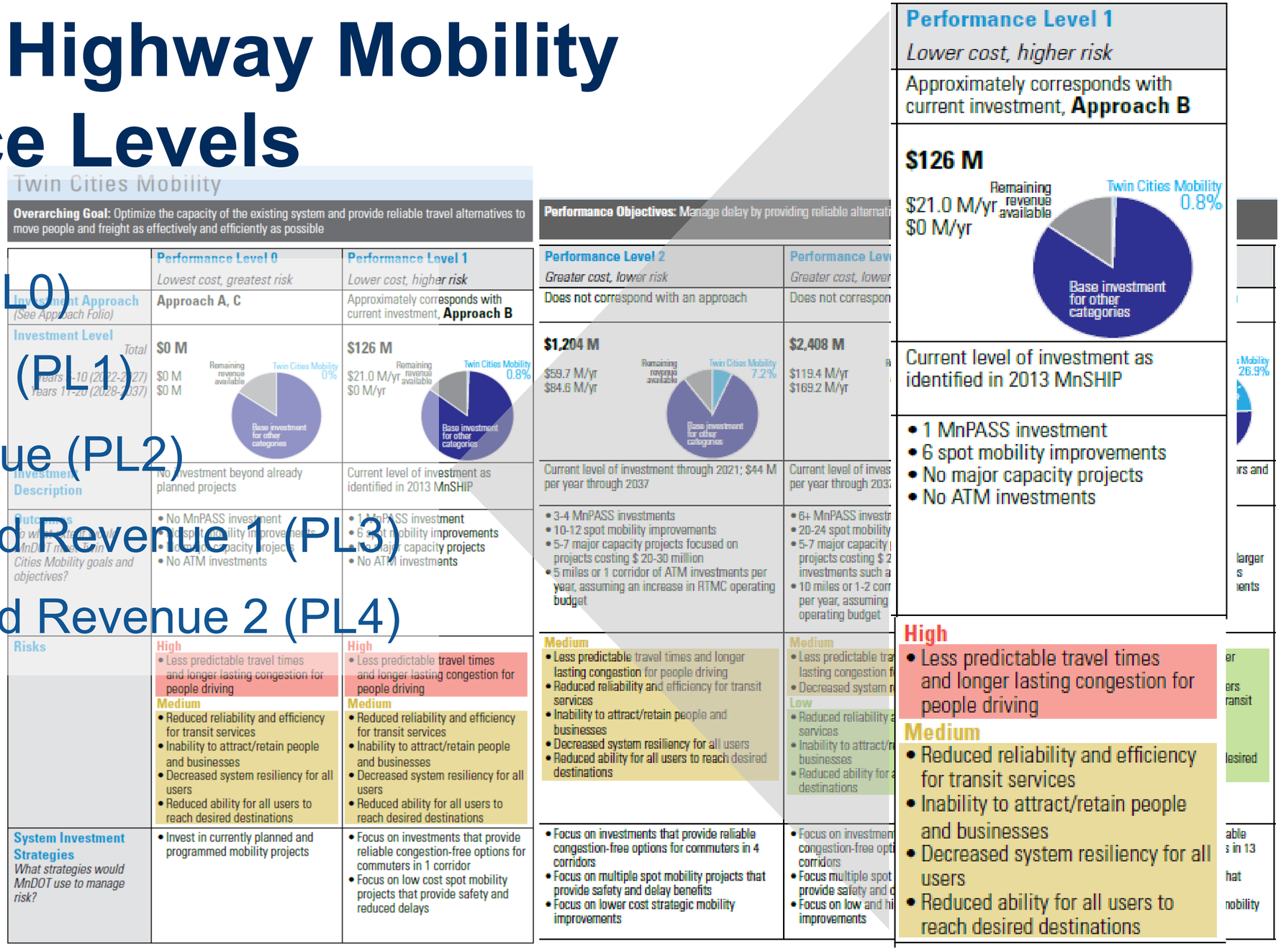
Twin Cities Highway Mobility Performance Levels

- Zero Revenue (PL0)
- Current Revenue (PL1)
- Increased Revenue (PL2)
- Beyond Increased Revenue 1 (PL3)
- Beyond Increased Revenue 2 (PL4)



Performance Level Information

* Relative to 2040 TPP Current Revenue Scenario

Objective	Implement planned investment	Extend investment at existing levels	Manage decline in regional mobility	Sustain regional Mobility	Improve regional mobility
20-year investment	**$0-$375M**	**$1 - $2 Billion**	**$2 – $3 billion**	**$3 – $5 billion**	**$4 – $6 billion**
Delay per capita	**56 hours** per person/per year	**52 hours** per person/per year	**48 hours** per person/per year	**44 hours** per person/per year	**40 hours** per person/per year
Travel time savings*	**- 4 hours (5%)** per person/per year	**N/A**	**4 hours (5%)** per person/per year	**8 hours (15%)** per person/per year	**12 hours (25%)** per person/per year
20-year benefit from travel time savings*	**- $2 billion**	**N/A**	**$2 billion**	**$5 billion**	**$8 billion**
Job access benefits*	**- 60,000 jobs** accessible by auto within 30 minutes (AM peak)	**N/A**	**+ 40,000 jobs** accessible by auto within 30 minutes (AM peak)	**+ 80,000 jobs** accessible by auto within 30 minutes (AM peak)	**+120,000 jobs** accessible by auto within 30 minutes (AM peak)
GHG emissions*	**Slight decrease (0 – 2.0%)**	**N/A**	**Slight increase (0 – 2.0%)**	**Slight increase (0 – 2.0%)**	**Slight increase (0 – 2.0%)**
Risk of not reaching target	**High**	**High**	**Moderate**	**Moderate**	**Low**

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Next steps

Next Steps

- Use mobility performance data and outcomes in MnSHIP
- Congestion Management Process Handbook (ongoing)
- Electric Vehicle Planning Study (ongoing)
- Travel Demand Management Study (fall 2021 start)
- Regional Transportation and Climate Change Measures (2022 start)
- Equity Study (fall 2021 start)
- Principal Arterial Intersection Conversion Study Update (late 2021 start)
- TPP Goals, including a review of the Regional Approach to Congestion (late 2022 start)

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More information

- Project website: metrocouncil.org/mobility
- Contact us:
  - Steve Peterson, Metropolitan Council
    Steven.Peterson@metc.state.mn.us
    651-602-1819
  - Paul Czech, MnDOT
    paul.czech@state.mn.us
    651-505-7831

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