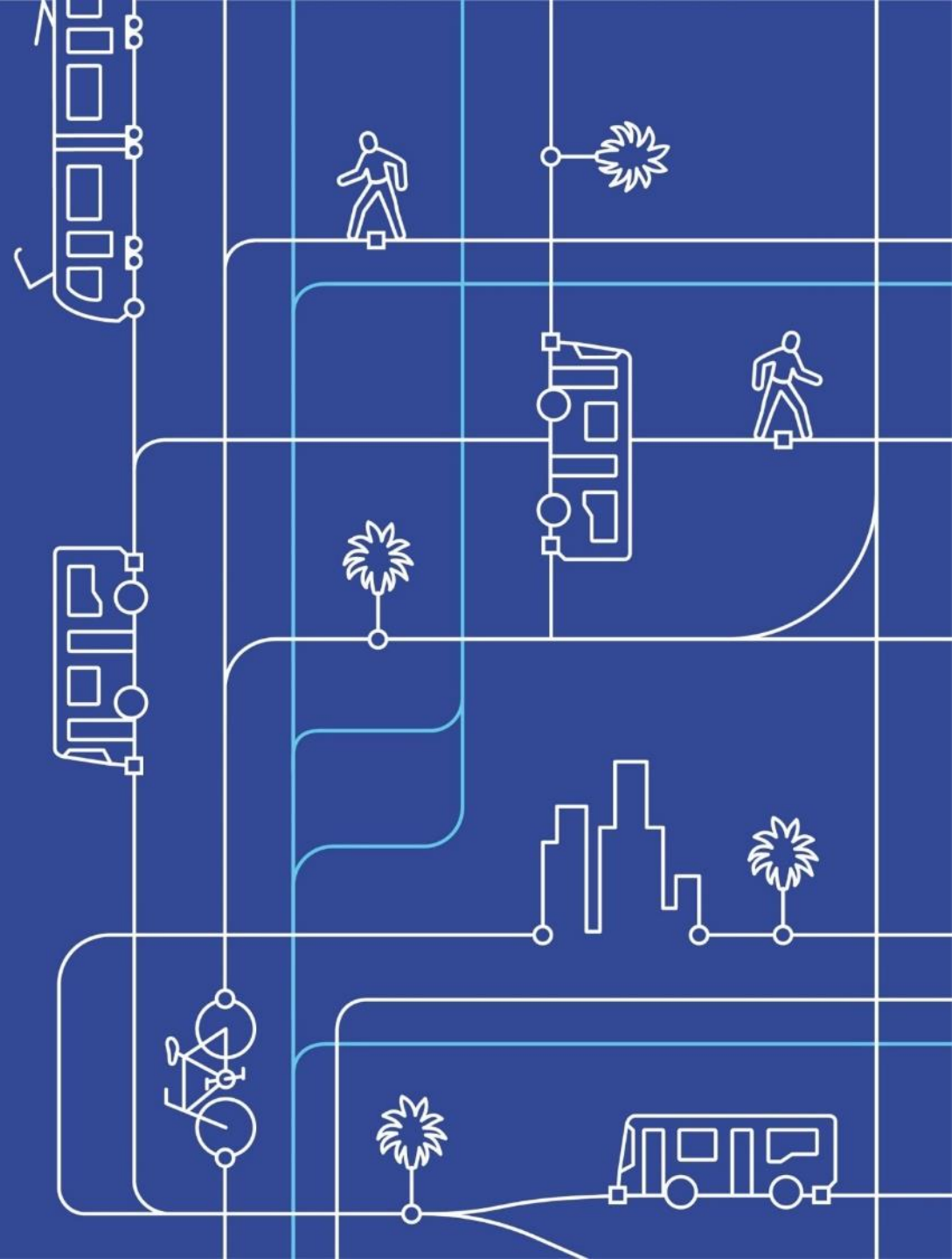


# NEXTGEN Bus Study

Reimagining the Transit Network

APTA Sustainability & Multimodal Workshop

07.31.19



# Metro System Overview



## BUS

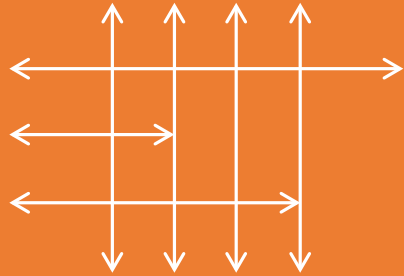
- 140 Lines/170 Routes
- 2,300 buses
- 14,000 stops
- 800,000 weekday boardings
- 7 million annual service hours
- \$1.2 billion annual operations

## RAIL

- 4 Light Rail/2 Subway
- 240 cars
- 93 stations
- 350,000 weekday boardings
- 1.3 million annual service hours
- \$542 million annual operations

Despite an extensive network and continued investment in mass transit we've experienced over 20% decrease in ridership over the last 5 years.

## So, what is NextGen?



A new bus network



Something for everyone

## Why are we doing this?

### Outdated bus network

It's been 25 years since last redesign!  
Travel patterns have changed

### More People

1 million new residents

### More places to go

New destinations

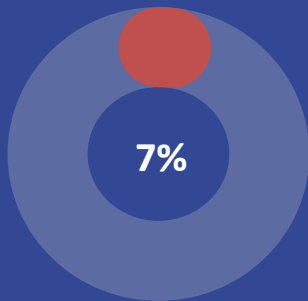
### More ways to get there

Transportation Network Companies,  
MicroMobility, shared vehicles

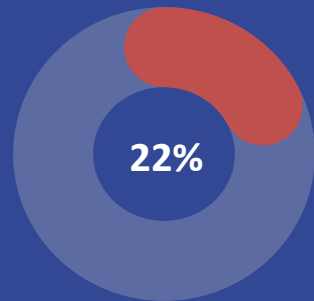
# Four Types of Customers



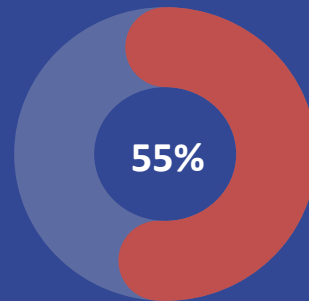
Frequent



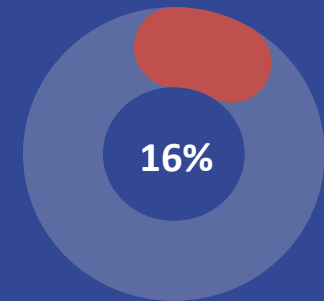
Occasional



Infrequent



Non-Rider



As a % of all LA County residents

If **1 in 4 non riders**  
used transit **two times per month,**  
we would **more than recoup**  
the **lost ridership**

# Service Parameters

## All Riders

Travel Speed

Frequency

Reliability

## Current

More Service

Fares

Information

## Former

Security  
(women, certain geographies)

First/Last Mile  
(elderly, higher income)

Comfort  
(odors, crowding)

## Infrequent/ Non-Rider

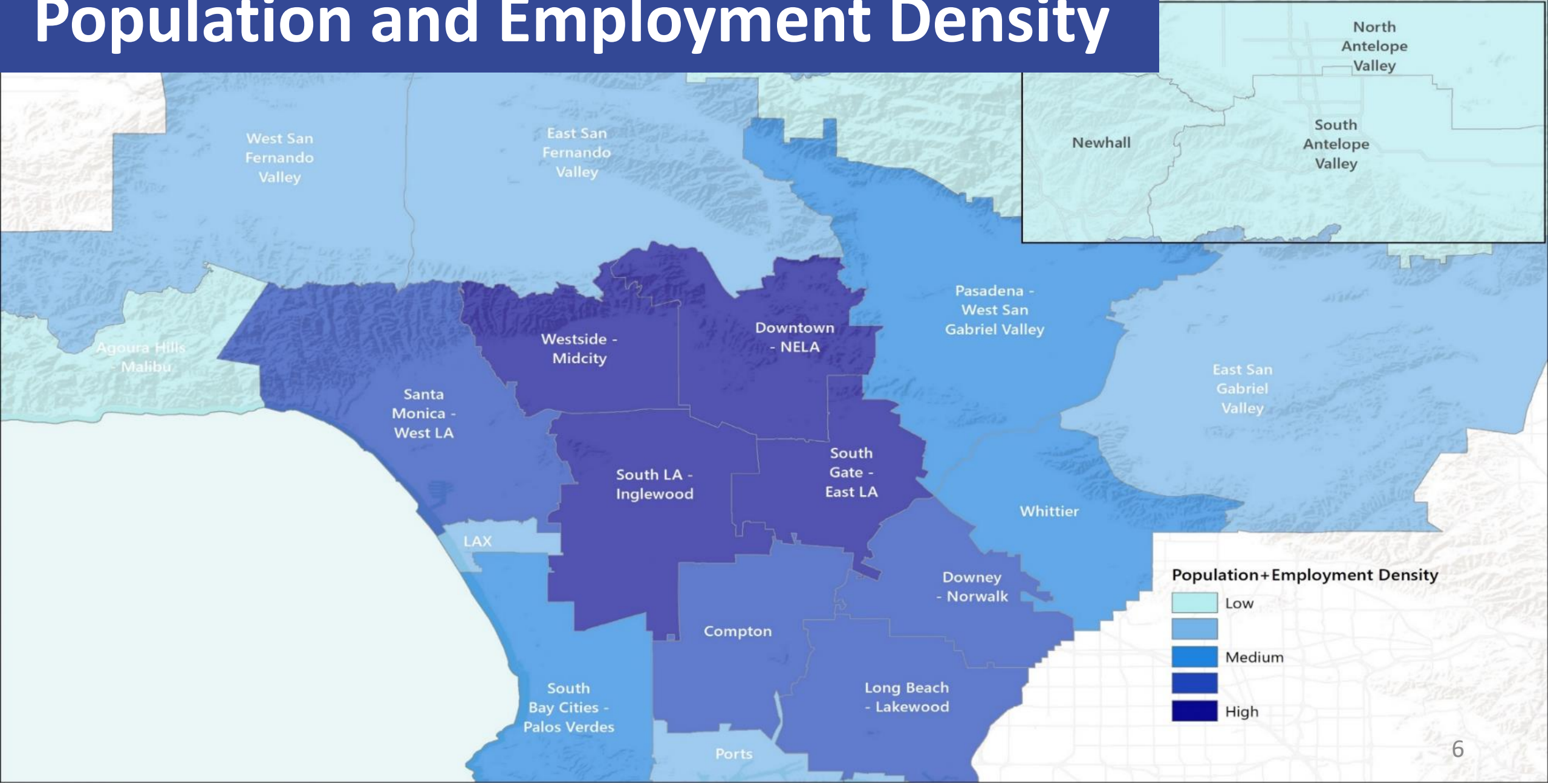
Information  
(non-riders)

First/Last Mile  
(women, youth, elderly)

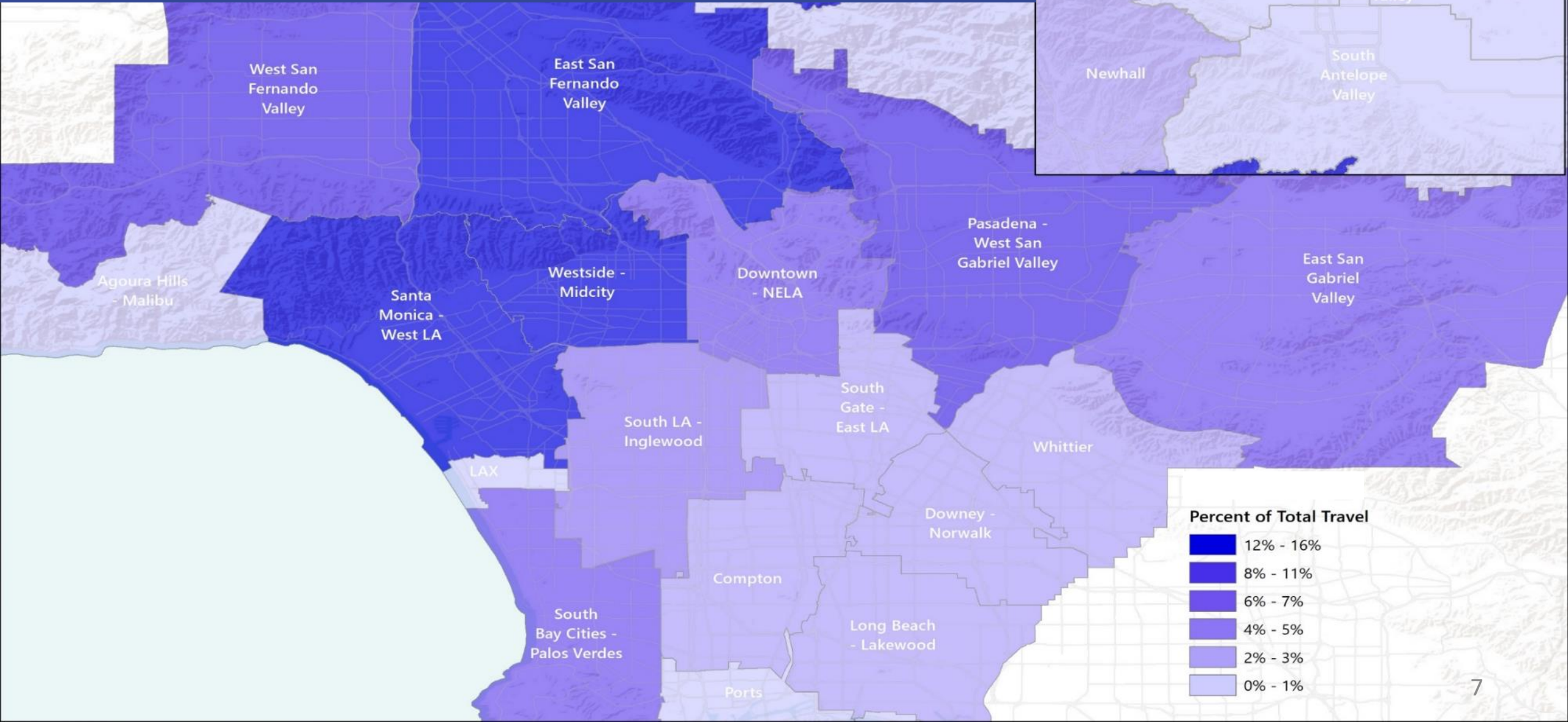
Comfort  
(odors, crowding)



# Population and Employment Density



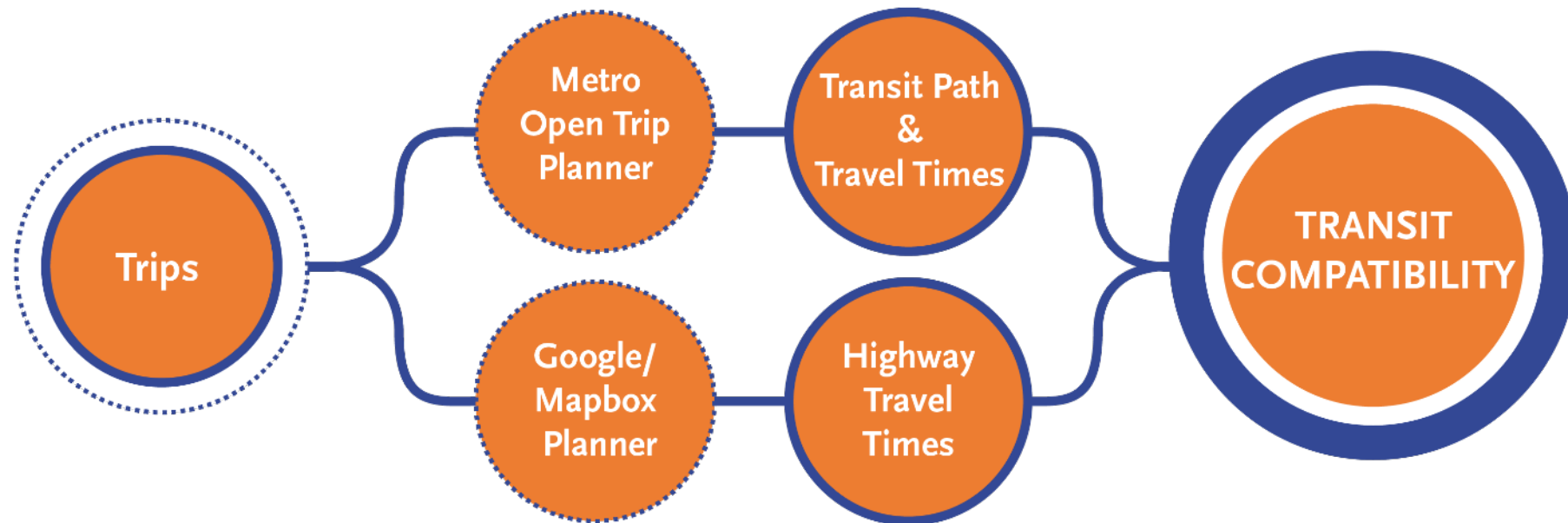
# Travel Intensity (Cell Phone Data)





# Competitiveness of Transit

1. Run trips from cell phone data through Metro Trip Planner to identify transit path and travel time;
2. Run trips from cell phone data through Google to calculate drive time;
3. Compare transit travel time to drive time.

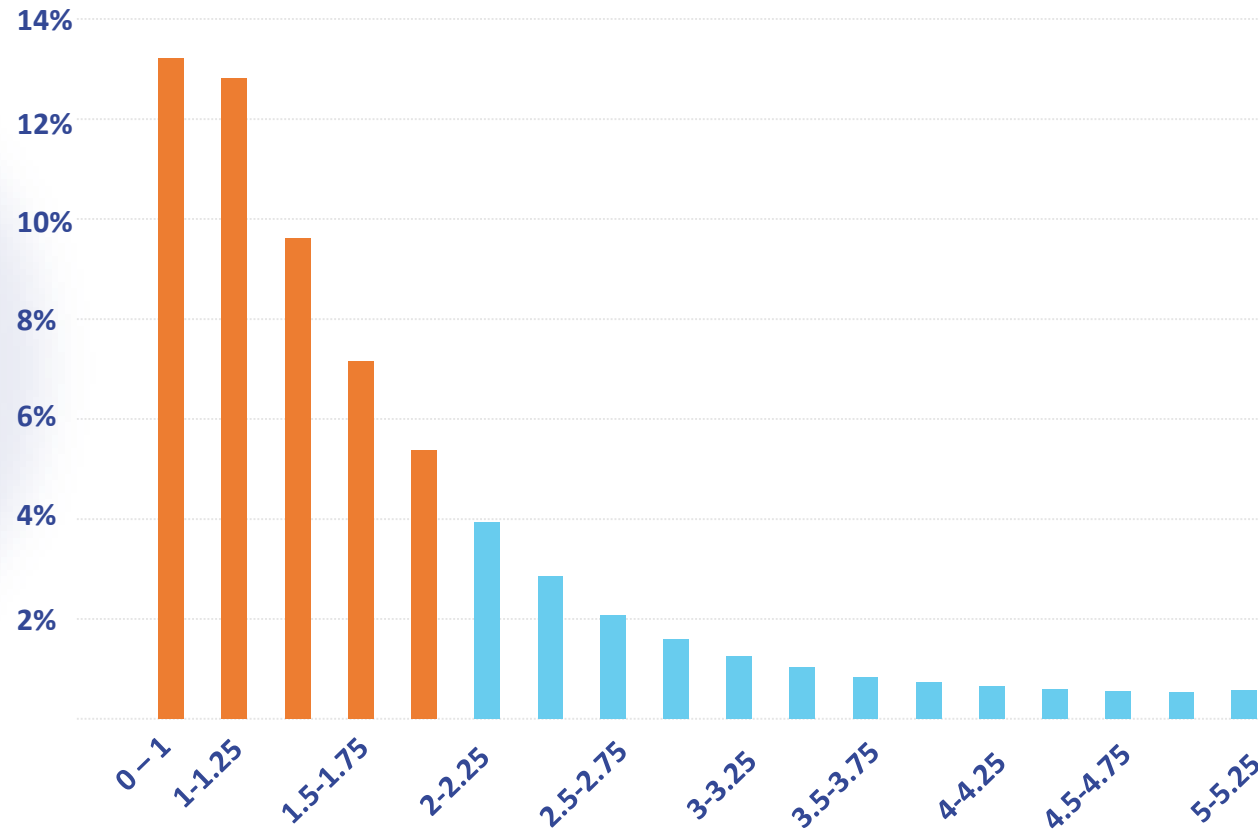


# Competitiveness of Relative Travel Time

## Travel Time Comparison with Auto

Transit Market Share

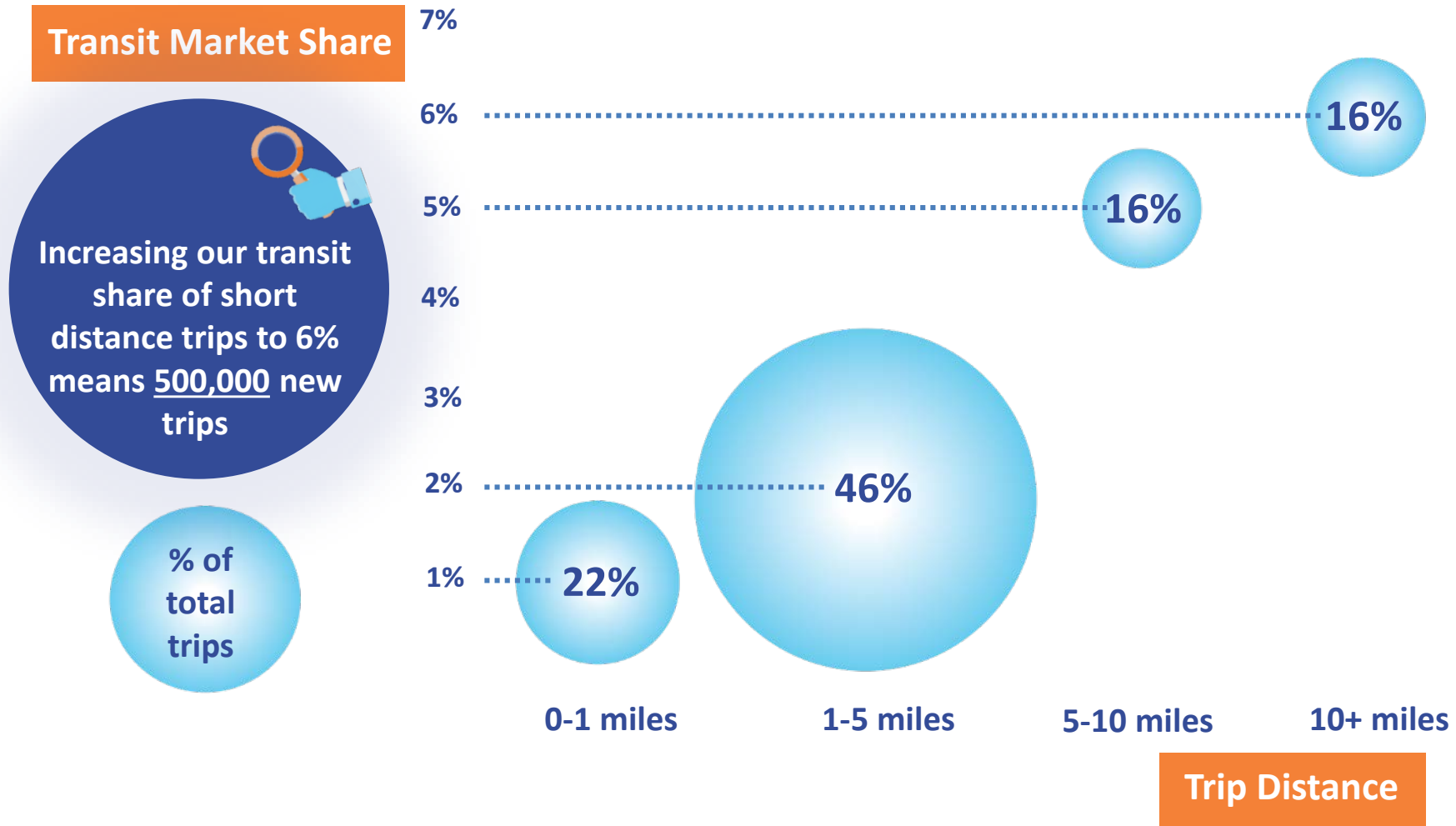
Transit is most competitive when no more than 2x slower than auto



Transit to Drive Time Ratio

# Competitiveness and Market Potential

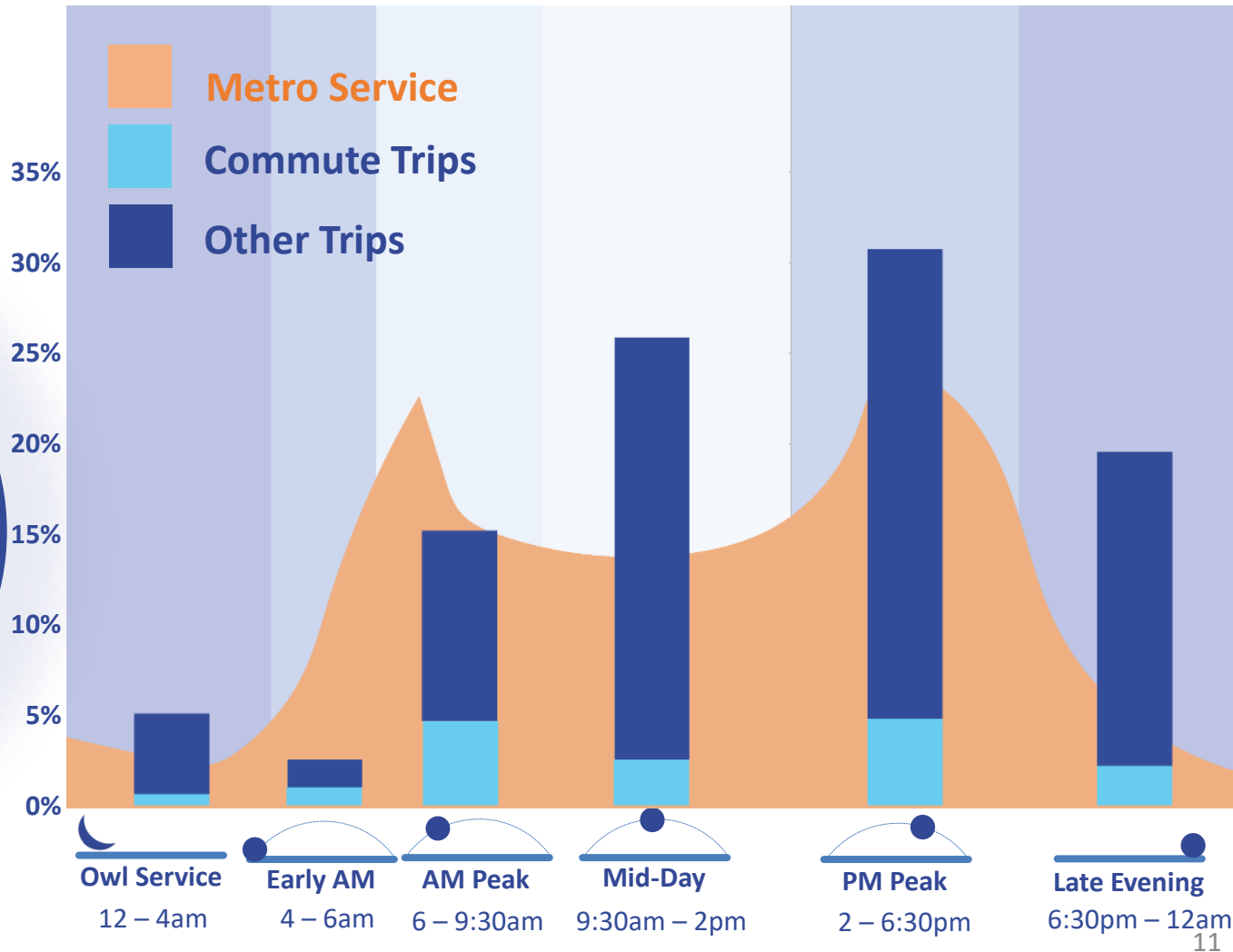
## Transit Market Share by Distance & Percent of Total Trips



# More Frequent Service for Non Commute Trips

Share of all trips and service by time of day

Current service does not match midday and evening travel demand.

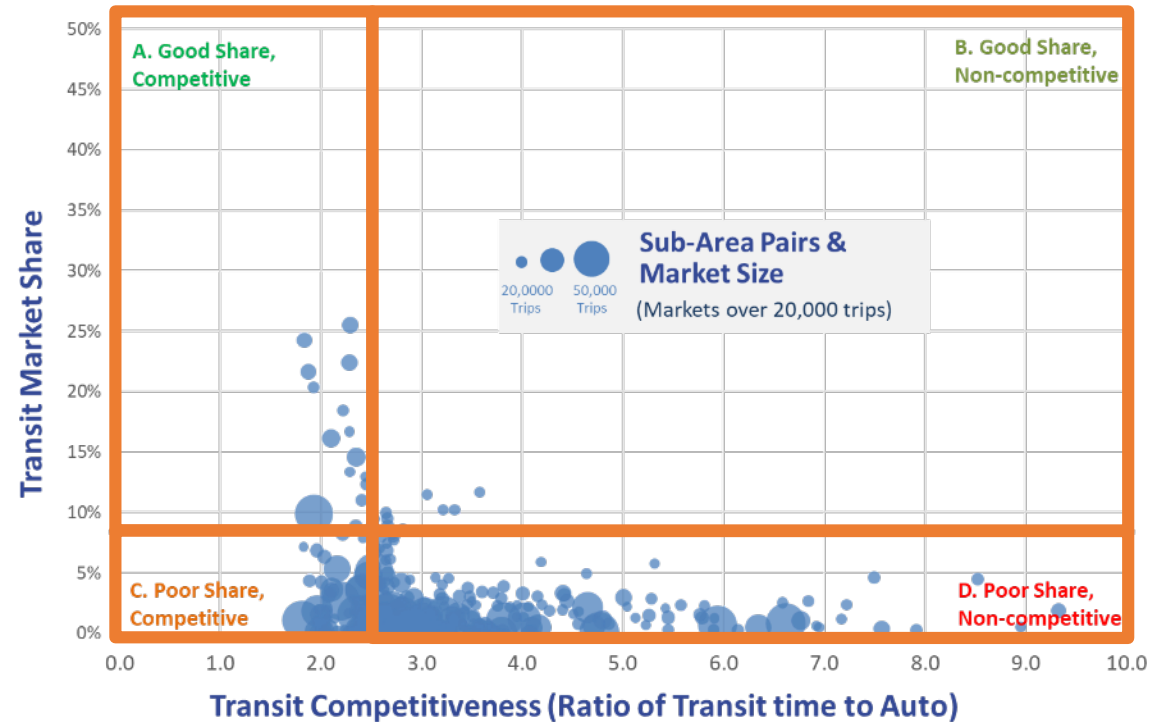


Note: Bar chart shows data by time period while area plot shows hourly data

# Market Demand

Diagnose the transit competitiveness of each origin to destination trip pair within LA County

- A. Succeeding where we should be (can we optimize?)
- B. Succeeding where we should not be (can we apply elsewhere?)
- C. Not succeeding where we should be (how do we fix it?)
- D. Not succeeding where we should not be (these areas are likely more suitable to other modes such as microtransit)

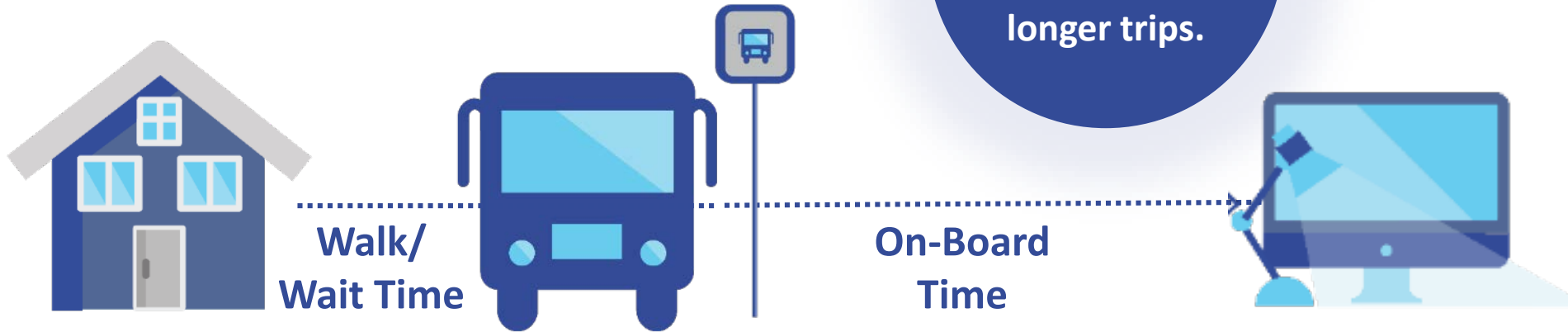




# When is Travel Speed Important?

*For Long Distance Trips: 10 to 12.5 Miles*

Travel Speed is the key factor for longer trips.



30% of time  
getting to/from transit

*e.g. 10 mins*

70% of time  
on-board transit

*e.g. 25 mins*

# When is Frequency Important?

*For Short Distance Trips: 0 to 2.5 Miles*

Frequency is the key factor for shorter trips.



*e.g. 10 mins*

*e.g. 10 mins*

Now that we know this,  
it's time to **design a new network**

**...in 18 months!**

# Creating *NextGen*

## Strategies

Increase frequency on routes serving short travel patterns to reduce wait time

Create express routes on corridors serving long travel patterns to reduce travel time

Create direct routes *For Short Distance Trips: 0 to 2.5 Miles*

Consolidate

reducing transfers and travel time

promising markets

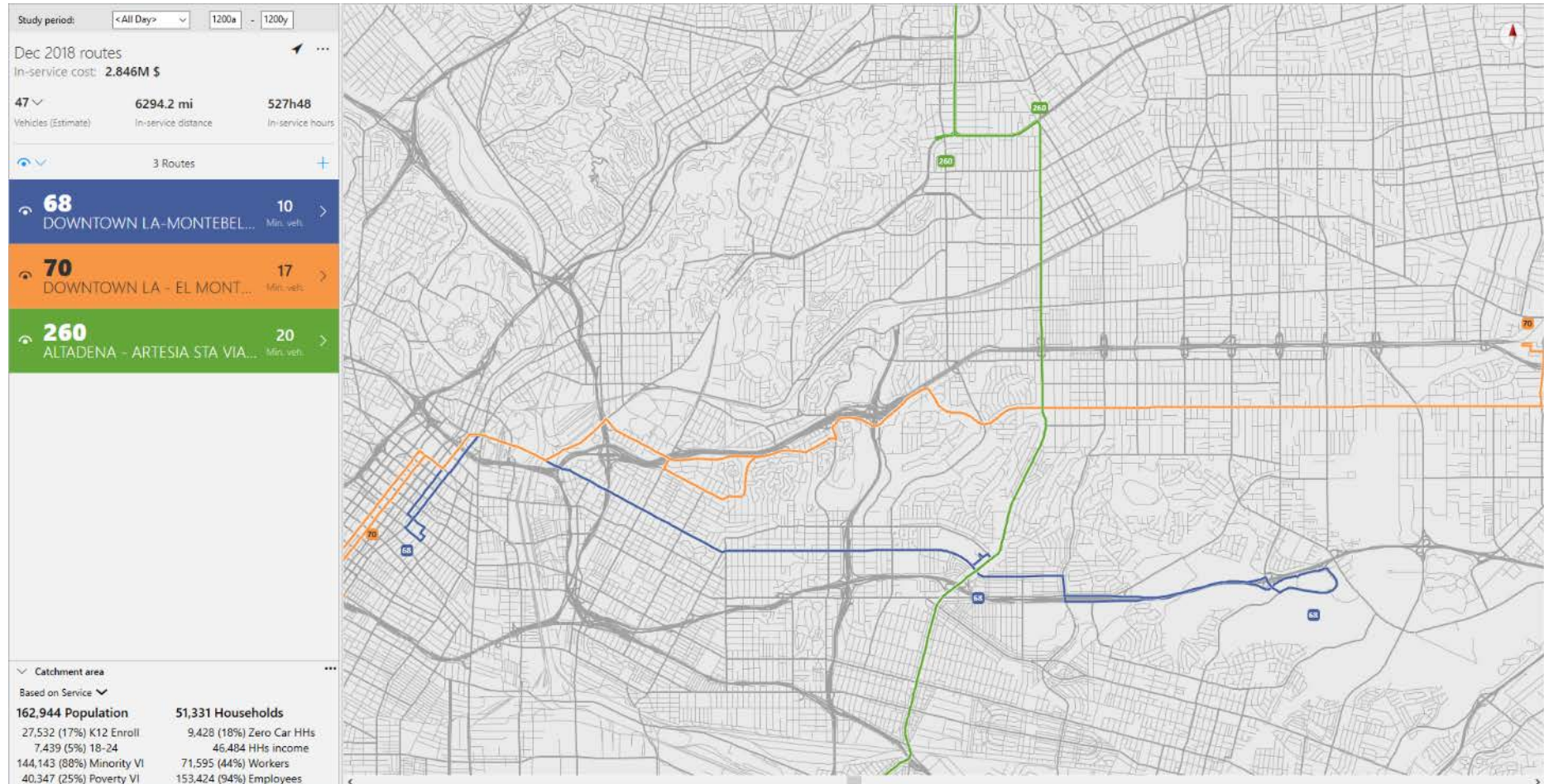
*For Long Distance Trips: 10 to 12.5 Miles*

***NextGen* must be cost neutral +/- 10%**

Wait Time

# Creating *NextGen* with *NetPlan*

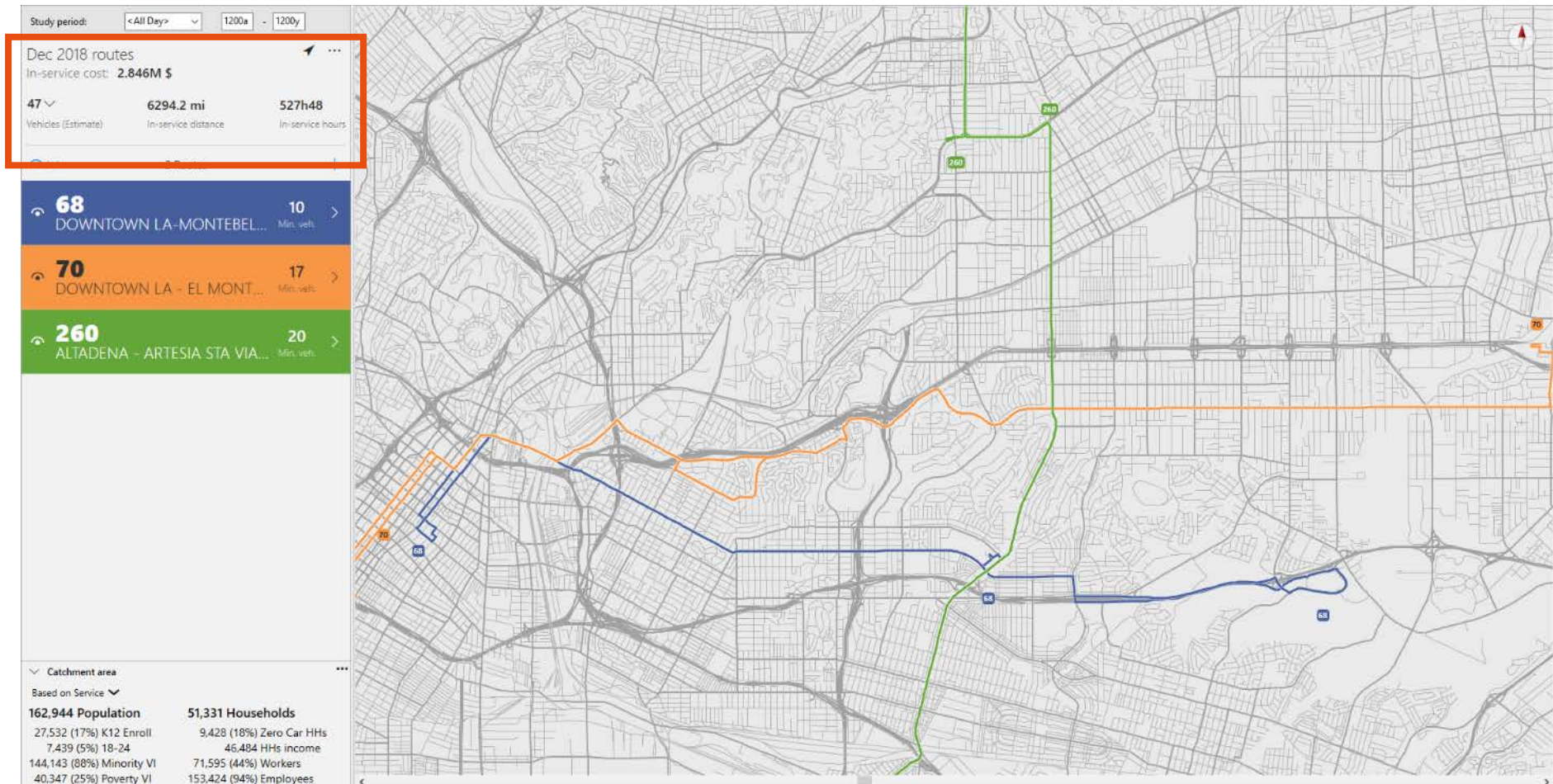
## Start from current network





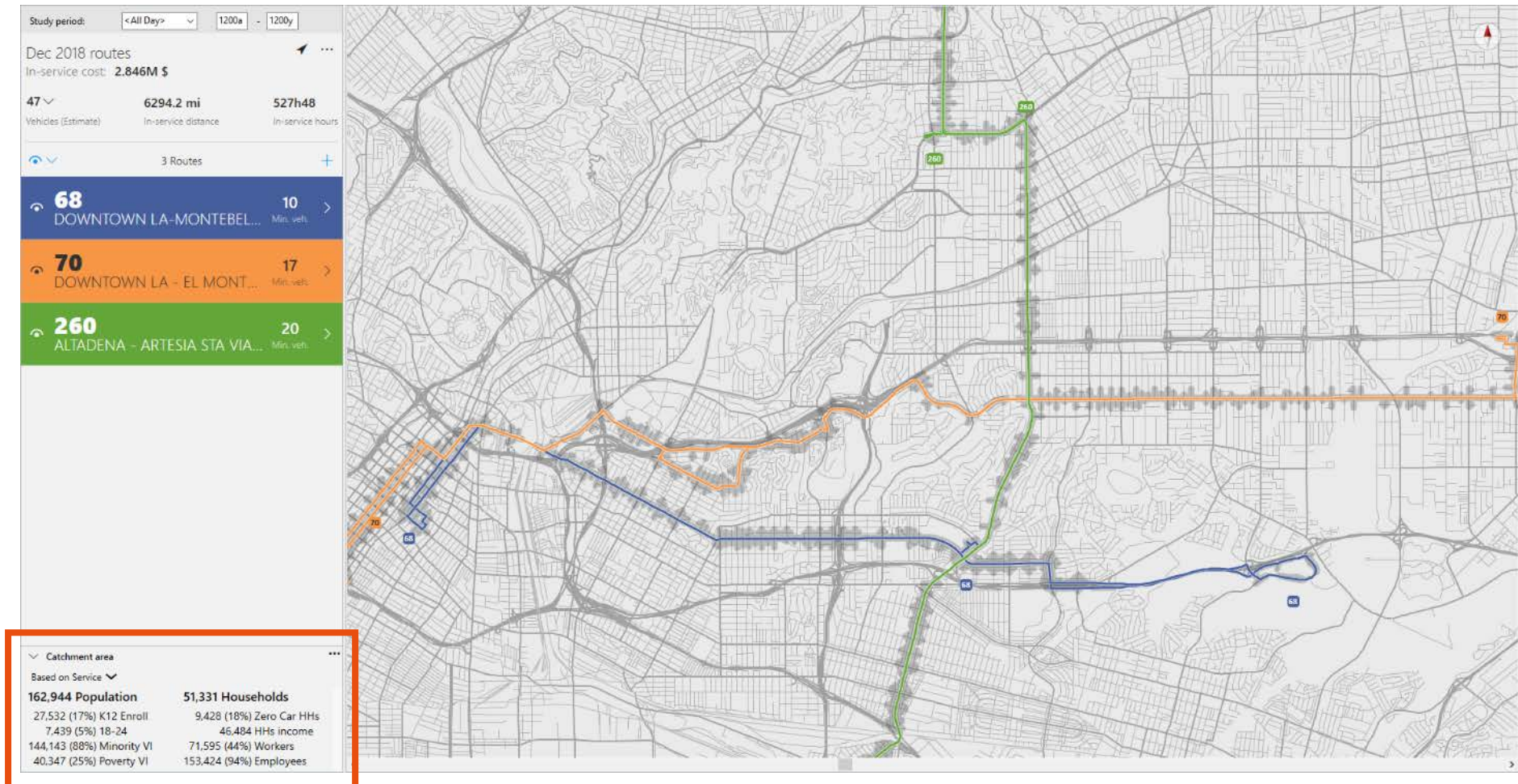
# Creating *NextGen* with *NetPlan*

## Analyze current state - Costs



# Creating *NextGen* with *NetPlan*

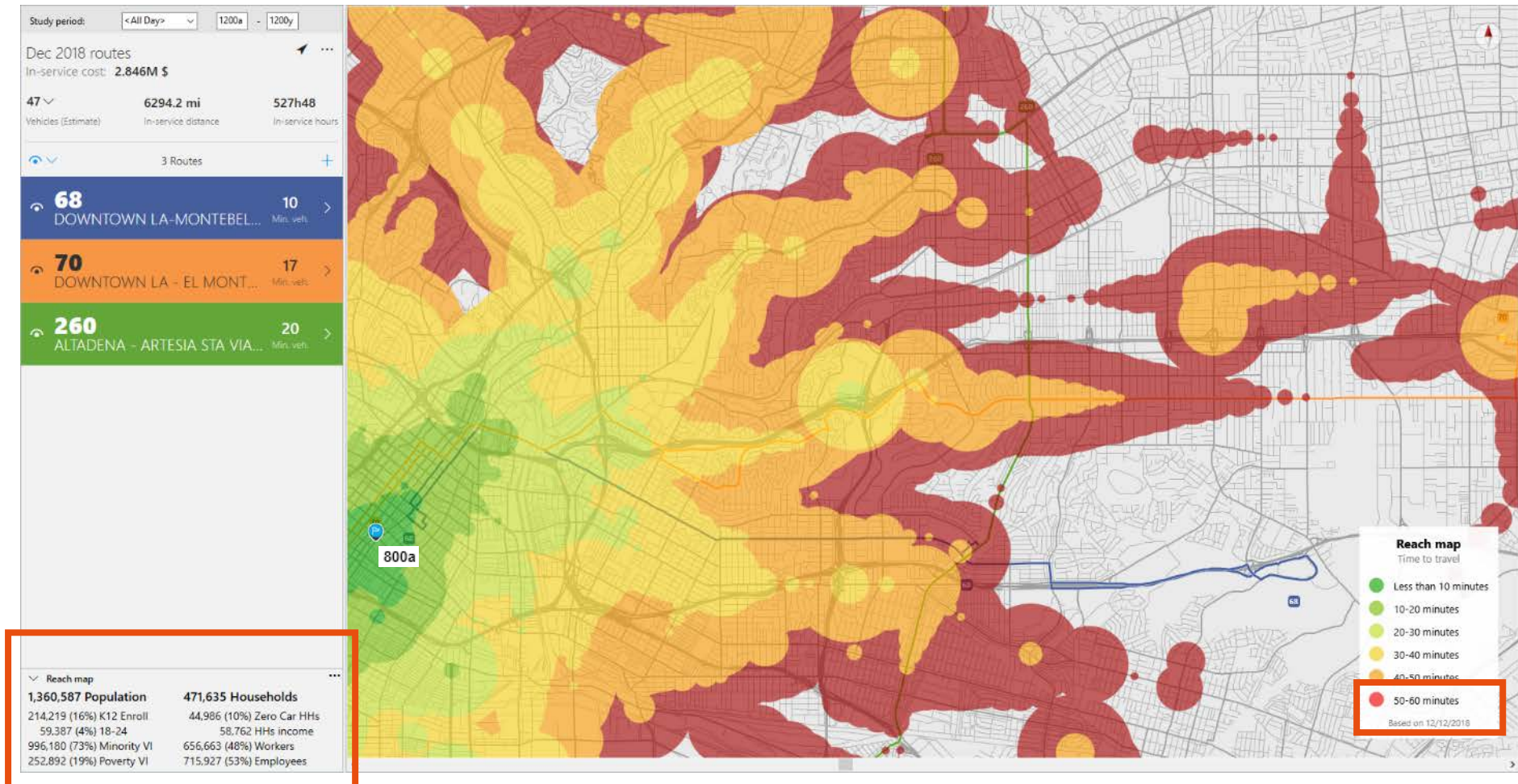
## Analyze current state - Catchment area





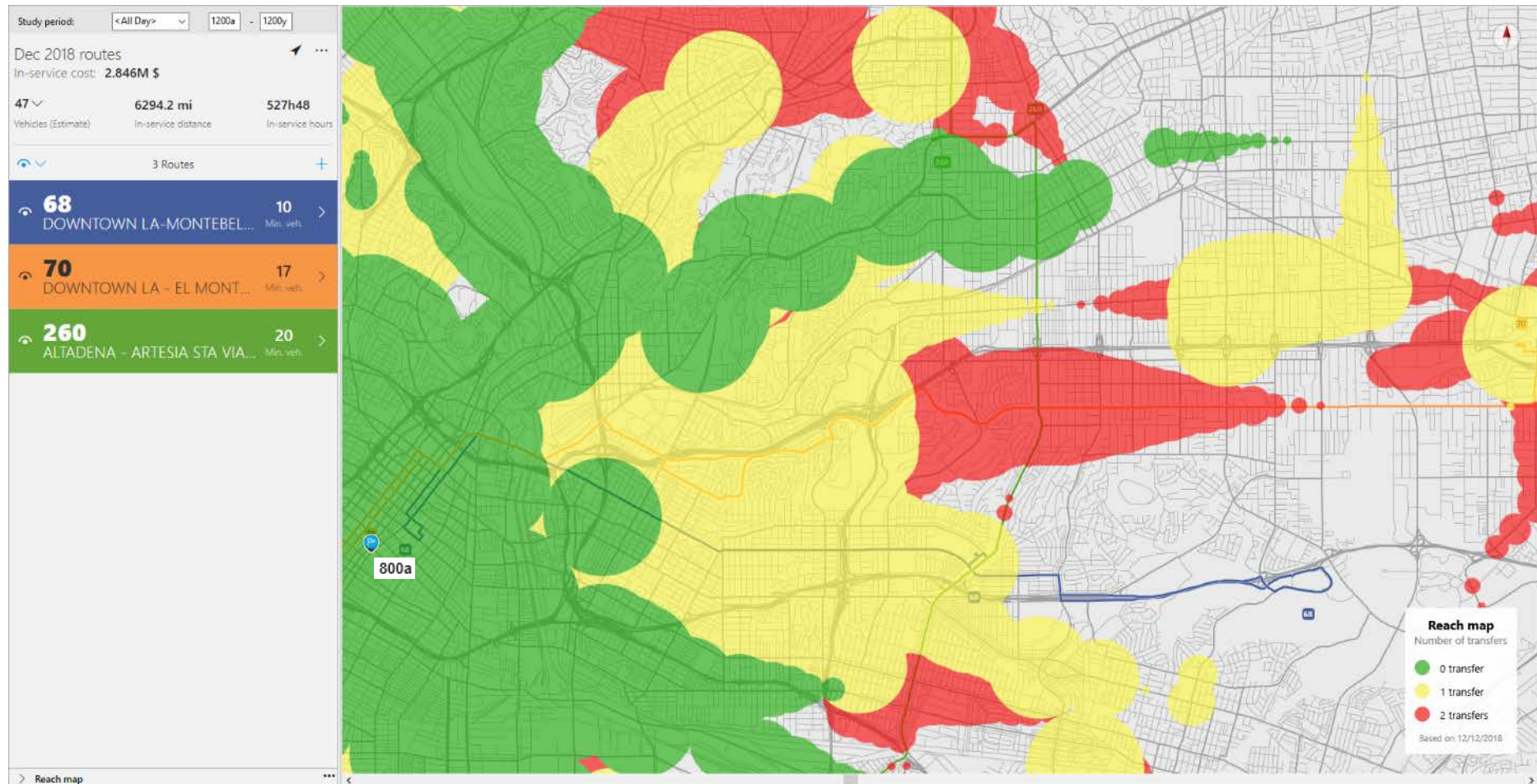
# Creating *NextGen* with *NetPlan*

## Analyze current state - Passenger travel times



# Creating *NextGen* with *NetPlan*

## Analyze current state - Passenger transfers





# Creating *NextGen* with *NetPlan*

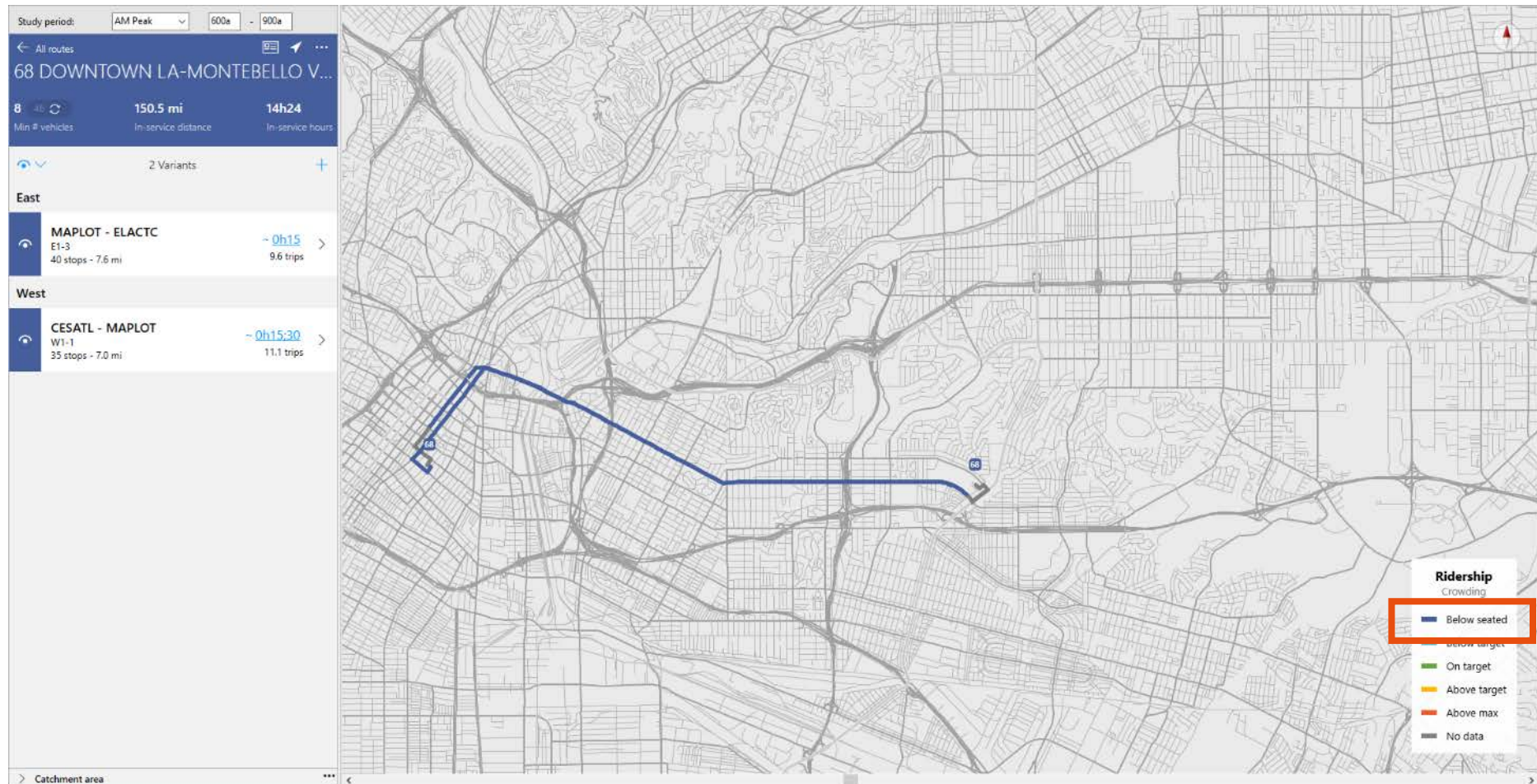
## Analyze current state - Ridership





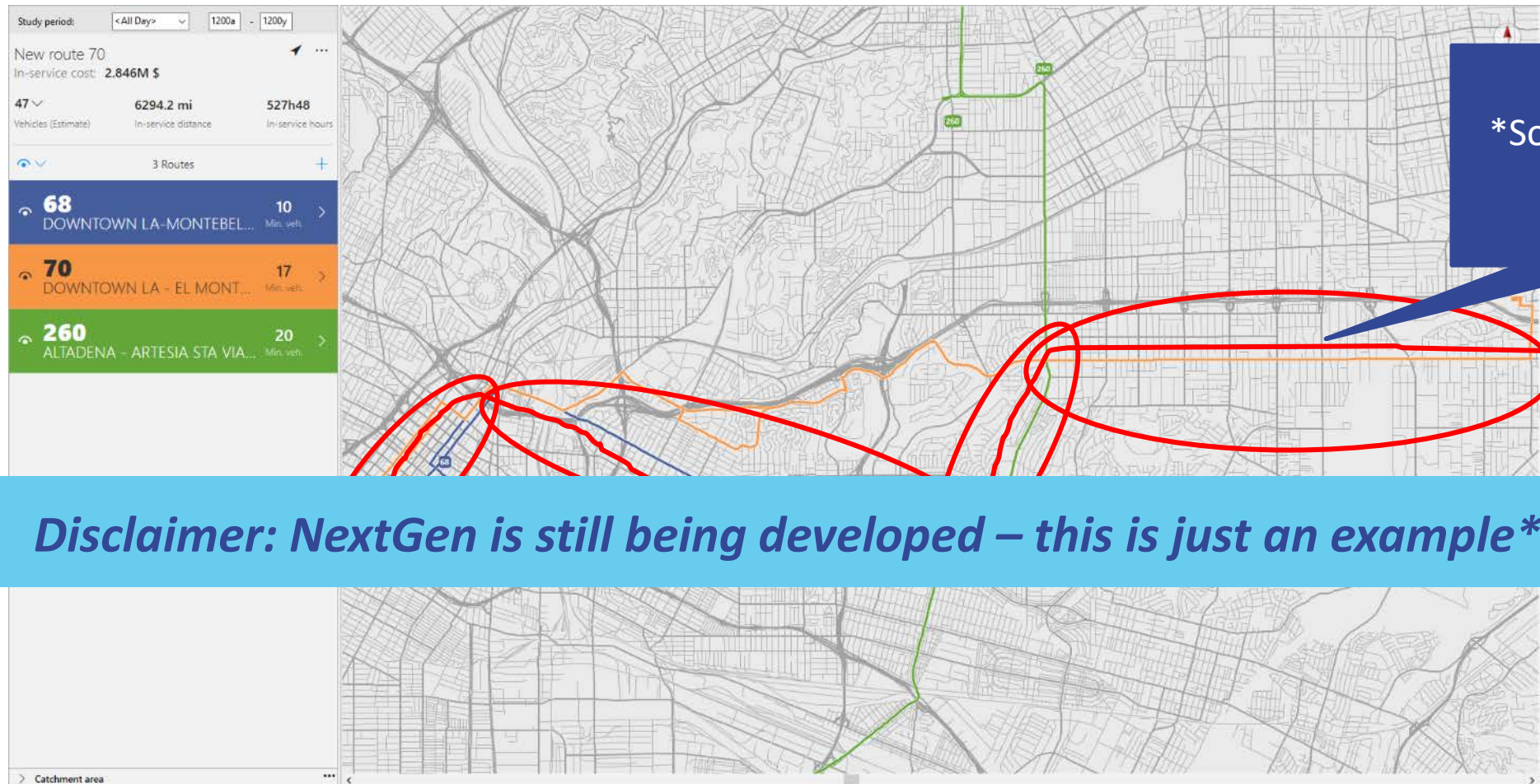
# Creating *NextGen* with *NetPlan*

## Analyze current state - Crowding



# Creating *NextGen* with *NetPlan*

*Build network scenarios - Consolidate low ridership routes*



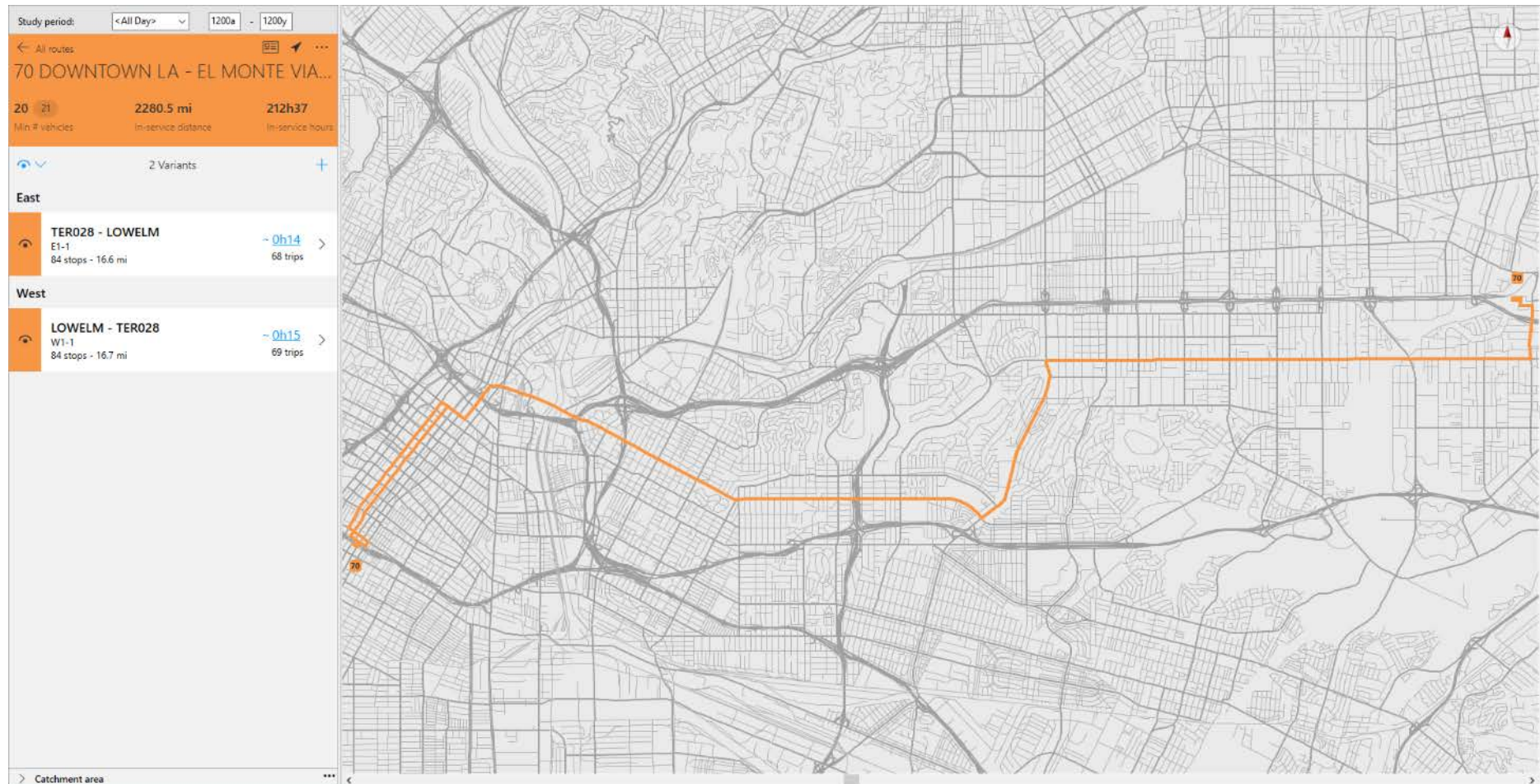
\*So don't freak out if you live here.

*Disclaimer: NextGen is still being developed – this is just an example\**



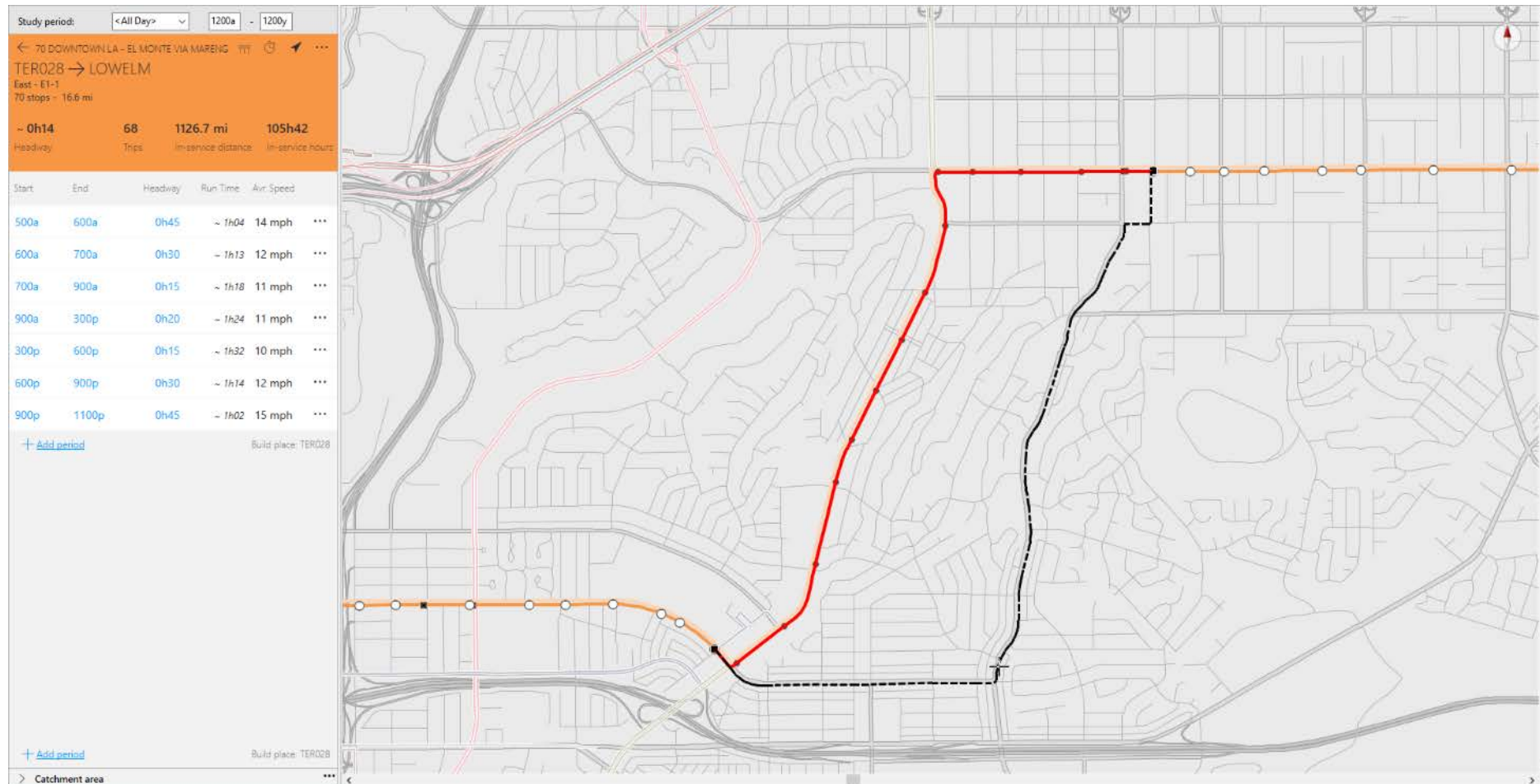
# Creating *NextGen* with *NetPlan*

*Build network scenarios - Combine segments of existing routes*



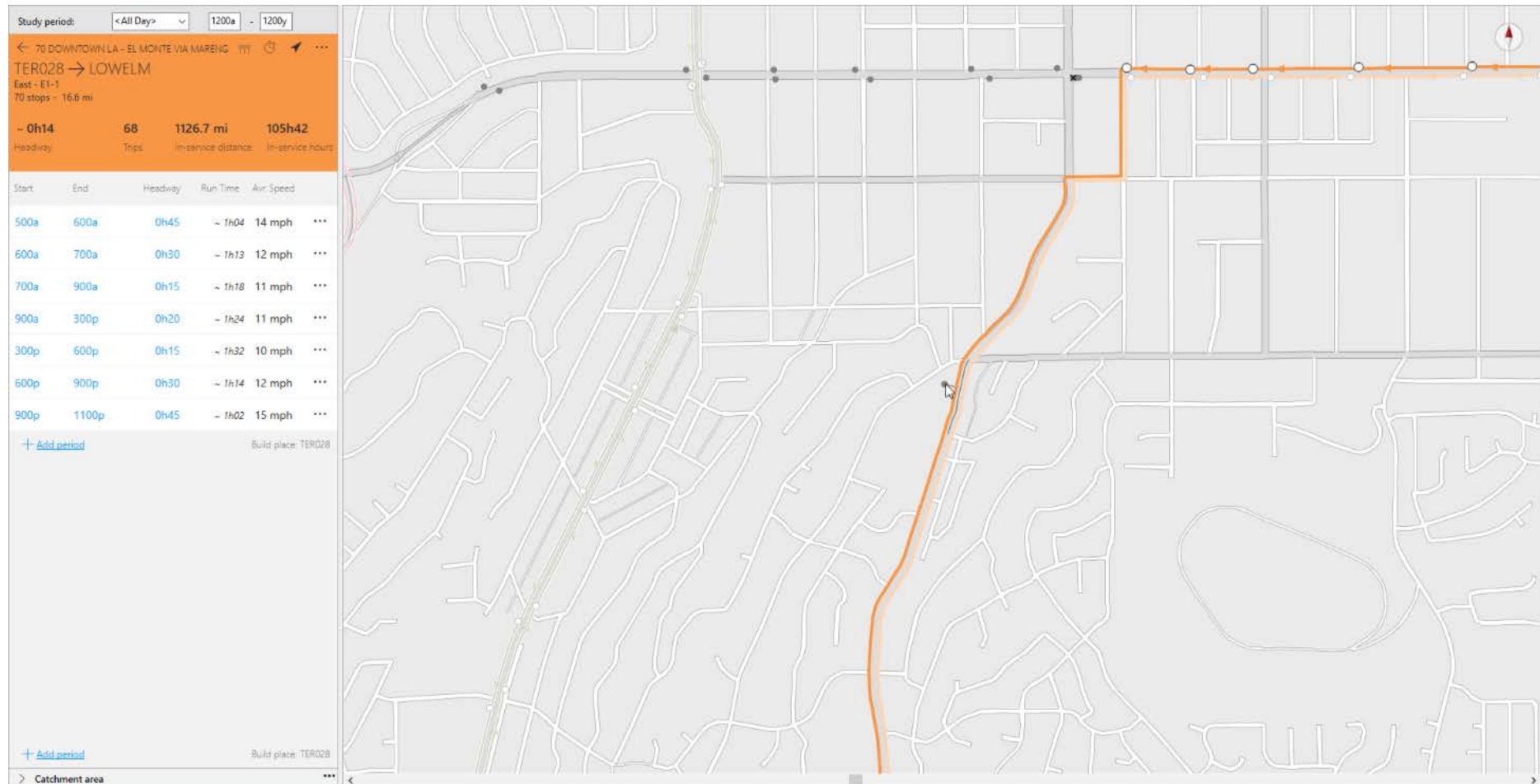
# Creating *NextGen* with *NetPlan*

## *Build network scenarios - Modify route paths*



# Creating *NextGen* with *NetPlan*

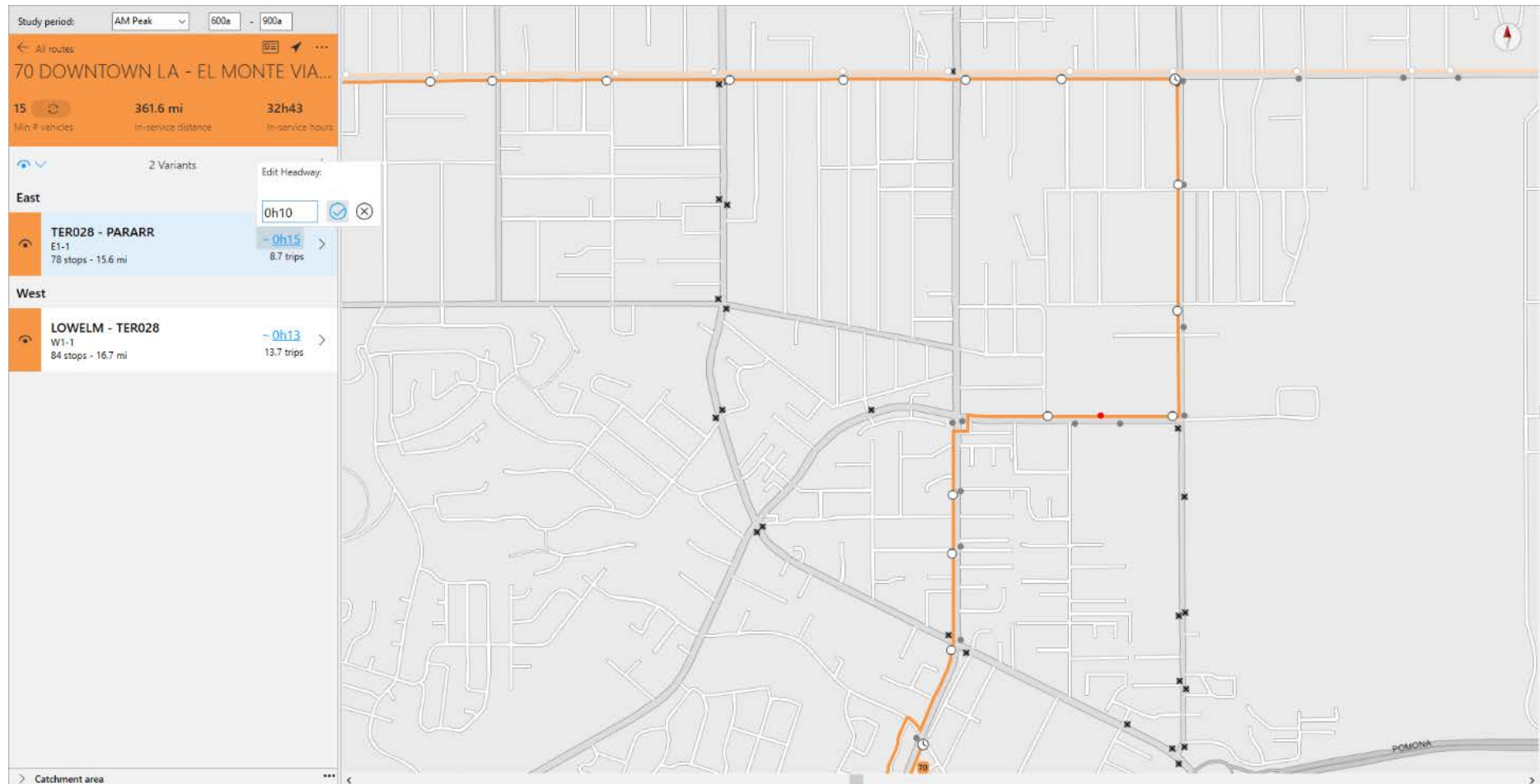
*Build network scenarios - Create new stops*





# Creating *NextGen* with *NetPlan*

*Build network scenarios - Adjust service levels and run times*



# Creating *NextGen* with *NetPlan*

*Build network scenarios - New route 70!*

The screenshot displays the NetPlan software interface. On the left, a sidebar shows route details for 'New route 70' and a list of other routes. The 'New route 70' entry is highlighted with an orange border and includes the following information:

- Study period: <All Day> (dropdown), 1200a - 1200y
- In-service cost: 1.271M \$
- 21 (dropdown) Vehicles (Estimate)
- 2312.1 mi In-service distance
- 211h12 In-service hours

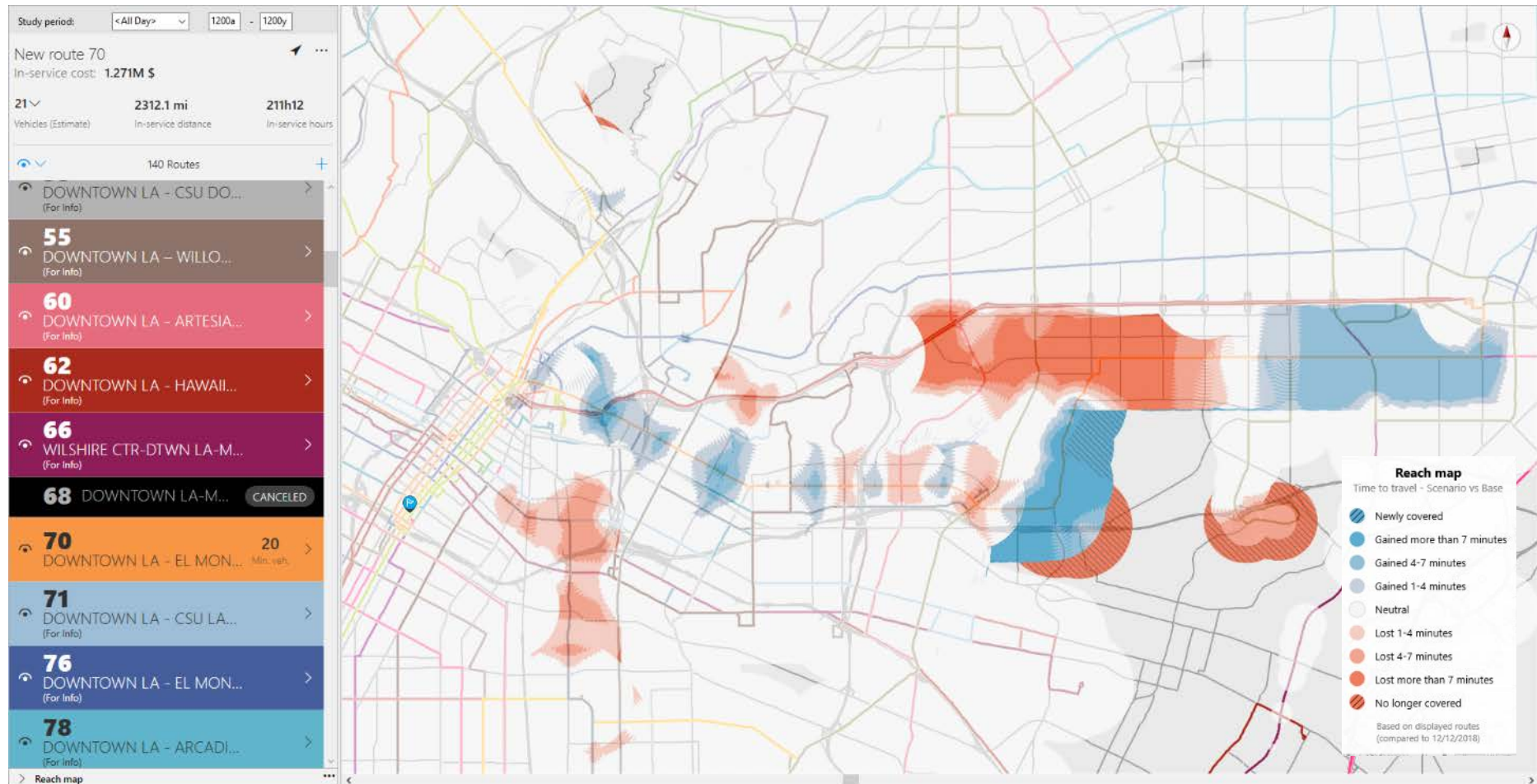
Below this, a list of routes is shown:

- 68 DOWNTOWN LA-MO... CANCELED
- 70 DOWNTOWN LA - EL MONT... 20 Min. veh. >
- 770 DOWNTOWN LA - E... CANCELED

The main area of the interface is a map showing a network of roads. A new route, highlighted in orange, starts in the downtown area and extends eastward, following a path that includes several turns and a long straight section. The map also shows existing road networks and a catchment area.

# Creating *NextGen* with *NetPlan*

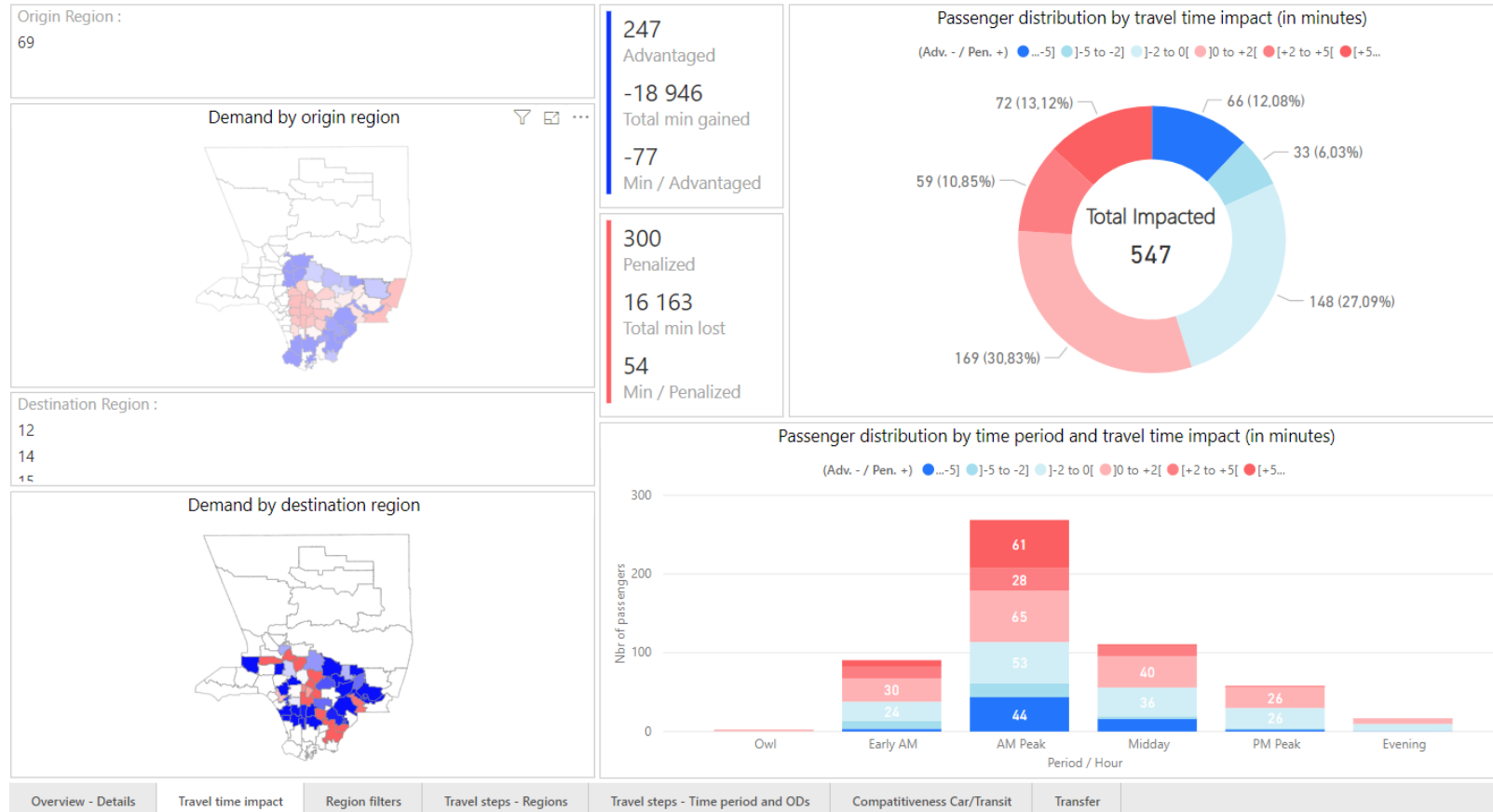
*Build network scenarios - Analyze impact on passengers*



# Creating *NextGen* with *NetPlan*

## Combine scenarios and analyze global impact

### Customer Impact Simulator (CIS) - Travel time impact


Overview - Details
**Travel time impact**
Region filters
Travel steps - Regions
Travel steps - Time period and ODs
Competitiveness Car/Transit
Transfer

# Conclusion

*Data is a great source of insight when redesigning a new network*

*Needs to be combined with customer outreach*

*LA Metro is focusing resources on favorable markets to increase ridership without increasing costs*

*Advanced planning tools can help quickly evaluate costs in a more precise way*

*Also estimate impact on customers based on travel patterns*



# Thank You

