Twin Cities
Highway Mobility Needs Analysis

Transportation Advisory Board
January 19, 2022

Consulting Team:

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

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Performance target

Delay is the extra time wasted by travelers due to congestion

Current annual delay per person is 42 hours

Delay/person is projected to increase by 33% to 56 hours by 2040 with no investment in this area

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	↓ 5%
Change from 2040 base	↓ 25%
20-year cost	$4 to $6 billion

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Met Council 2050 Forecasts (2021)

	2020	2040	2050	2020-2050 Change
Population	3,163,000 (Census)	3,476,000	4,001,000	+818,000
Employment	1,548,000	2,055,000	2,175,000	+627,000

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Connection to TAB

1. Regional Solicitation (Project Selection in late 2022):

- Metro cities and counties have assisted in the planning and partial funding of highway mobility projects on MnDOT's system.
- 10 different cities and all 7 counties have been awarded funding for highway mobility projects on MnDOT's system (primarily new interchanges) since 2014.
- 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.

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Connection to TAB Continued

2. Transportation Policy Plan (TPP) 2050 (Drafting Chapters in 2023)

Investment Priorities for Highway Mobility in 2040 TPP

1. Travel Demand Management (TDM)
2. Traffic Management Technologies
3. Spot Mobility (Lower Cost/High Benefit) (e.g., roundabouts or turn lanes)
4. MnPASS (E-ZPass)
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.

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Project overview

- The Metropolitan Council and the MnDOT developed a performance-based approach to mobility investment on highways in the Twin Cities. Similar efforts have been completed for other investment areas like pavements & bridges.
- This approach
  - Recommends a **highway mobility target**
  - Estimates a 20-year capital **investment need** on metro-area state highways
- This study focused on capital highway investment. It is expected that a range of solutions from travel demand management, transit/bicycle/pedestrian investment, land use changes, and other strategies will be needed to meet the target.

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

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

Delay per Capita

Why measure highway mobility system performance in terms of delay per capita?

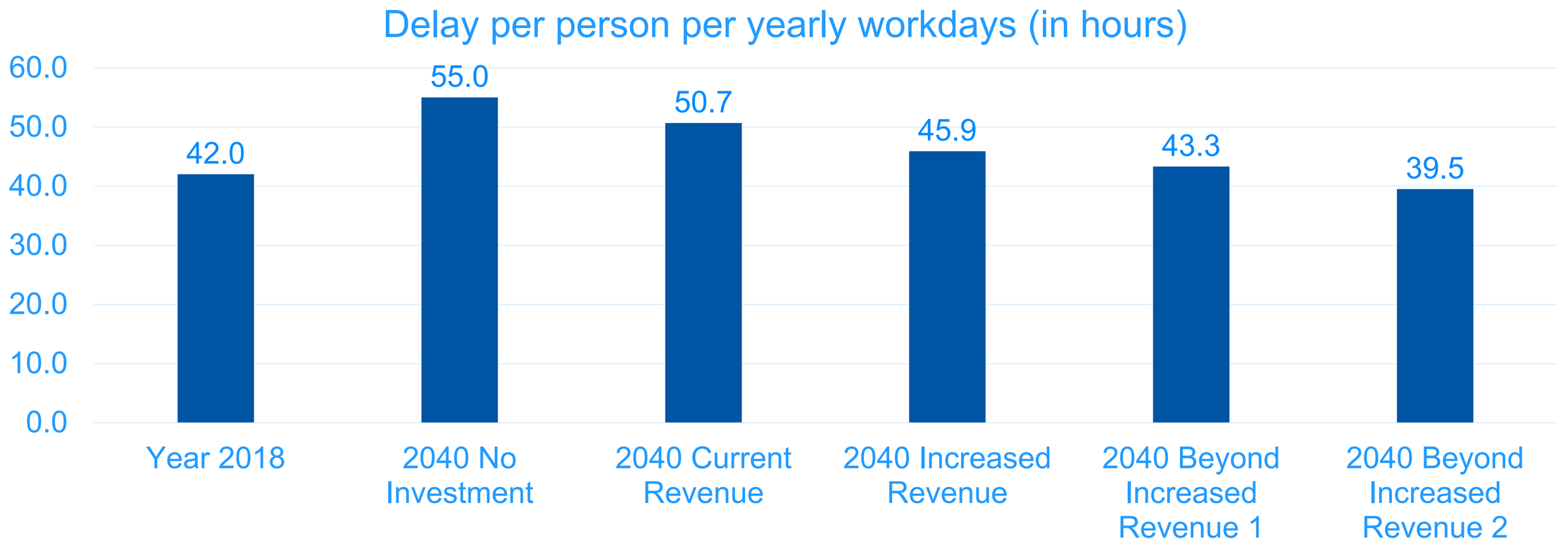
- Simple
- Relatable at the regional, corridor, project and person-level
- Responsive to MnDOT/Met Council highway investment strategies
- Supportive of economic analyses
- Captures the extent to which highway mobility contributes to broader transportation goals

There are many measures of highway congestion that are important to consider in fully understanding the issue.

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

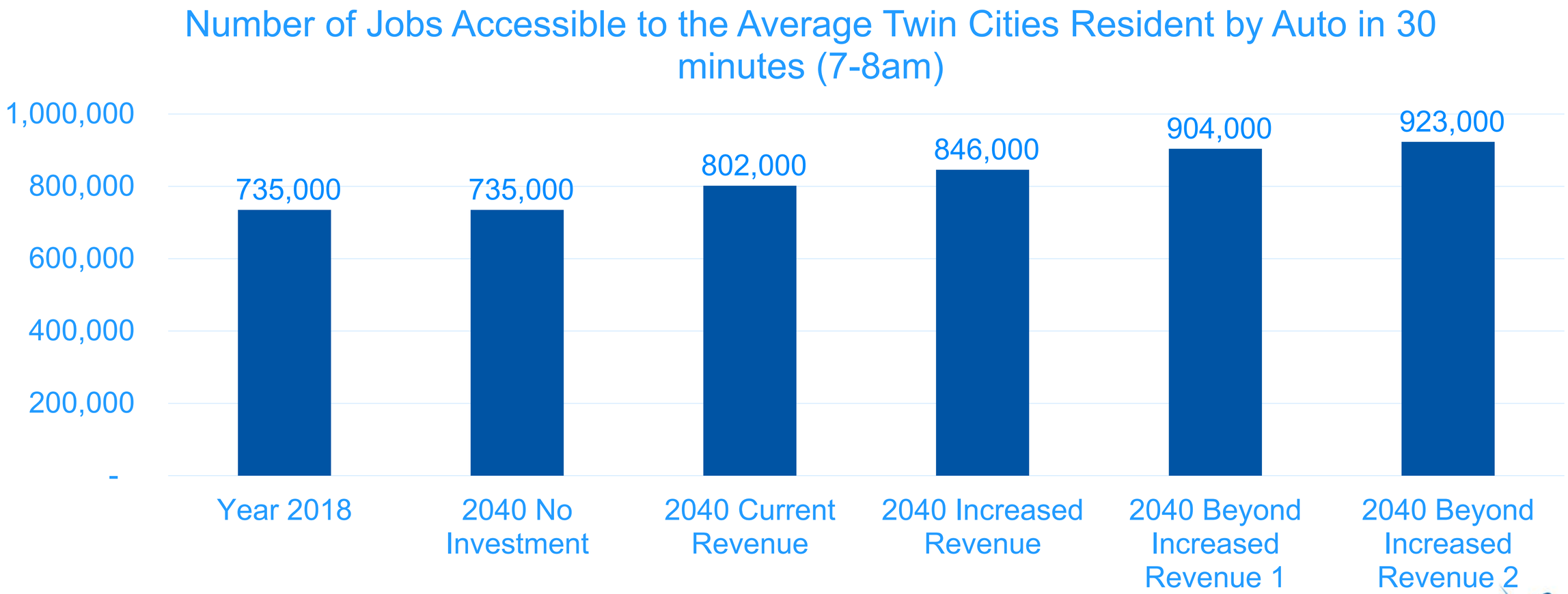
Modeled Results – Average Annual Delay



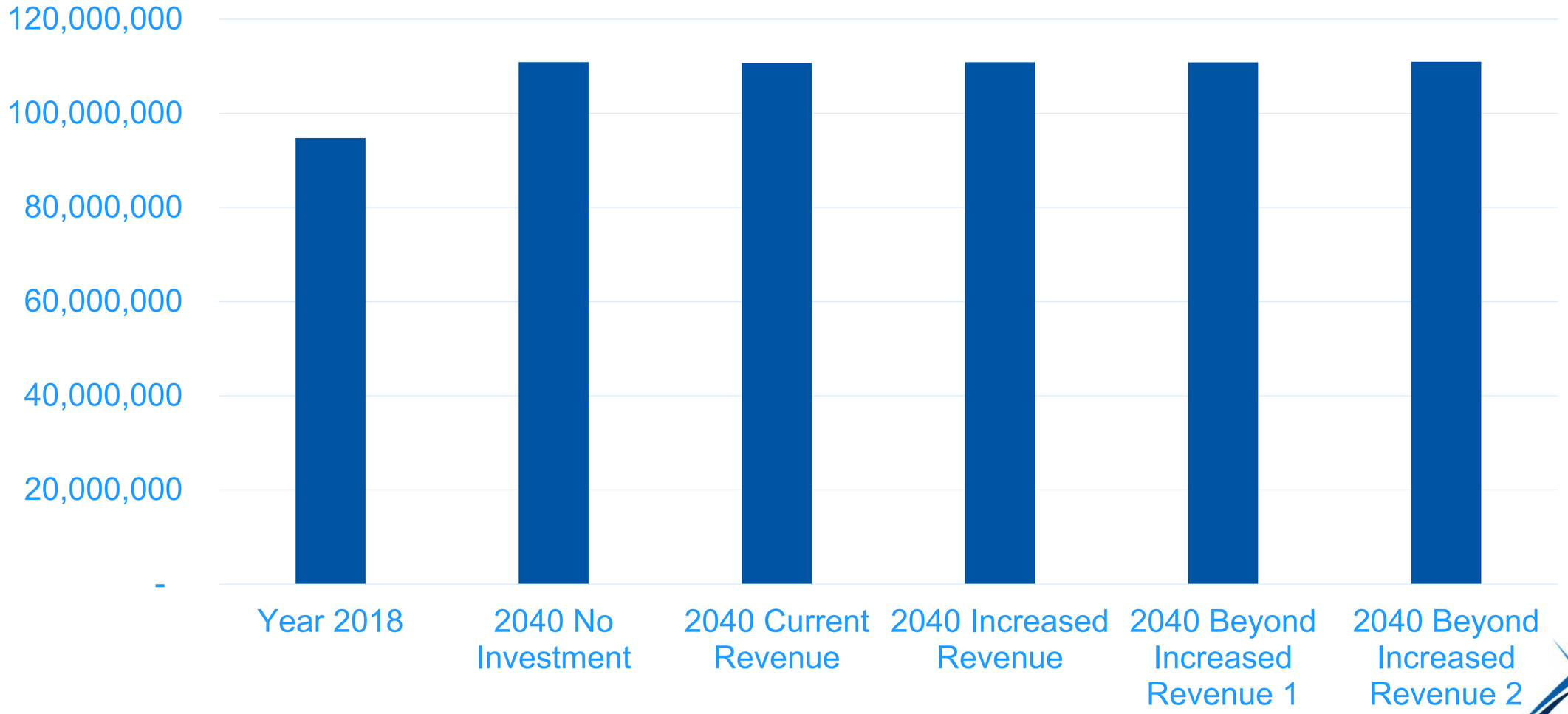
DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Modeled Results – Job Access



Modeled Results – Vehicle Miles Traveled



DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

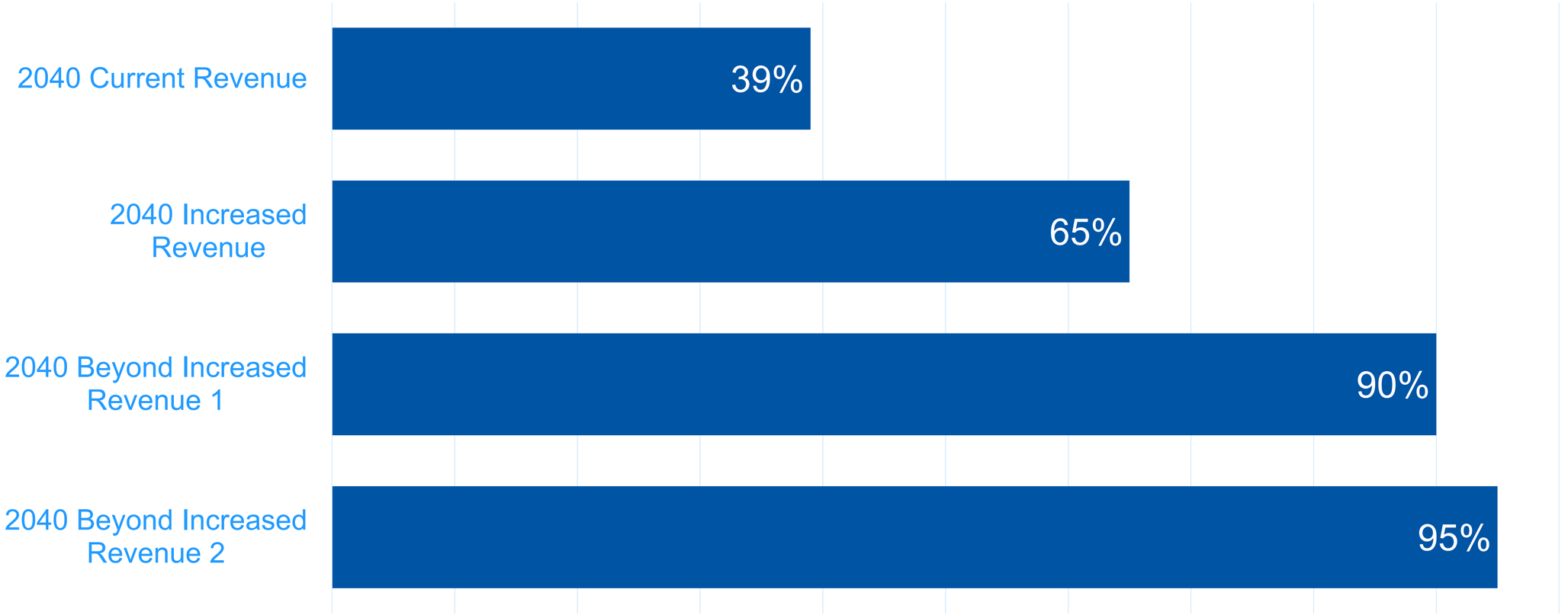
Vehicle Miles Traveled 2040 Modeling

- Follows methodology used in the 2040 Transportation Policy Plan (TPP).
- Population growth (+550,000 more people by 2040) is the primary driver of VMT.
- Accounts for some level of induced demand (increasing roadway capacity encourages more people to drive).
- Uses 2040 regional land use allocations by city as approved by the Met Council and shown in approved, local comprehensive plans. More study is planned to examine how land use changes may result from the increased mobility investment.
- Holds 2040 land use constant and does not change further based on investment.
- Modeling uses EPA's MOVES model for assumptions for the rate of EV adoption and future fuel efficiency standards as it relates to emissions.

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Freight Bottlenecks Improved

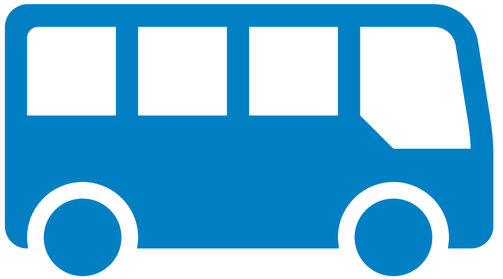


DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Equity analysis

- How does job access of equity populations change under each funding scenario?
  - 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.



DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

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
  - November 2021, 11% 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

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Performance Target

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	↓ 5%
Change from 2040 base	↓ 25%
20-year cost	$4 to $6 billion

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

2040 Investment Scenarios and Outcomes

Scenario	Implement Planned Investments	Extend Current Investment	Manage Decline in Regional Mobility	Sustain Regional Mobility	Improve Regional Mobility
20-Year Investment	$0-$375 million	$1-$2 billion	$2-$3 billion	$3-$5 billion	$4-$6 billion
Annual Delay per Capita = An 8 hour workday -- = Delay per capita in 2018	56 hours 14 hours more than 2018	52 hours 10 hours more than 2018	48 hours 6 hours more than 2018	44 hours 2 hours more than 2018	40 hours 2 hours less than 2018
Jobs Accessible to Typical Twin Cities Resident (within 30 minute drive during AM peak) = 200,000 jobs accessible	740k jobs Same as 2018	820k jobs 80k jobs more than 2018	860k jobs 120k jobs more than 2018	900k jobs 160k jobs more than 2018	920k jobs 180k jobs more than 2018
2040 Benefit from Travel Time Savings ($) = 100 dollars per household	N/A	$200	$400	$600	$800
Freight Bottlenecks Improved	0%	39%	65%	90%	95%
Greenhouse Gas Emissions	4 million metric tons per day in 2040 (Substantial decreases in greenhouse gas emissions through year 2040 are projected based on vehicle efficiency improvements; the overall magnitude of regional emissions in 2040 are not greatly influenced by these highway mobility investment scenarios, but further study is needed.)				
Risk of Not Reaching Delay Target	HIGH	HIGH	MODERATE	MODERATE	LOW

Key Messages

- Delay/person is projected to increase by 33% by 2040 with no investment.
- Meeting the highway mobility target value (decrease of 5%) will:
  - Provide access to 180,000 more jobs within a 30-minute drive by 2040
  - $800 in travel time savings annually per household
  - 95% of the region's freight bottlenecks improved
  - Reduced transit delay for transit users
  - Limited impact on greenhouse gas emissions; further analysis is planned in this area in 2022
- This study focused on a capital highway investment approach. A range of solutions including travel demand management, transit, bike/ped, and land use will be needed to meet the target.
- The increase of telework that resulted during COVID-19 suggests that this is an effective strategy in reducing delay per person.

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Next steps

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

Next Steps

- Electric Vehicle Planning Study (being finalized)
- Congestion Management Plan Handbook (ongoing)
  - Consider a range of lower cost alternatives to improve mobility
- Travel Demand Management Study (ongoing)
- Regional Transportation and Climate Change Measures (2022 start)
  - More study needed to understand and quantify the connection between transportation project types and greenhouse gas emissions
- Transportation Policy Plan Goals, including a review of the Regional Approach to Congestion (late 2022 start)

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL

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
    612-505-7831

DEPARTMENT OF TRANSPORTATION

METROPOLITAN COUNCIL