We make life better!

DENVER REGIONAL COUNCIL OF GOVERNMENTS

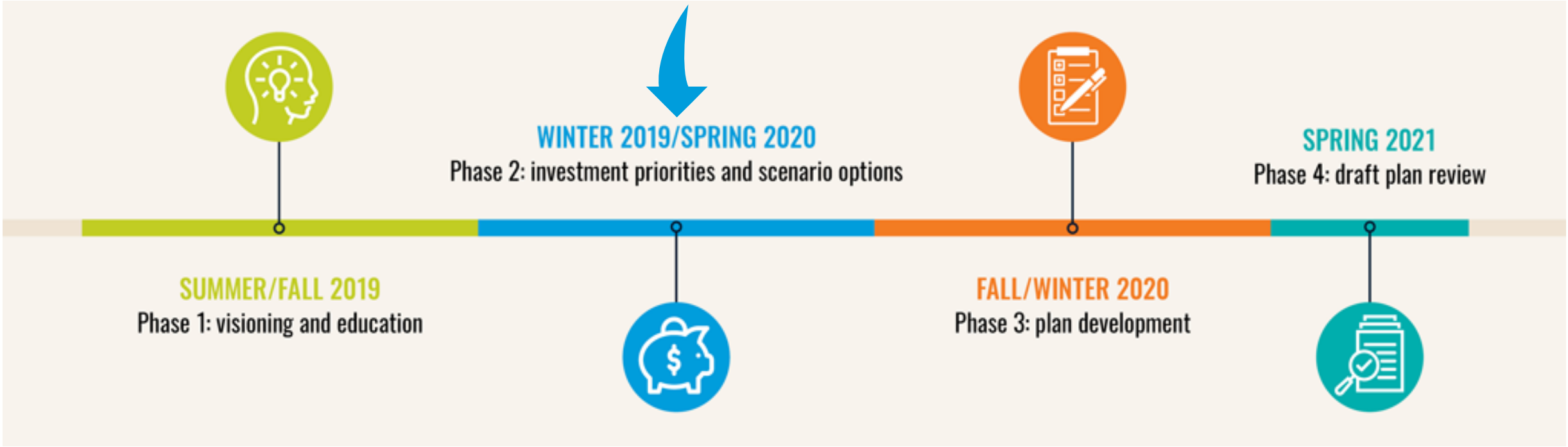
DRCOG Transportation Advisory Committee

March 23, 2020

2050 Metro Vision Regional Transportation Plan

Draft 2050 Scenario Outcome Results

Project Schedule



Scenario Planning Process

WE ARE HERE

Define Vision & Desired Outcomes

- Phase I Engagement

- What's important to us about our transportation system?

Prepare Tools

- 2050 Land Use Forecasts
- Land Use Model
- Updated Travel Model

- Tools to model and test regional scenarios

Define & Test Scenarios

- Transportation
- Urban Form

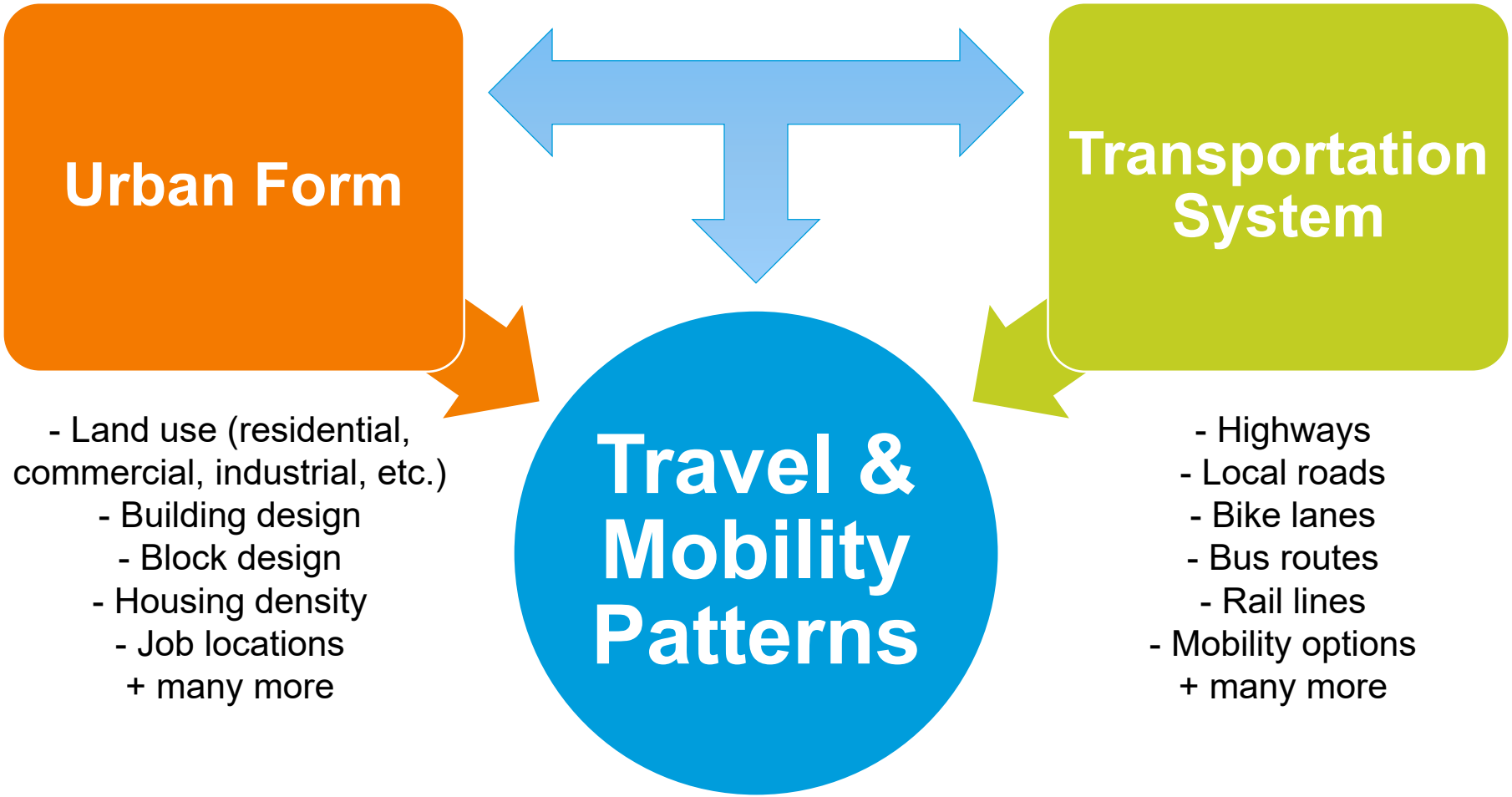
- Explore regional relationships between urban form, transportation investments, and mobility outcomes

Prepare 2050 MVRTP

- Major Projects
- Investment Strategy

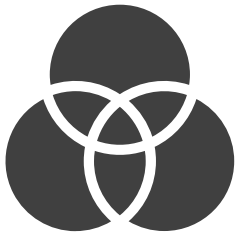
- How do scenario analysis outcomes inform project & investment decisions in the 2050 MVRTP?

Understanding Relationships

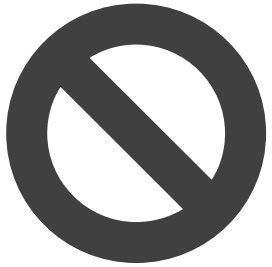


DRCOG's Approach

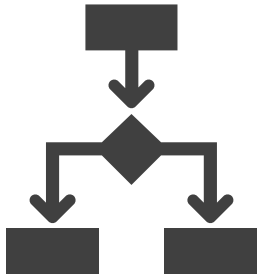
Explores **"what if"** alternative futures



Relative comparisons between scenarios and baseline



Not rigorous evaluation of scenarios, nor choosing/ judging scenarios



Choices & tradeoffs from individual scenarios

Provide **guidance and direction** for plan development

Scenario Analysis

Land Use Scenarios

2050 Base

Infill

Centers

Transportation Scenarios

2050 Base (2040 FCRTP)

Off-Peak Congestion

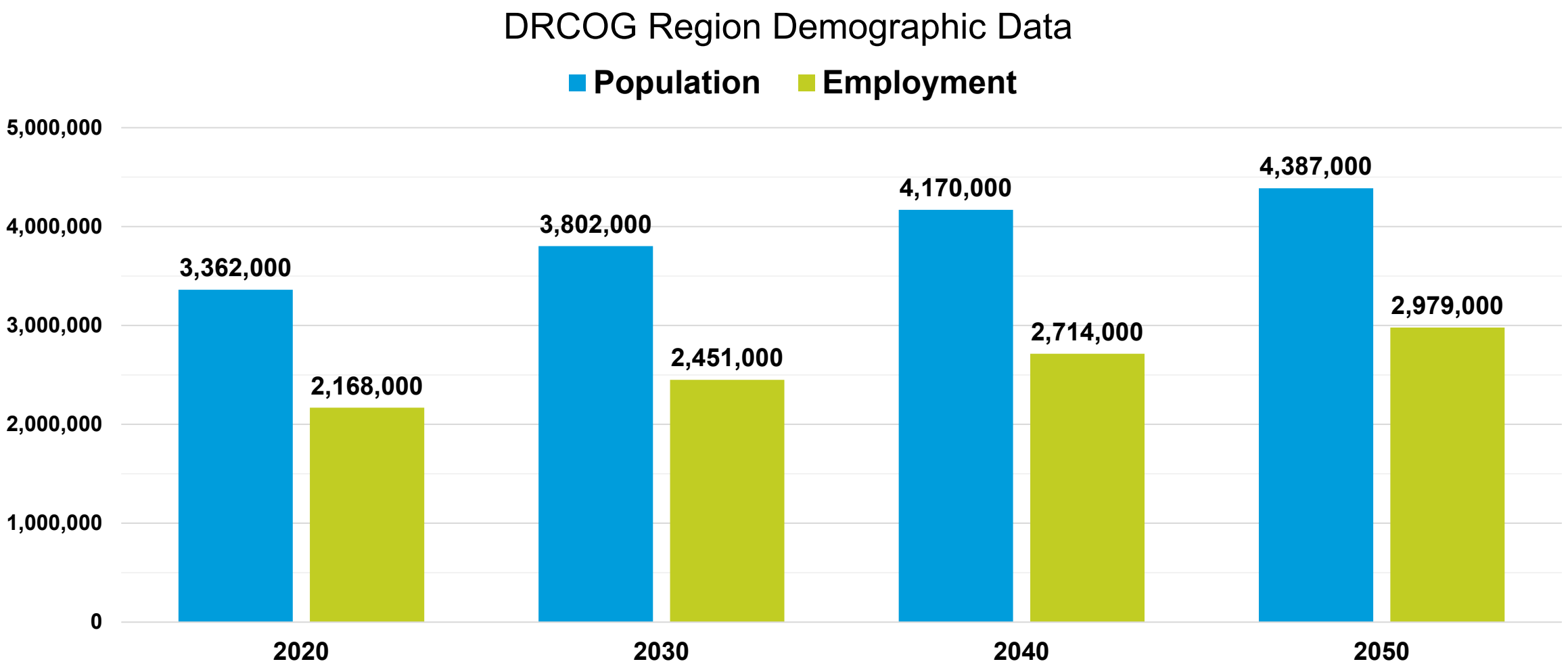
Managed Lanes & Operations

Travel Choices

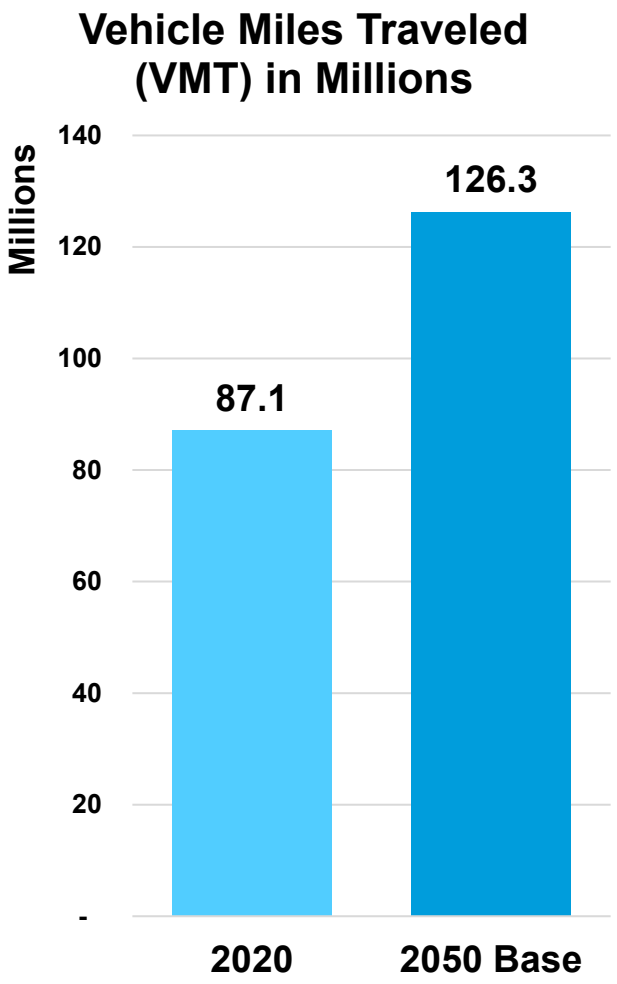
Transit

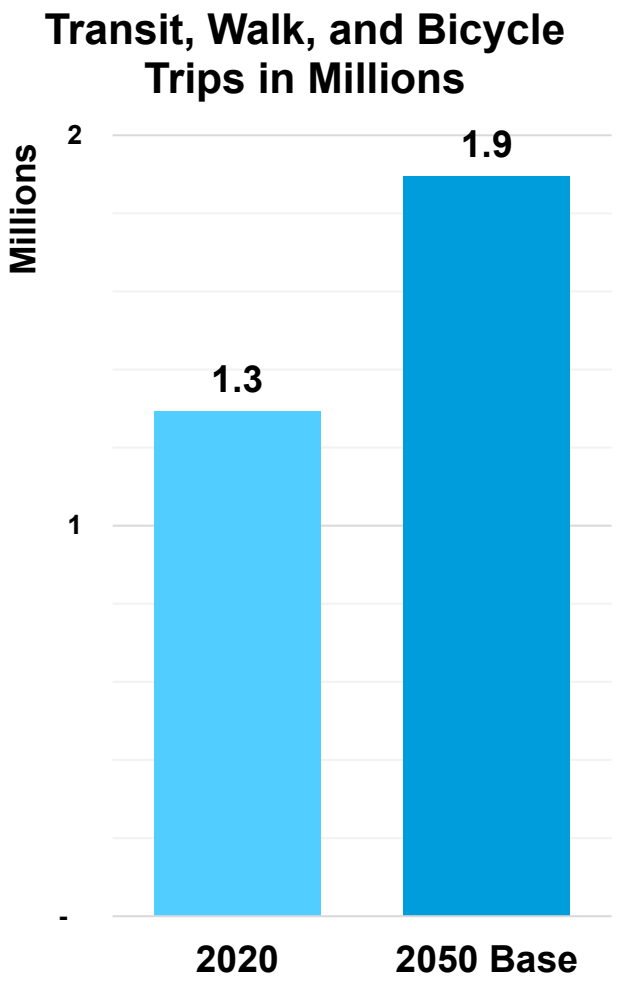
Automated/Connected Vehicles

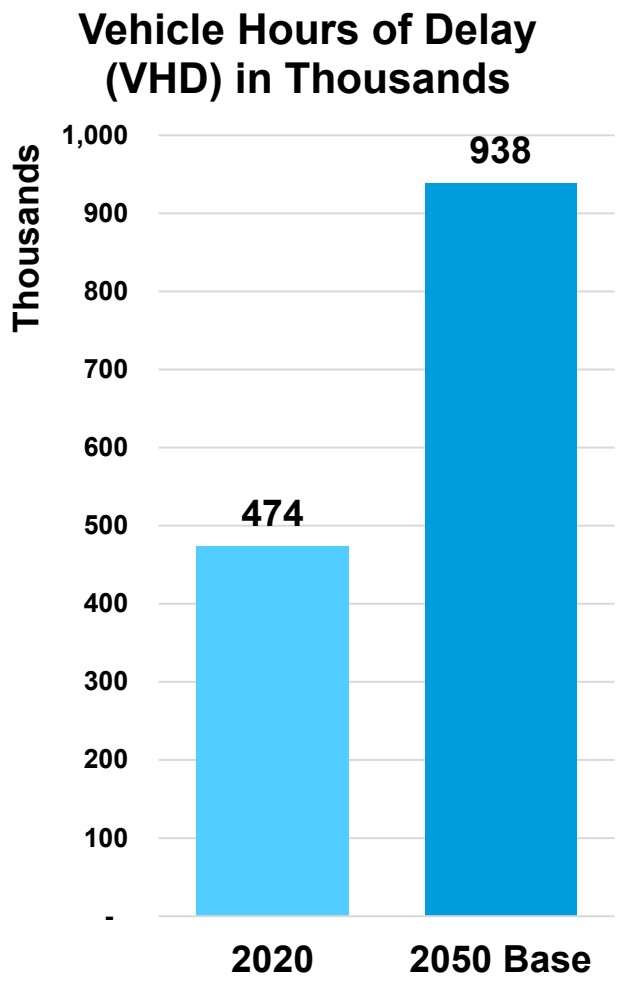
A Growing Region



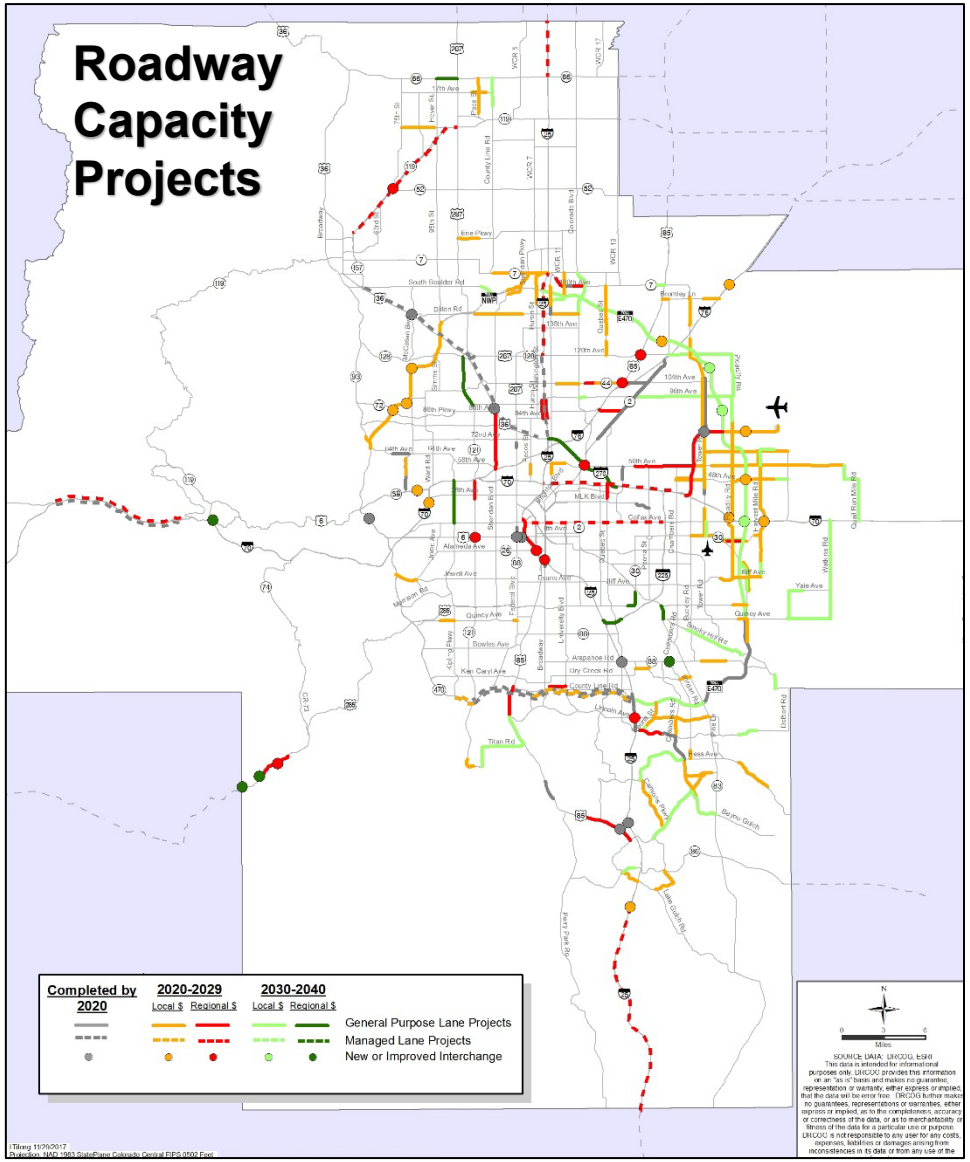
A Growing Region

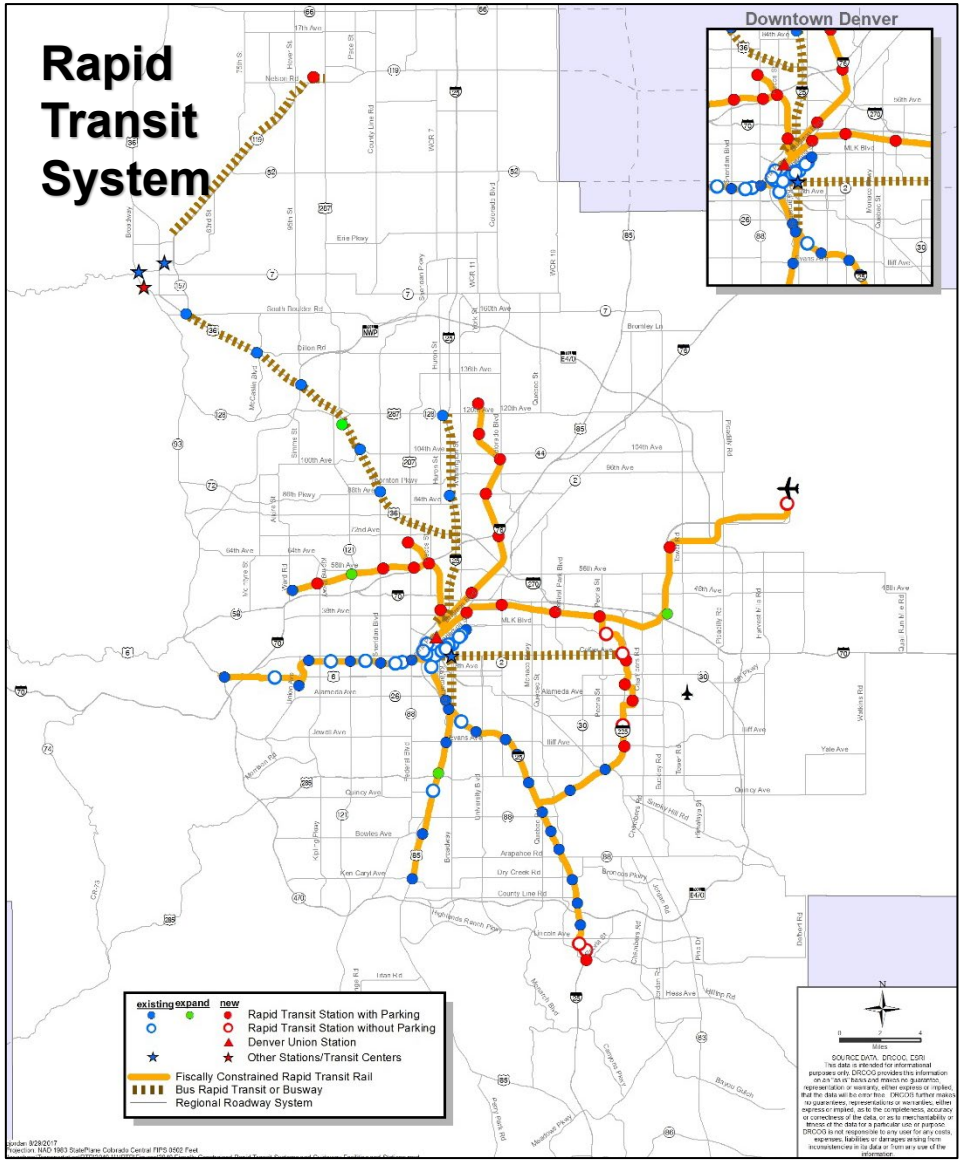




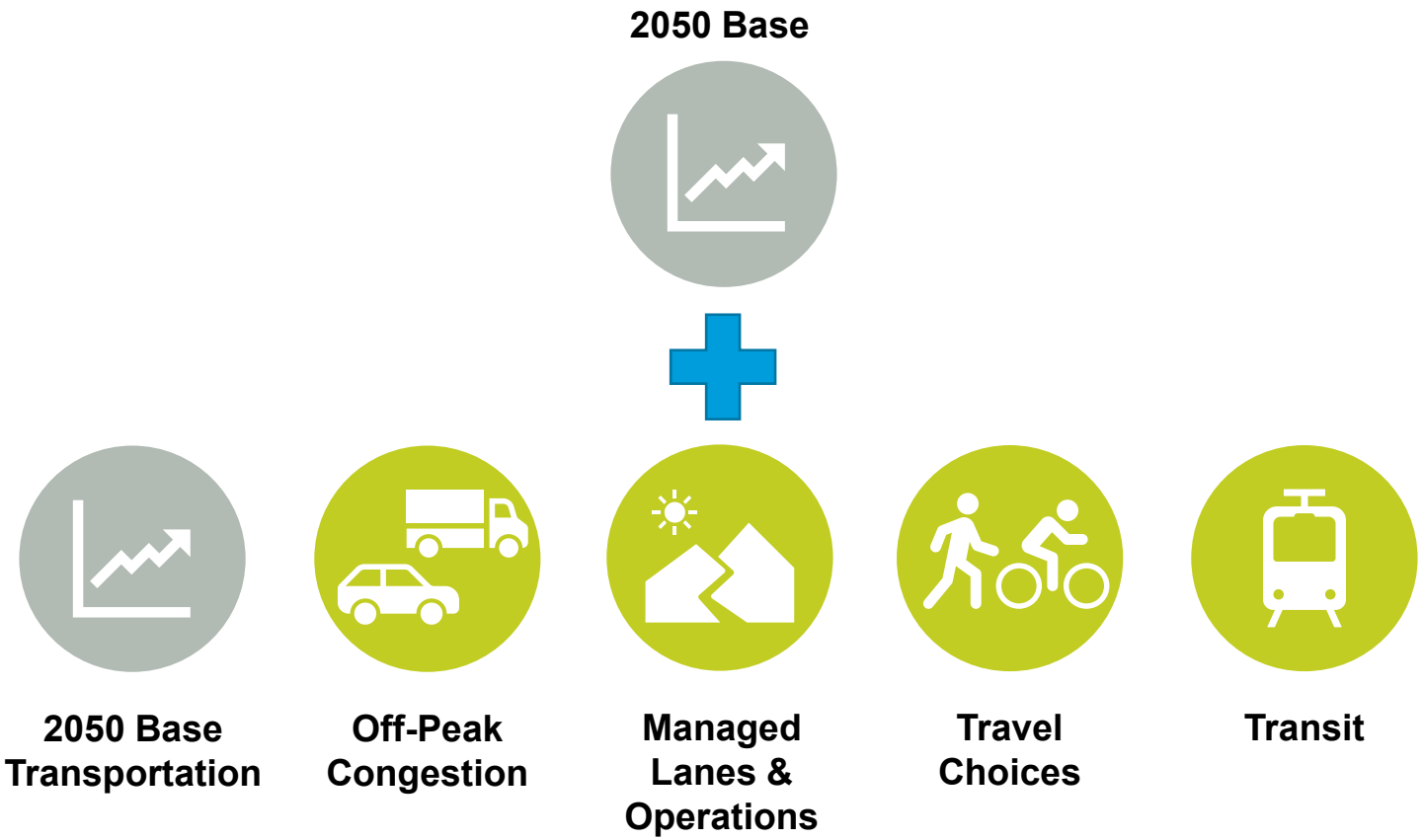


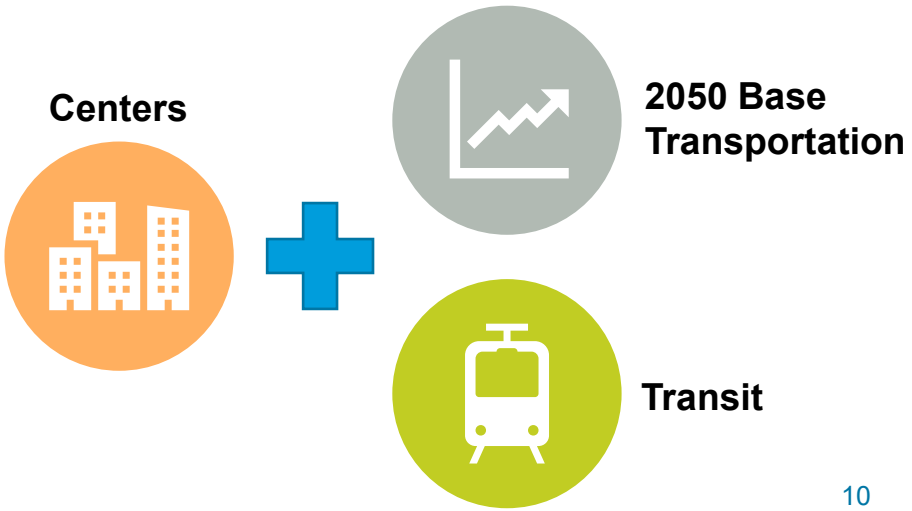
2040 Fiscally Constrained Networks
2050 Base





Scenario Combinations Summary





Scenario Combinations

2050 Base Land Use

2050 Base Transportation

Off-Peak Congestion

Managed Lanes & Operations

Travel Choices

Transit

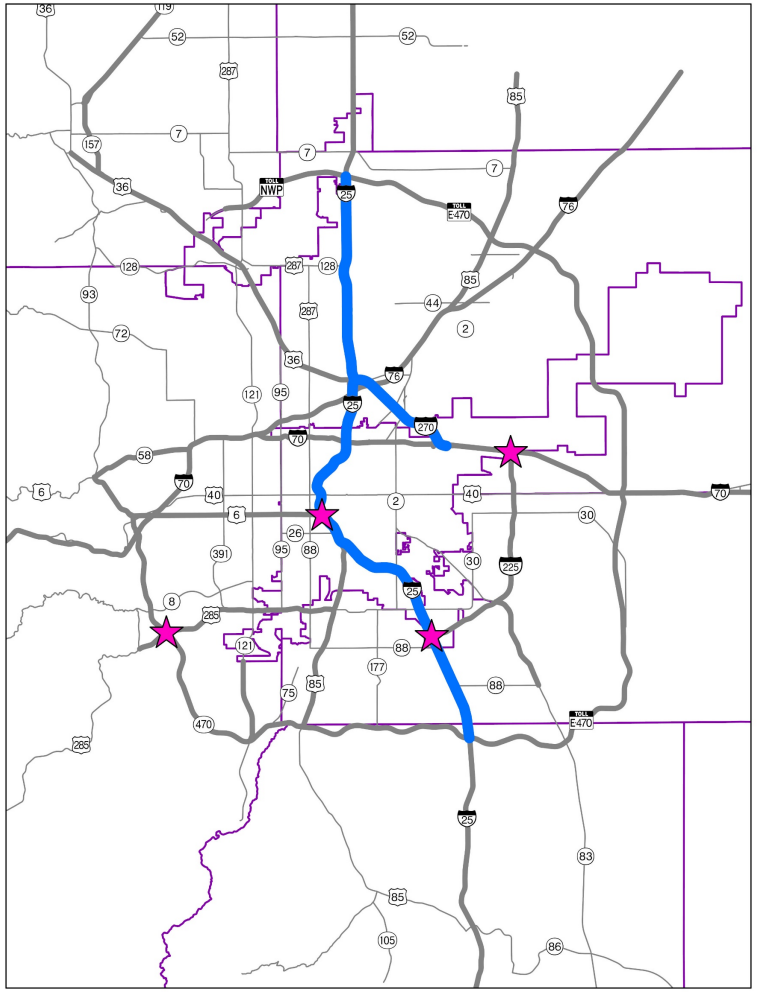
Off-Peak Congestion Scenario

Build out the freeway/interstate system to address off-peak congestion.

Widen I-270 and I-25 (between E-470/NW Pkwy. and C-470/E-470)

Major **interchange reconstructions** at four bottleneck locations:

- I-225 / I-70
- I-225 / I-25
- US-6 / I-25
- US-285 / C-470



Off-Peak Congestion Outcomes

Compared to the 2050 Base

Less than 1% change in vehicle miles traveled and transit trips

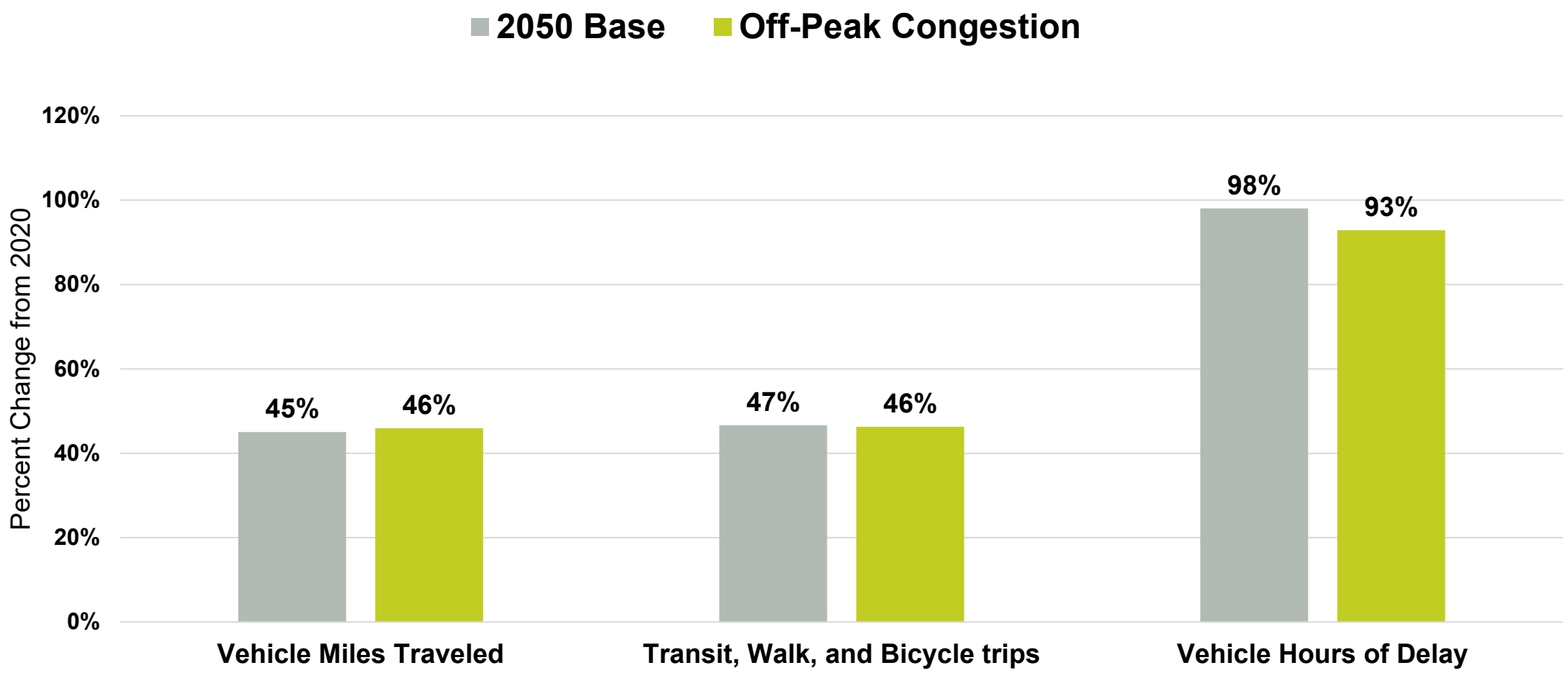
(Regional person delay decreases by 3%)

	AM Peak I-25 from C-470 (Lone Tree) to SH-7 (Broomfield)	Daily Volume I-25 @ Speer
2020 Base	70 minutes	260,000
2050 Base	88 minutes	330,000
Off-Peak Congestion Scenario	79 minutes	380,000

Some traffic is diverted from arterial streets onto I-70 and I-25.

While there are few changes at the regional level, some specific corridors have significant impacts.

OffPeak Congestion
Change from 2020

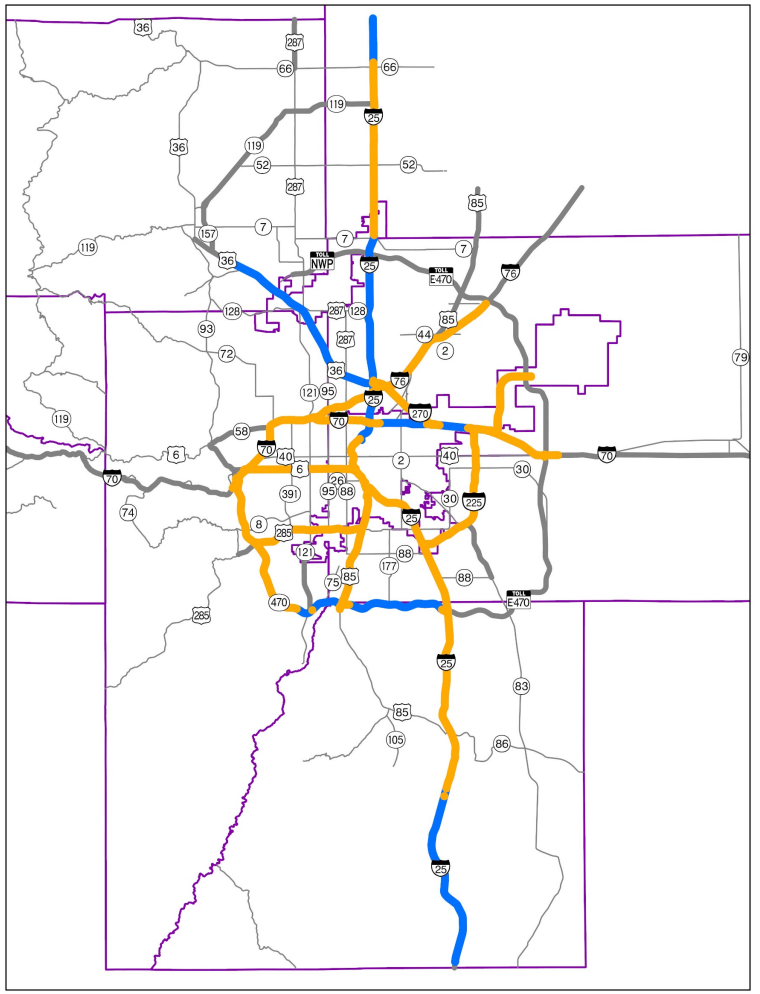


Managed Lanes & Operations Scenario

Improve operations & traffic flow on region's highways/freeways.

Build **325 additional lane miles** of freeway managed lanes (HPTE Express Lanes Master Plan)

Improve operations and incident management strategies



Managed Lanes & Operations Outcomes

Compared to the 2050 Base

People in vehicles experience **25% less delay** on average

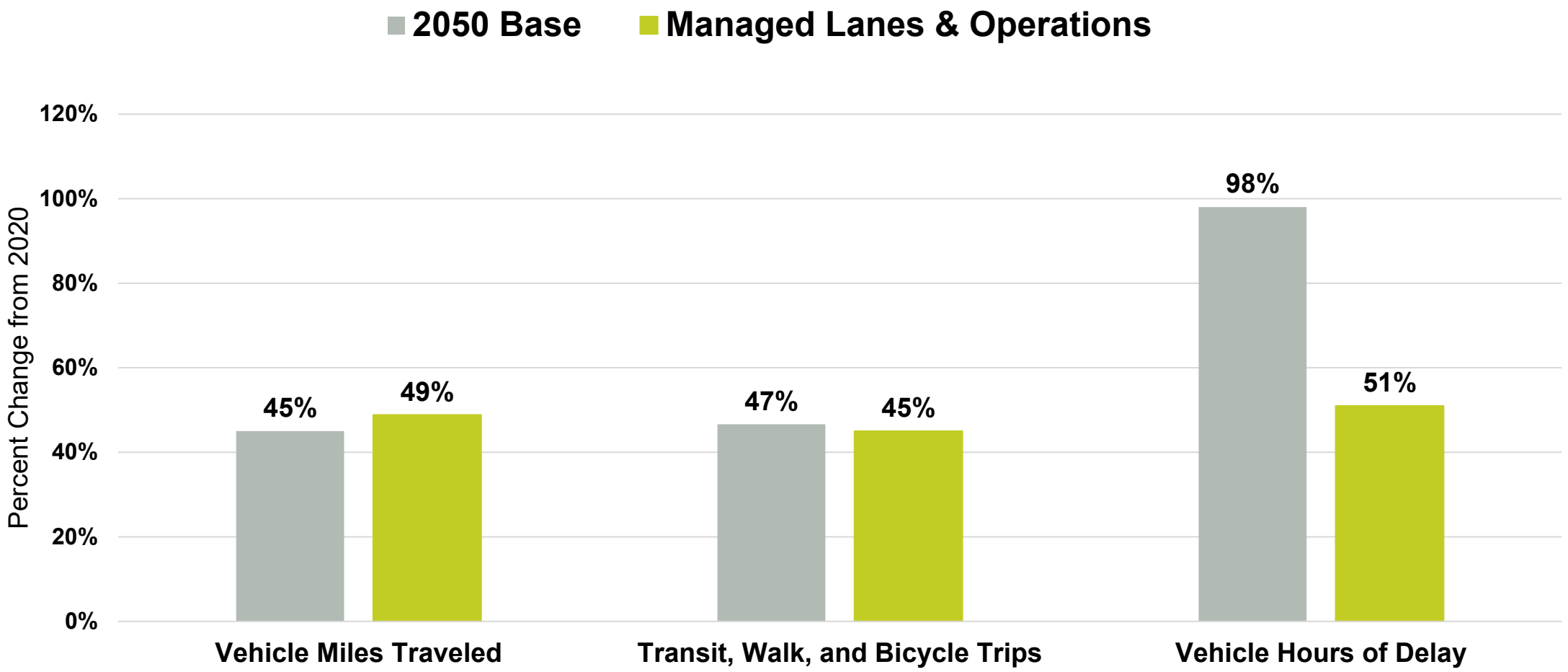
3% increase in vehicle miles traveled

(~800,000 more daily VMT compared to the 2050 Base)

Travel reliability increases significantly on the region's freeways.

Fewer secondary crashes and improved safety due to enhanced incident management.

Managed Lanes & Operations
Change from 2020

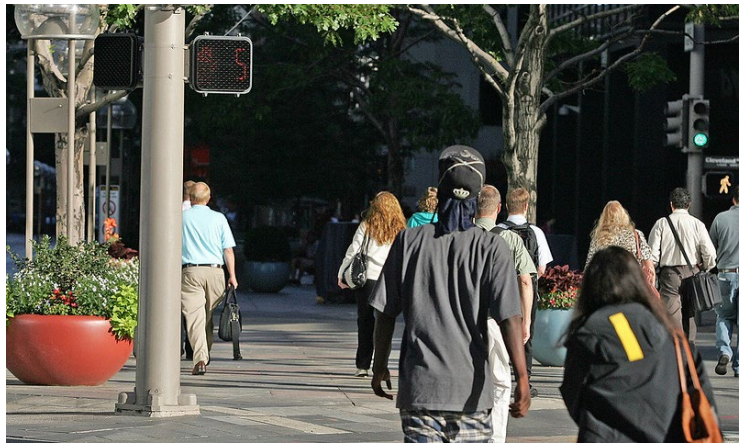


Travel Choices Scenario

Increase travel & mobility choices along region's major arterials.

Active transportation is encouraged through **better infrastructure and lower speeds** on high activity urban arterials

Telecommuting & other Transportation Demand Management (TDM) strategies



Travel Choice Outcomes

Compared to the 2050 Base

More than **twice** as many teleworkers

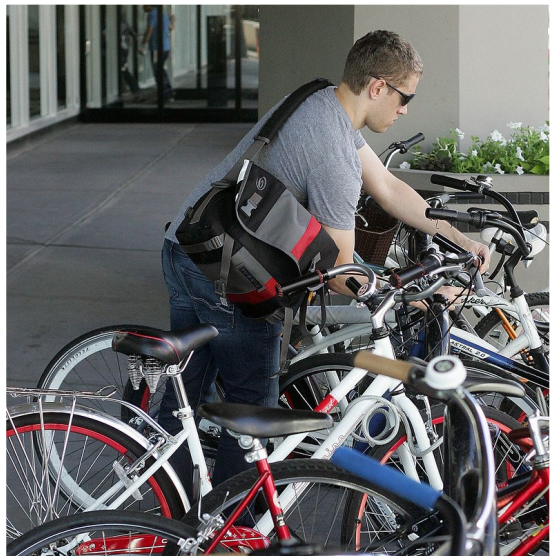
400,000 fewer drive alone work trips every day

50% increase in bicycle/pedestrian trips

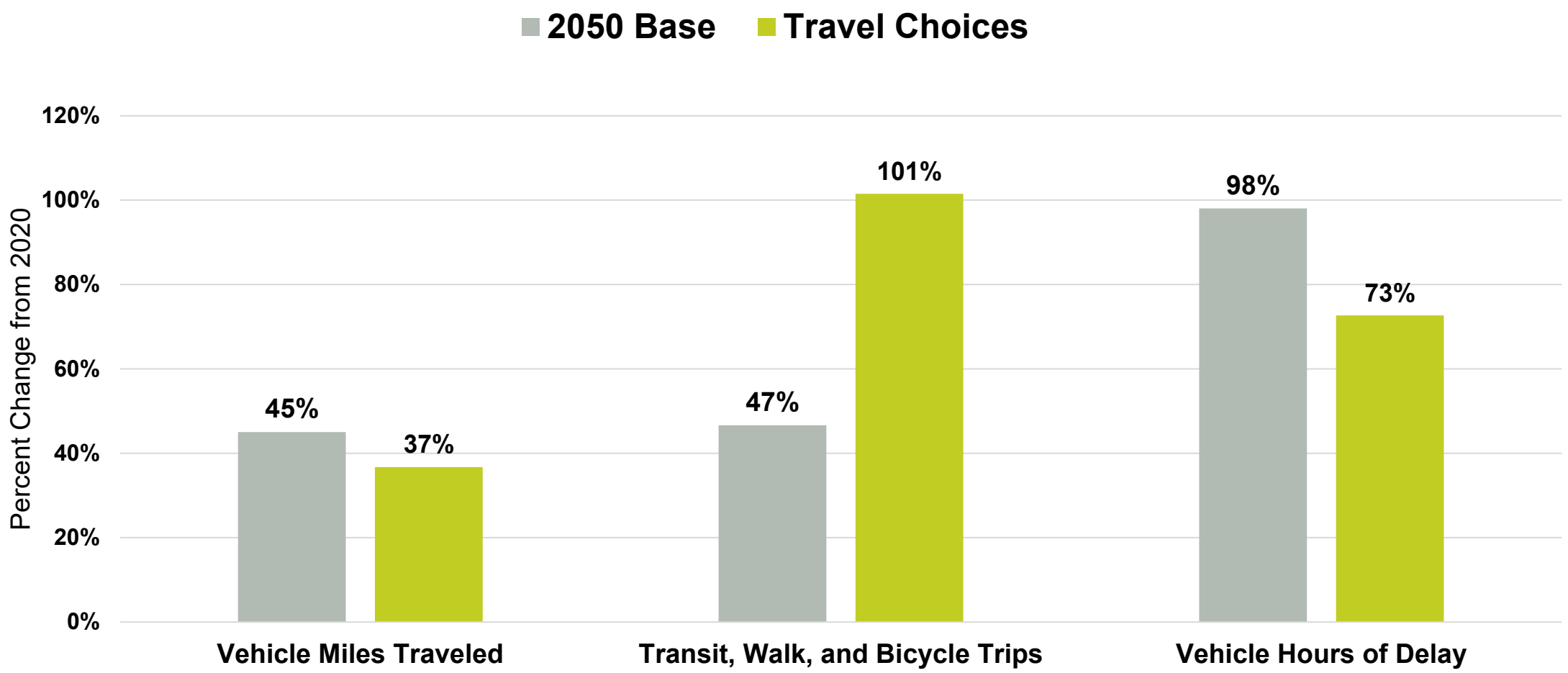
(Slight decrease in transit trips)

Due to safer roadway design there are fewer crashes, injuries, and fatalities.

Even with reduced speed limits, there is less total delay.



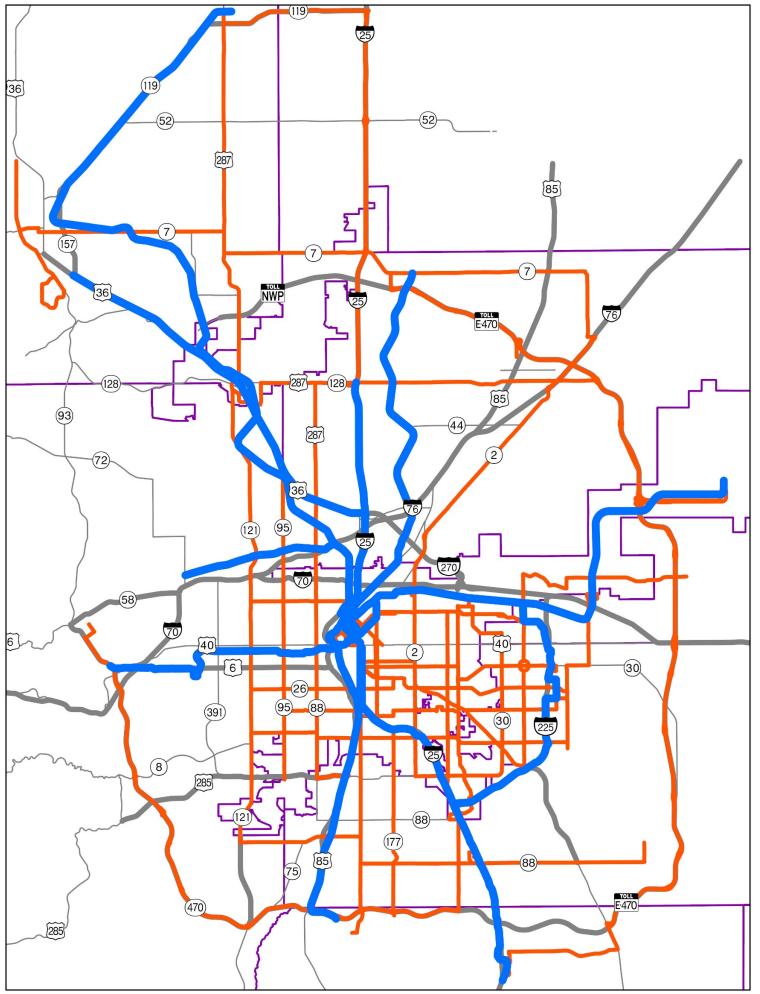
Travel Choices Change from 2020



TransitScenario

Improve/expand the region's transit network and service.

- Completion of **FasTracks and additional miles of rail**
- Extensive **Bus Rapid Transit (BRT)** network and expanded transit service on all routes ***(8x as many service hours)***
- **Free fares** and improved station/stop access



TransitOutcomes

Compared to the 2050 Base

79% of households have good transit access to jobs

(Compared to 58% in the 2050 Base)

76% more transit trips

(Small decrease in walk and bike trips)

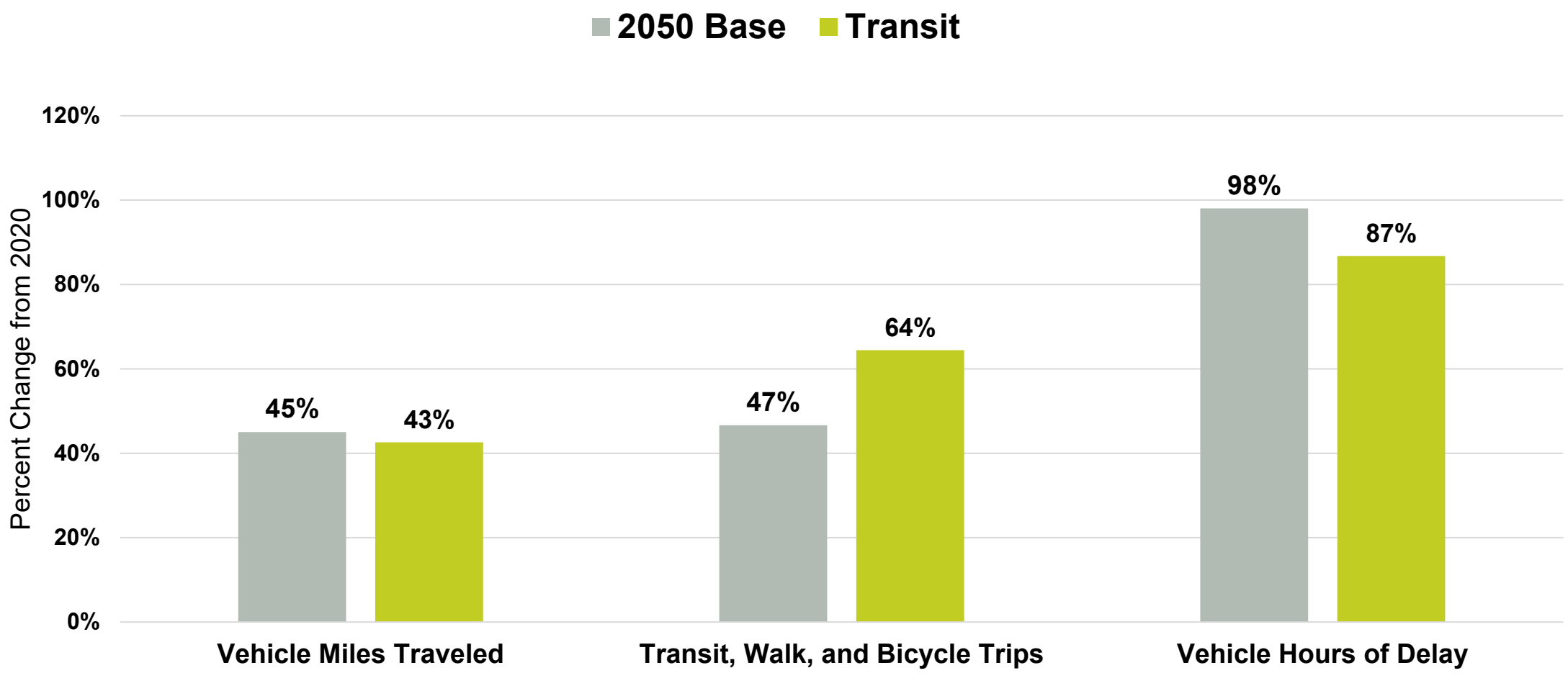
100,000 more households use transit

(14% of all households)

Free transit provides personal, mobility, and equity benefits.

There is a 2% decrease in vehicle miles traveled.

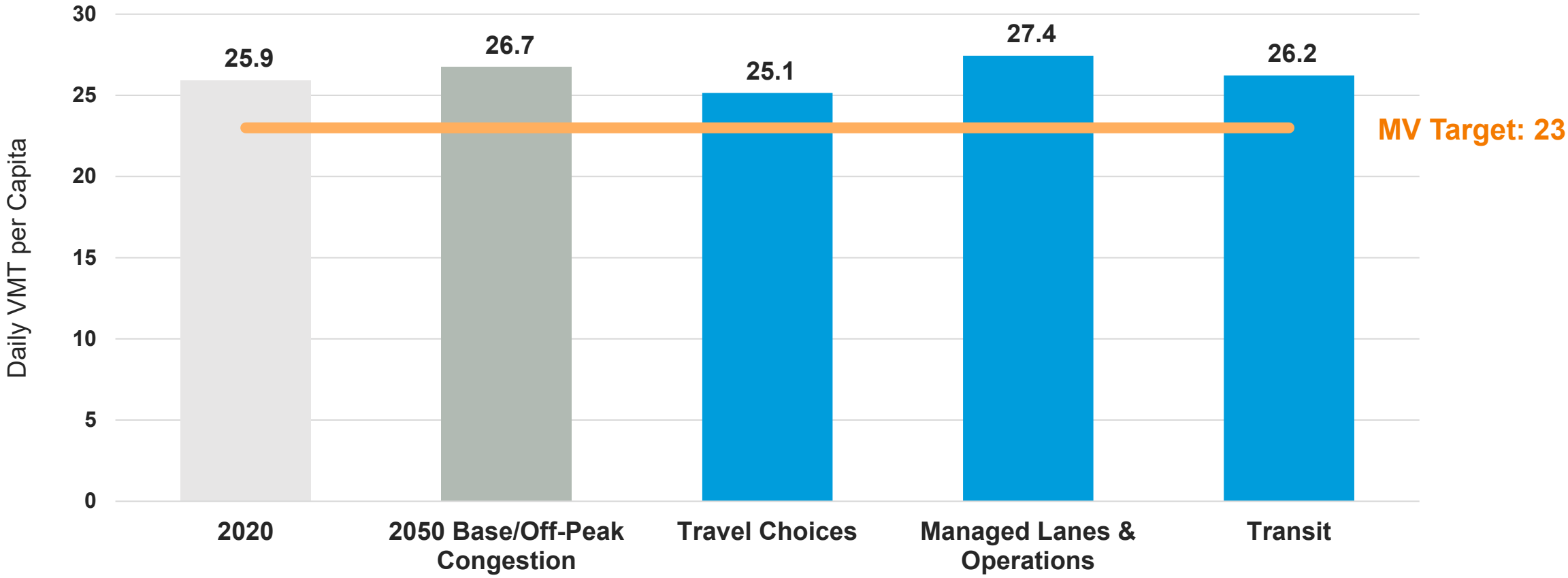
TransitChange from 2020



METRO VISION TARGETS

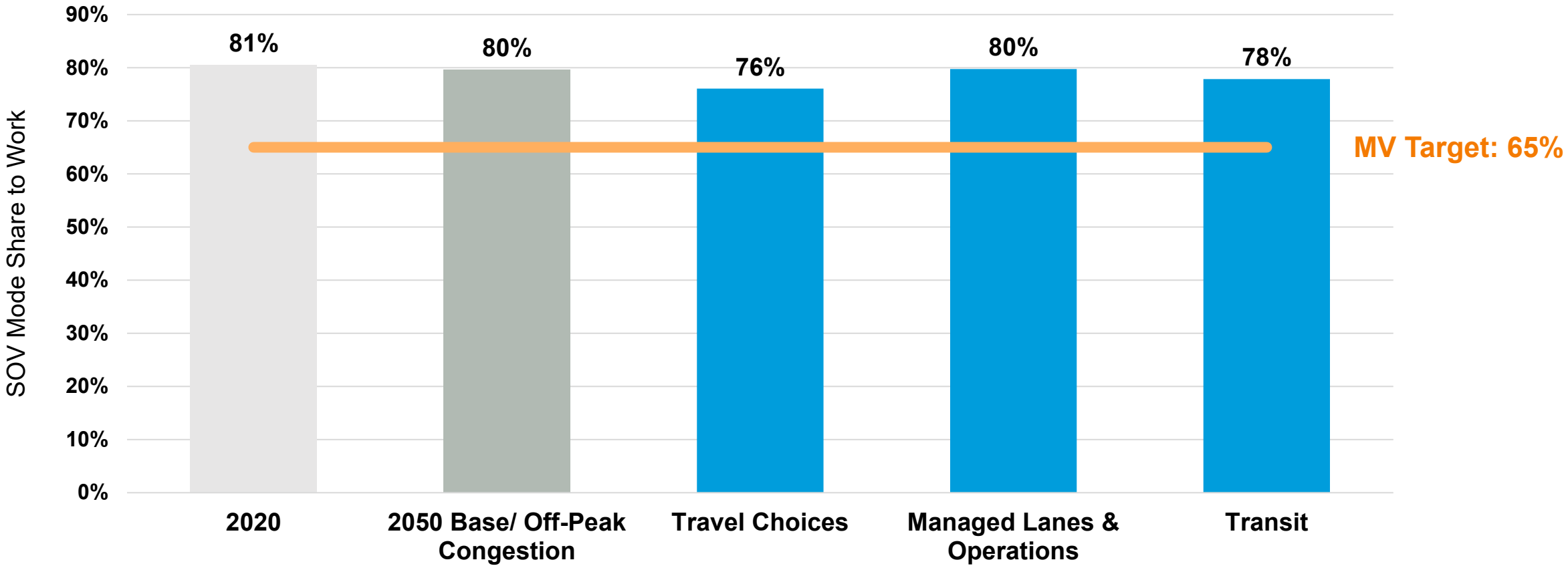
Transportation Scenarios
Metro Vision Targets

Reduce Daily Vehicle Miles Traveled (VMT) per Capita

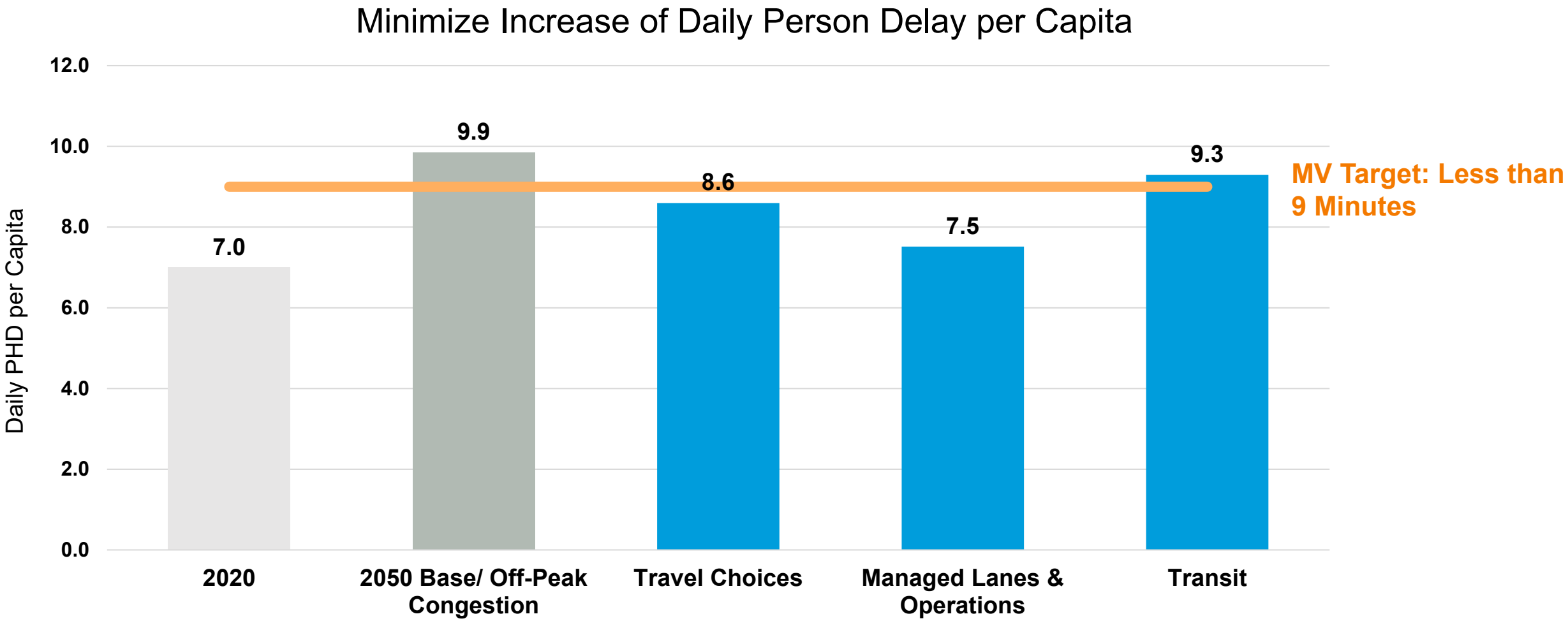


Transportation Scenarios
Metro Vision Targets

Reduce Single-Occupant Vehicle (SOV) Mode Share to Work



Transportation Scenarios
Metro Vision Targets



LAND USE SCENARIOS

Land Use Scenarios
Households & Employment

Land Use Scenarios
Households & Employment

Sourced from our shared vision

Baseline

Infill

Centers

Introduce Change by Making Different Choices A

Infill

*What if local governments allow for more **urban and suburban redevelopment and infill**?*

Urban +
Inner suburban

11%
of region's land area*

* 2010 Census Urban Area was **15%** of region's land area

Centers

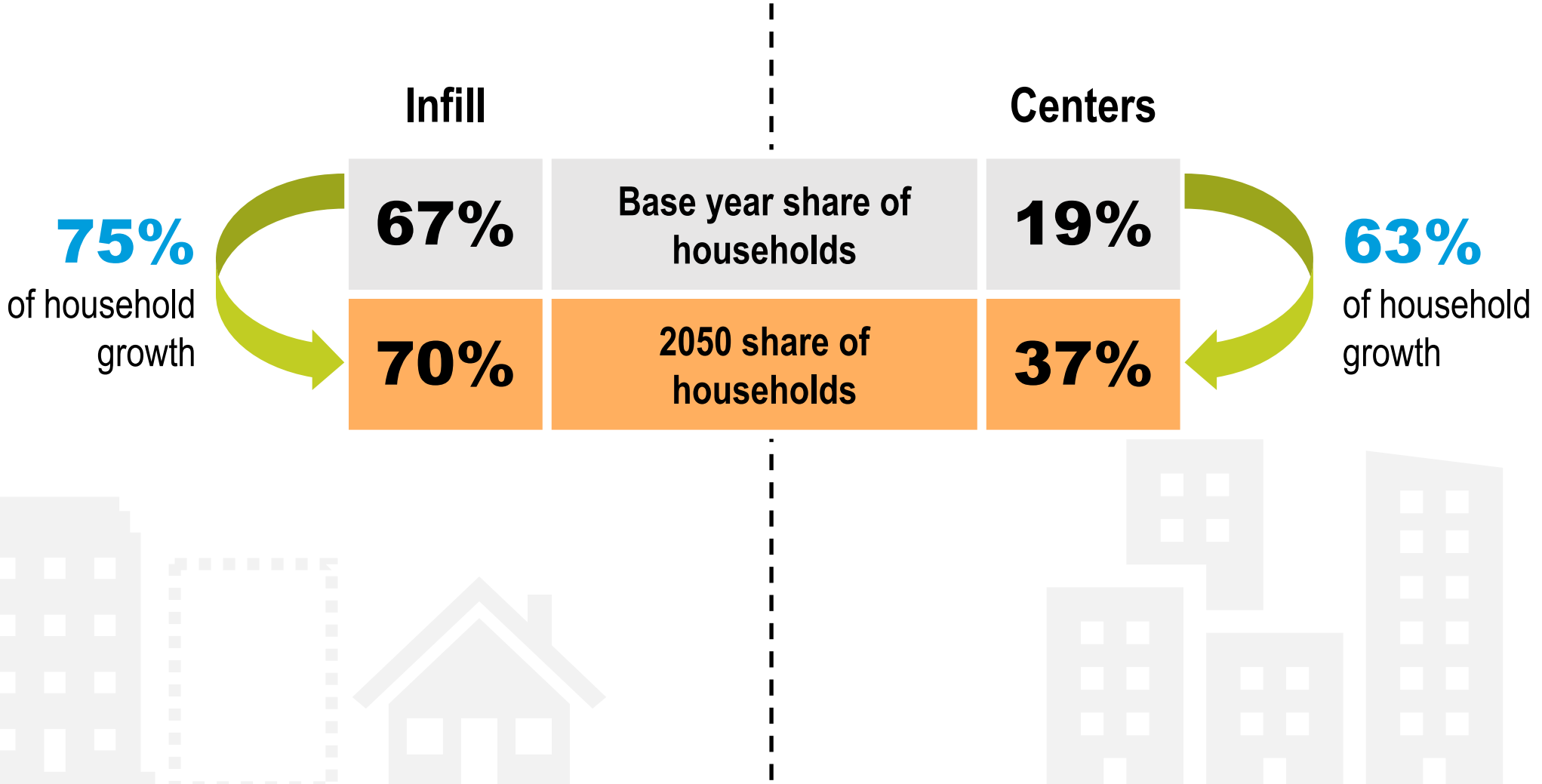
*What if local governments focus opportunity for development around **key centers and corridors**?*

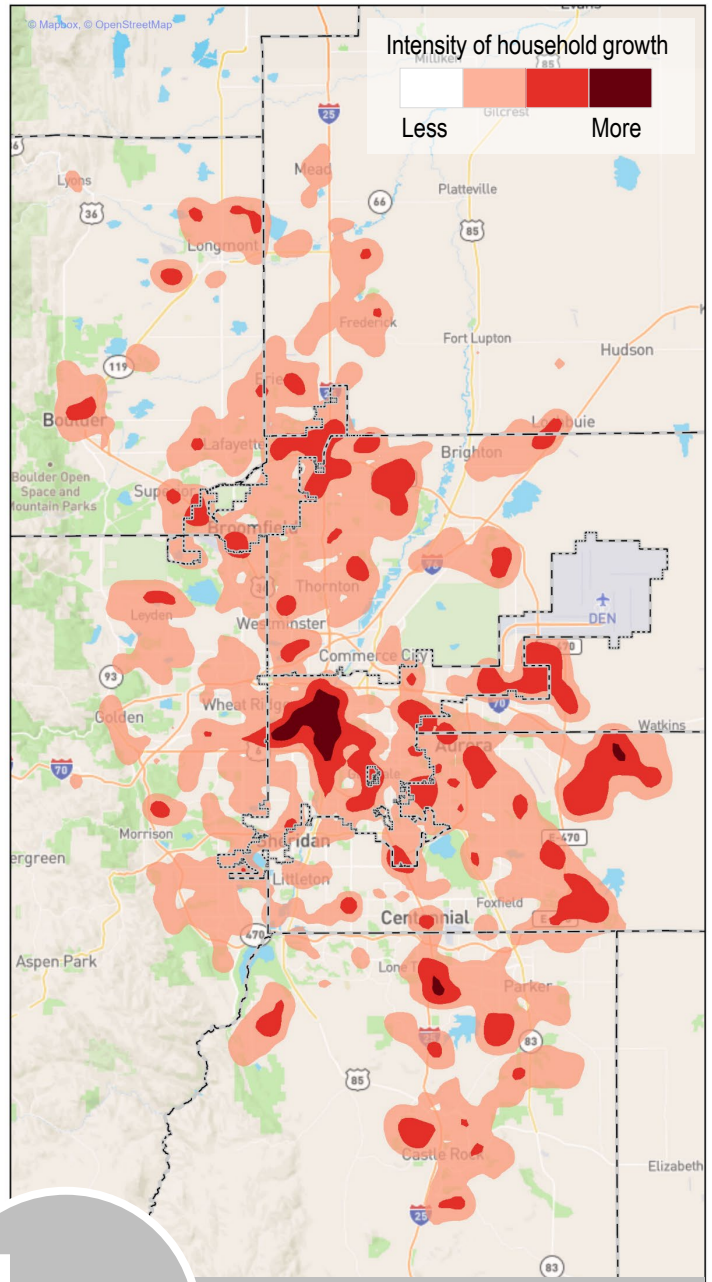
3%
of region's land area

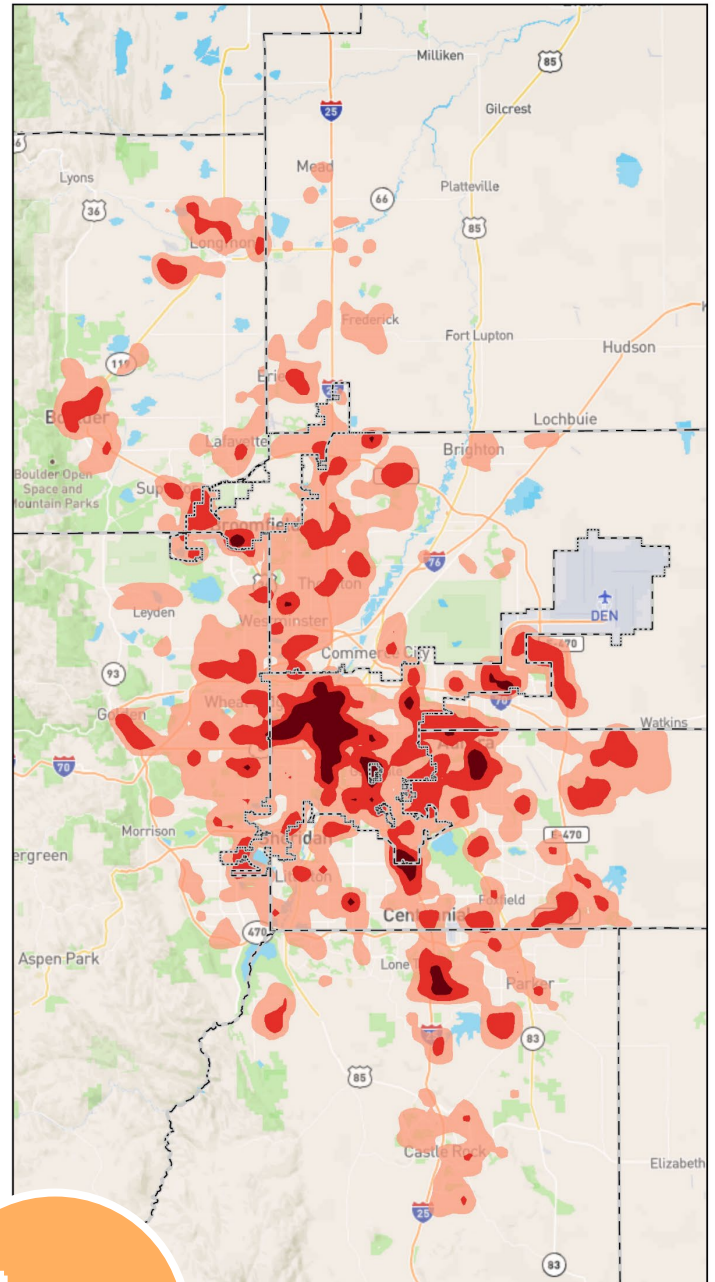
Rapid transit stations +
Urban centers +
Employment centers

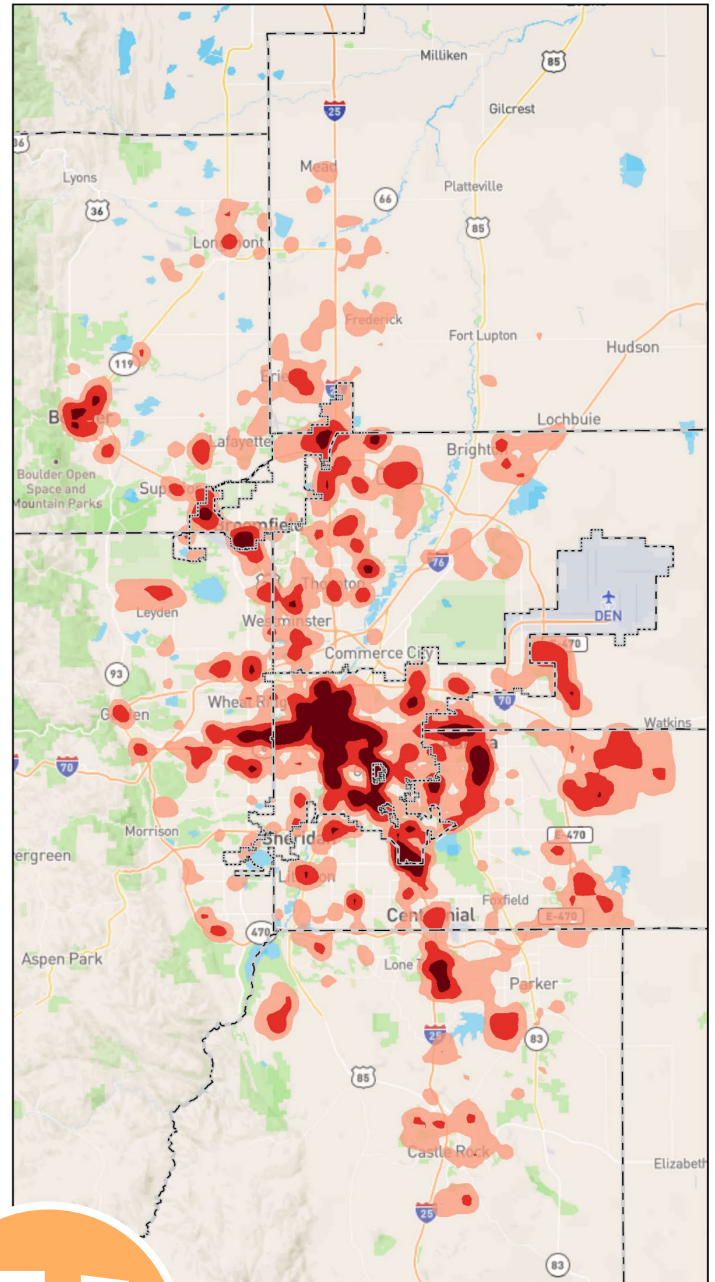
Where Location Choices Fall

*Modest intensification over a large area **vs.** significant change in a small area*




Intensity of household growth
Less
More
Baseline


Infill


Centers

Beyond Visualization to Metrics

	Outcome Metric	Baseline	Infill	Centers	MV Target
Density	Regional population-weighted density	6,152 people per mi.^{2}	7,620 people per mi.^{2}	9,816 people per mi.^{2}	6,063 people per mi.^{2}
Urban Centers	Share of total households in urban centers	11%	15%	20%	25%
	Share of total jobs in urban centers	31%	35%	41%	50%

	Outcome Metric	Baseline	Infill	Centers
Jobs/ Housing	Median distance of household growth to a top 10 employment center	5.8 mi.	2.6 mi.	1.8 mi.
Area Stability	Share of single-family areas remaining in that range of development intensity	81%	82%	88%
Intensity of Change	Share of households in highest range of development intensity	15%	18%	24%

Scenario Combinations

Infill

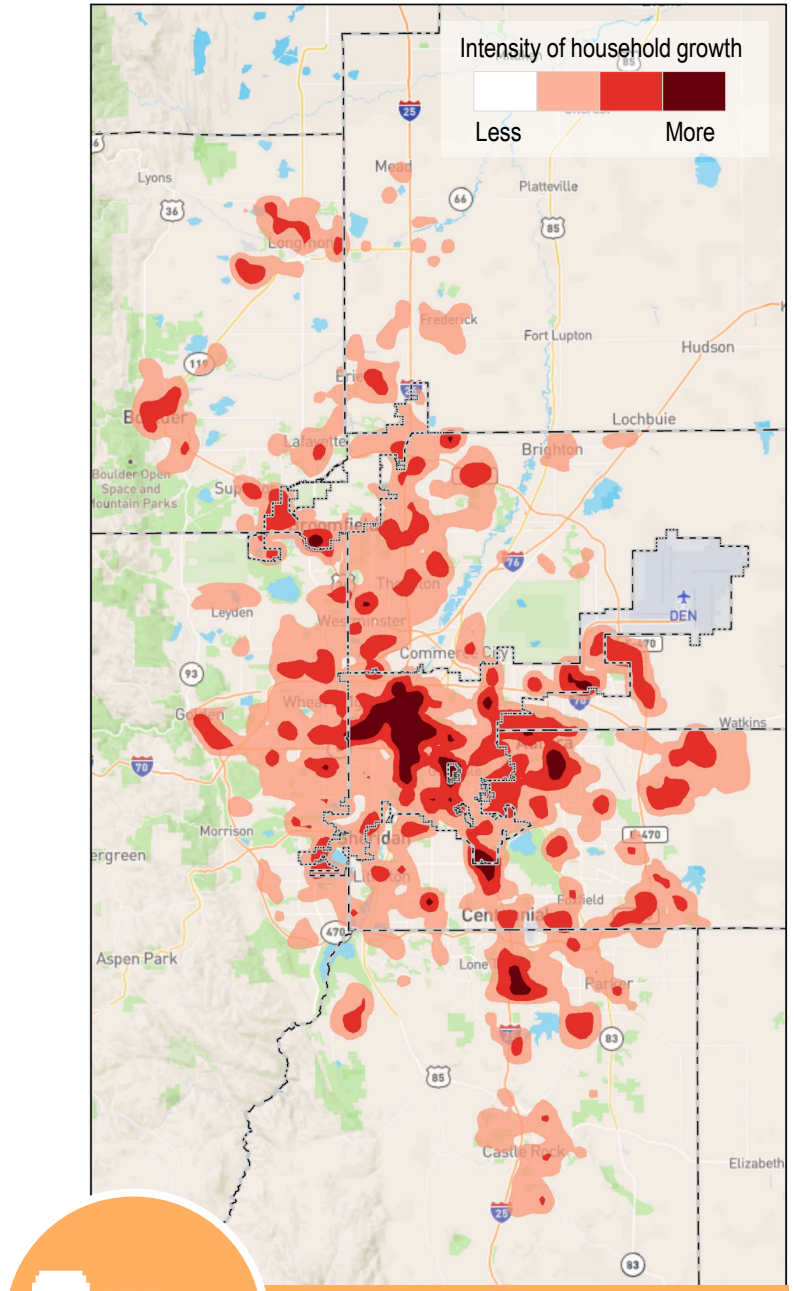
Baseline 2050 + **Travel Choices**

Centers

Baseline 2050 + **Transit**

Infill Scenario

*What if local governments allow for more **urban and suburban redevelopment and infill**?*



Infill

Infill Outcomes

Compared to the 2050 Base

6% decrease in vehicle miles traveled

People in vehicles experience **11% less delay** on average

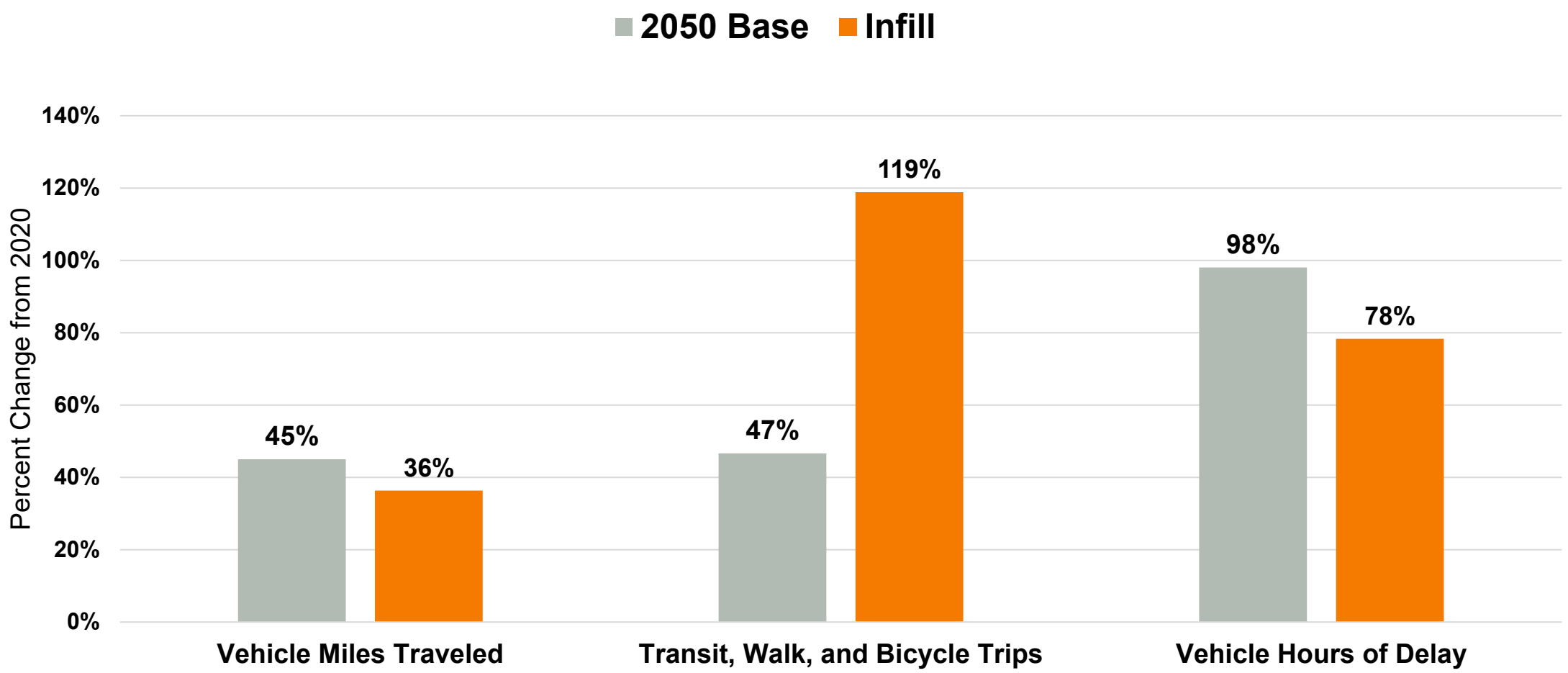
Almost **twice** as many transit trips

(and a 50% increase in walk and bike trips)

A range of housing options across the region benefits individuals and families and can improve the economic vitality and diversity of local communities.

Commercial vehicle trips decrease with consolidation of stops.

Infill Change from 2020



Infill + Travel Choice Scenario

Increase travel & mobility choices along region's major arterials.

Allow for more housing/jobs in **existing urban and inner suburban areas**

+

Active transportation is encouraged through **better infrastructure and lower speeds** on high activity urban arterials

Telecommuting & other Transportation Demand management (TDM) strategies

Infill + Travel Choice Outcomes

Compared to the 2050 Base

Vehicle miles traveled decreases by **14.5 million** each day

(~11% less VMT compared to the 2050 Base)

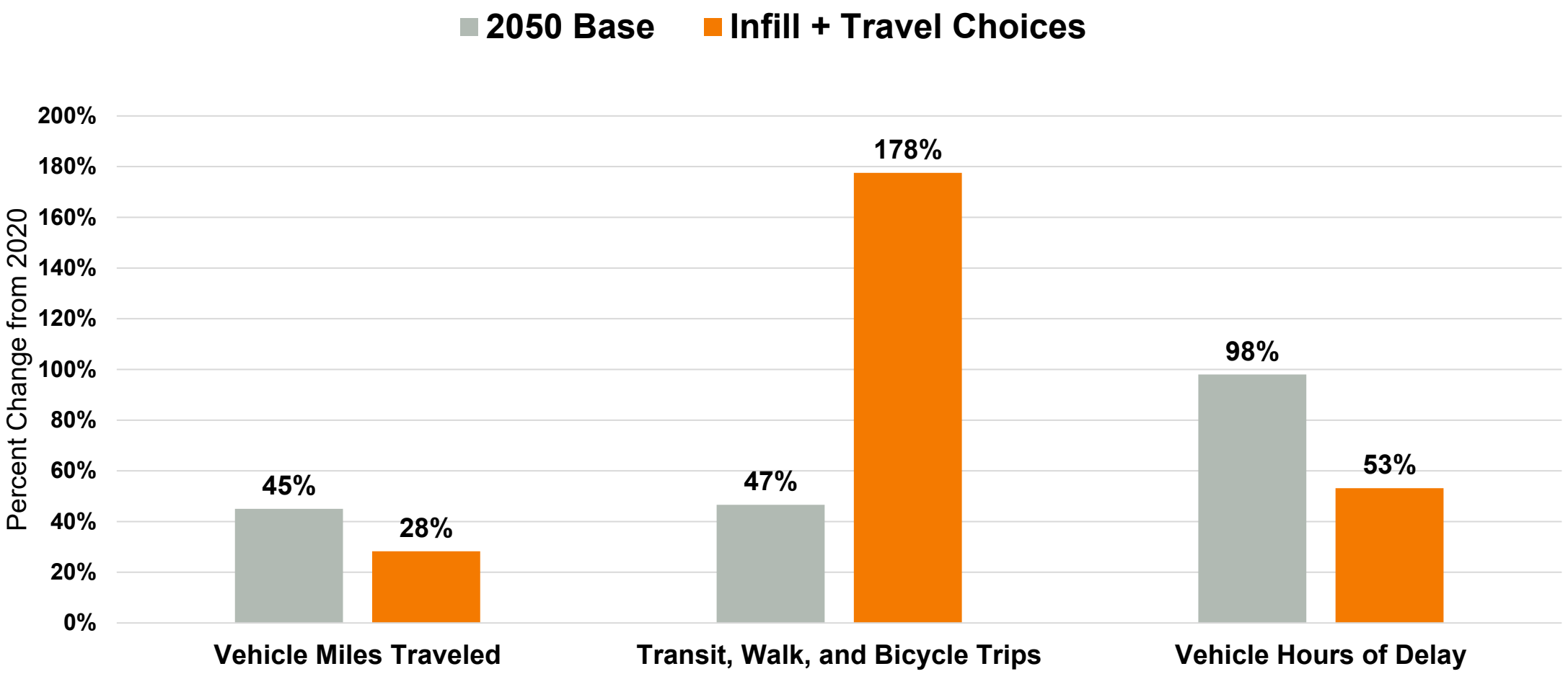
Twice as many walking and biking trips

(~16% of all trips taken in the region)

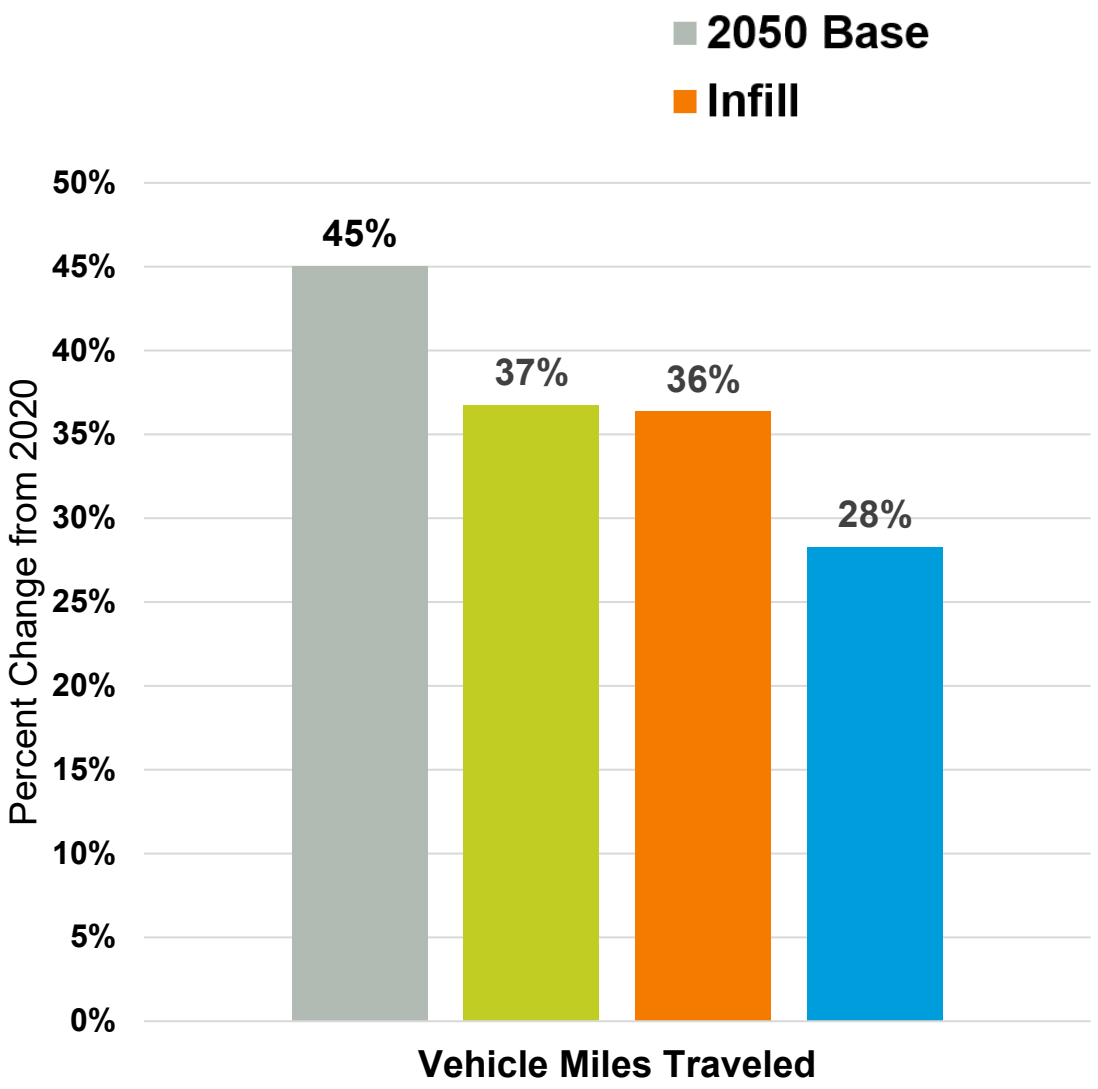
A range of housing options across the region benefits individuals and families and can improve the economic vitality and diversity of local communities.

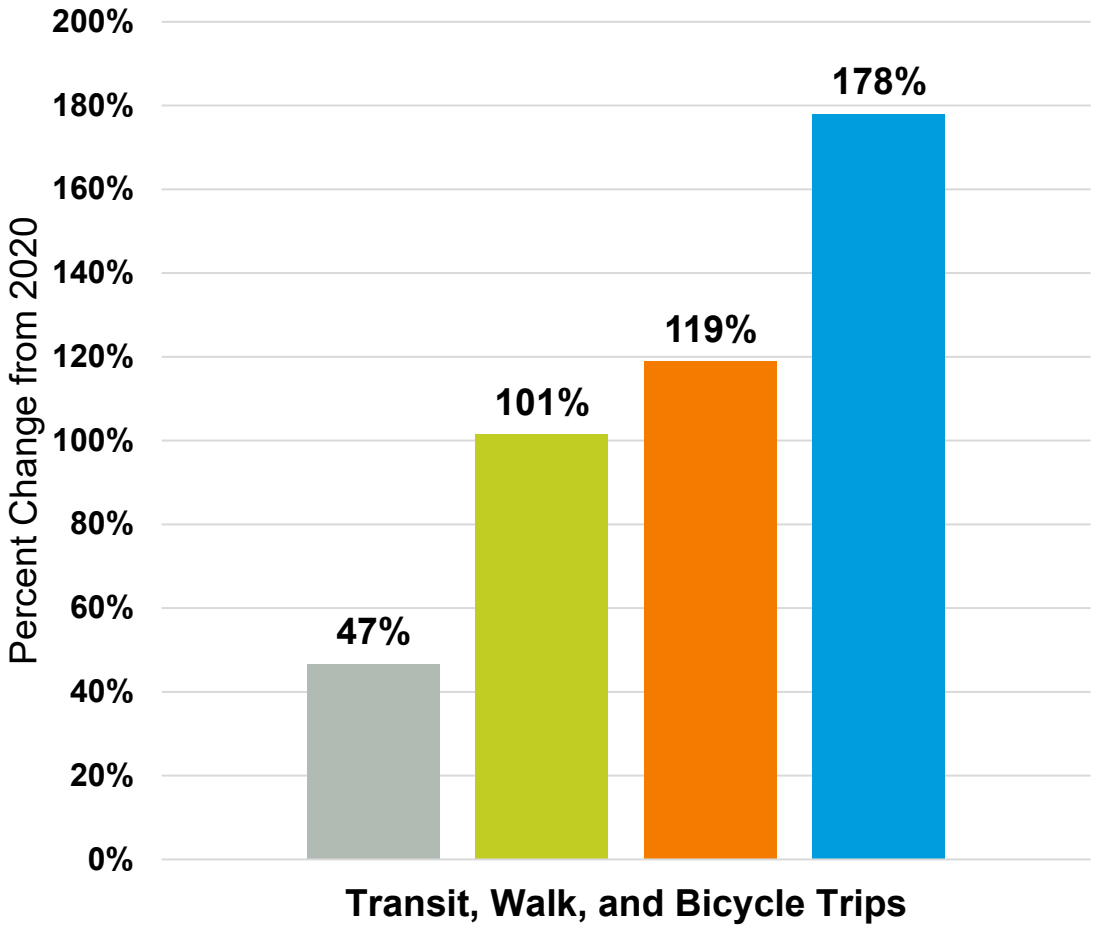
More transit trips than in the "Transit" Scenario.

Infill + Travel Choices
Change from 2020



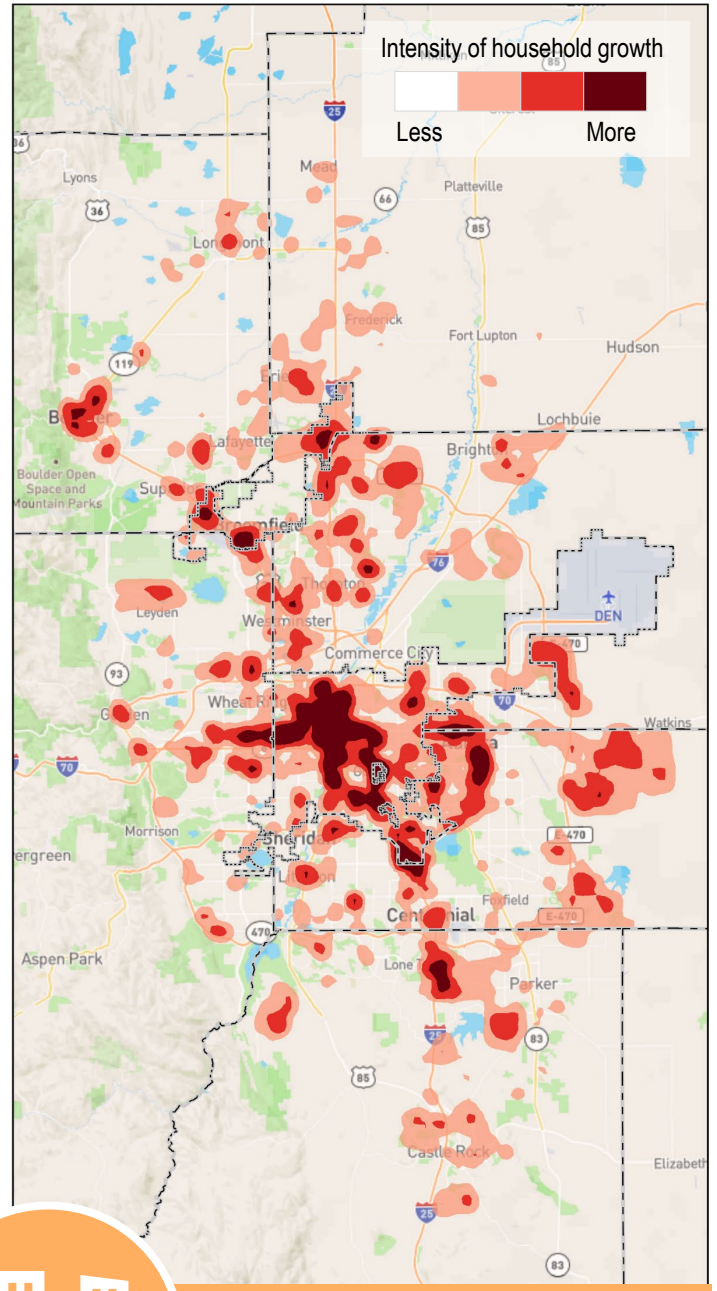
Scenario Comparisons
Change from 2020





Centers Scenario

*What if local governments focus opportunity for development around **key centers and corridors**?*



Centers

Center Outcomes

Compared to the 2050 Base

8% decrease in vehicle miles traveled

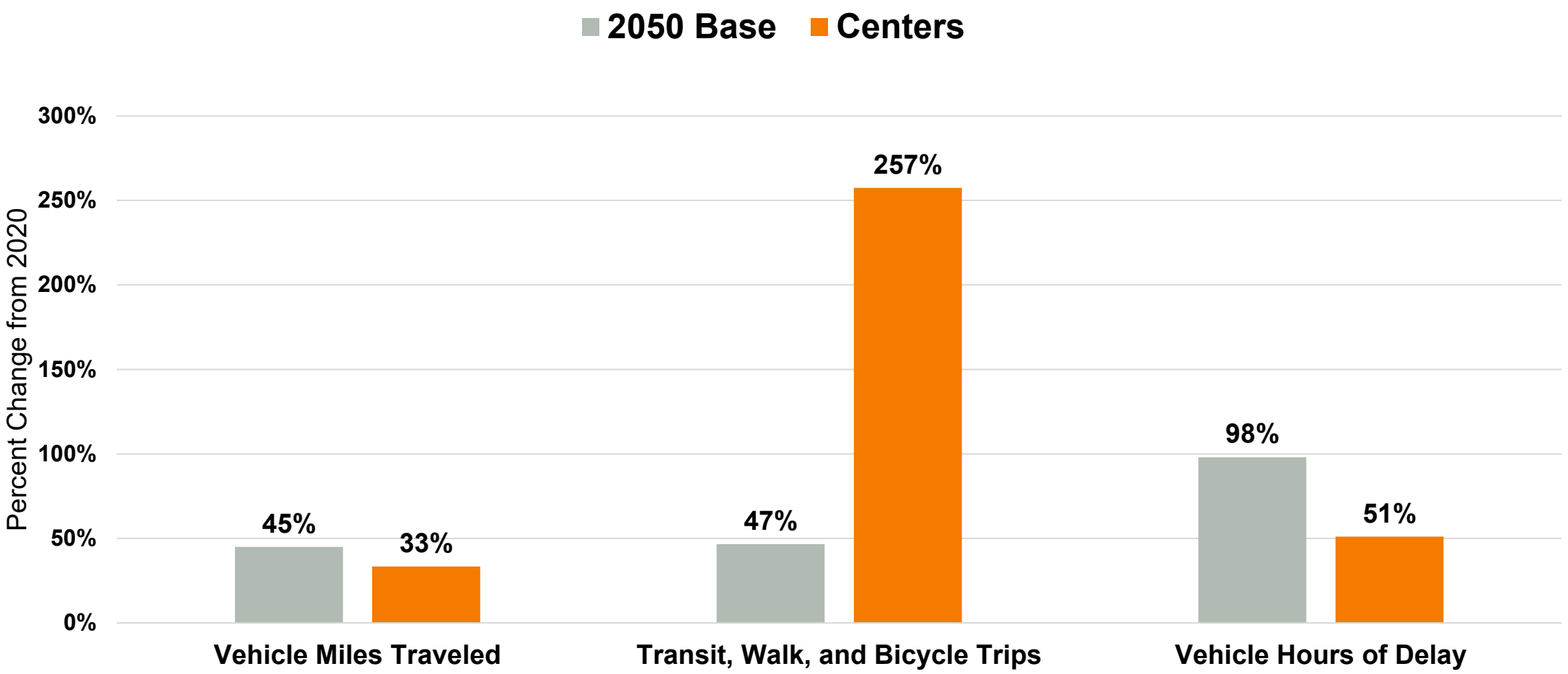
Over **3 times** as many transit trips

Over **twice** as many walk and bicycle trips

Connected urban centers across the region accommodate a growing share of the region's housing and employment and support existing neighborhoods.

Average Person Delay per Trip decreases by 27%. Some localized areas experience more congestion.

Centers Change from 2020



Centers + Transit Scenario

Improve/expand the region's transit network and service.

Focus housing/jobs around **key centers and corridors**

Cost of driving and parking increases significantly

+

Completion of **FasTracks and additional miles of rail**

Extensive **BRT network** and expanded service

Free fares & improved station/stop access

Centers + Transit Outcomes

Compared to the 2050 Base

Vehicle miles traveled **decrease 24%**

3 times as many walk and bicycle trips

6 times as many transit trips

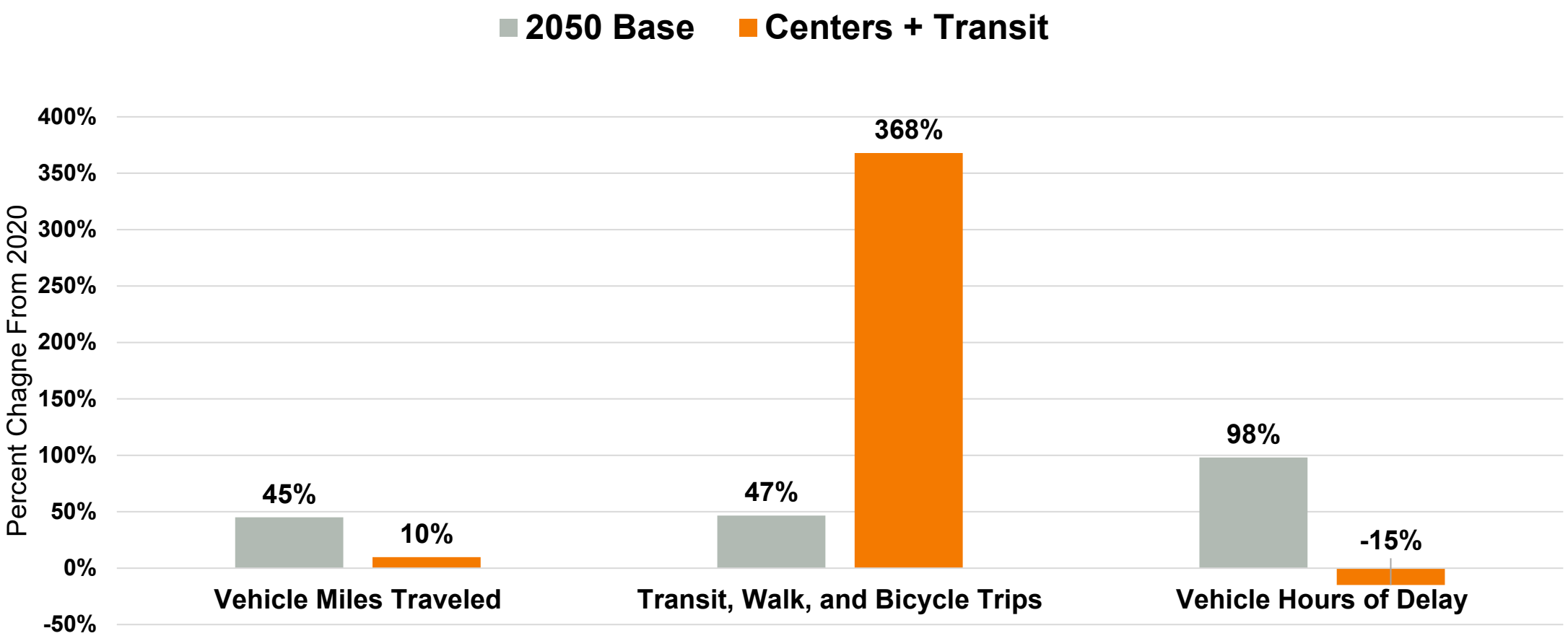
(2.4 million transit trips daily)

Connected urban centers across the region accommodate a growing share of the region's housing and employment and support existing neighborhoods.

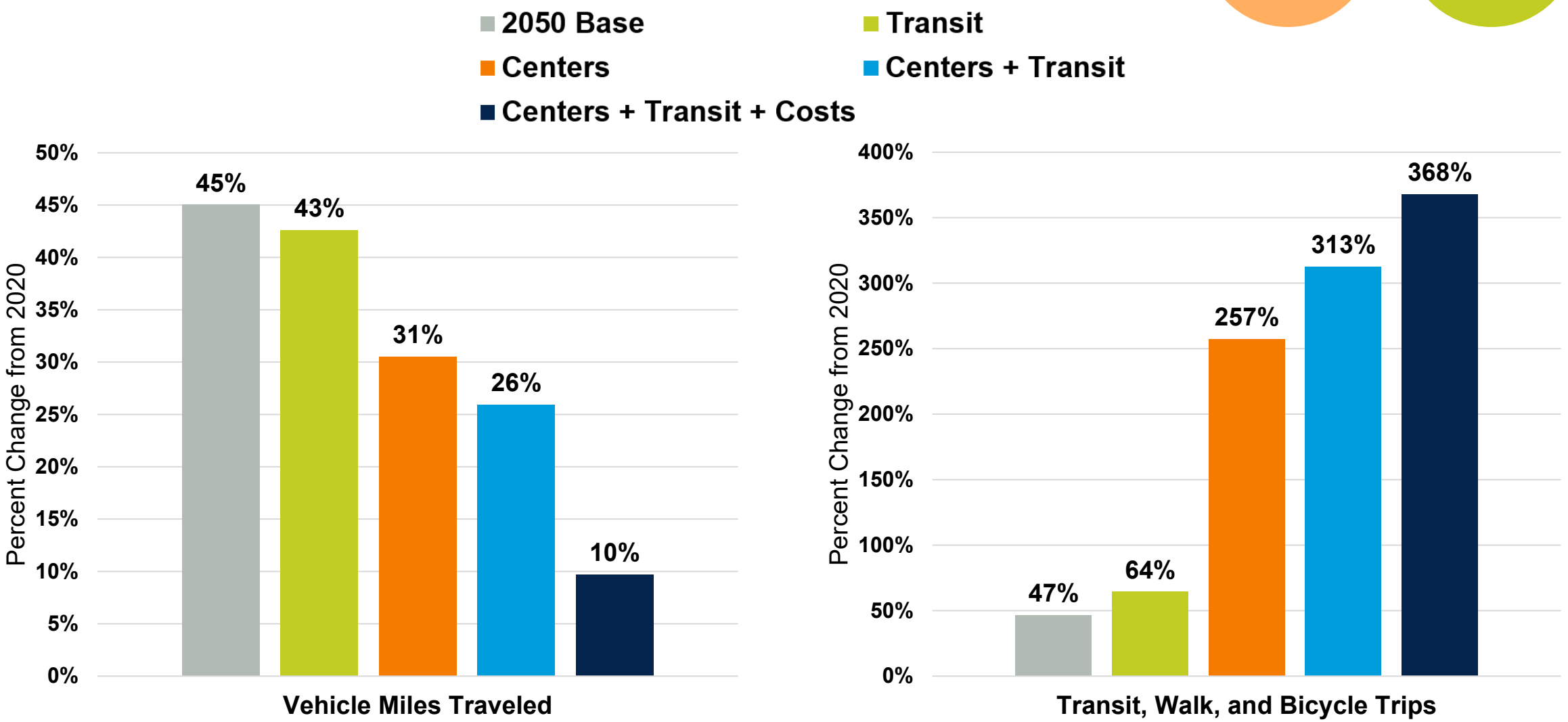
More total person trips since there is more free-time for short trips.

People in vehicles experience 50% less delay on average.

Centers + Transit Change from 2020



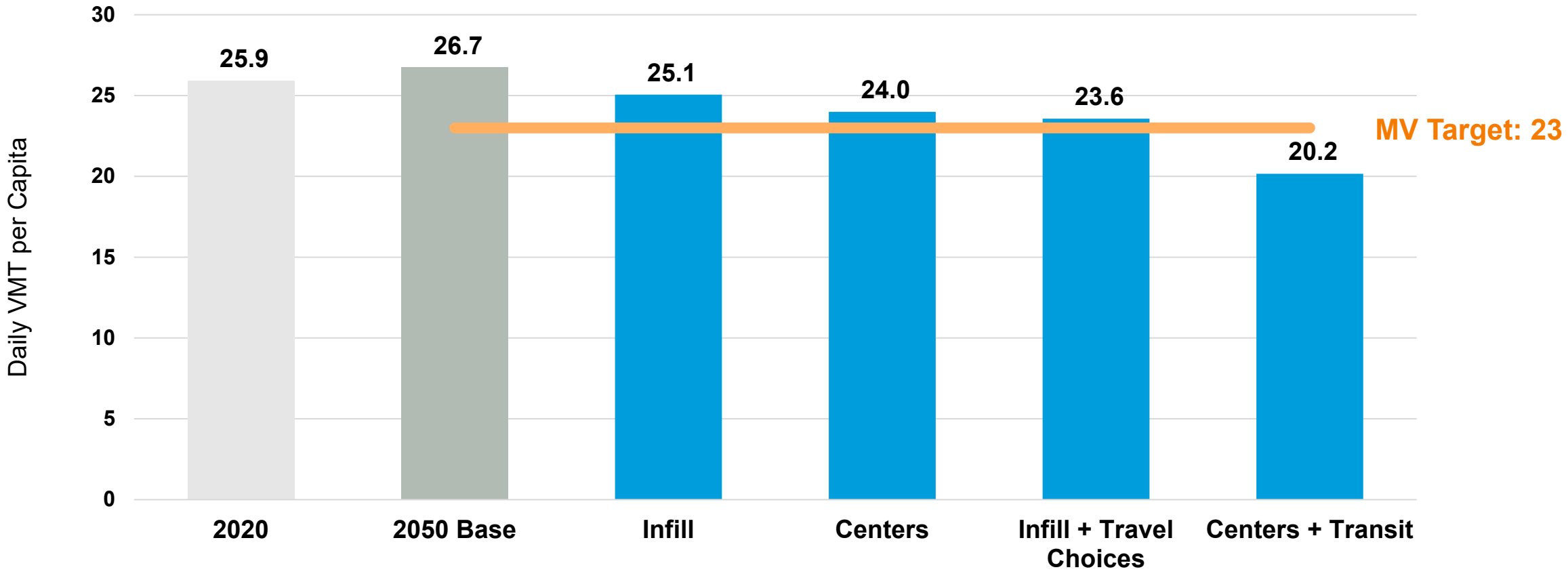
Scenario Comparisons
Change from 2020



METRO VISION TARGETS

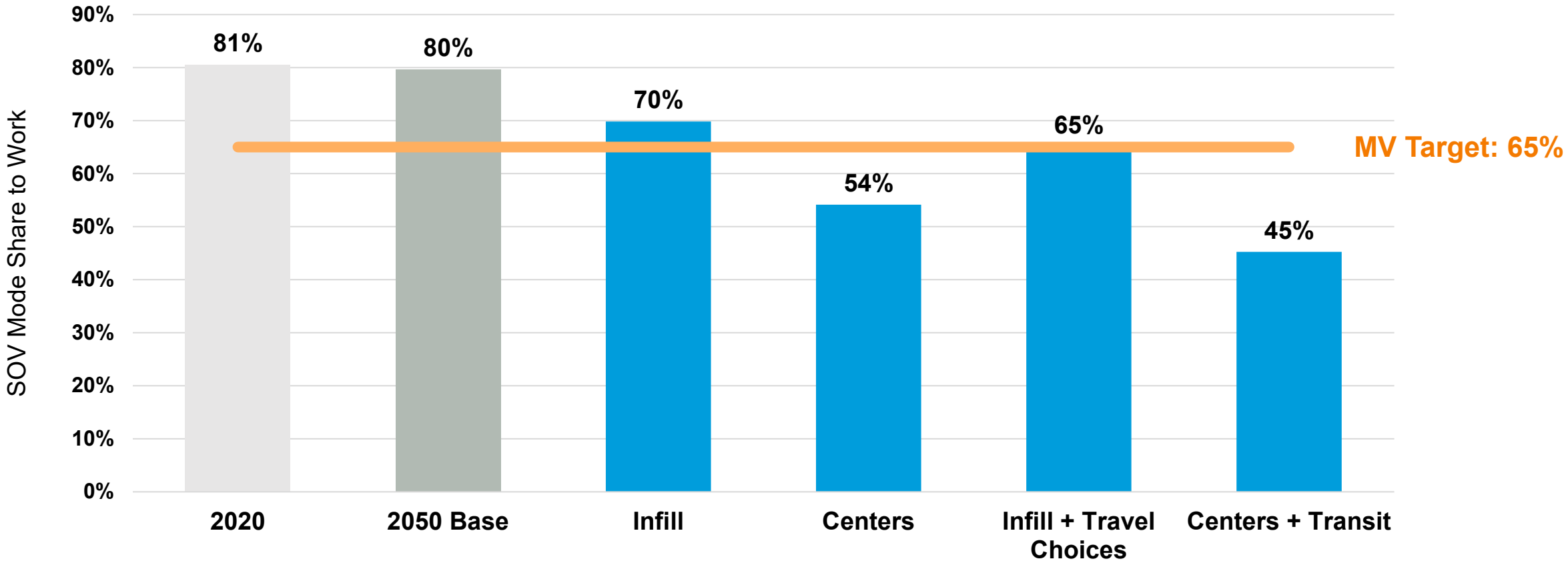
Land Use + Transportation Scenarios
Metro Vision Targets

Reduce Daily Vehicle Miles Traveled (VMT) per Capita

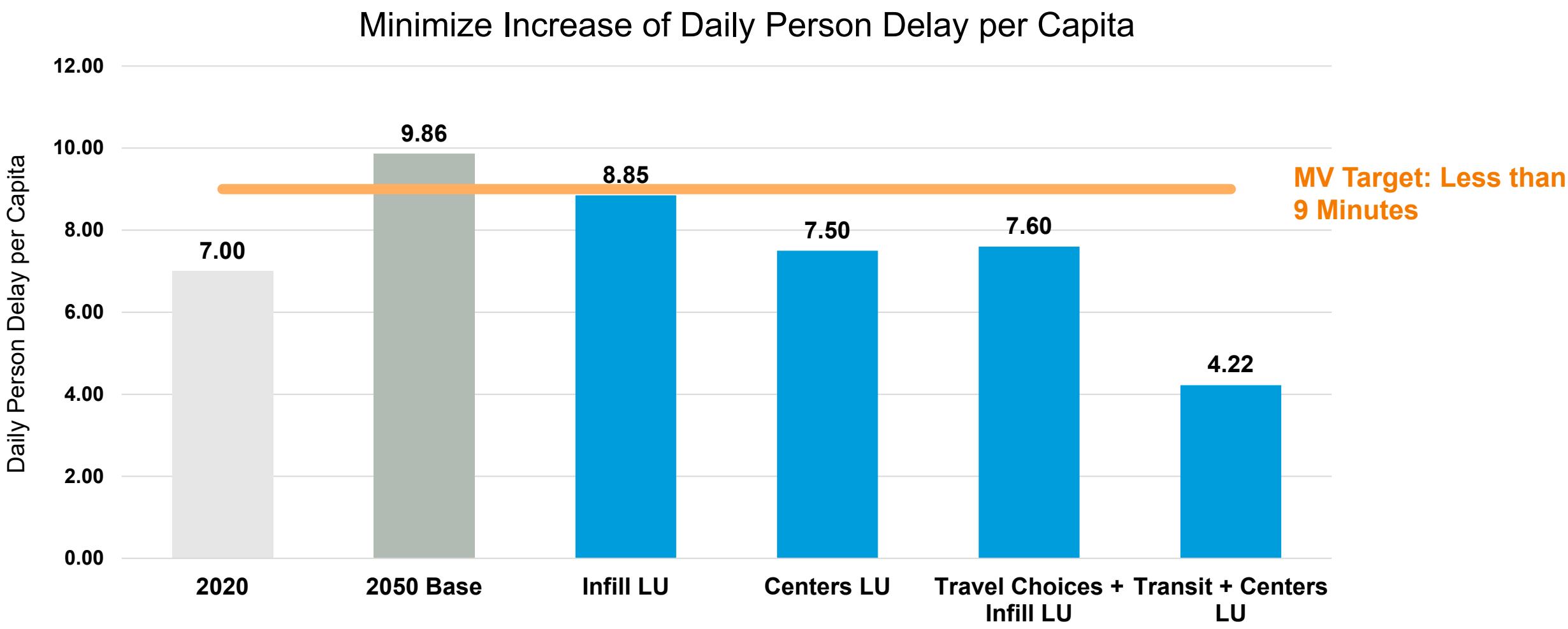


Land Use + Transportation Scenarios
Metro Vision Targets

Reduce Single-Occupant Vehicle (SOV) Mode Share to Work

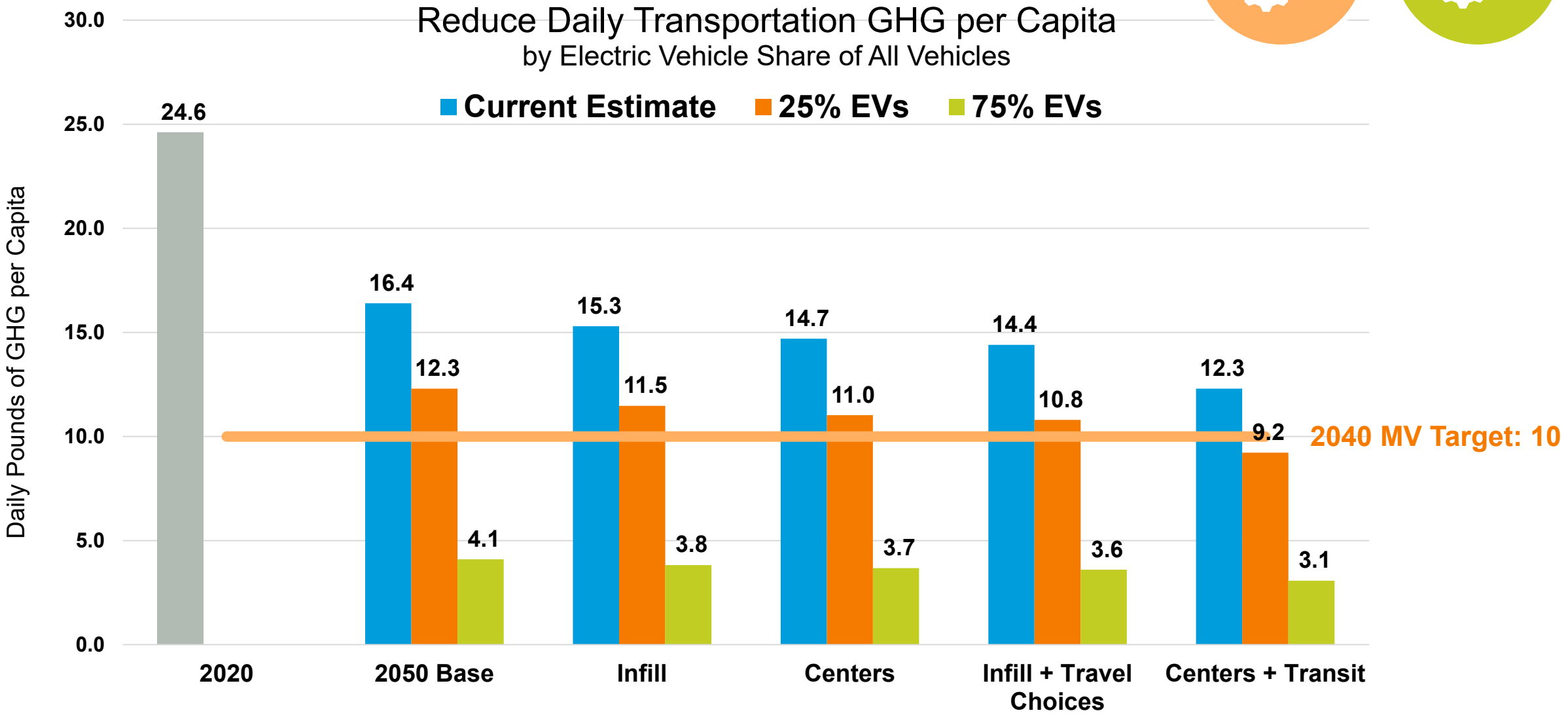


Land Use + Transportation Scenarios
Metro Vision Targets



ELECTRIC & AUTOMATED VEHICLES

EV Adoption Rates
Metro Vision Targets



Automated/Connected Vehicles

Mobility technology & autonomous vehicles benefit or impact regional mobility.

Potential Positive Effects

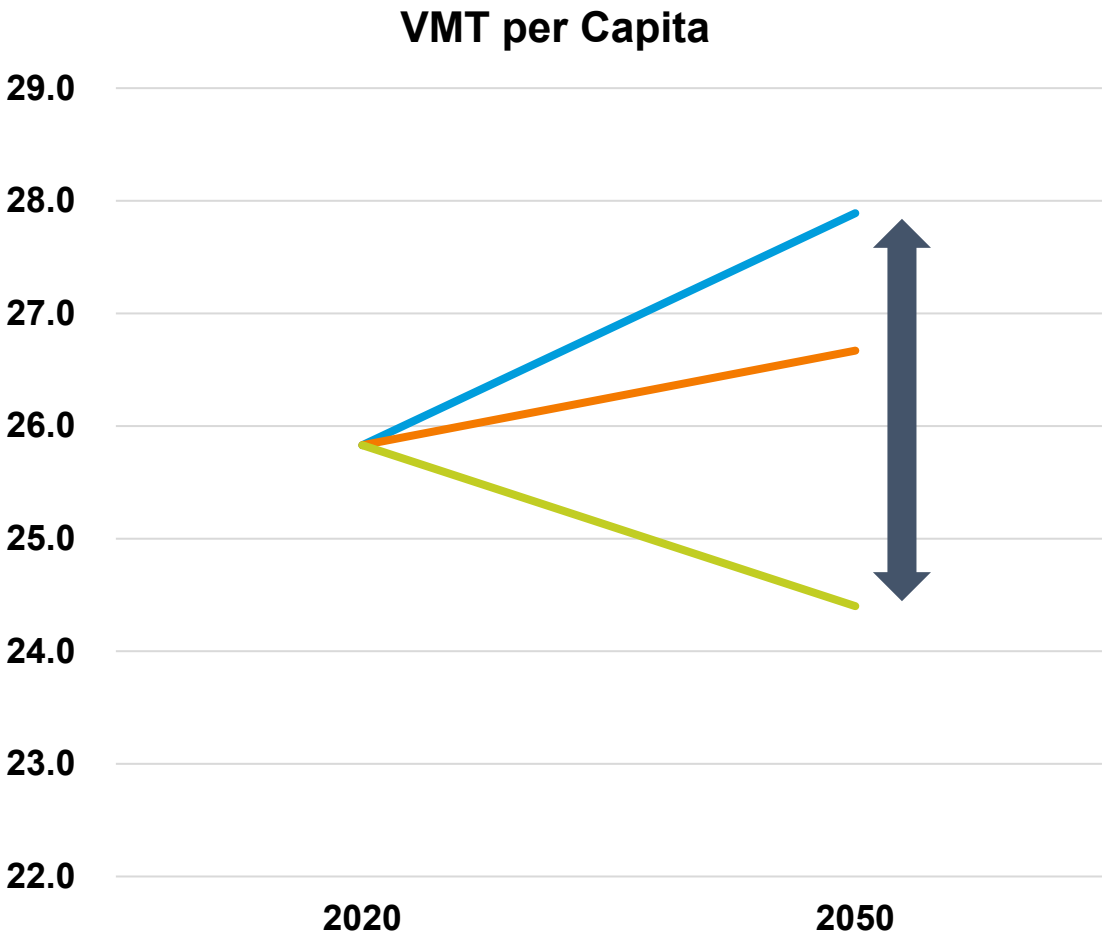
- Vehicles and roadways operate efficiently and increasing capacity
- Decreased demand and cost of parking
- More shared rides
- Safety – Decreased crashes and incidents

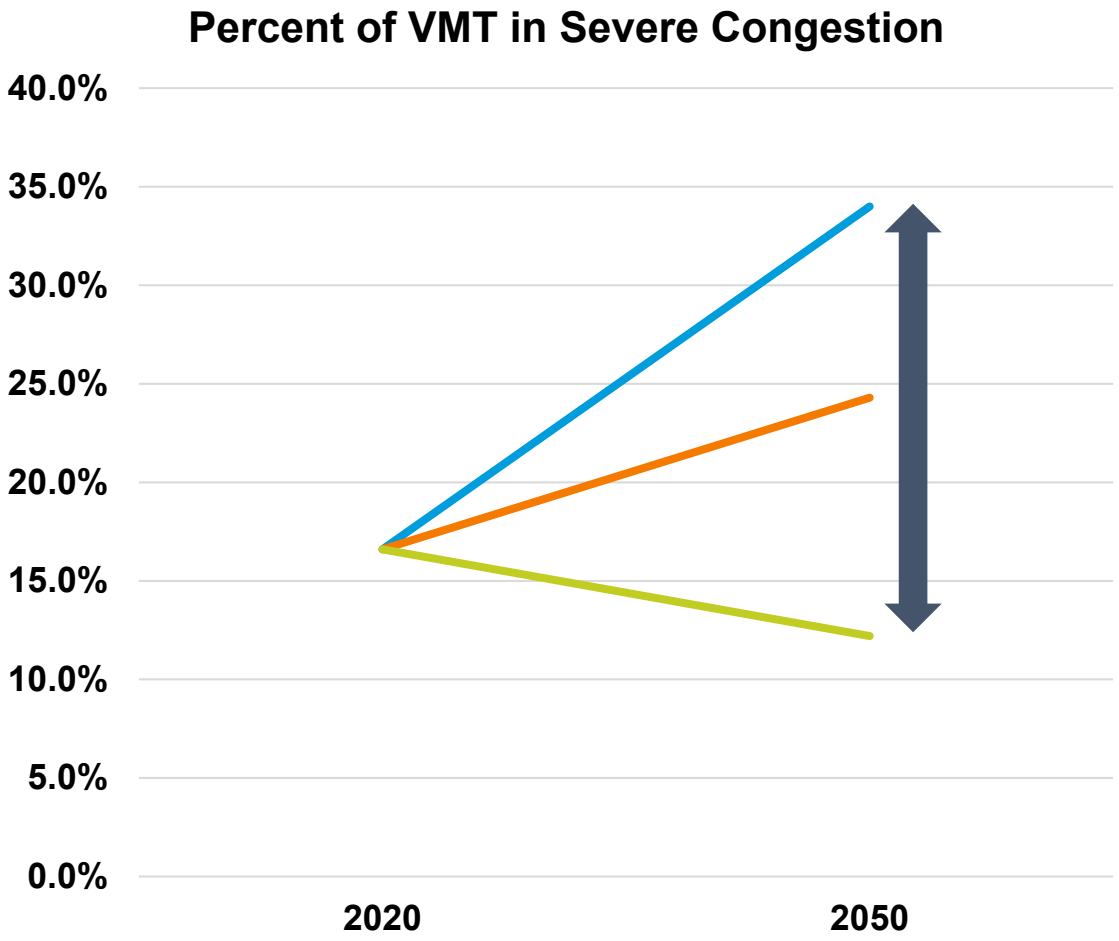
Potential Negative Effects

- Decreases freeway and ramp capacity (more spacing between vehicles)
- More demand for parking
- More zero occupancy vehicles
- Increased driving because of ability to multitask

Automated/Connected Vehicles

Connected/ Autonomous Vehicles (Inefficiencies)
2020 Base to 2050 Base
Connected/ Autonomous Vehicles (Efficiencies)





Scenario Planning Engagement

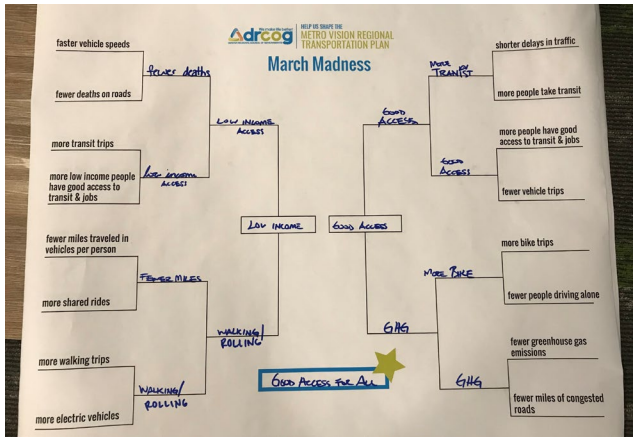
- Meetings with the **Youth Advisory Panel** and **Civic Advisory Group** in February and March

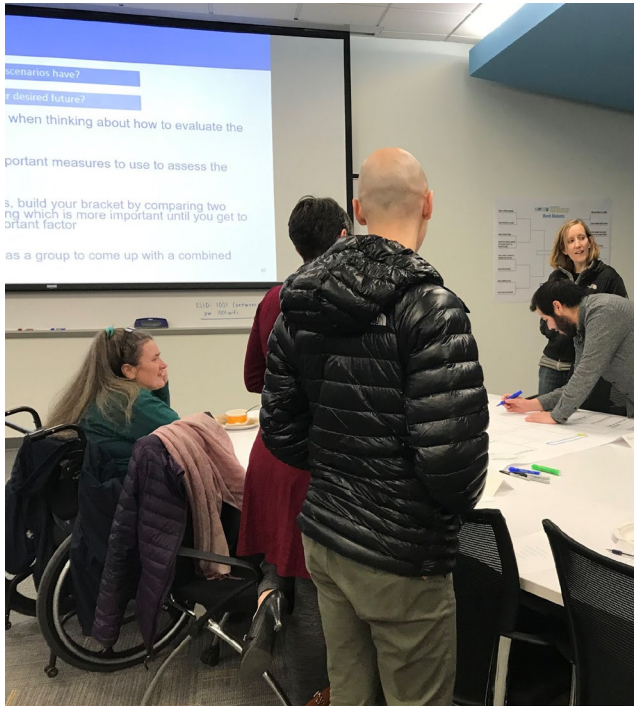
- "**March Madness**" activity to prioritize the relative importance of scenario assessment measures

- We asked:

What are the most important measures to use to assess the different scenarios?

The “Final Four” Top Priority Measures





Youth Advisory Panel:

- Fewer deaths on roads
- More electric vehicles
- Fewer greenhouse gas emissions
- **More people have good access to *electric* transit & jobs**

Civic Advisory Group:

- More low-income people have good access to transit & jobs
- More walking/rolling trips
- Fewer greenhouse gas emissions
- **More people have good access to transit & jobs**

Next Steps

- Today: Absorb plethora of scenario results

- April TAC: Implications of scenario results for 2050 MVRTP
  - How should scenario results shape project identification & evaluation?
  - How should scenario results shape financial plan investment strategies?