

THE  
**MAX**  
Tunnel Study

Examining the feasibility of faster light rail



Metro

OCTOBER 2019



# CHALLENGES

## EVERY DAY, THOUSANDS RIDE TRIMET BUSES AND MAX INTO AND THROUGH PORTLAND'S CENTRAL CITY.

People ride to work, to school, to the doctor, or to meet with friends, family and colleagues. For some, downtown Portland is the final destination; others are passing through on their way to places like Hillsboro, Beaverton, and Gresham.

The central city—the 14 neighborhoods closest to downtown on the east and west sides of the Willamette River—is the hub of our regional transportation system and a significant employment center. The region has grown and the central city can be a transportation bottleneck, impeding travel into and through the city's core. In downtown Portland, MAX trains share space with cars, bikes and pedestrians, and the congestion slows down everyone.

TODAY, MAX TRAINS ARE

# 3X TO 4X

FASTER OUTSIDE OF DOWNTOWN THAN THROUGH IT



BY THE YEAR 2040 THERE WILL BE:



**400k** MORE PEOPLE



**260k** MORE JOBS



WHICH WILL MAKE CONGESTION

# WORSE

## DEMAND FOR TRIMET SERVICES WILL ONLY INCREASE WITH THE REGION'S GROWTH AND MAX EXPANSION

### PUBLIC TRANSIT GROWTH: CONNECTING EAST + WEST

# 190% to 200%

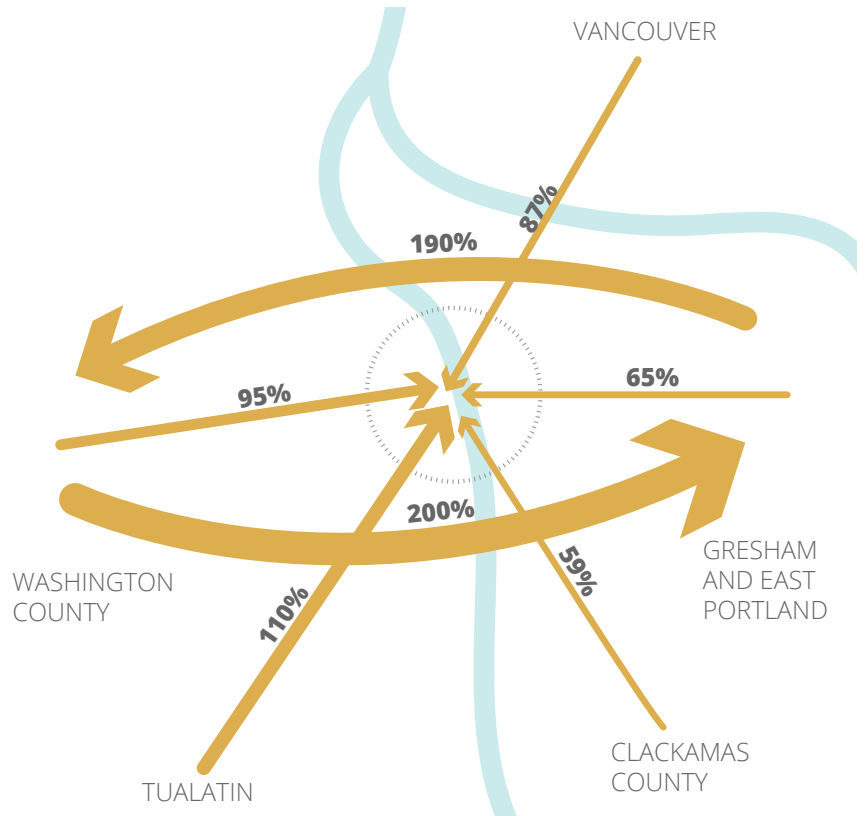
increase in transit trips between Washington County and East Multnomah County by the year 2035, assuming the transit system provides fast and reliable service

# 30% to 35%

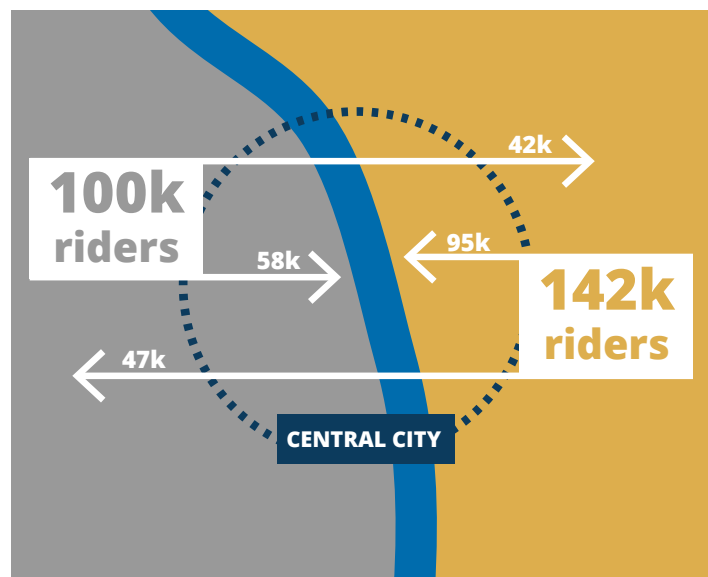
increase in travel by any mode, including driving, between Washington County and East Multnomah County

# 65% to 95%

Increase in transit trips between downtown Portland and the east and west sides



Growth in average weekday transit use by the year 2035 assumes service keeps pace with demand and MAX lines reach Vancouver and Tualatin.



In 2035, over 80,000 people will take transit across the Willamette River—and over 200,000 into the central city on an average weekday.

## Pinch Point

## DOWNTOWN



As the population has grown, so has congestion, with different modes of travel competing for limited space. The region continues to expand and mobility demands increase, and the constraints of the urban landscape challenge the transit system.

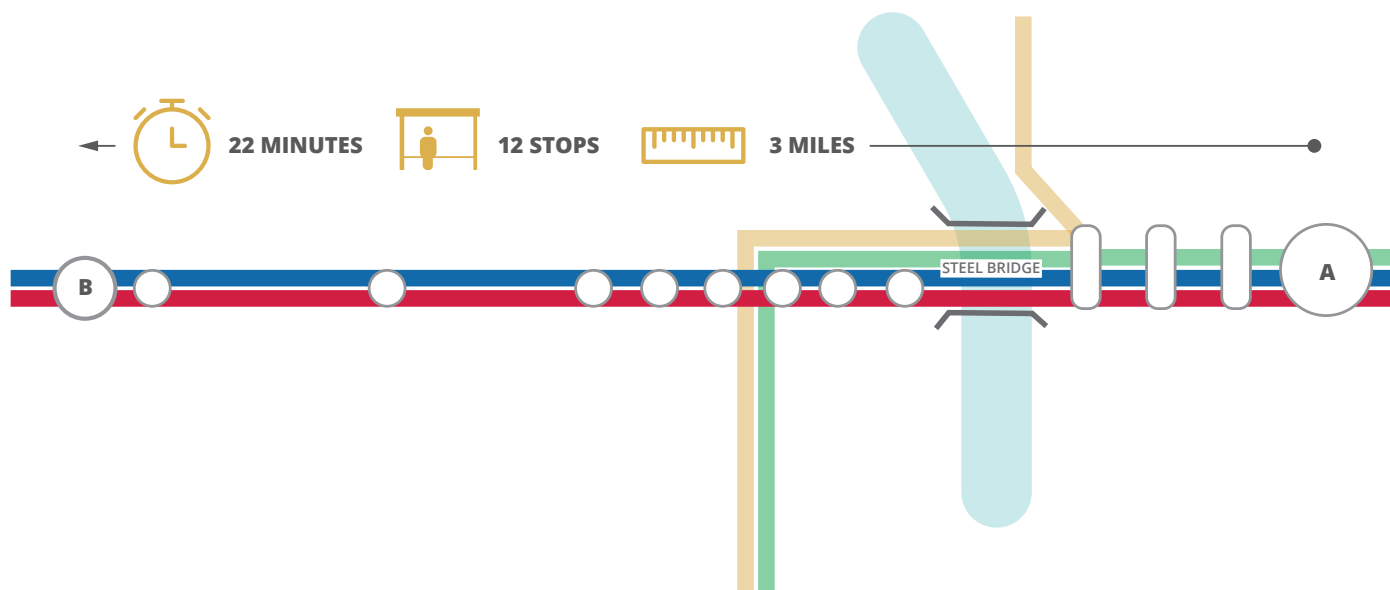
Downtown is also subject to frequent vehicle conflicts in the light rail right-of-way that interfere with rail operations and result in delays on MAX Blue and Red Lines.

WE NEED TO MOVE

**MORE  
PEOPLE**

IN THE SAME AMOUNT OF SPACE

A TRIP **BETWEEN LLOYD CENTER AND GOOSE HOLLOW** TODAY IS:





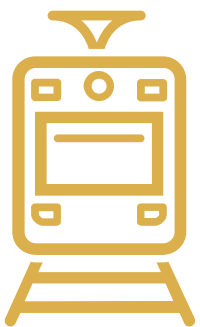
## Pinch Point

## STEEL BRIDGE



All of the region's light rail lines cross the river at the same place: the **Steel Bridge**. Built in 1912, the bridge slows down travel and impacts on-time performance. While TriMet is making investments in the Steel Bridge to help in the short-term, in the long-term a higher capacity solution is needed.

Downtown congestion and slowdowns at the Steel Bridge don't just impact the central city—they ripple throughout the entire region. They impact people's ability to get where they need to go, and impact businesses' ability to deliver goods and services. This is particularly challenging for people who live farther out and travel into or across downtown Portland.



TODAY,

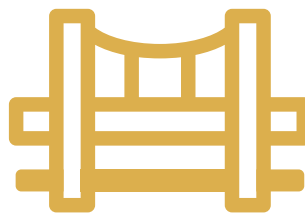
**40**

trains cross during the busiest hour—*one train every 90 seconds.*

IN 20 YEARS, we will need

**60 trains**

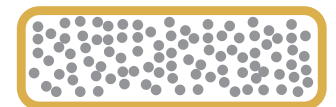
to keep up with projected population and employment growth.



**FURTHER  
STRAINING  
THE STEEL  
BRIDGE**

**WORSENING**

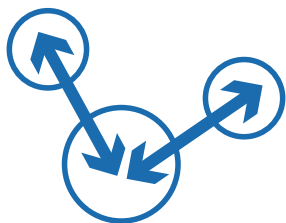
systemwide  
on-time performance  
compared to today

**OVERCROWDING**

on fewer trains

# SOLUTION

**A MAX TUNNEL WOULD INCREASE REGIONAL MOBILITY AND CAPACITY BY IMPROVING TRANSIT TRAVEL TIMES AND SYSTEM RELIABILITY TO AND THROUGH THE CENTRAL CITY.**



The tunnel would improve MAX travel time between the Lloyd District and Goose Hollow by up to 13 minutes, providing quick access to downtown Portland and to key destinations across the central city.



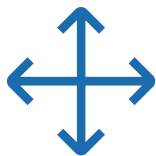
39% of regulated affordable housing in the region is within walking distance of MAX Blue Line stations. Shorter commute times mean people have access to more job opportunities and reducing dependence on cars lowers household transportation costs.



Faster transit attracts more riders. The tunnel would increase MAX Red and Blue Line ridership by up to 27% by 2035.



A tunnel would provide the region another option for crossing the river—generally tunnels have proven to be more resilient to earthquakes than bridges and surface systems.



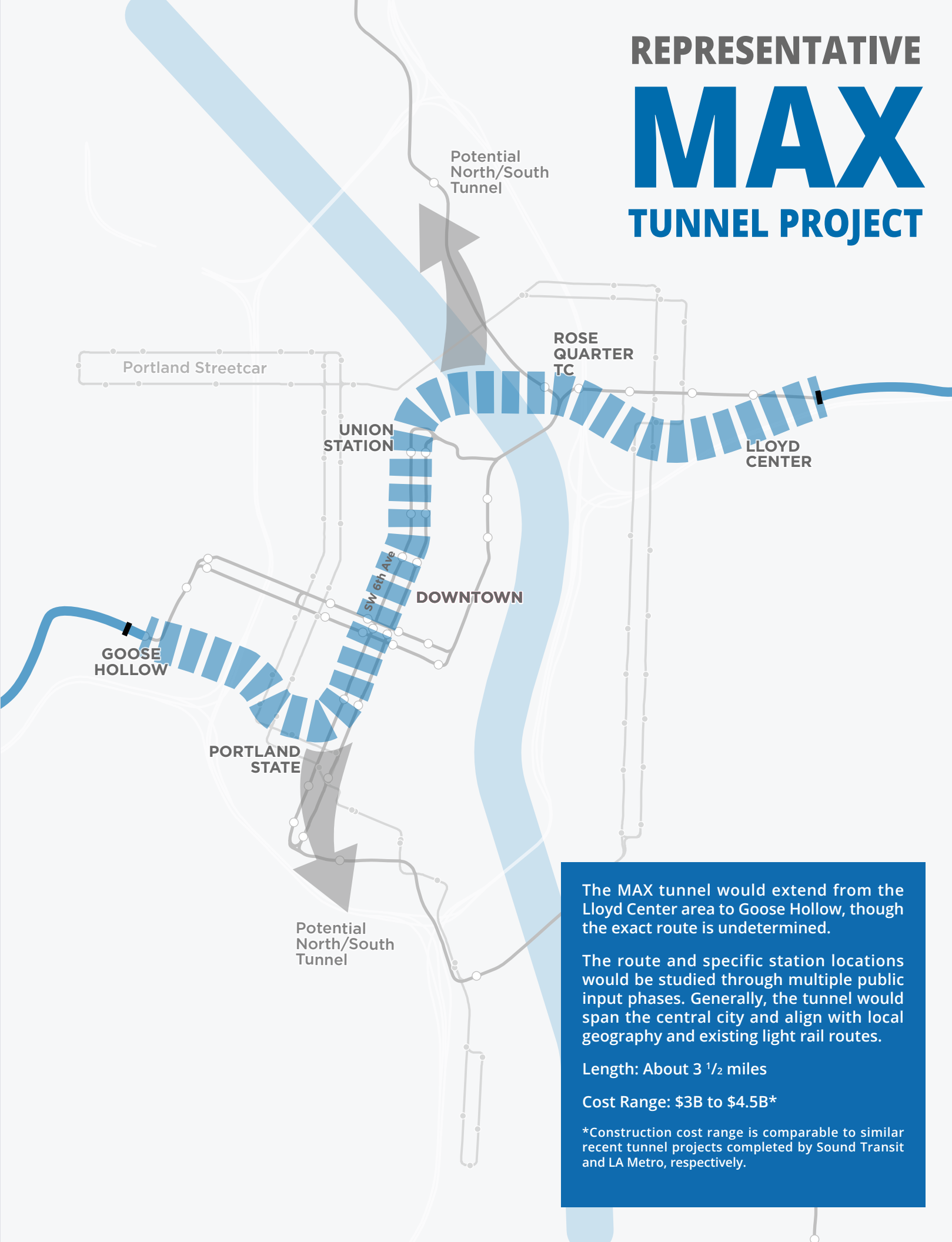
The tunnel would improve future MAX on-time performance to levels better than today, even with higher ridership, so people can count on getting to jobs, school, or appointments on time.



Increased MAX use reduces air pollution and greenhouse gas emissions, supporting progress toward the region's climate goals.



# REPRESENTATIVE MAX TUNNEL PROJECT



The MAX tunnel would extend from the Lloyd Center area to Goose Hollow, though the exact route is undetermined.

The route and specific station locations would be studied through multiple public input phases. Generally, the tunnel would span the central city and align with local geography and existing light rail routes.

Length: About 3 1/2 miles

Cost Range: \$3B to \$4.5B\*






\*Construction cost range is comparable to similar recent tunnel projects completed by Sound Transit and LA Metro, respectively.

# MAX TUNNEL BENEFITS

## 1

### Travel Time Savings

Routing MAX through a tunnel under downtown Portland and the Willamette River would save people time and make MAX as fast as or faster than driving. This would lead to even greater benefits such as lower car ownership costs, less traffic, less constrained parking downtown, and reduced greenhouse gas emissions.

LLOYD CENTER → GOOSE HOLLOW			GRESHAM TC → SUNSET TC		
	TODAY	2035 PROJECTION (includes tunnel)		TODAY	2035 PROJECTION (includes tunnel)
	22 minutes	+/- 9 minutes		65 minutes	+/- 52 minutes
	20 minutes	30 minutes		45 minutes	65 minutes
	18 minutes	18 minutes			

*Transit travel time estimates based on midday schedules.  
Automobile travel time based on average travel times today, and  
a 50% time increase in the future due to congestion.*



# 2

## Improved Reliability

For the many people in the region who rely on public transit as their primary transportation, a light rail tunnel would sustain the MAX service they count on for access to school, jobs, recreation and other opportunities. Today, average on-time performance is 87%, higher than just a year ago, but still below the over 90% we can expect with a tunnel. Train delays average 2 ½ minutes, with one in eight delays lasting between 5 and 8 minutes.

Trying to accommodate increased ridership with today's infrastructure on east-west MAX lines would substantially drop on-time performance in the future. Average delays would stretch to over 3 ½ minutes, with one in eight trains running more than 8 minutes late.

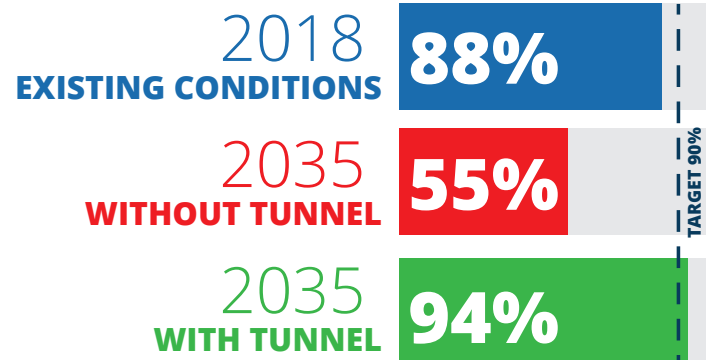
TRYING TO ACCOMMODATE  
**INCREASED  
RIDERSHIP**

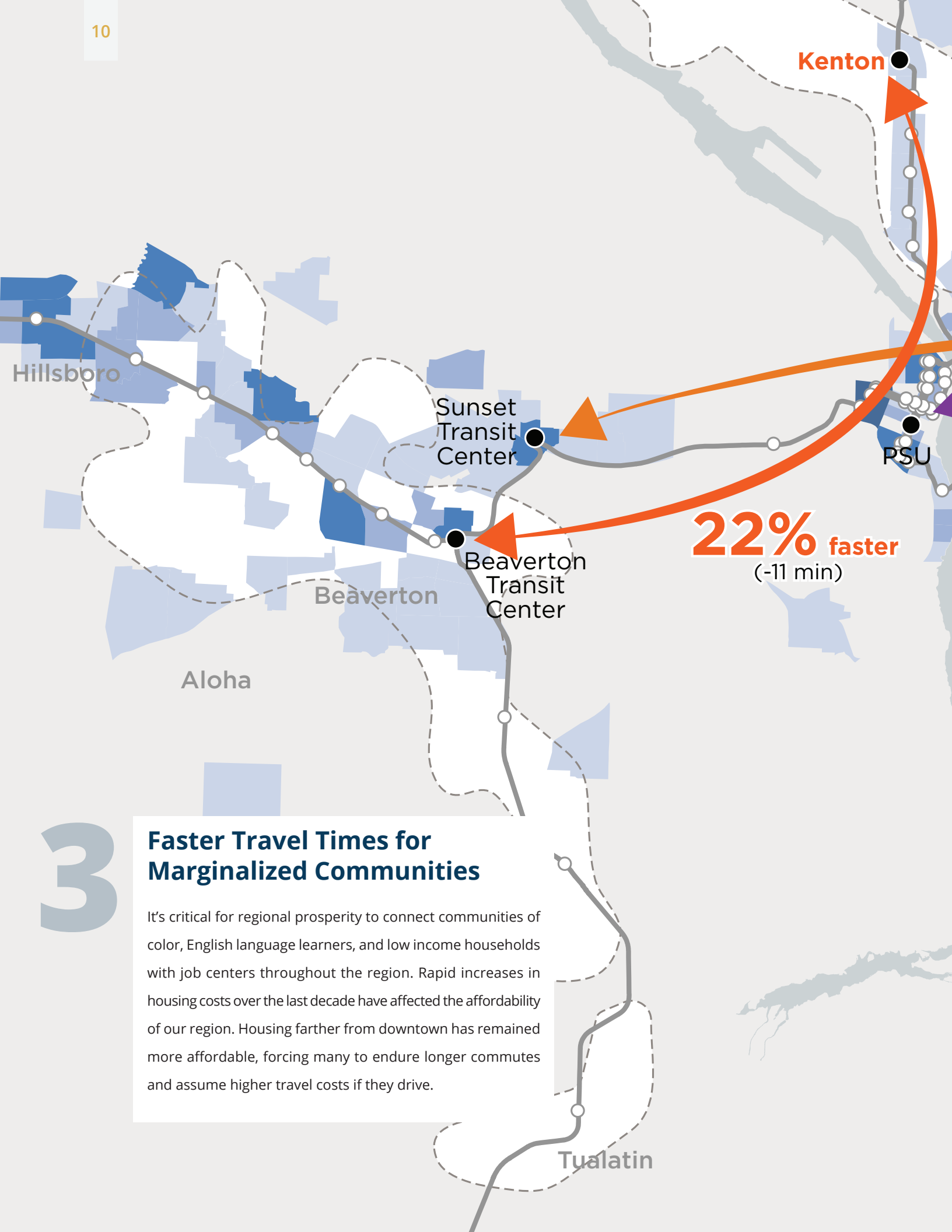
WITH TODAY'S INFRASTRUCTURE  
WOULD RESULT IN

**HALF**

OF MAX TRAINS LATE TO THE STATION

### ON-TIME PERFORMANCE



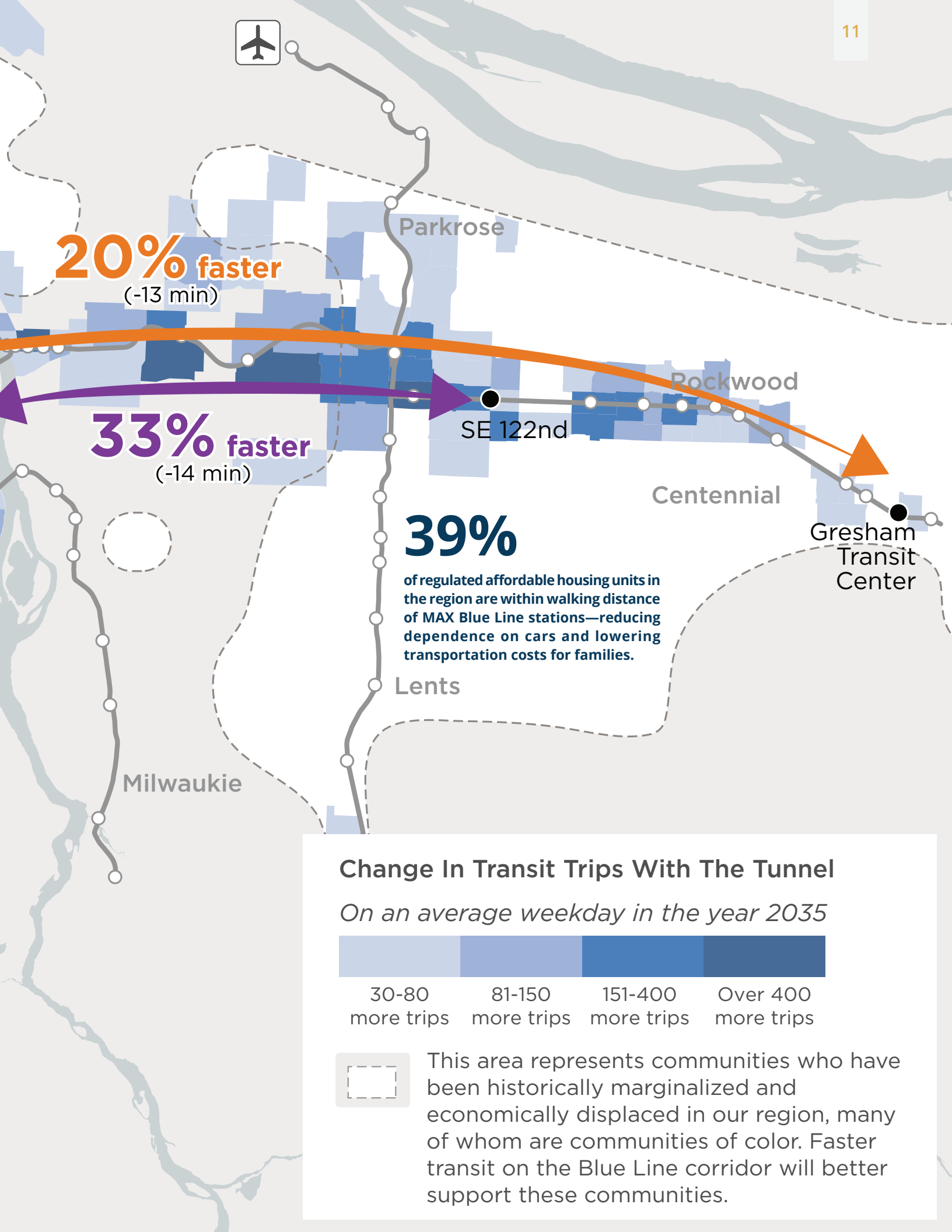


## 3

### Faster Travel Times for Marginalized Communities

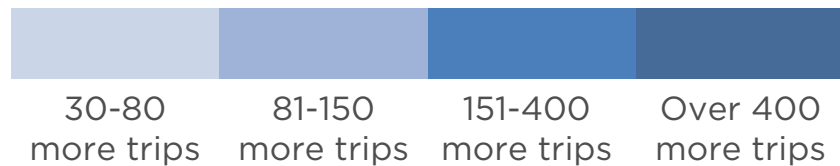
It's critical for regional prosperity to connect communities of color, English language learners, and low income households with job centers throughout the region. Rapid increases in housing costs over the last decade have affected the affordability of our region. Housing farther from downtown has remained more affordable, forcing many to endure longer commutes and assume higher travel costs if they drive.





### Change In Transit Trips With The Tunnel

*On an average weekday in the year 2035*

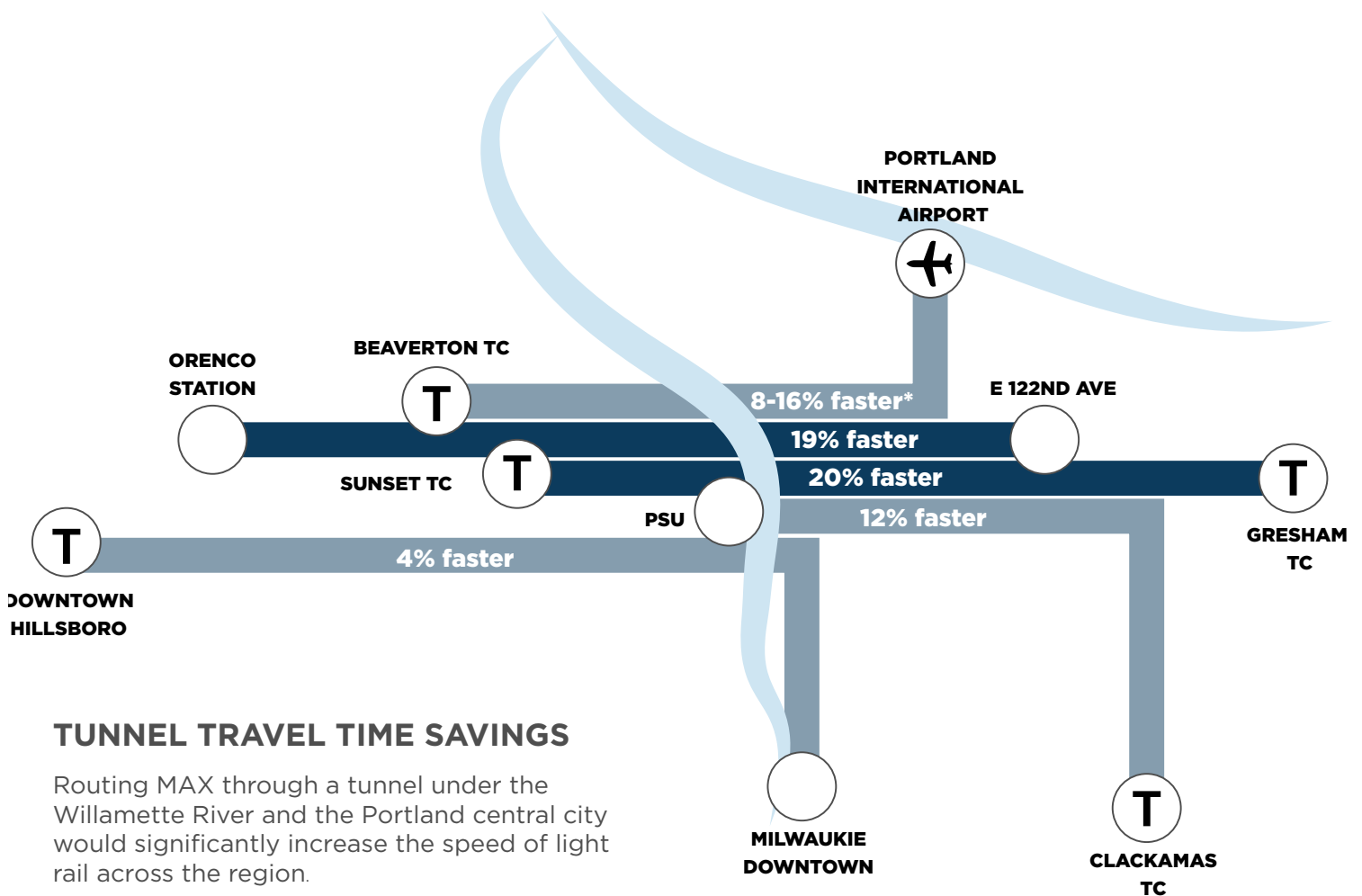


This area represents communities who have been historically marginalized and economically displaced in our region, many of whom are communities of color. Faster transit on the Blue Line corridor will better support these communities.

## 4

## Speed

The MAX tunnel can save over 12 minutes for a trip through the central city. Even people going to downtown Portland, to places like PSU or Pioneer Square, would save 5 to 6 minutes, depending on where they're coming from. While the MAX tunnel stations have yet to be determined, access to downtown destinations will be further enhanced by surface travel options like bus, streetcar, bikeshare, and a great walking environment.



Note: Assumes MAX Red Line does not operate in the tunnel. Decisions on tunnel routes have not been made.



## 5

## Resiliency

A MAX tunnel would add a resource to the regional transportation network that would be resilient to natural disasters and other regional disruptions.

It would join a growing resilient infrastructure network including the recently built Tilikum Crossing and the rehabilitated Sellwood Bridge. A MAX tunnel would offer a critical link to help the region recover from possible future events.

TriMet explored rehabilitating the Steel Bridge and found the small fixes would not substantially improve resilience in an earthquake. A new bridge would more likely survive a major seismic event,

but would not fully address traffic congestion and bottlenecks in the central city and would have major impacts on historic and environmental resources.

**Transportation is essential to our quality of life. Our current trajectory will lead to even more congested roads, crowded trains and buses, and more time going to, rather than enjoying places.**

## 6

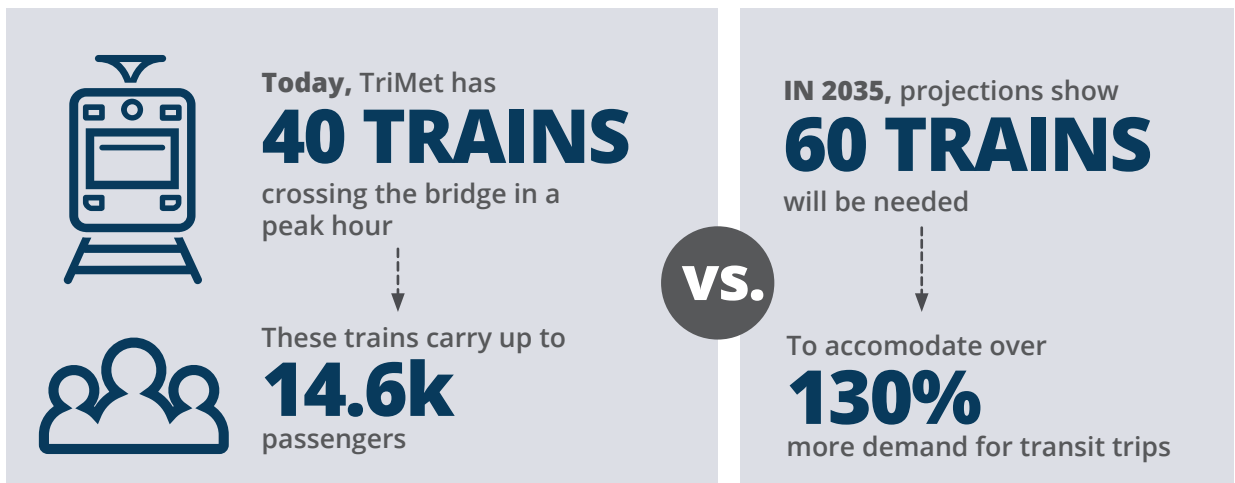
## Capacity

The MAX lines connect downtown Portland with dense and growing neighborhoods and employment areas. A comfortable and reliable transit system is essential to accommodating this growth—ensuring our communities provide social and economic opportunity for all, and help reduce greenhouse gas emissions.

The MAX tunnel will help make sure light rail is there for people even at the busiest times of day. To fit people comfortably in trains over the next 15 years,

we anticipate 60 trains crossing between the central city and Rose Quarter every day—a 50% increase in rail traffic. The MAX tunnel accommodates added service and maintains capacity on the Steel Bridge.

Today MAX is limited to 2-car trains because of the length of downtown city blocks. A tunnel could allow for longer trains if the stations outside the downtown core are retrofitted. In the long-term, this could greatly increase MAX capacity.



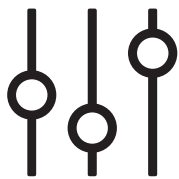
# PUBLIC INVOLVEMENT



The *MAX Tunnel Study* provided a preliminary assessment of a MAX tunnel to help decision-makers determine if a full study should be initiated. The purpose of a full study would be to include conceptual design, alignment alternatives, and environmental impacts analysis. Metro crafted targeted stakeholder engagement activities with three goals that will continue forward through all future analysis and studies:



Engage in a long-term conversation with stakeholders about the options to improve light rail travel across the region



Help people understand the benefits and drawbacks of the transit option being considered



Collect feedback, ideas and improvements from a diverse range of stakeholders, including groups most impacted and members of the public to improve future planning efforts

Strategy and technical groups guided this preliminary study with agency partners including:

- Metro
- TriMet
- Oregon Department of Transportation
- City of Portland
- Multnomah County
- Clackamas County
- Prosper Portland
- Port of Portland
- Washington County

Metro and TriMet met with other regional stakeholder groups to introduce the project. These groups included:

- Lloyd District Transportation Management Association Board
- East Metro Economic Alliance
- Washington County Coordinating Committee TAC and full committee
- Central Eastside Industrial Council Land Use Committee
- Non-profit community leaders forum
- Momentum Alliance
- TriMet Transit Equity Advisory Committee
- PBA Transportation Committee
- WEA Transportation Committee
- East Multnomah County Transportation Committee

## Online Survey

Metro's online survey drew 2,500 respondents who shared their ideas about the project. The survey findings will be used to hone the scope of future studies to ensure people's interests and needs are addressed.



Consider the region's transportation challenges significant or very significant



Support studying a MAX tunnel



Would take MAX more frequently if it was faster

## Open House

An open house at Metro engaged over 50 people, providing one-on-one time to talk with staff directly about the project.



Most people agreed with the need to get through downtown faster and were excited about the potential of a MAX tunnel



Attendees wanted to ensure good transit access downtown while improving travel times



Equitable access for the whole region, and improving environmental outcomes, are top issues



# NEXT STEPS

The MAX Tunnel Study produced preliminary projections of MAX tunnel benefits and construction costs, and the estimated funds needed to complete the next stages of the required planning and engineering. The future phases would identify the tunnel route, station locations, and light rail operating plan, and include the environmental analysis, design, and engineering.

- 1 Project Development:** Portland central city rail system plan, preferred route and station locations, Environmental Impact Statement, public engagement, constructability and staging, preliminary risk assessment, finance plan
- 2 Design:** final engineering and design, implementation schedule and budget, permitting and property acquisition, grant approvals
- 3 Construction:** environmental mitigations and implementing service







