SJ

DOWNTOWN
TRANSPORTATION PLAN

APPENDIX F

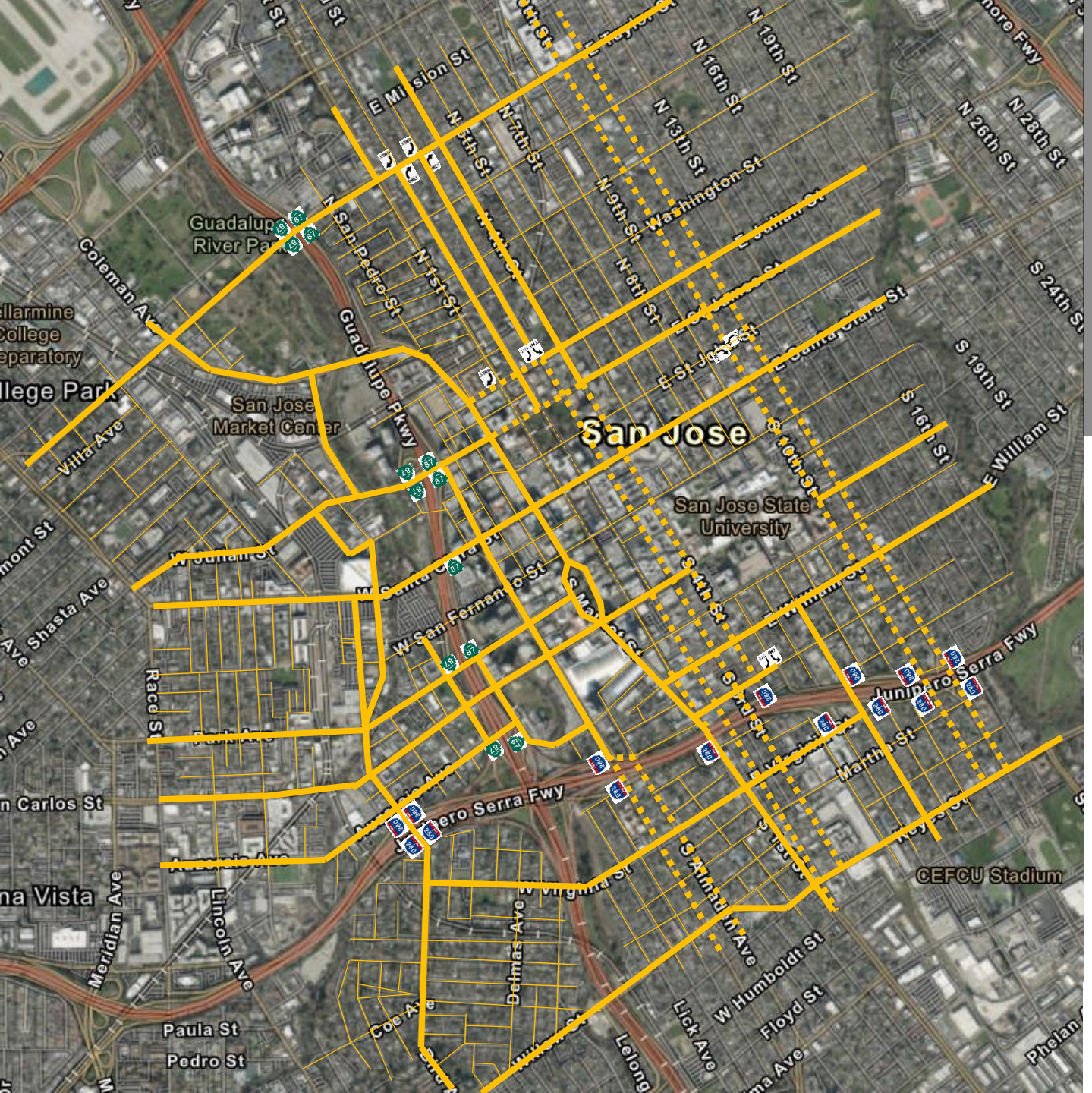
Vehicle Network Screenline Analysis

Public Draft

Source: Tomwsulcer

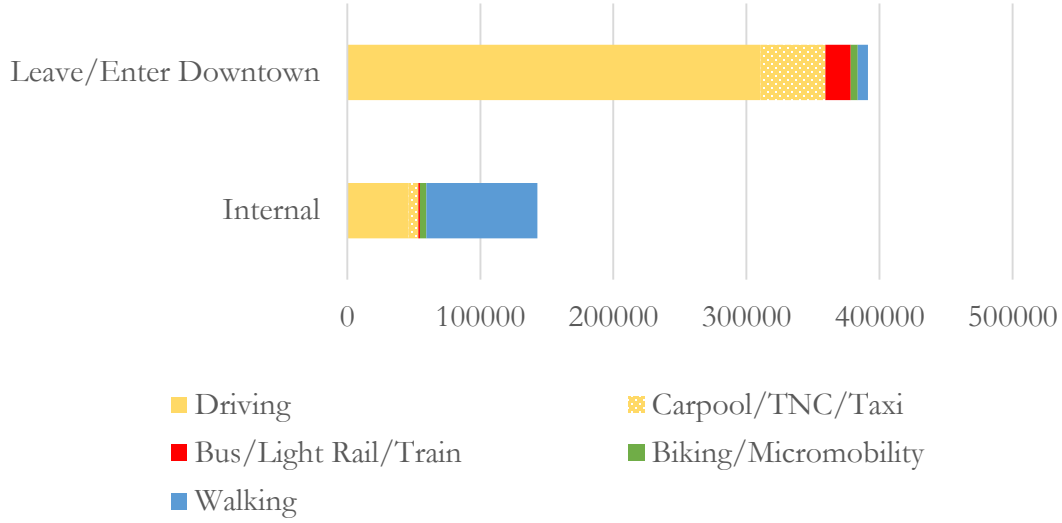
Downtown Transportation Today

DRAFT



The automobile is by far the most popular mode of transportation today. Most streets prioritize driving and parking.

2019 Daily Trips in Downtown



= Primary Vehicle Routes
= One-way streets
= Other streets for vehicle circulation
= Freeway ramps

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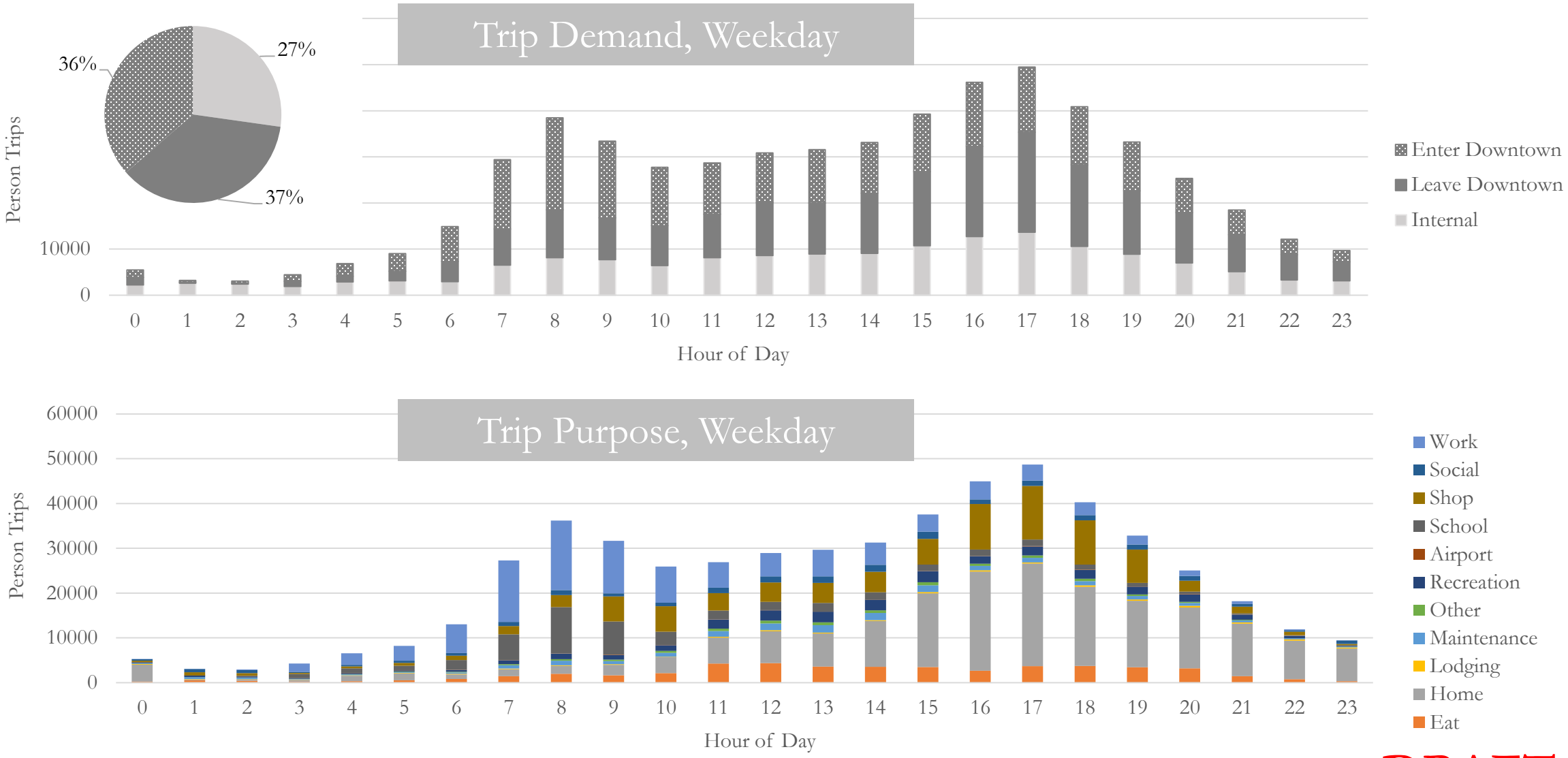
Two-thirds of Downtown trips today come from elsewhere.

2019



Source: Replica, SJDOT

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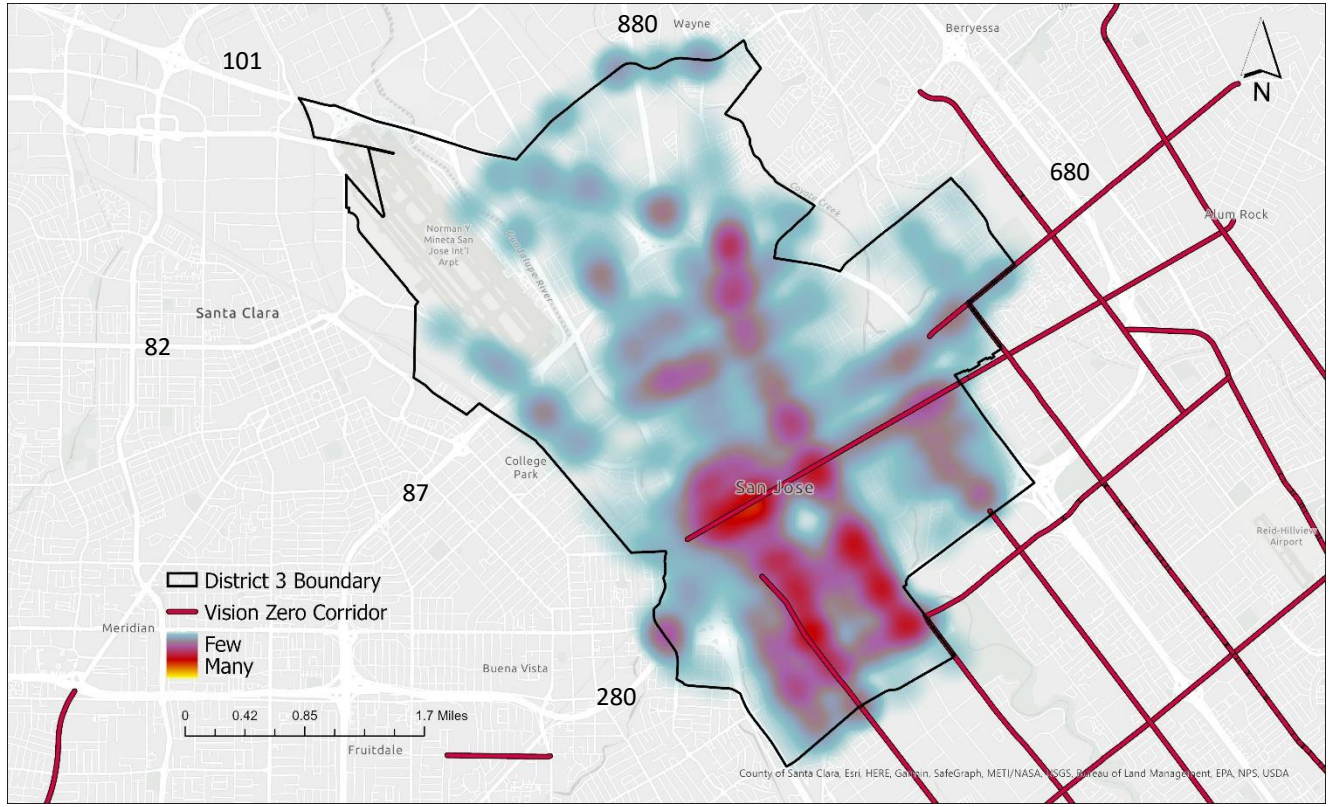
The community has concerns relating to transportation and personal safety.



Source: SJDOT Vision Zero 2016-2020

District 3 Statistics:

- 5,801 crashes in between 2016-2020
- 225 crashes in Equity Focused Areas
- 195 crashes caused severe injuries or fatalities
- 29 of 42 fatalities were pedestrians & bicyclists
- High collision corridors in Downtown
  - Santa Clara St (Vision Zero)
  - 1st St (Vision Zero)
  - 10th St & 11th St

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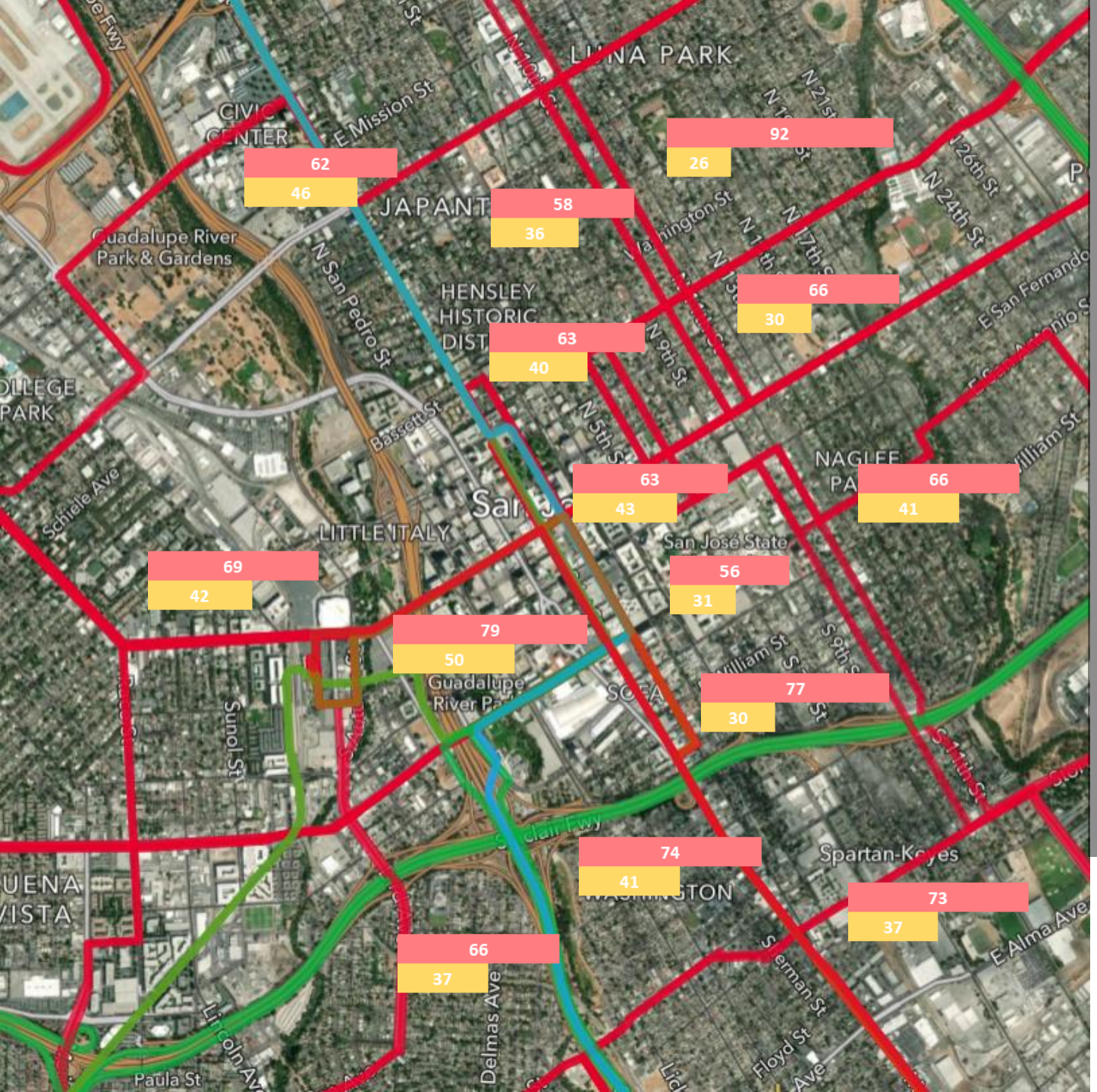

Transit travel times and reliability are primary challenges faced by transit riders.

Buses and light rail vehicles get delayed in traffic.

For trips starting or ending in the subarea of Downtown (in minutes):

Average Travel Time for Transit Trips

Average Travel Time for Driving Trips

Source: Replica, Moovit, VTA, SJDOT

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A Street Network to Support Growth

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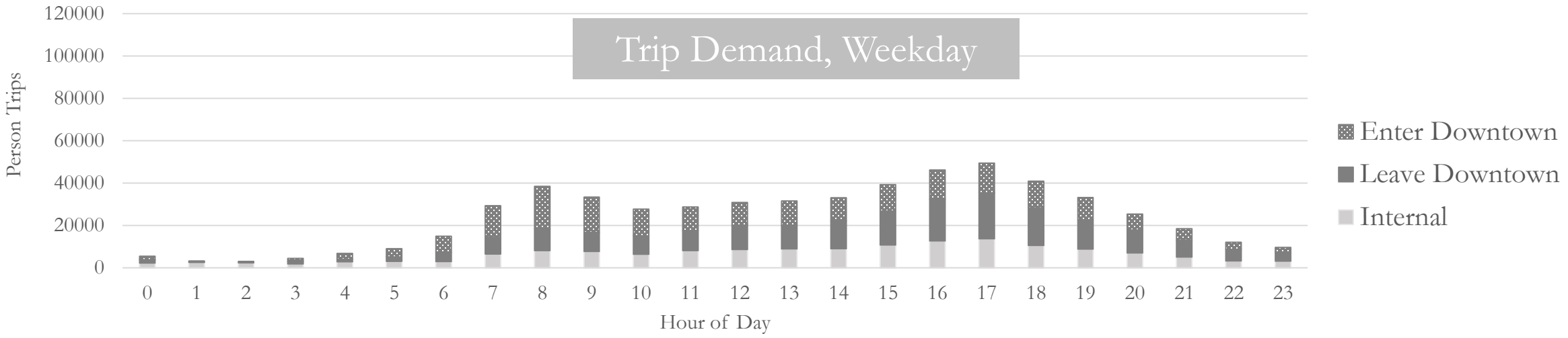
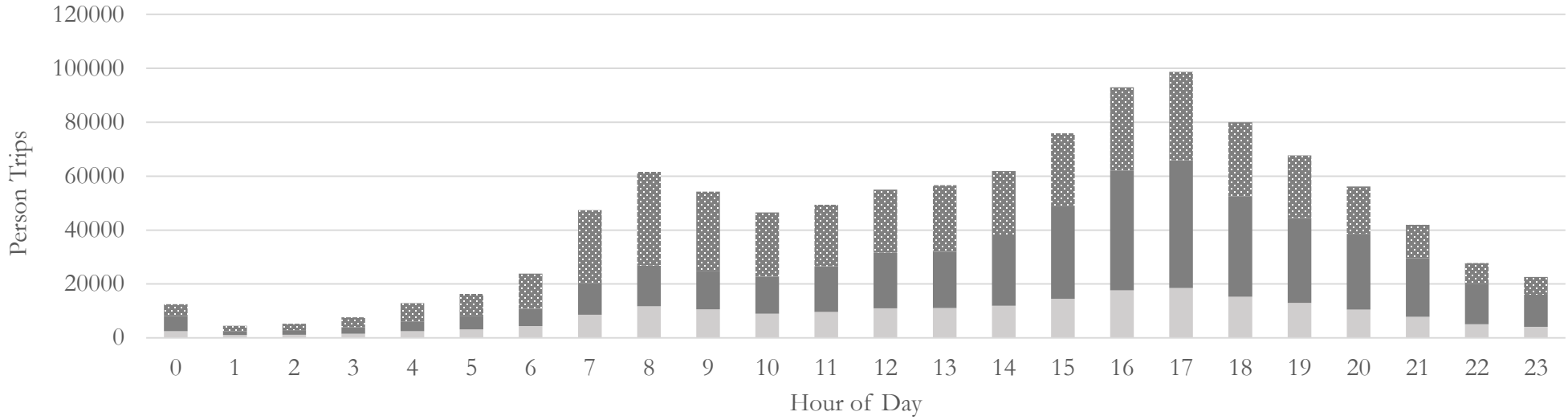
Downtown growth (2x residents and 2.5x workers) is expected to double travel demand from 50,000 to as many as 100,000 peak hour trips in 2040.

2019



2040



Source: Replica, SJDOT

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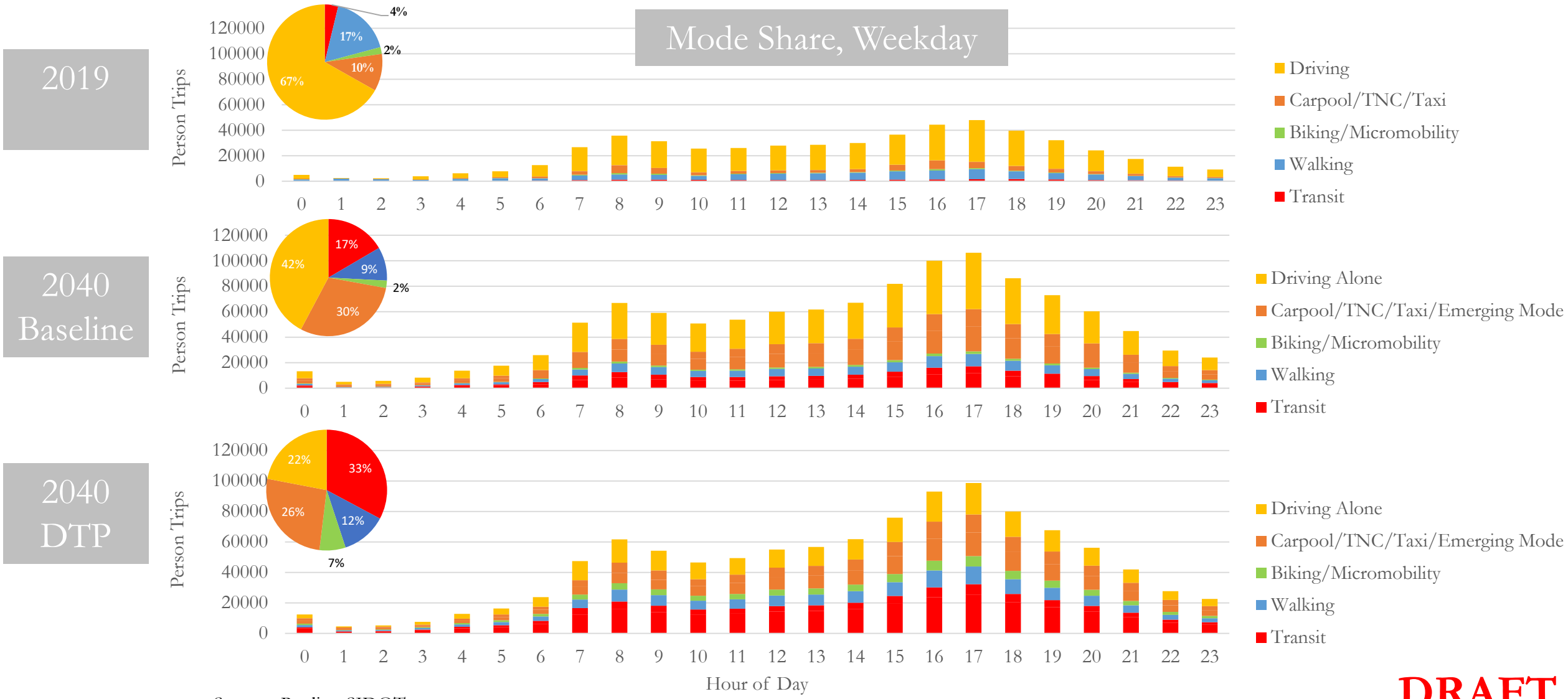
To realize our collective economic development goals, we must do more than just delivering BART, electrified Caltrain, HSR, VTA enhanced service, and the Bike Plan (2040 Baseline).



Source: Replica, SJDOT

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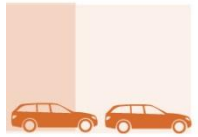
Moving People vs. Moving Vehicles



PRIVATE MOTOR VEHICLES
600–1,600/HR

MIXED TRAFFIC WITH FREQUENT BUSES
1,000–2,800/HR

TWO-WAY PROTECTED BIKEWAY
7,500/HR

DEDICATED TRANSIT LANES
4,000–8,000/HR

SIDEWALK
9,000/HR

ON-STREET TRANSITWAY, BUS OR RAIL
10,000–25,000/HR

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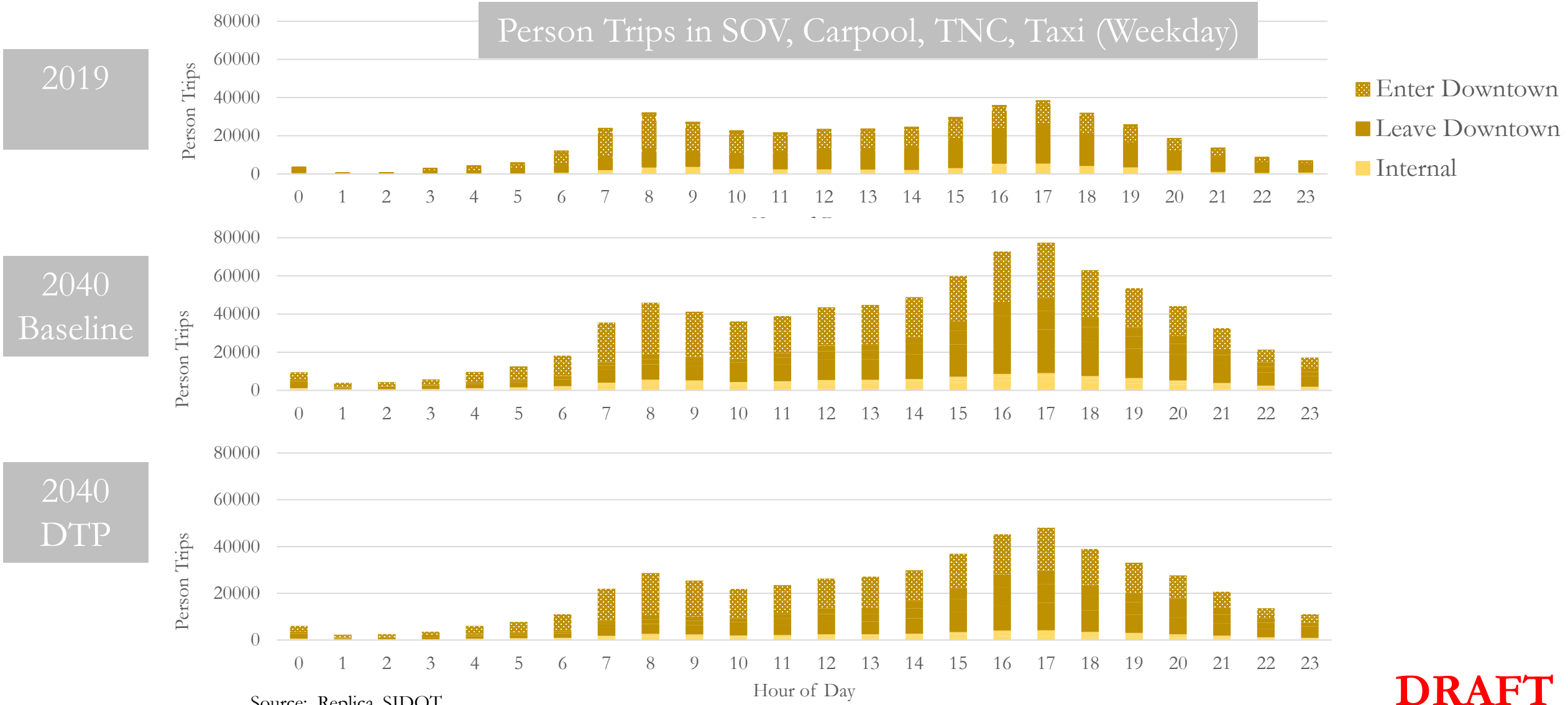
If we do not reach our mode shift goals for Downtown, the number of person trips made in vehicles would double to as many as 80,000 during peak hour in 2040. The vehicle network cannot support this many drivers, and so Downtown economic potential is likely to be stymied.



Source: Replica, SJDOT

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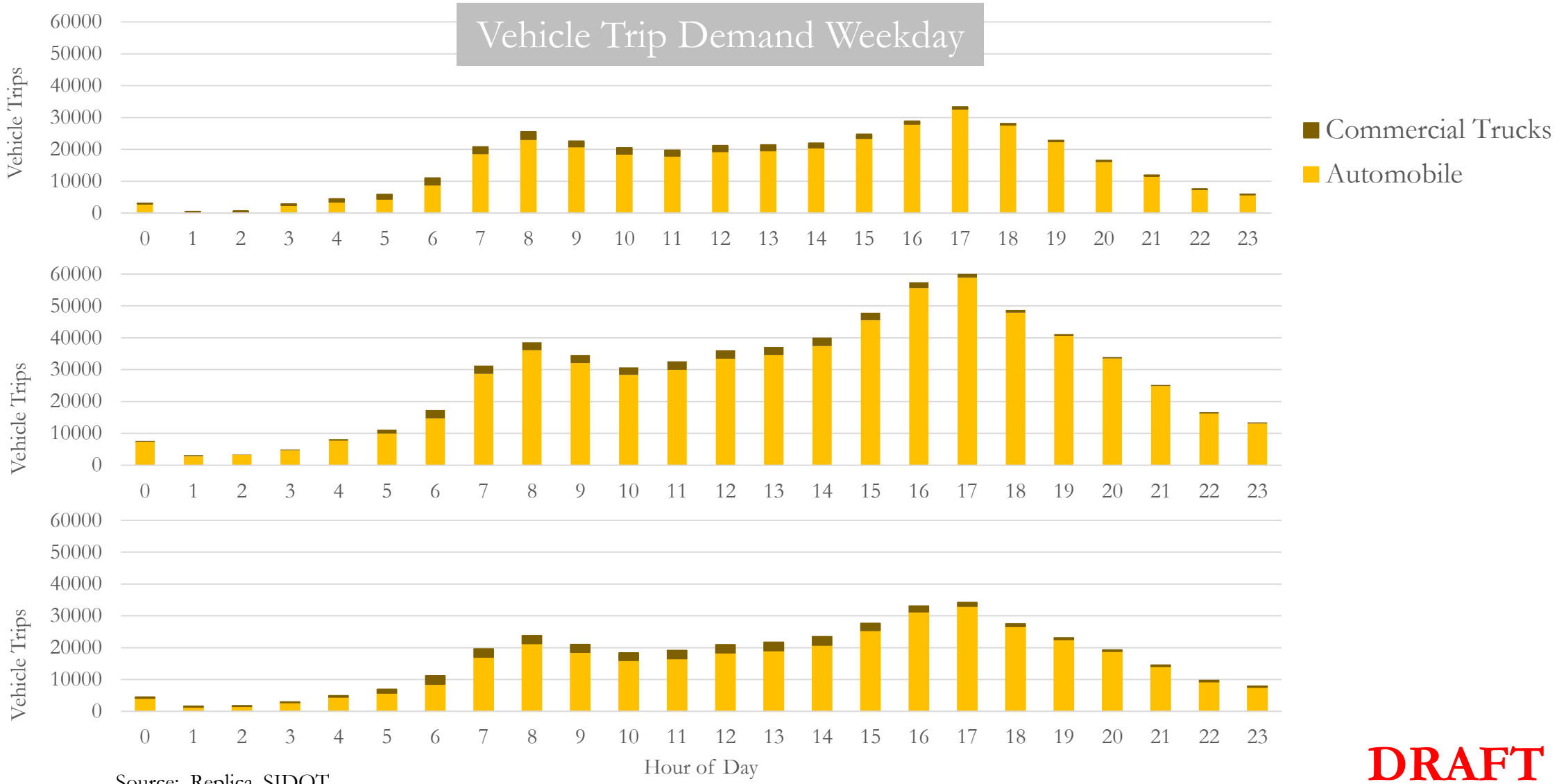
Designing streets to make transit, walk, and bike trips more attractive can help reduce vehicle trip demand.

2019

2040 Baseline

2040 DTP



Source: Replica, SJDOT

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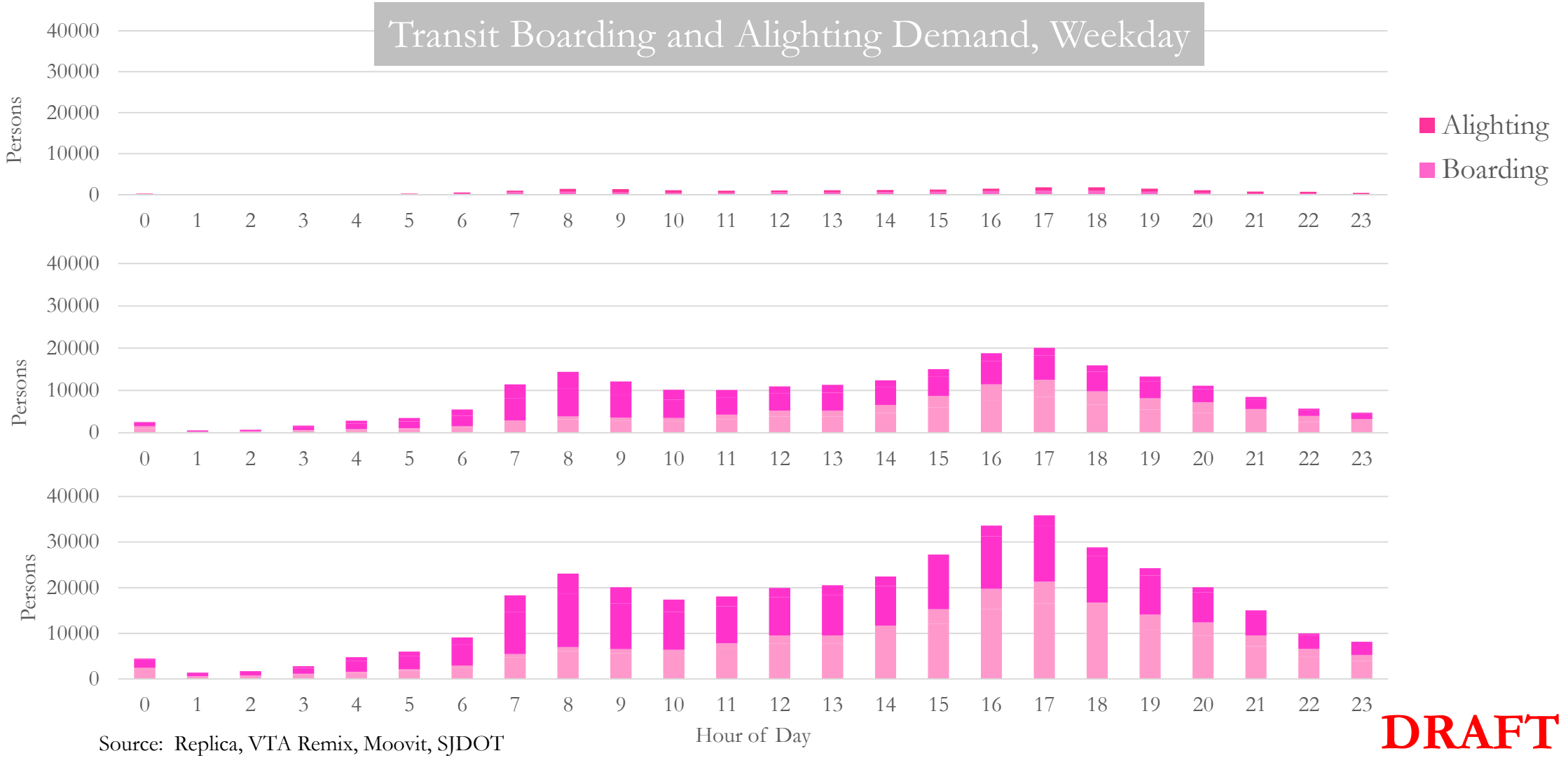
Investments in high-capacity transit (VTA, BART, Caltrain, HSR) have the potential to double overall ridership (to as many as 35,000 trips in PM peak hour) and produce much higher economic returns if accommodated by corridors that prioritize transit.

2019

2040 Baseline

2040 DTP



Source: Replica, VTA Remix, Moovit, SJDOT

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As many as 25,000 transit riders could walk to the transit stops in the peak hour, generating more Downtown business opportunities than the case when they would otherwise be drivers being stuck in traffic and not being able to find parking.

Source: Replica, VTA Remix, Moovit, SJDOT

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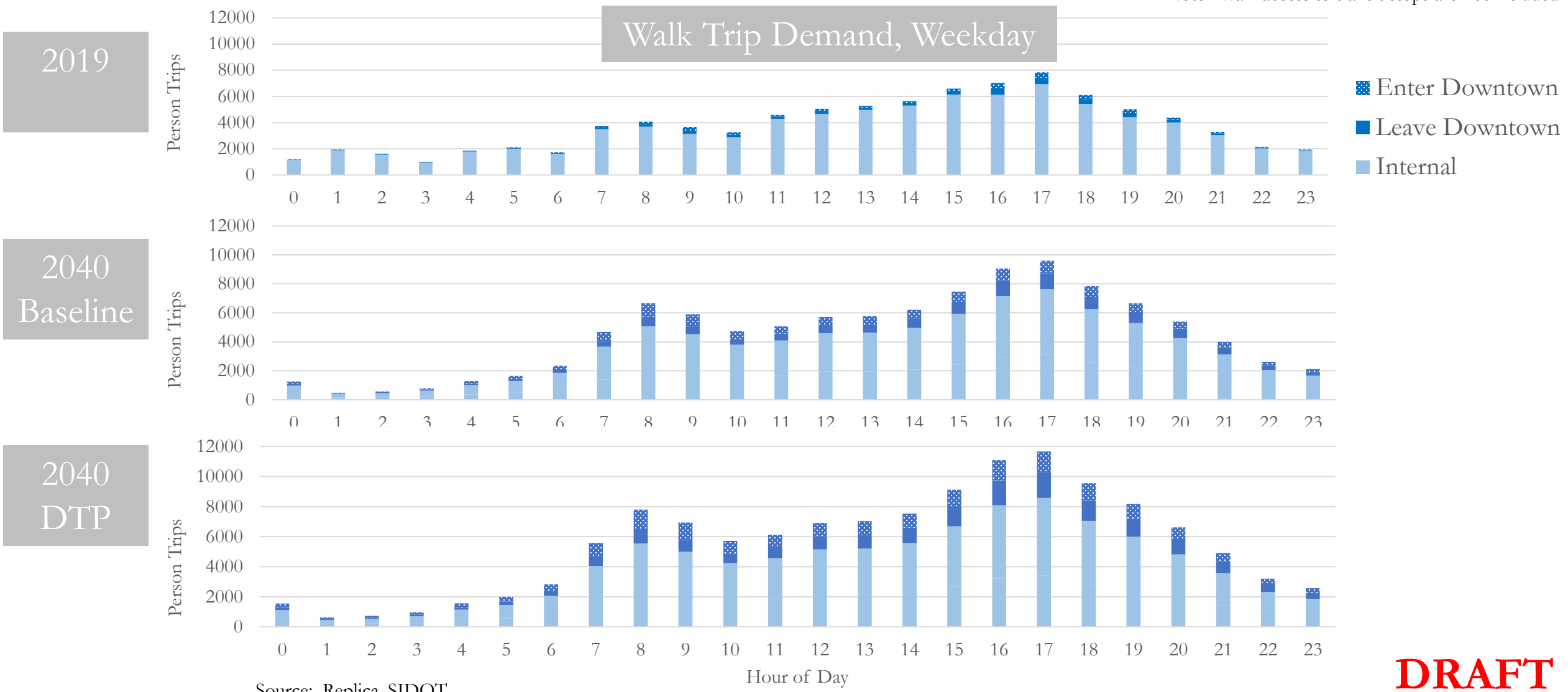
Fully connected corridors that prioritize pedestrian connectivity and access to destinations could generate as many as 8,000-12,000 walk trips per hour during peak periods, increasing foot traffic to Downtown businesses.

Note: Walk access to transit stops are not included.



Source: Replica, SJDOT

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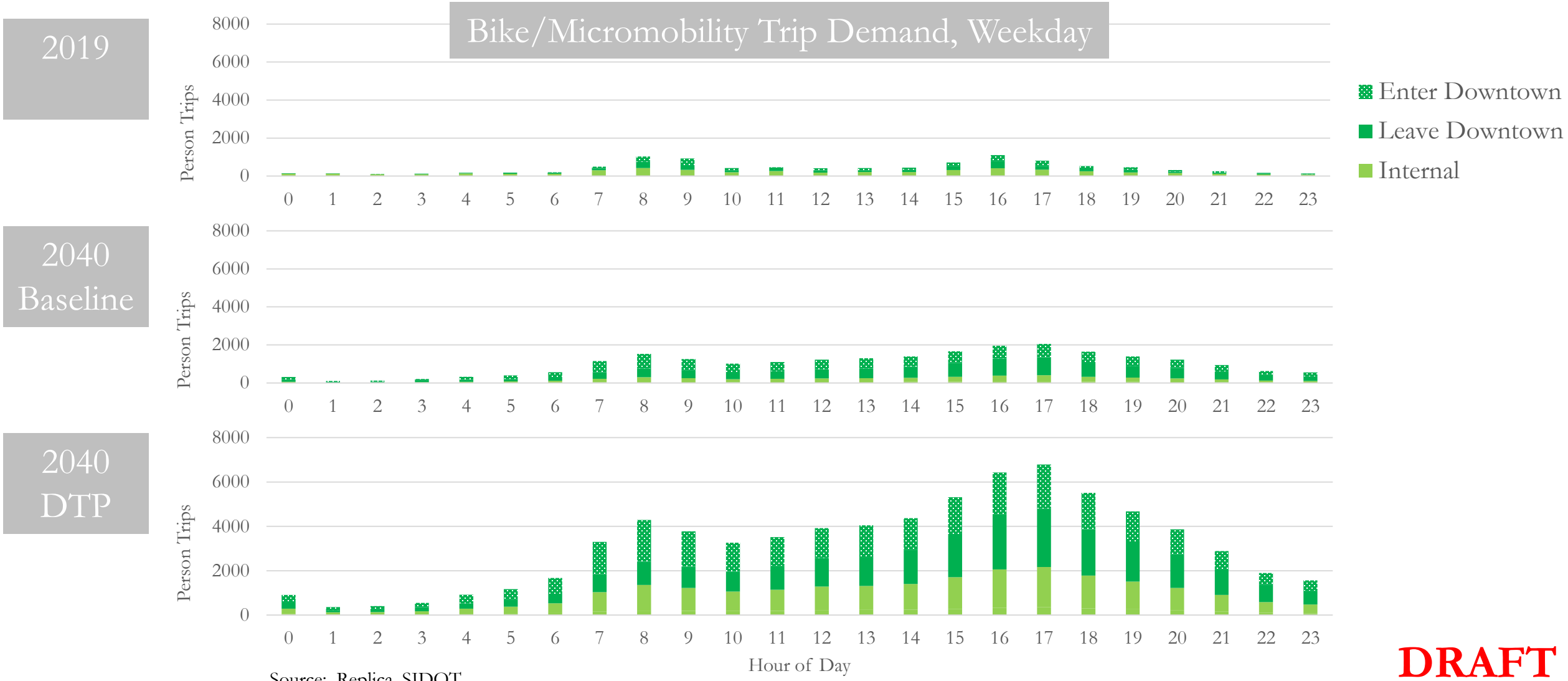
Fully connected corridors that prioritize bike mobility and access could generate as many as 4,000-7,000 bike and micromobility trips per hour during peak periods, increasing business potential.

Note: Bike access to transit stops are not included.



Source: Replica, SJDOT

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Proposed Street Network

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Proposed Vehicle Network

Connectors are used primarily by drivers, bikers and walkers for safe, inter-neighborhood mobility. Other streets are used for internal circulation.

= City/Local Connectors
= Other streets for vehicle circulation
= Active Greenways (closed to vehicles)
= Temporary closure for festivals or events
= New ramp
= Ramp closure
= Freeway ramps

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Proposed Bike Network

Primary Bikeways encourage people with less experience to get around by bikes and scooters for inter-neighborhood mobility.

= Primary Bikeways
= Active Greenways/Trails
= Trailheads
= Other Streets with either protected bike lanes or bike boulevards

= New ramp
= Ramp closure
= Freeway ramps

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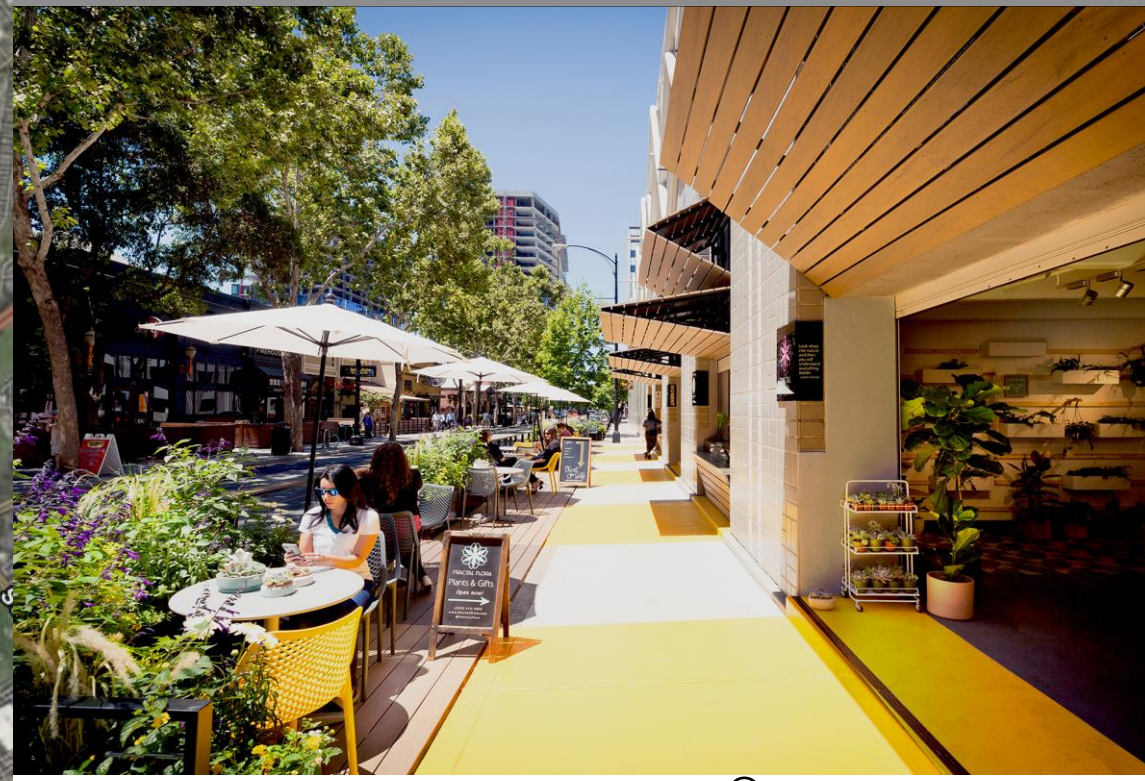
Proposed Pedestrian Network

Placemaking and wayfinding provide safe and enjoyable walk trips to shops, restaurants, parks, transit stops, and even the street as a destination of itself!



= Ped Access to Transit Routes
= Active Greenways/Trails (ped/bike-only)
= Trailheads
= Temporary closure to vehicles for festivals or events
= Streets with high pedestrian volume potential
= Other streets with at least standard sidewalks

= New ramp
= Ramp closure
= Freeway ramps

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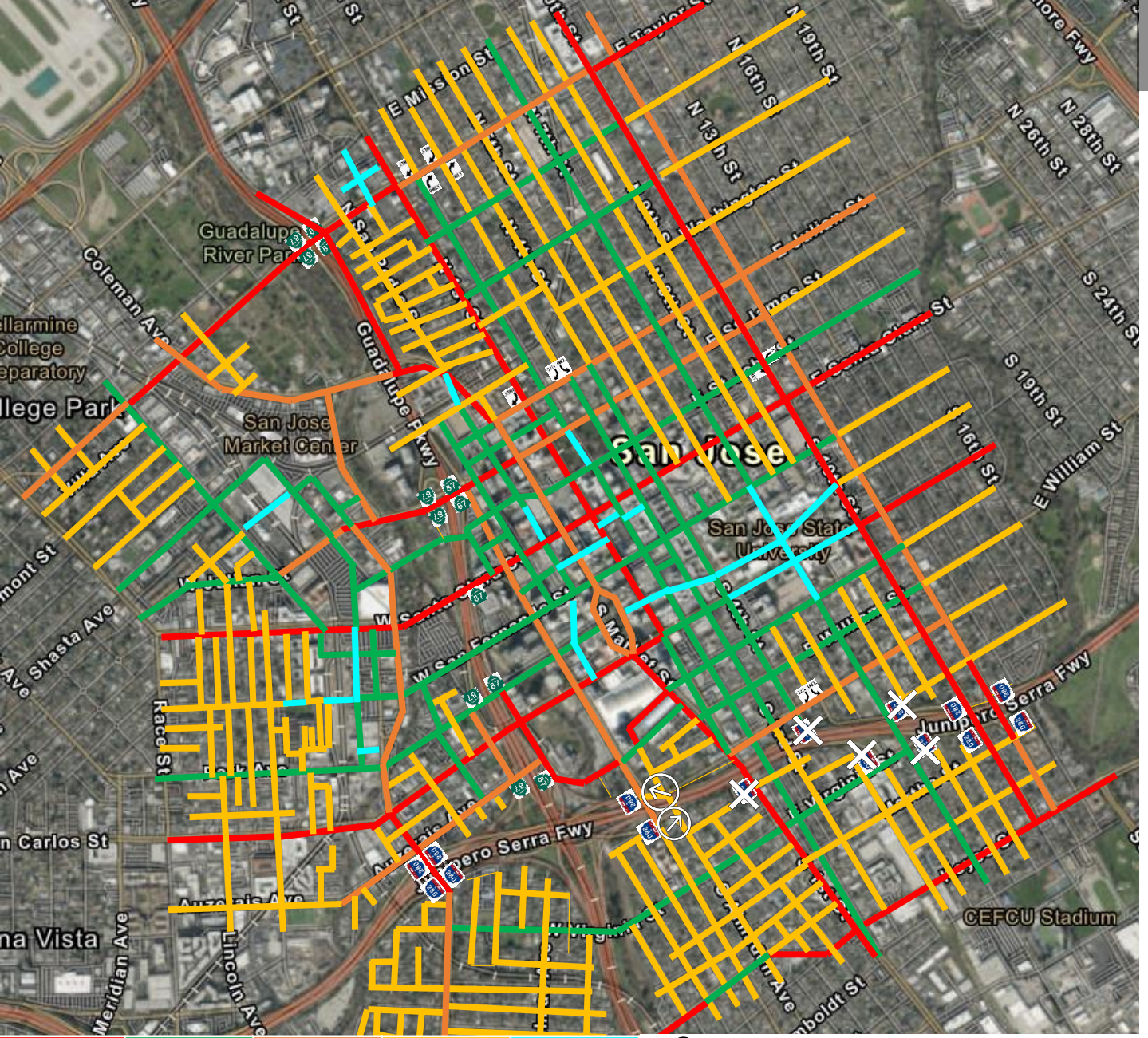
Proposed Curb Uses and Parking



No Stopping	Short Term Access	Longer Term Access	Parking	Closed Streets

= New ramp
= Ramp closure
= Freeway ramps

General Rule	Primary Use Examples
No Stopping	Transit boarding, Streetscape
Short Term Access	Parklets, Outdoor dining, Streetscape Commercial loading, Passenger loading, 30-min parking
Longer Term Access	Commercial loading, Passenger loading, 60-min parking
Parking	Residential parking, Streetscape

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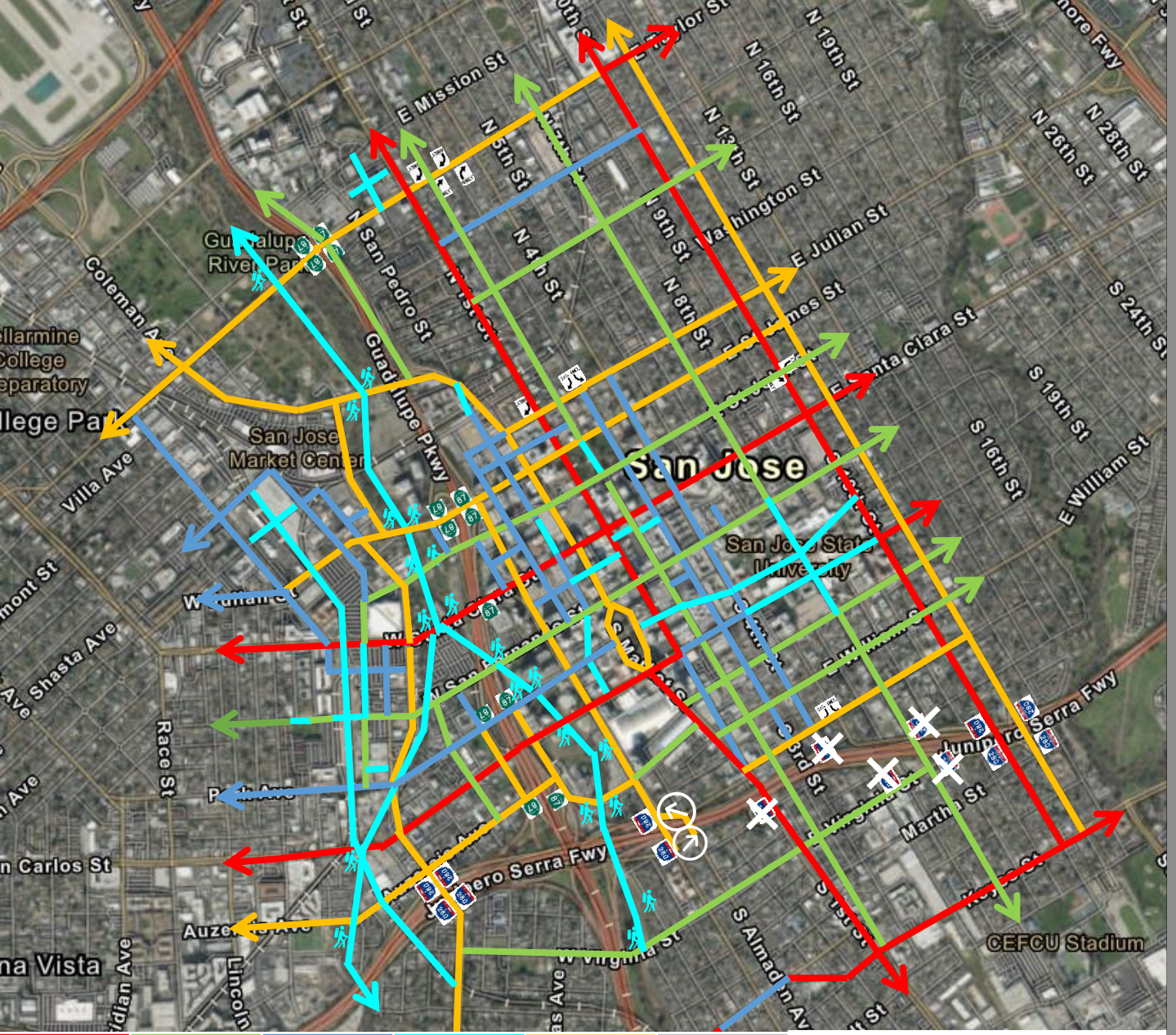

Street Typology is a policy framework for street design, ensuring that each street is designed, constructed, and operated to serve its primary uses.

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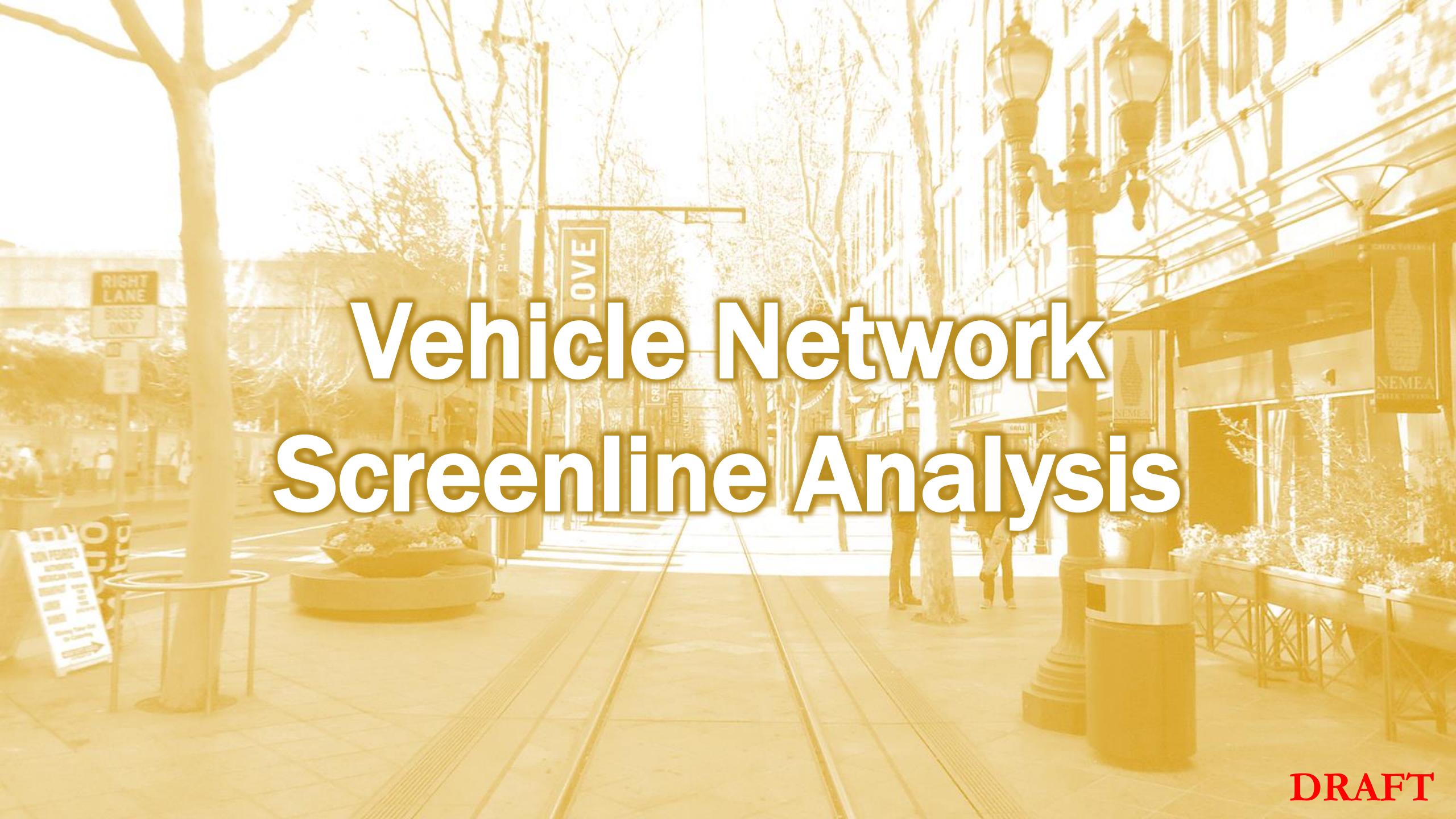

Vehicle Network Screenline Analysis

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Can the Downtown street network accommodate the vehicle trip demand?

- A screenline is an imaginary line on a map that crosses multiple parallel streets serving the same direction of traffic. The sum of traffic demand traversing through the screenline is compared with total roadway capacity of the screenline to evaluate network performance.

- 4 Screenlines
  - South, North, East, West

- 3 Scenarios
  - 2019 Weekday
  - 2040 Baseline, Weekday
  - 2040 DTP, Weekday

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Can the Downtown street network accommodate the vehicle trip demand?

= Virtual screenline representing the direction of trips entering and exiting Downtown

- If the total traffic demand of the same direction traversing through a screenline is less than the total capacity of the screenline, the screenline would be considered adequate to accommodate the traffic demand of that direction, though congestions may still occur at some locations.

- Otherwise, the screenline would be considered inadequate. Long durations of massive gridlock would occur. Unserved demand may be discouraged to travel to Downtown again.

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South Screenline, Northbound Traffic 2019 Weekday

Northbound traffic enter Downtown via one of 11 gateway options:

- 5 primary local routes (9 lanes)
- 4 off-ramps on SR-87
- 2 off-ramps on I-280

Not all entering traffic end in Downtown; roughly half of them drive past Downtown to elsewhere without stopping.

Three-quarters of entering traffic travel on primary local routes; 25% travel on northbound SR-87 and take exits at the 6 off-ramps.

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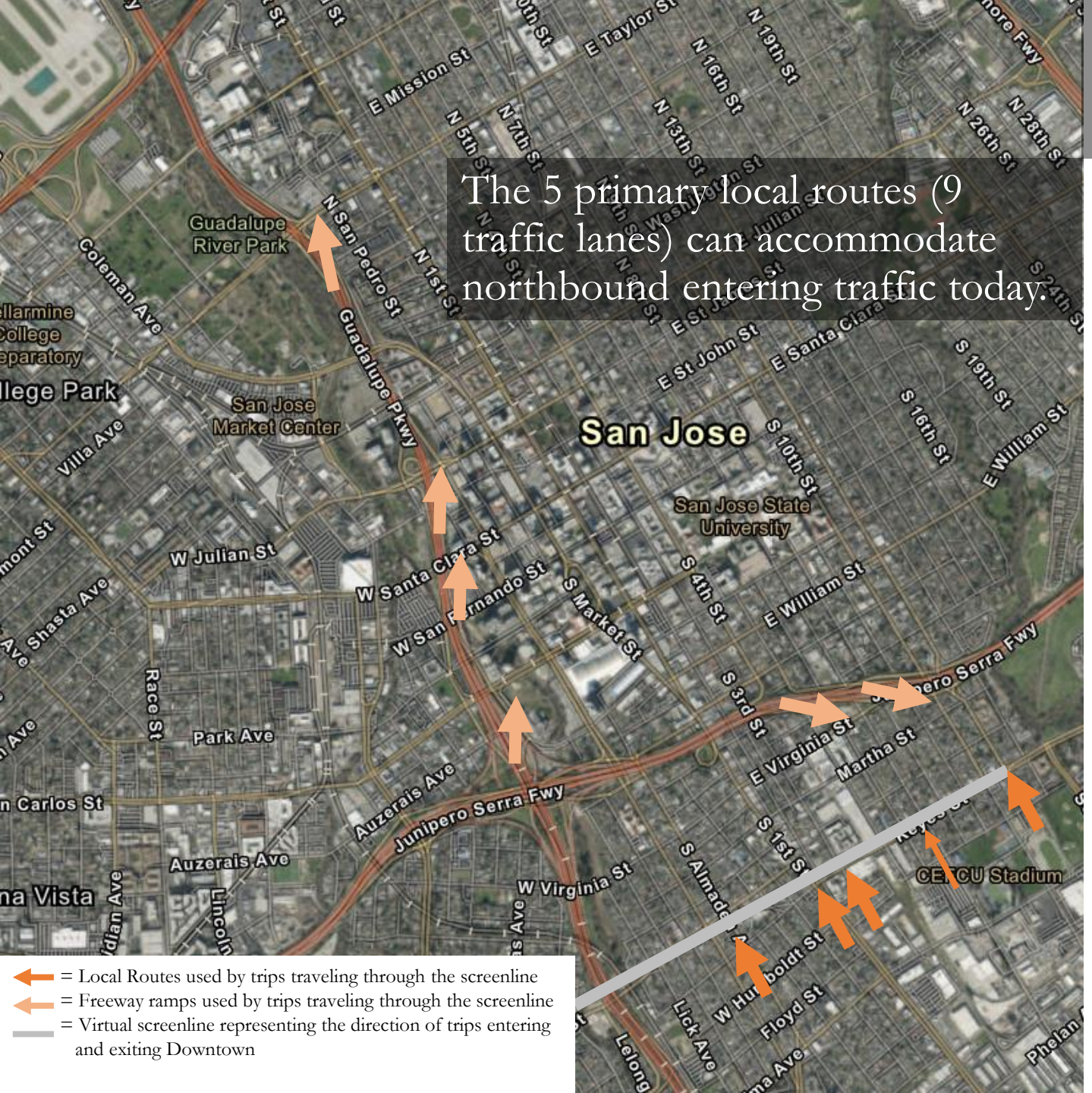
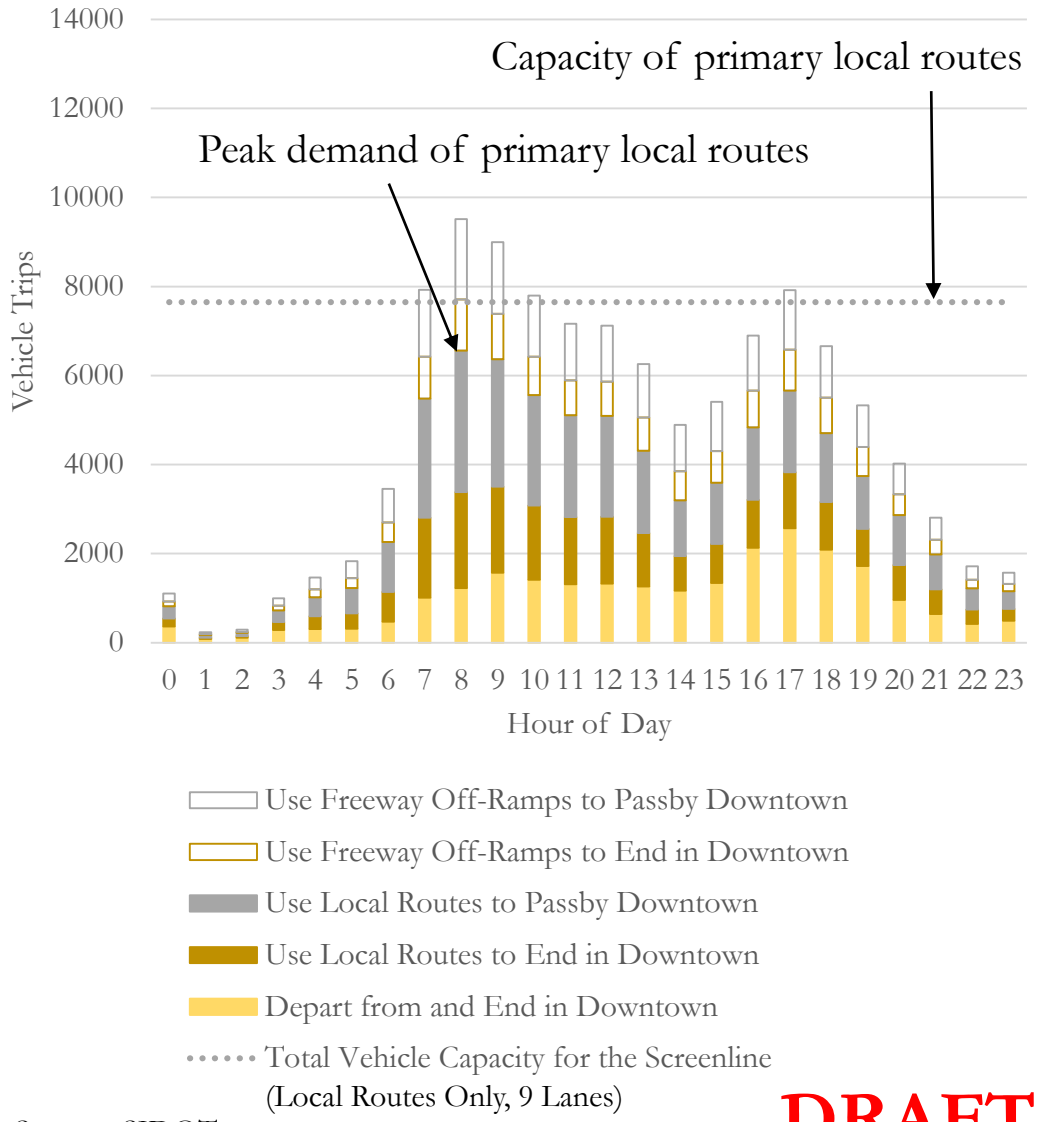
South Screenline, Northbound Traffic 2019 Weekday





Source: SJDOT

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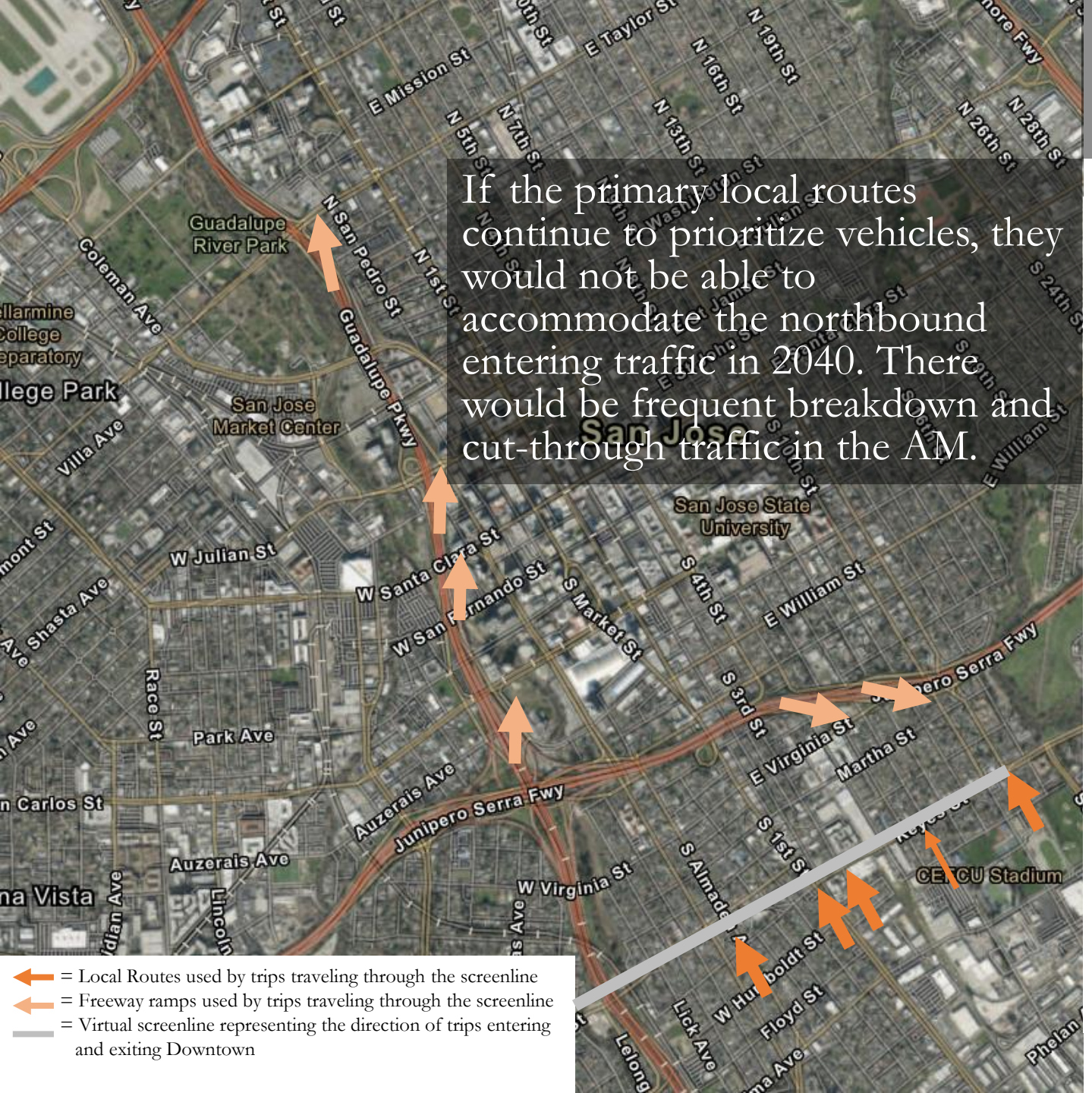
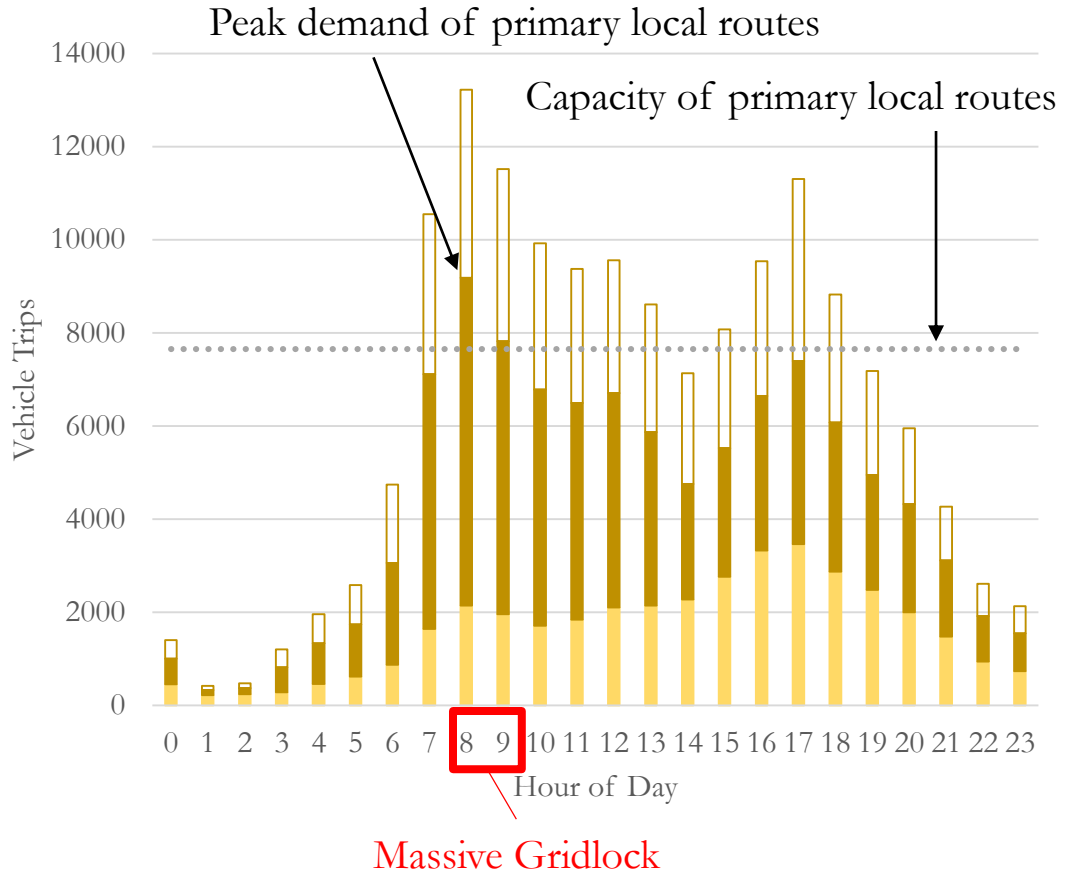
South Screenline, Northbound Traffic 2040 Baseline, Weekday





Source: SJDOT

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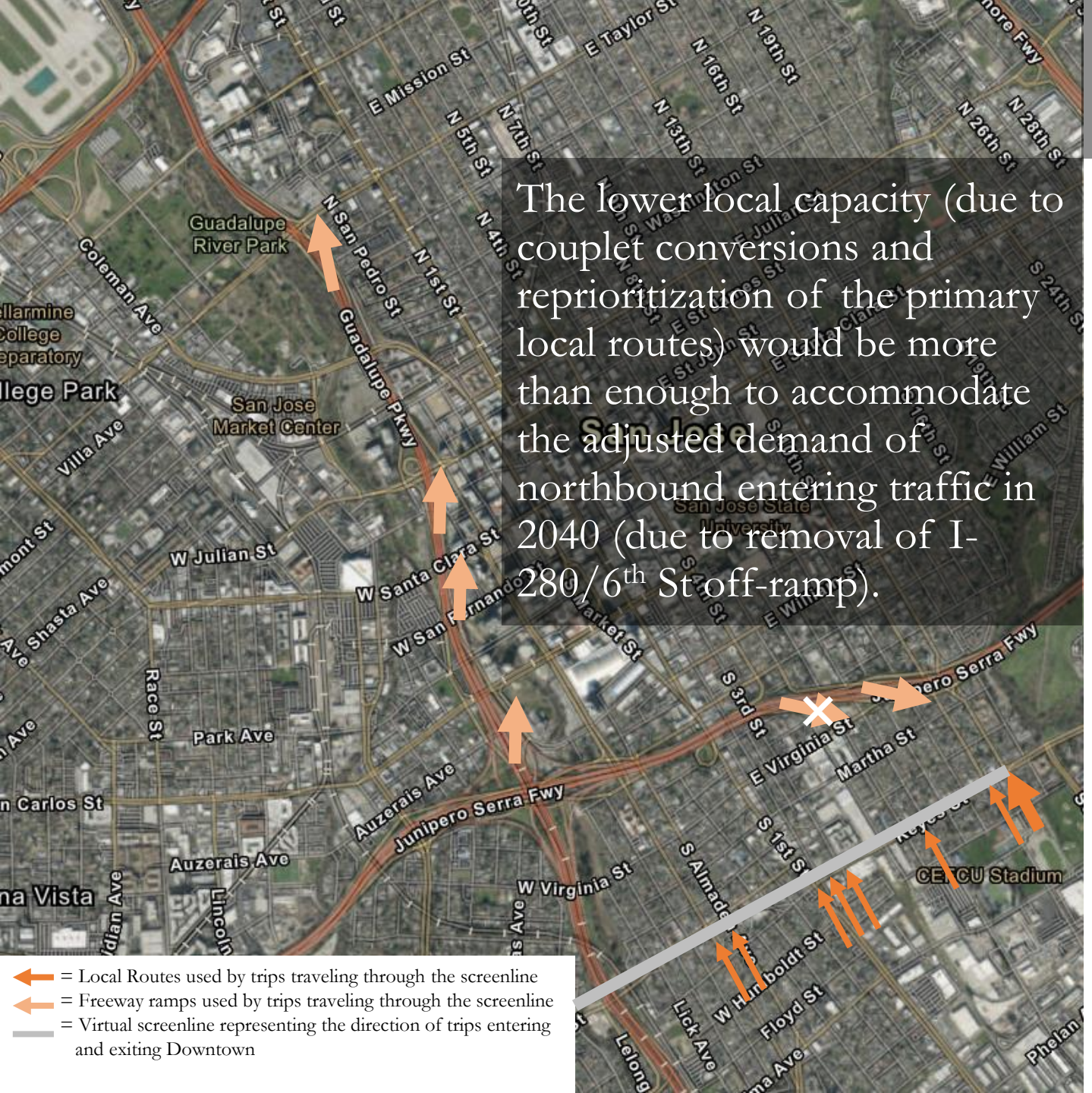
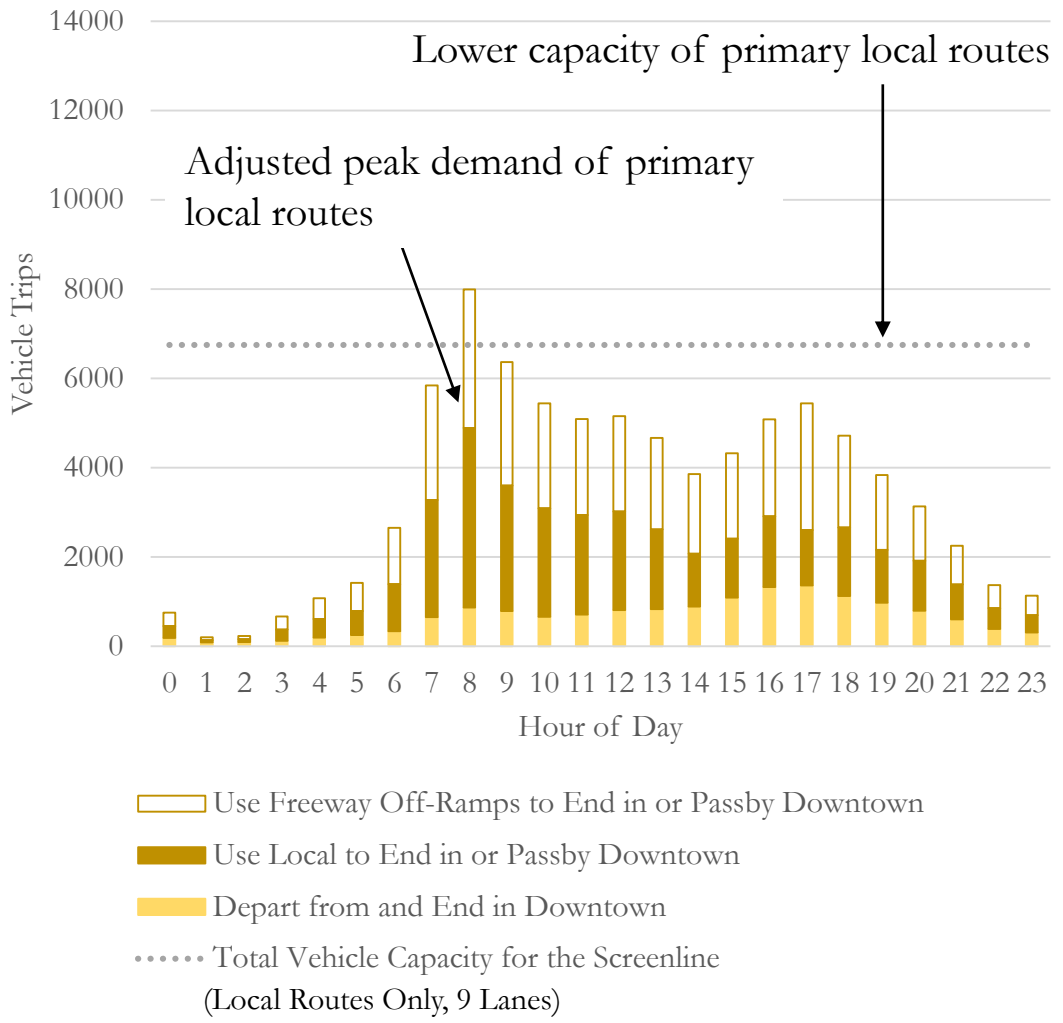
South Screenline, Northbound Traffic 2040 DTP, Weekday





Source: SJDOT

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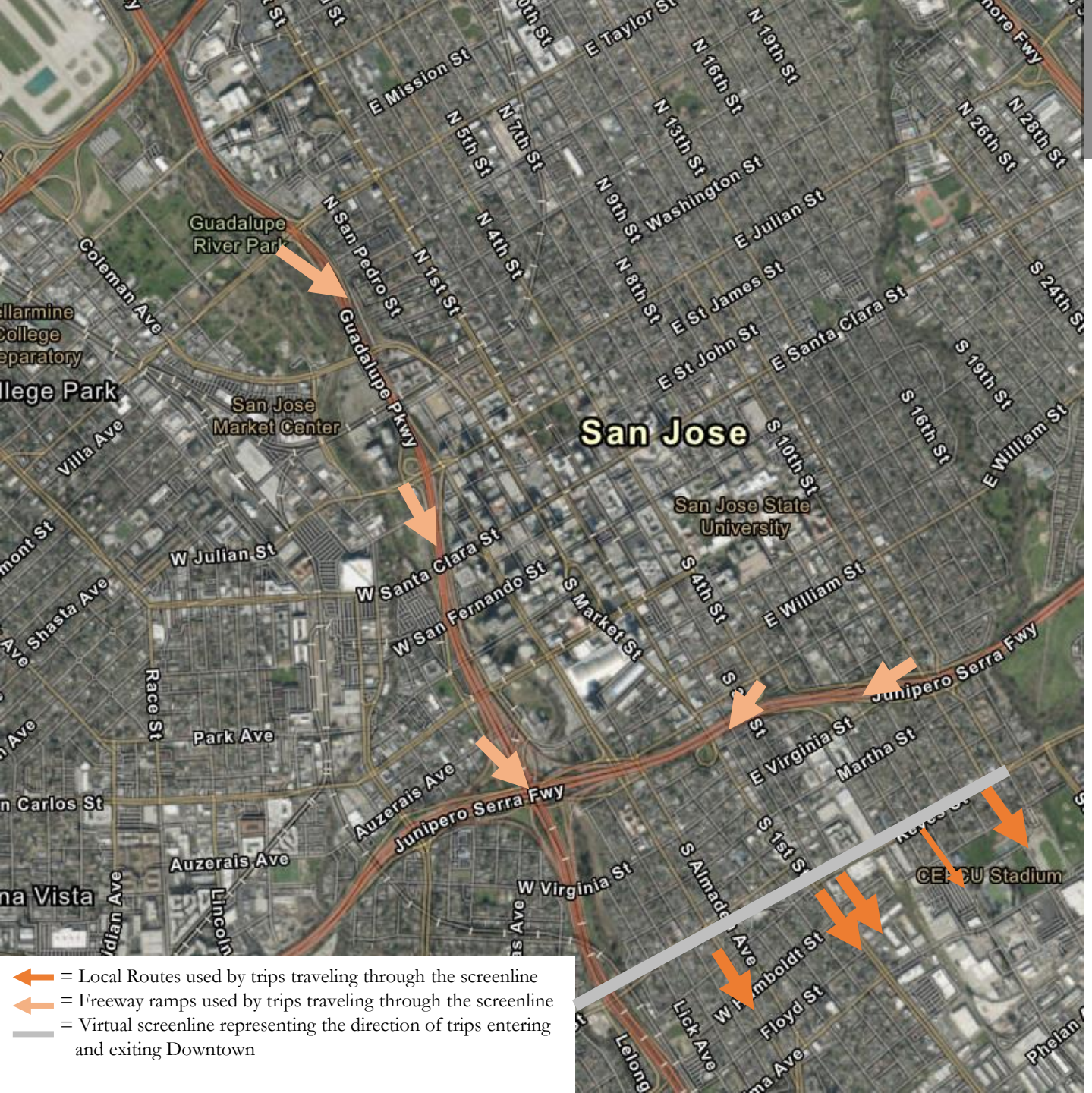
South Screenline, Southbound Traffic 2019 Weekday



Southbound traffic depart from Downtown via one of 10 gateway options:

- 5 primary local routes (9 lanes)
- 3 on-ramps on SR-87
- 2 on-ramps on I-280

Not all exiting traffic originate from Downtown; roughly half of them drive past Downtown without stopping.

80% of exiting traffic travel on primary local routes; 20% use the 5 on-ramps and travel on southbound SR-87.

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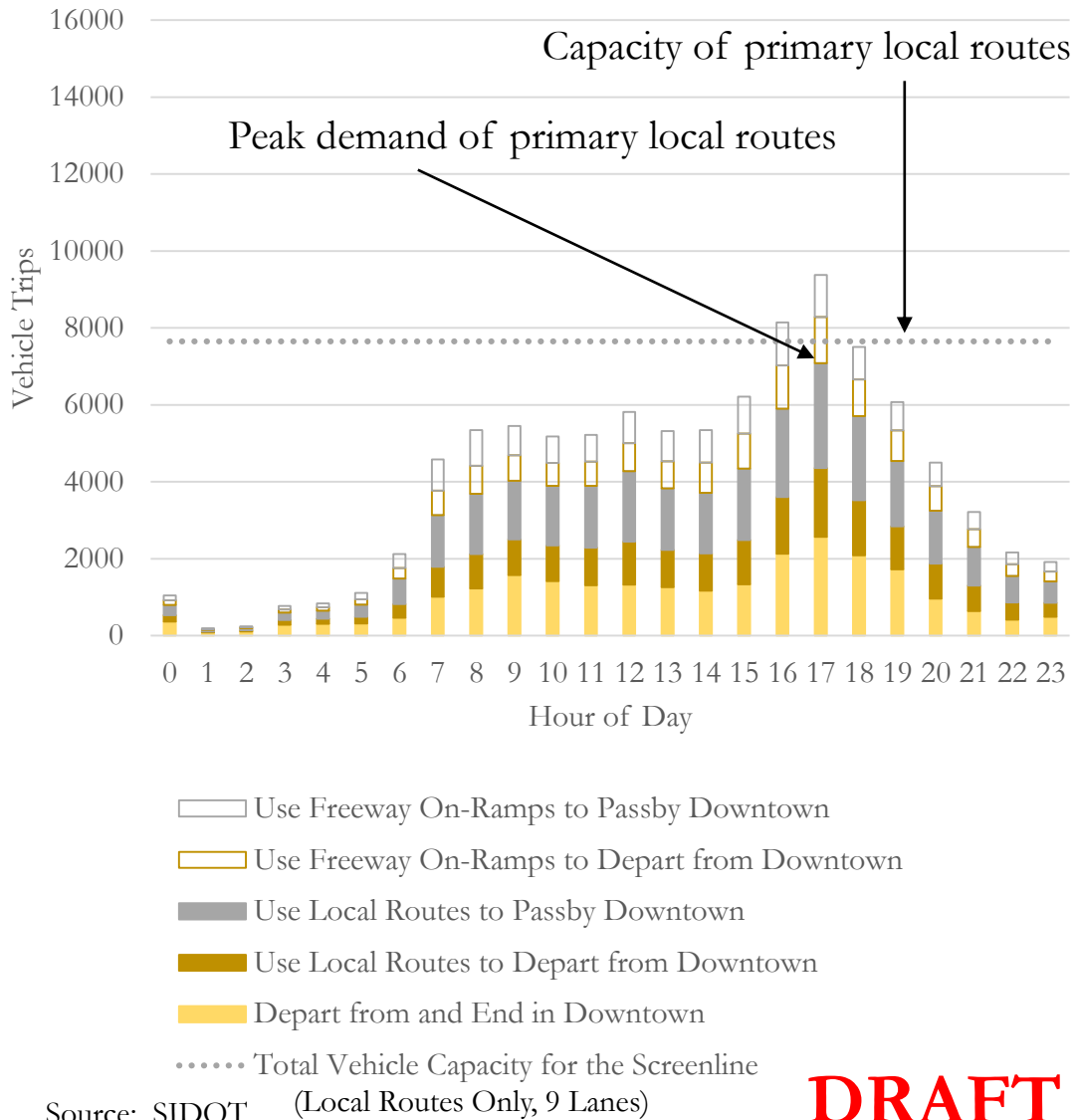
South Screenline, Southbound Traffic 2019 Weekday



Source: SJDOT

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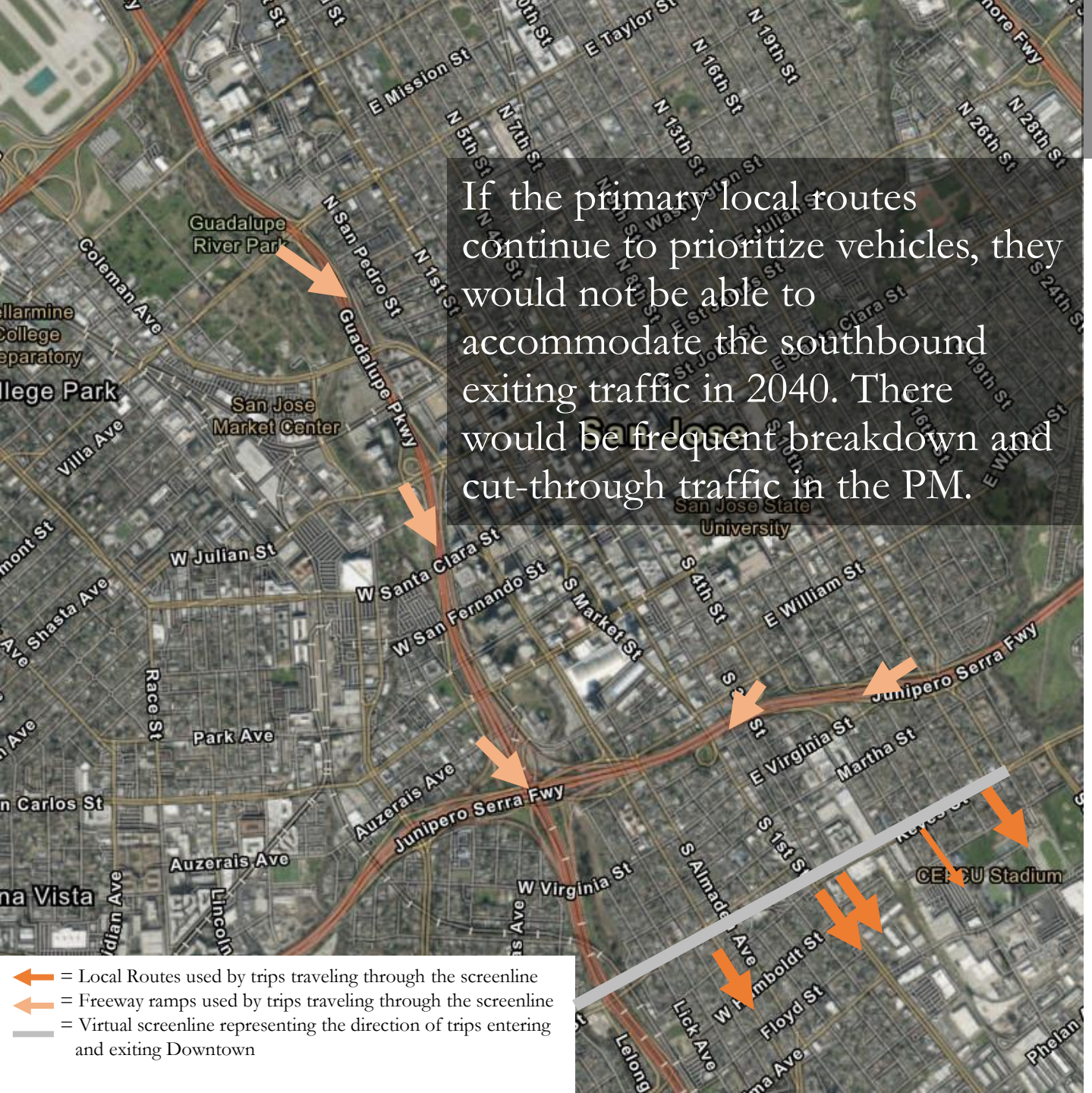
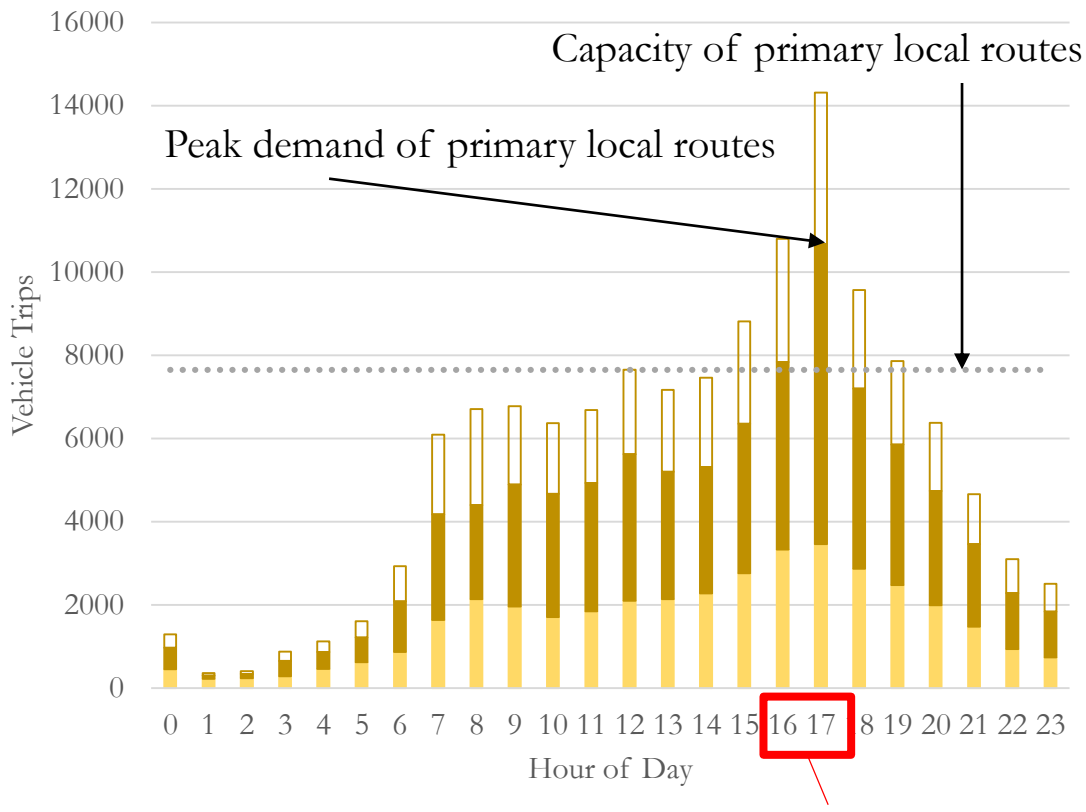
South Screenline, Southbound Traffic 2040 Baseline, Weekday





Source: SJDOT

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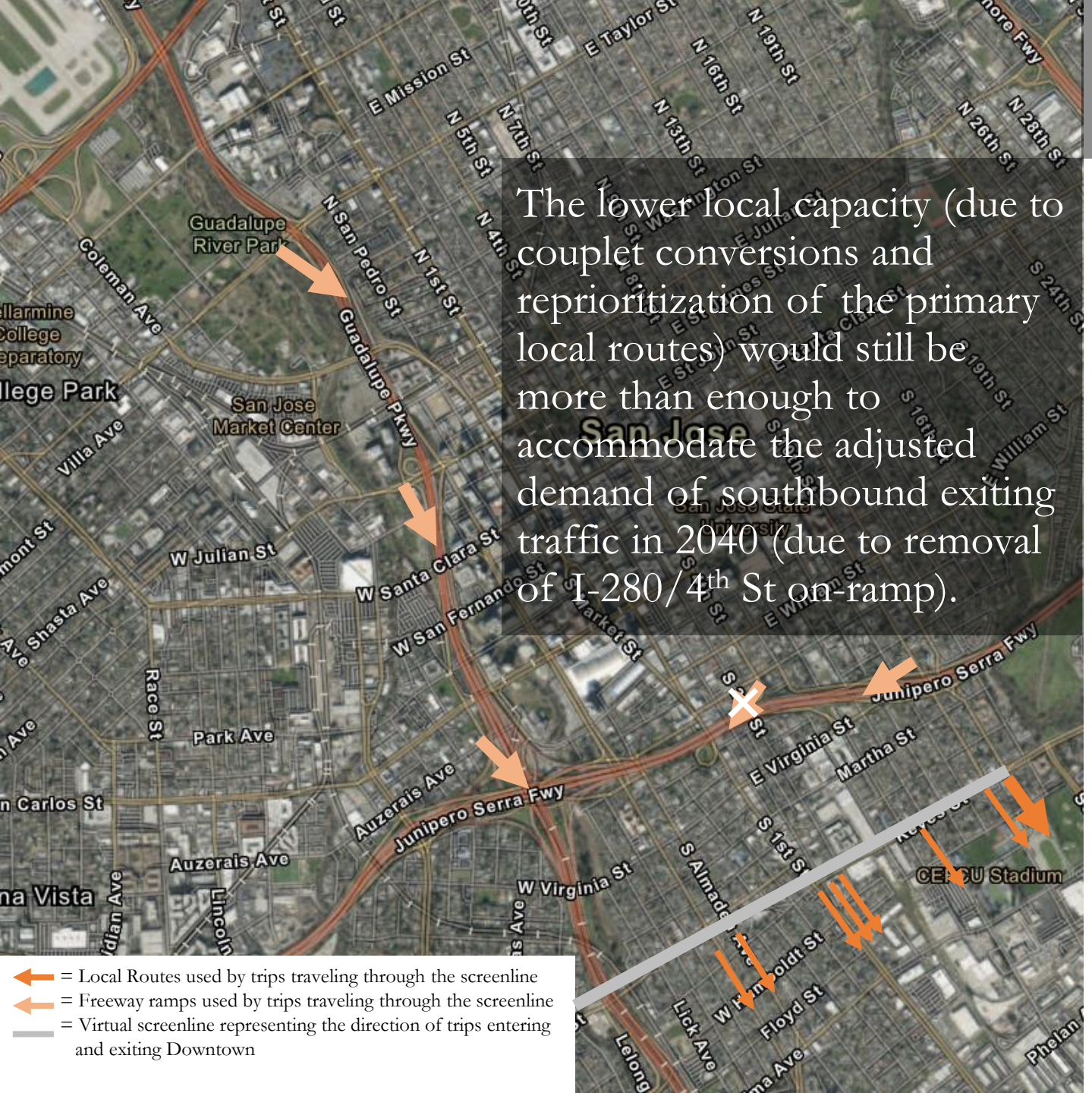
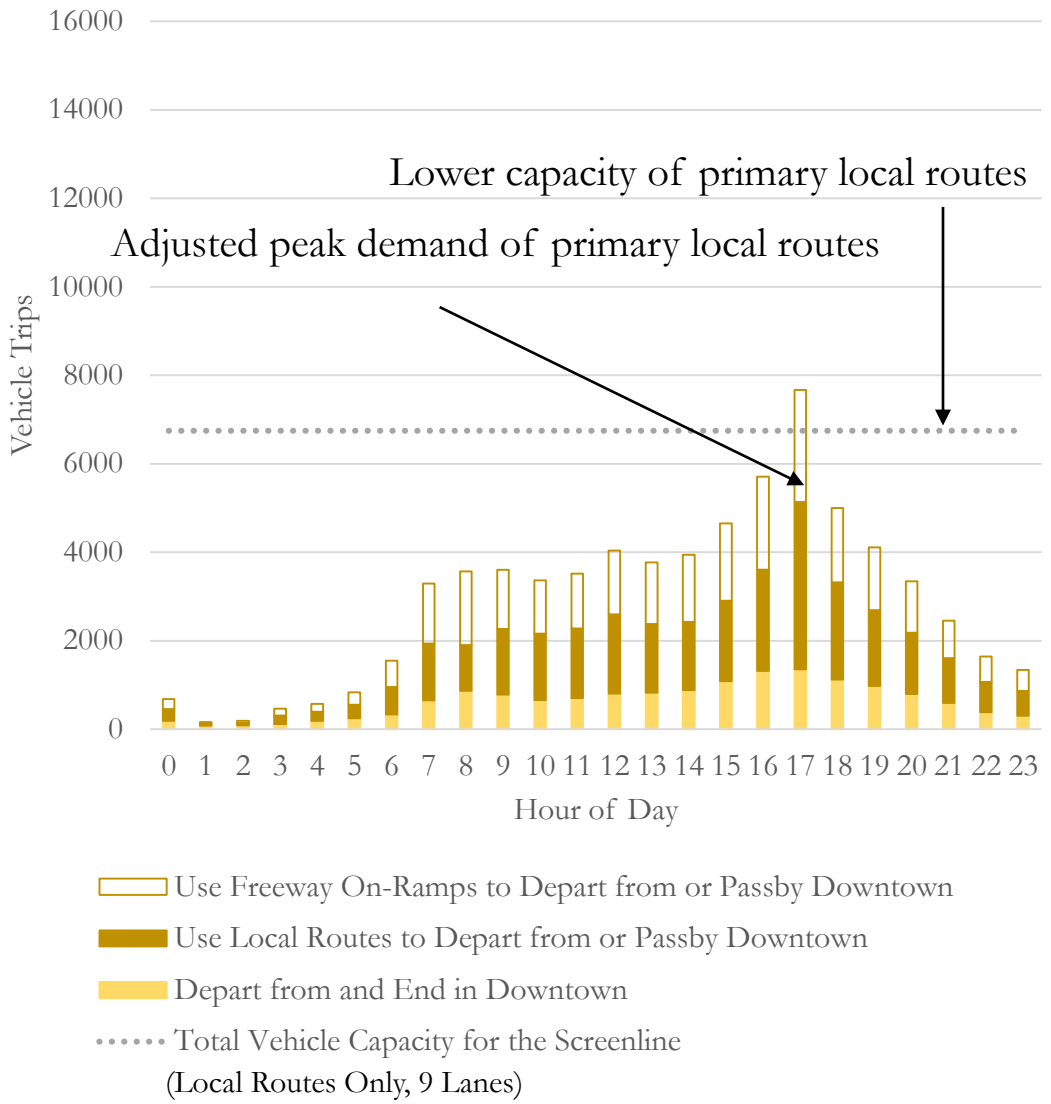
South Screenline, Southbound Traffic 2040 DTP, Weekday





Source: SJDOT

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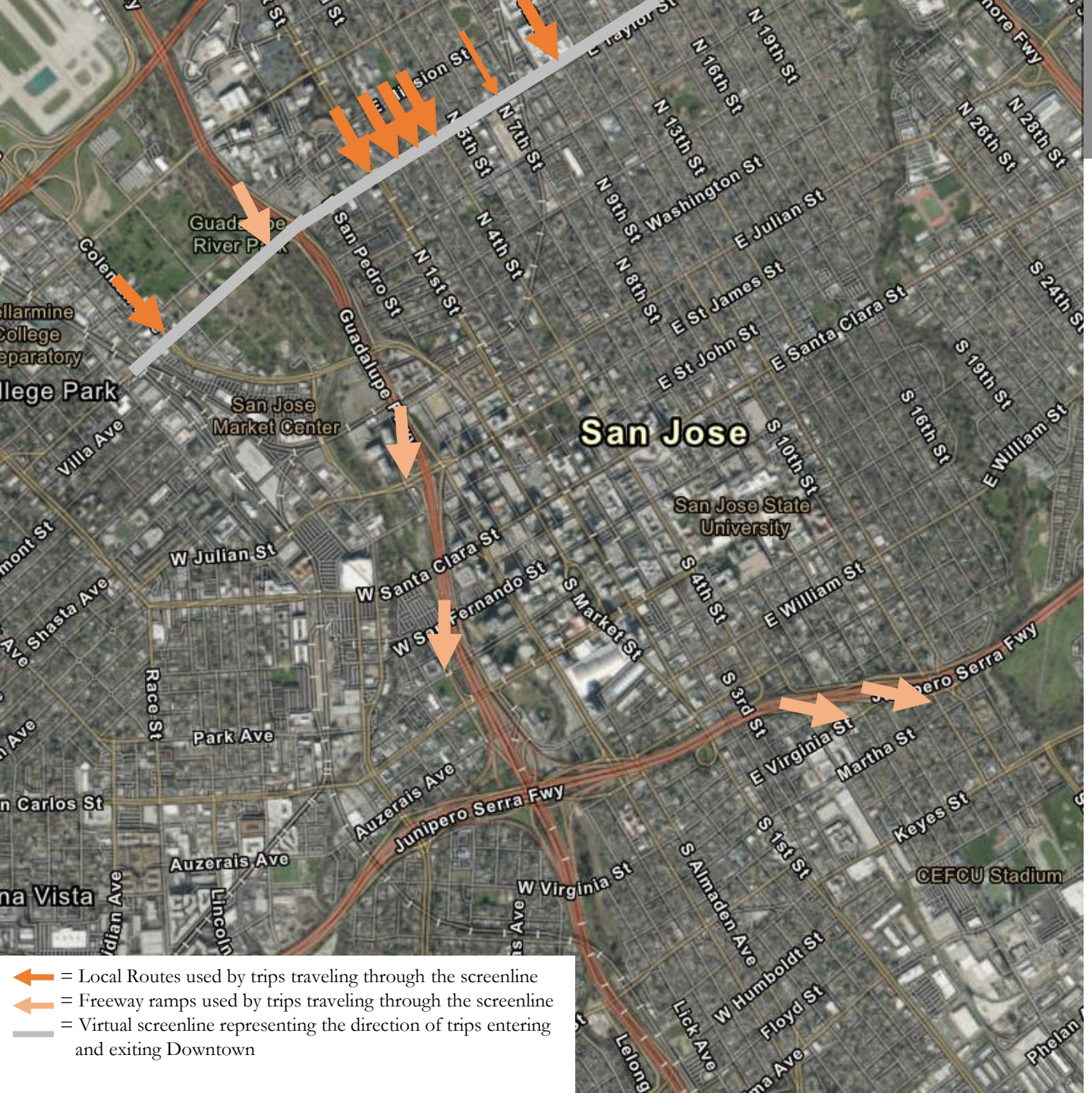
North Screenline, Southbound Traffic 2019 Weekday



Southbound traffic enter Downtown via one of 12 gateway options:

- 7 primary local routes (9 lanes)
- 3 off-ramps on SR-87
- 2 off-ramps on I-280

Not all entering traffic end in Downtown; roughly 40% drive past Downtown to elsewhere without stopping.

Most entering traffic travel on primary local routes as opposed to southbound SR-87 in the PM.

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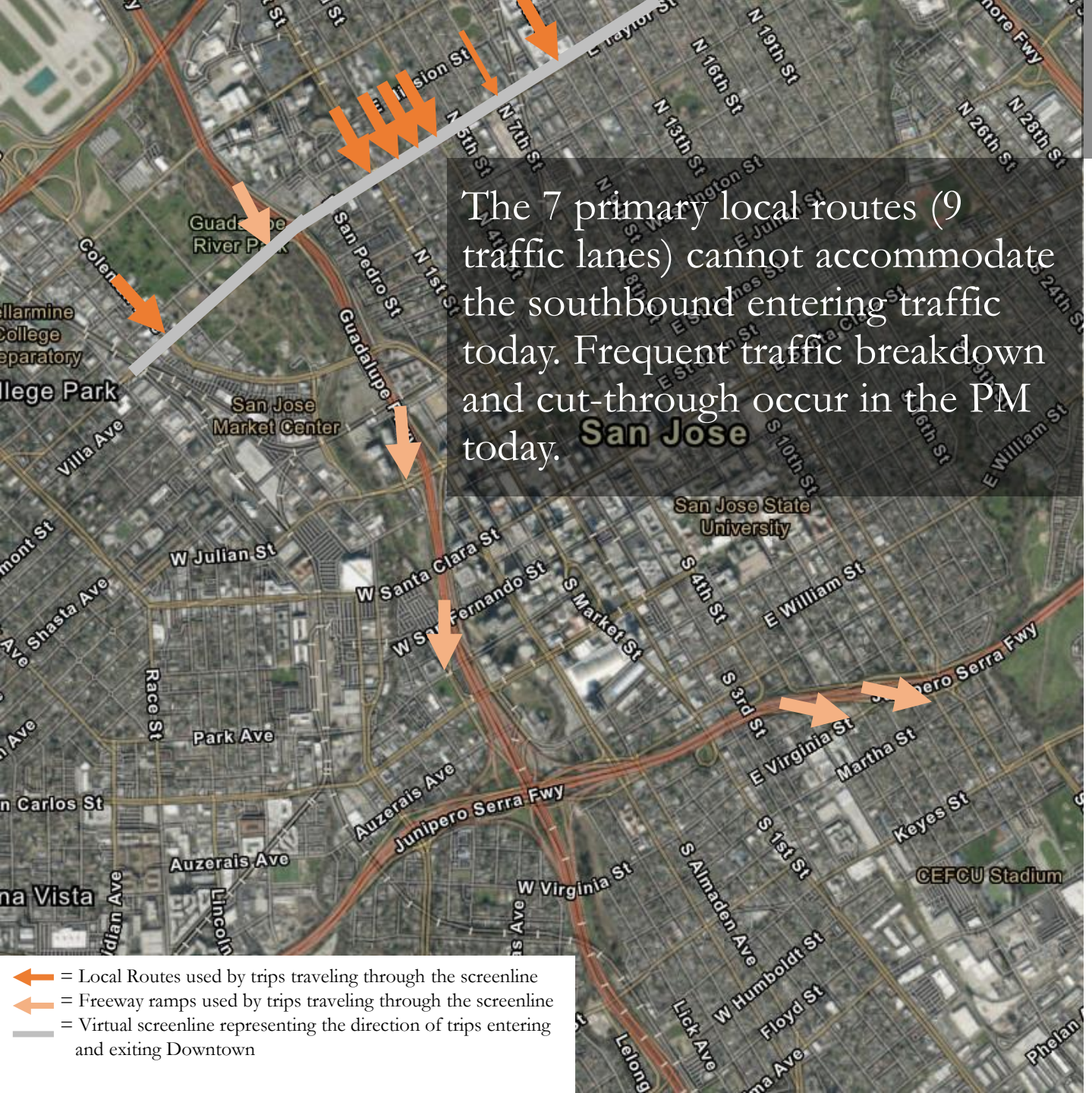
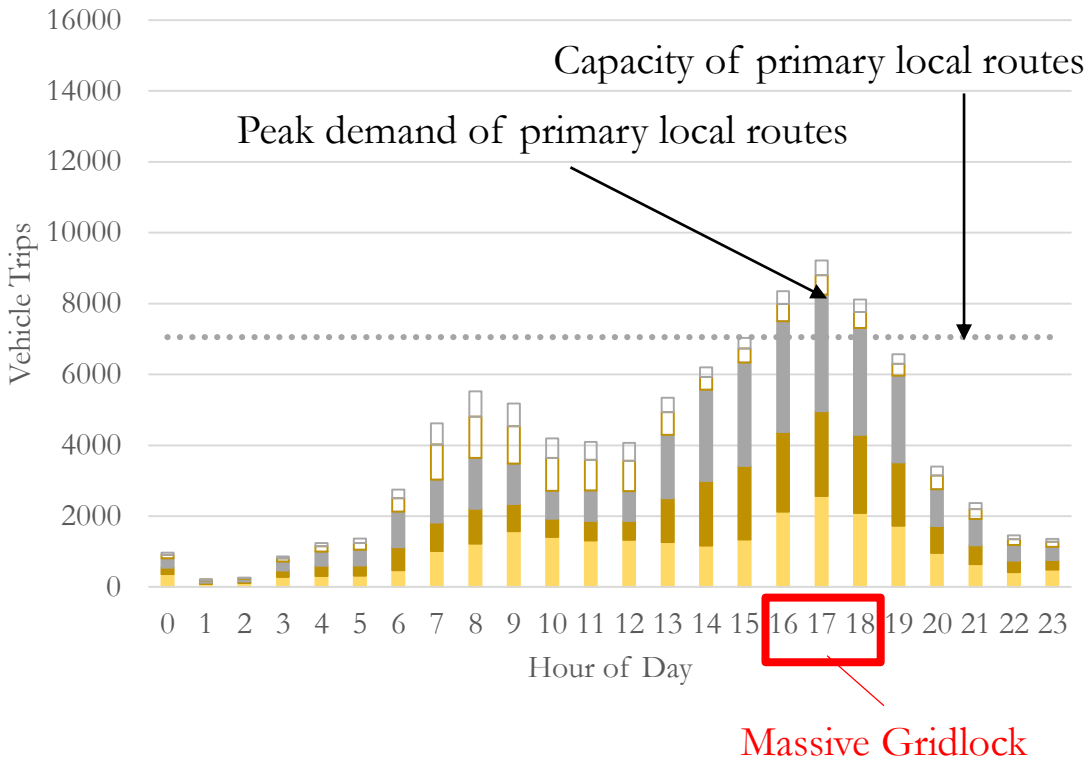
North Screenline, Southbound Traffic 2019 Weekday





Source: SJDOT

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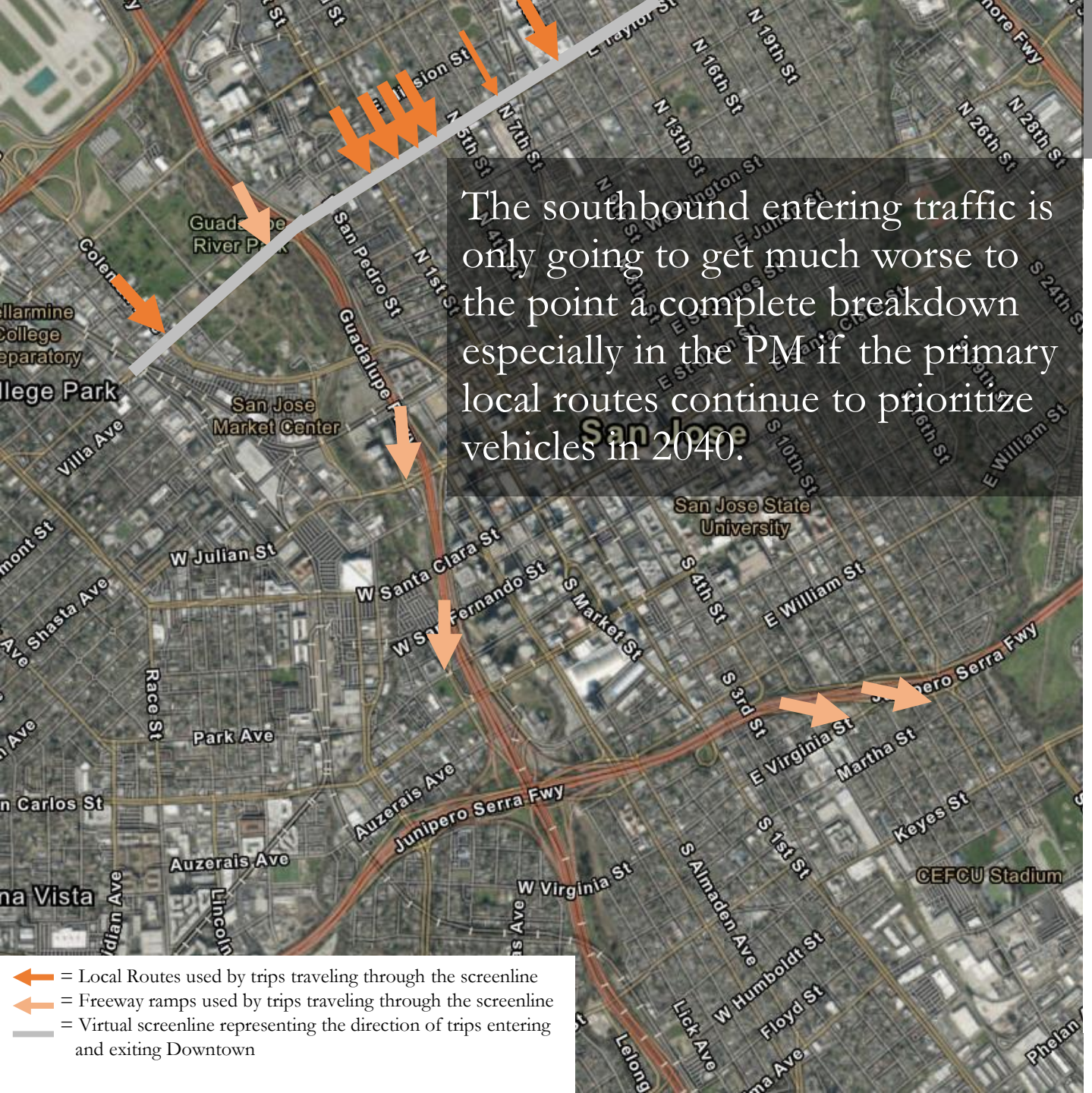
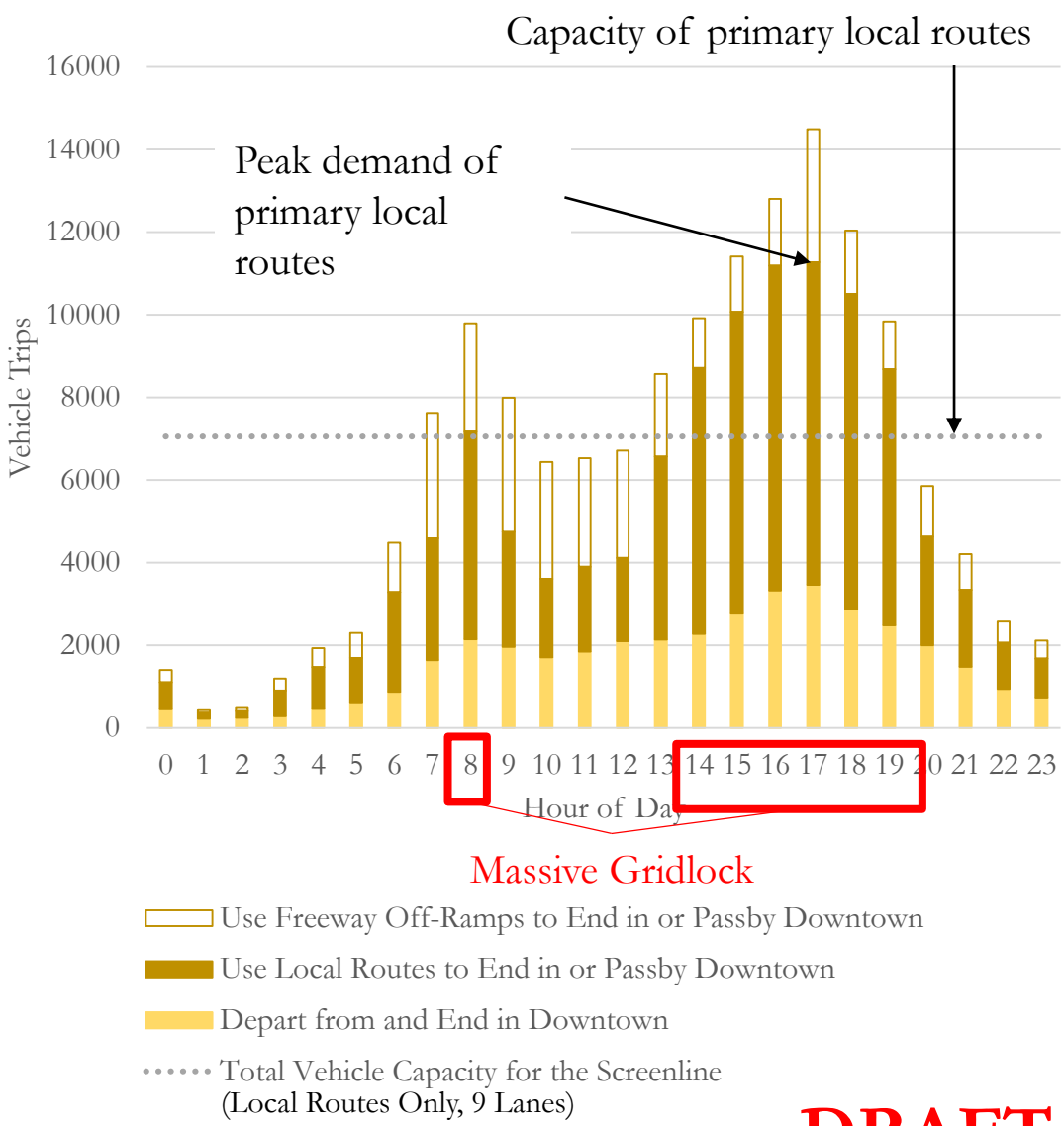
North Screenline, Southbound Traffic 2040 Baseline, Weekday





Source: SJDOT

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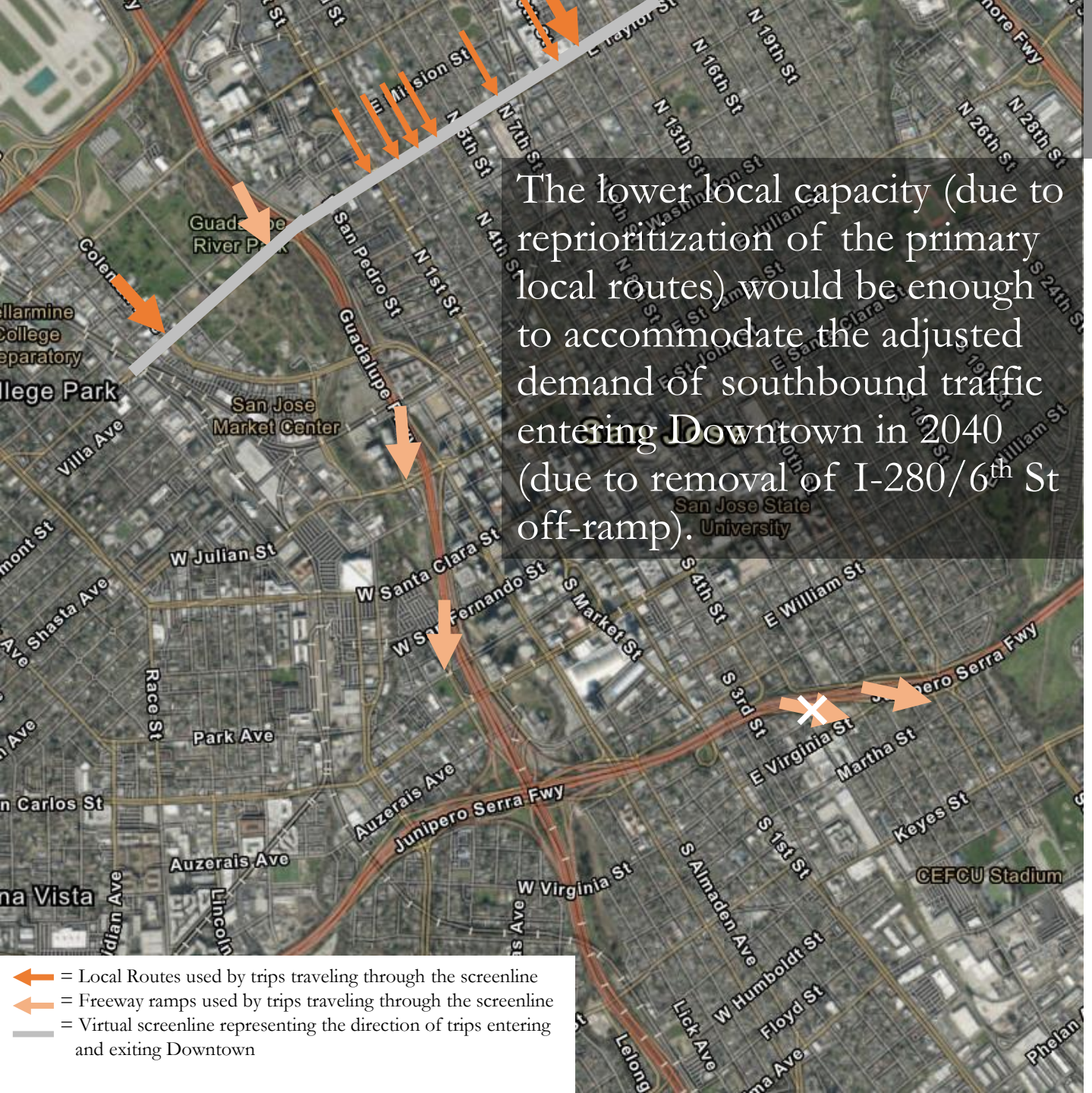
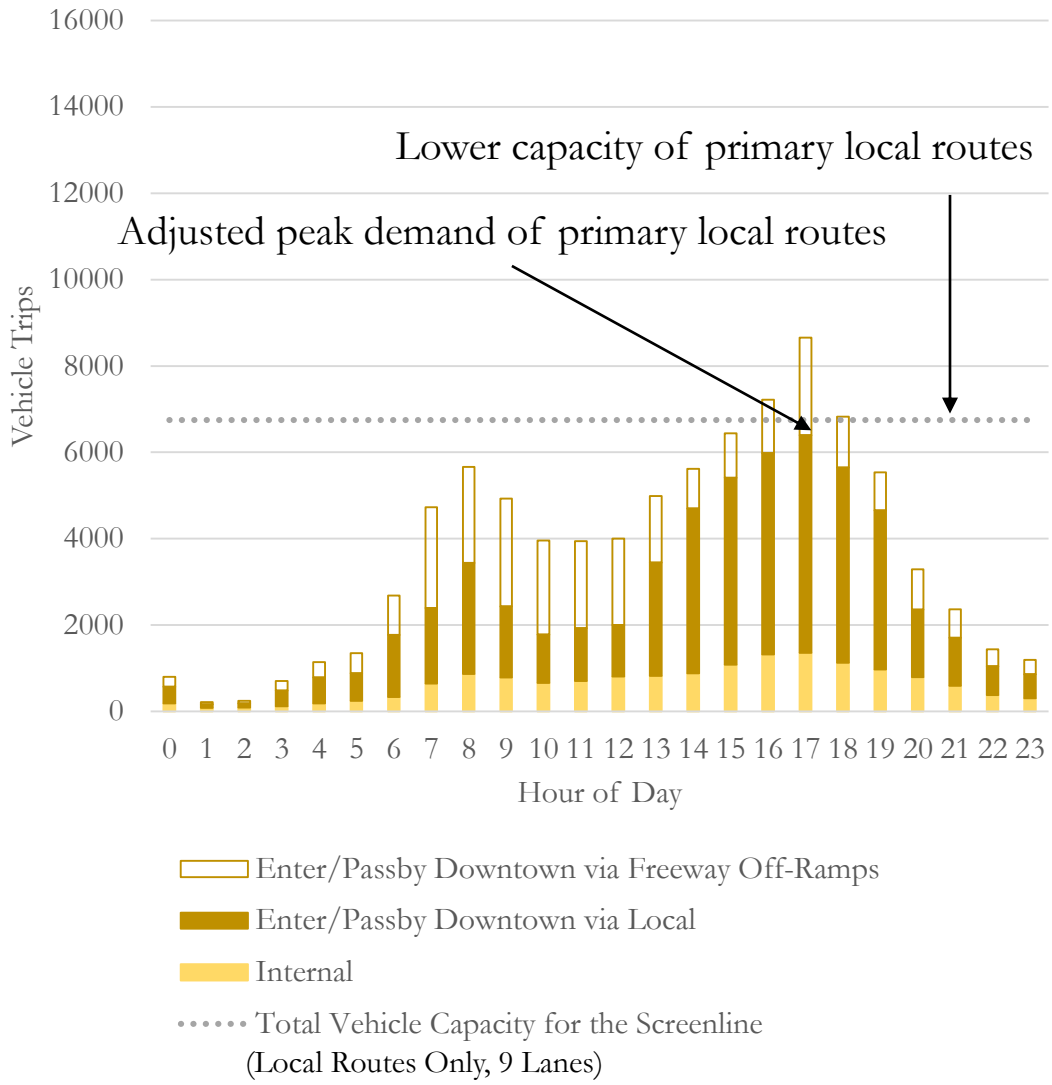
North Screenline, Southbound Traffic 2040 DTP, Weekday





Source: SJDOT

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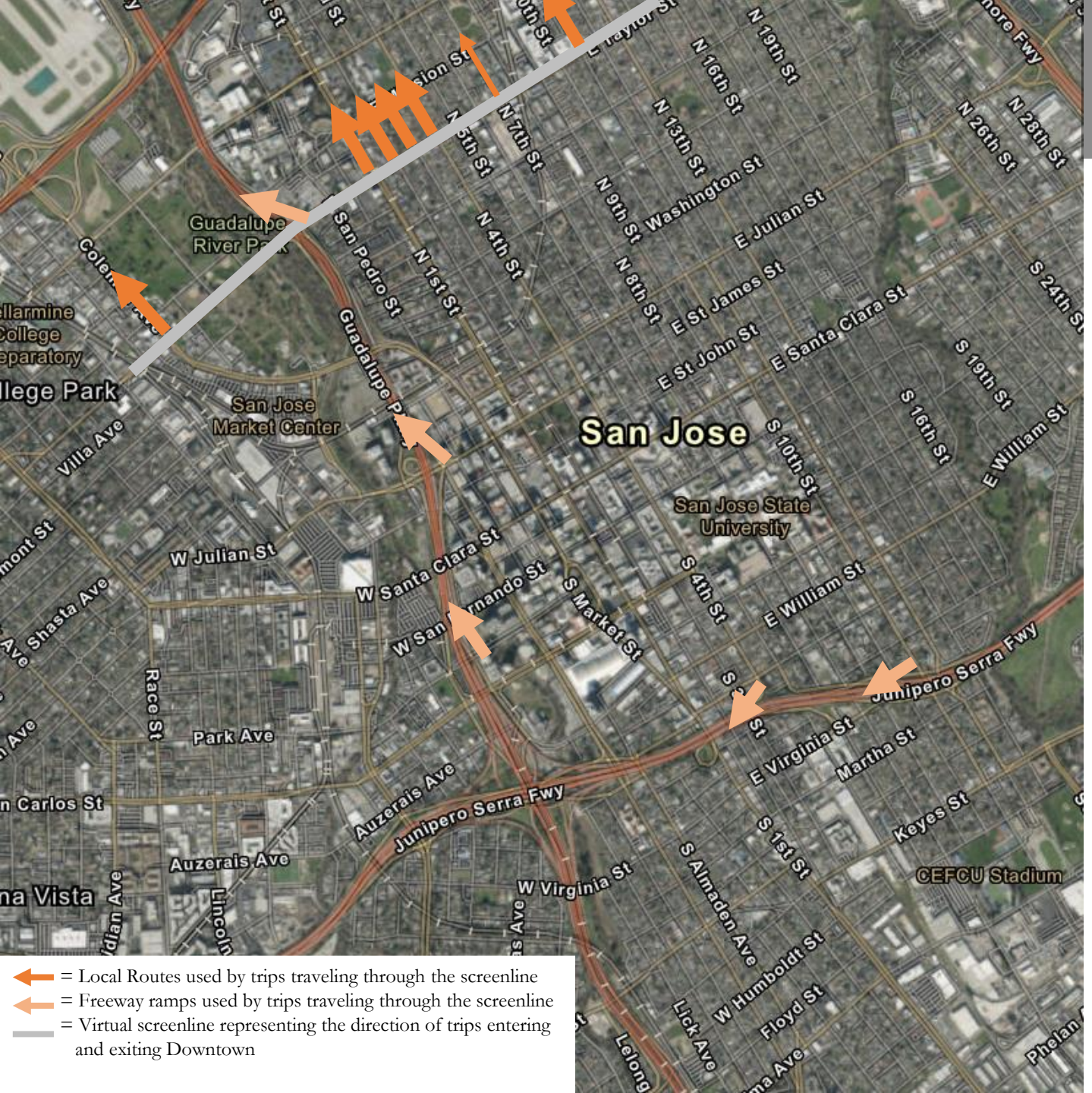
North Screenline, Northbound Traffic
2019 Weekday



Northbound traffic depart from Downtown via one of 12 gateway options:

- 7 primary local routes (9 lanes)
- 3 on-ramps on SR-87
- 2 on-ramps on I-280

Not all exiting traffic end in Downtown; roughly 40% drive past Downtown to elsewhere without stopping.

85% of exiting traffic travel on primary local routes; 15% use the 5 on-ramps and travel on northbound SR-87.

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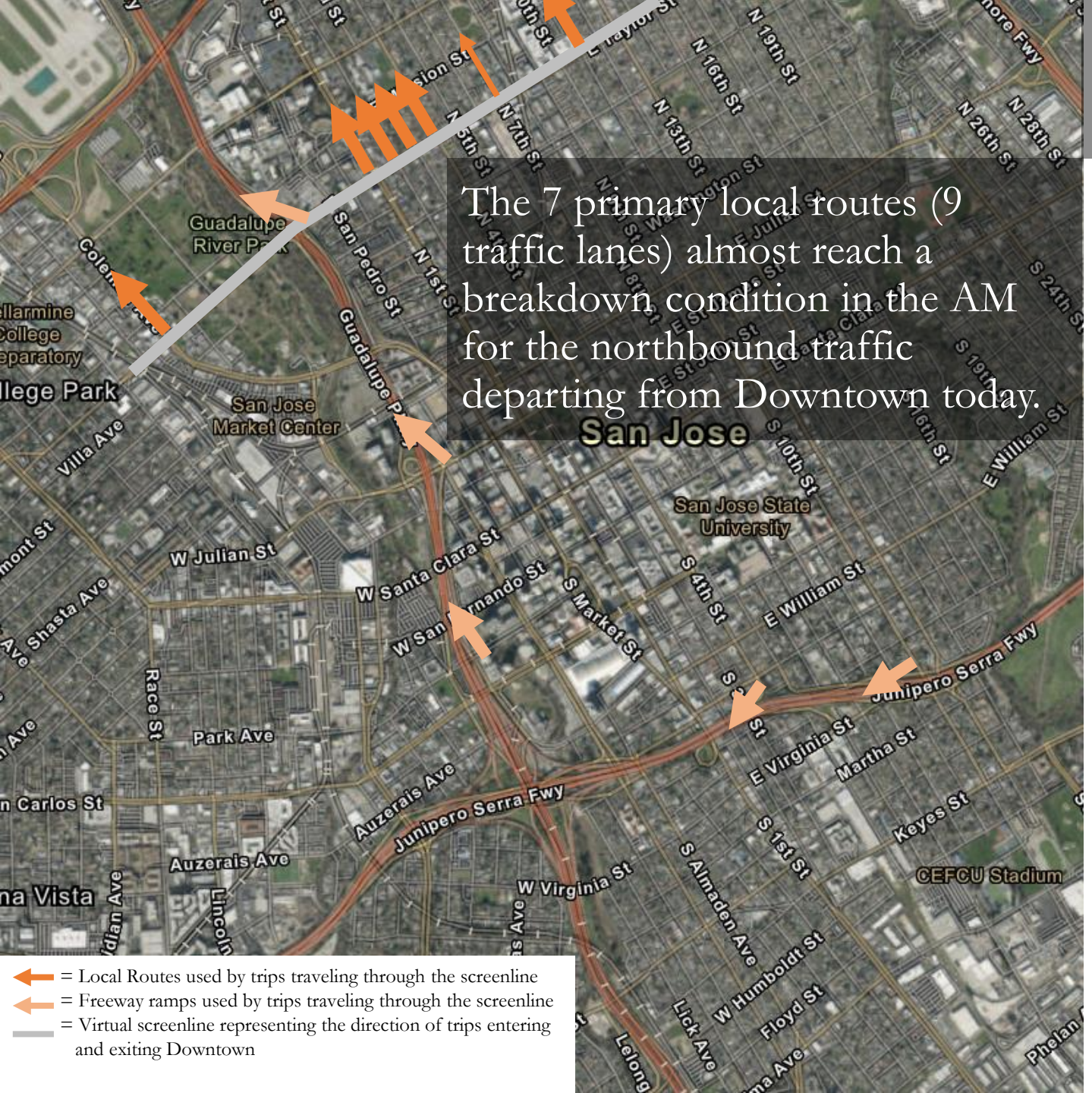
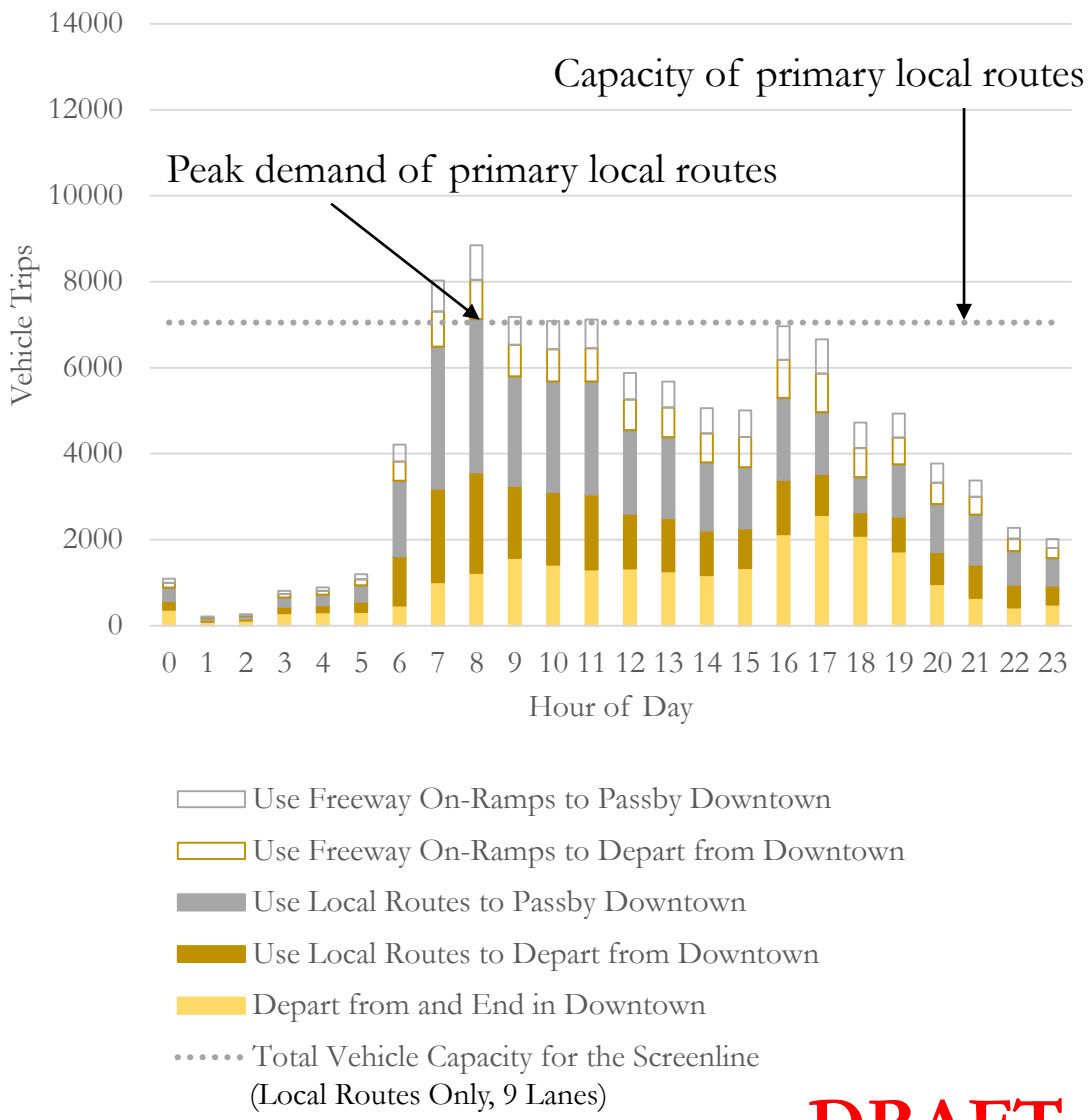
North Screenline, Northbound Traffic 2019 Weekday





Source: SJDOT

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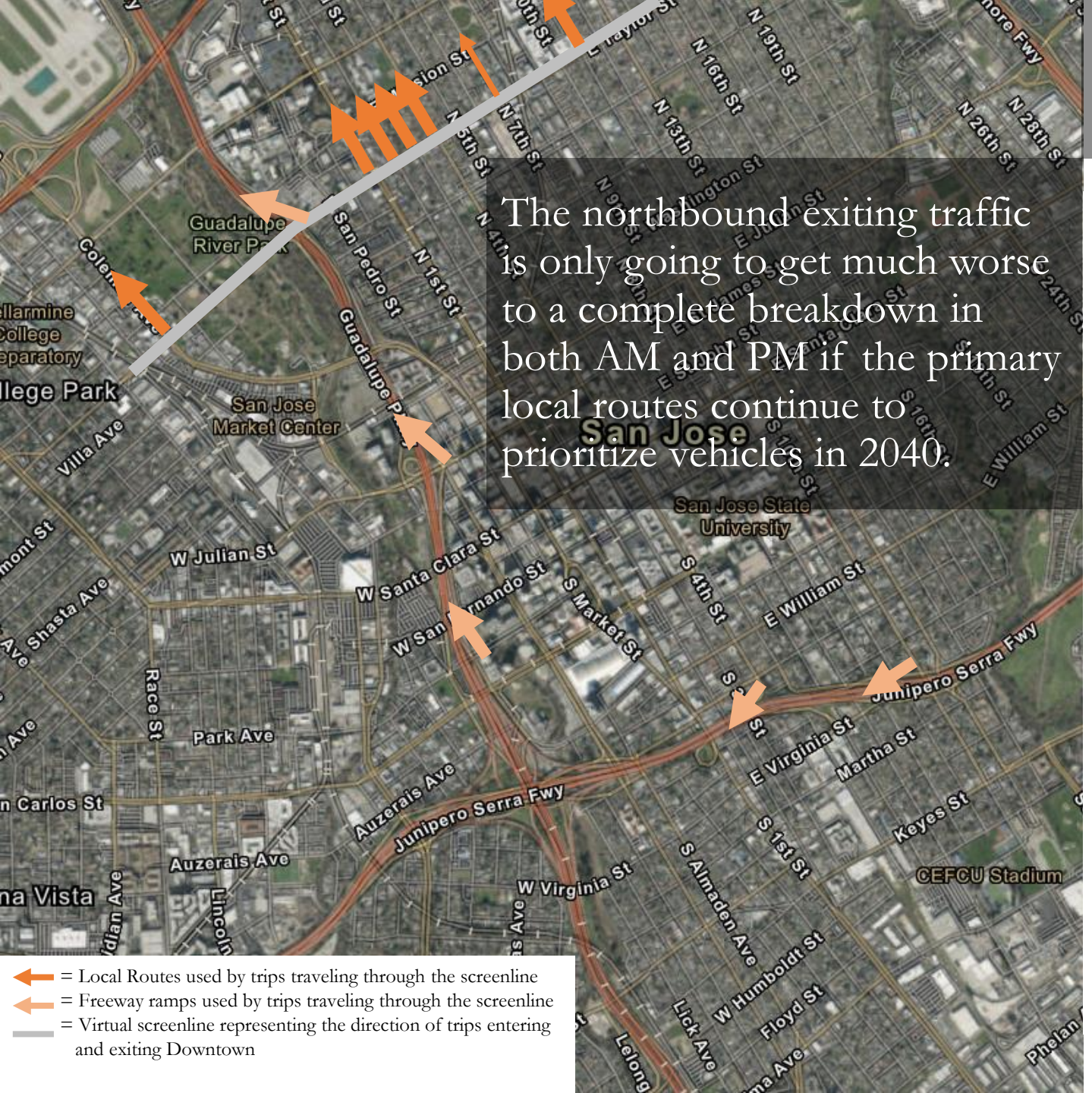
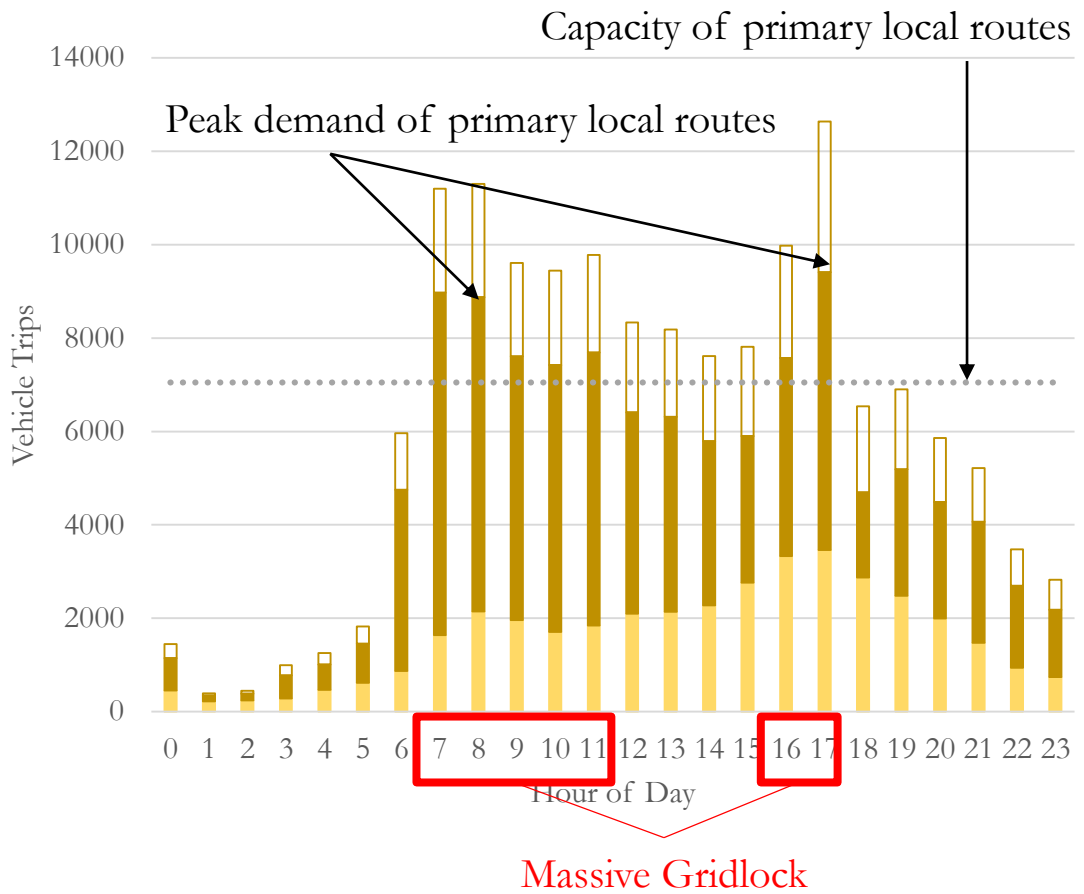
North Screenline, Northbound Traffic
2040 Baseline, Weekday





Source: SJDOT

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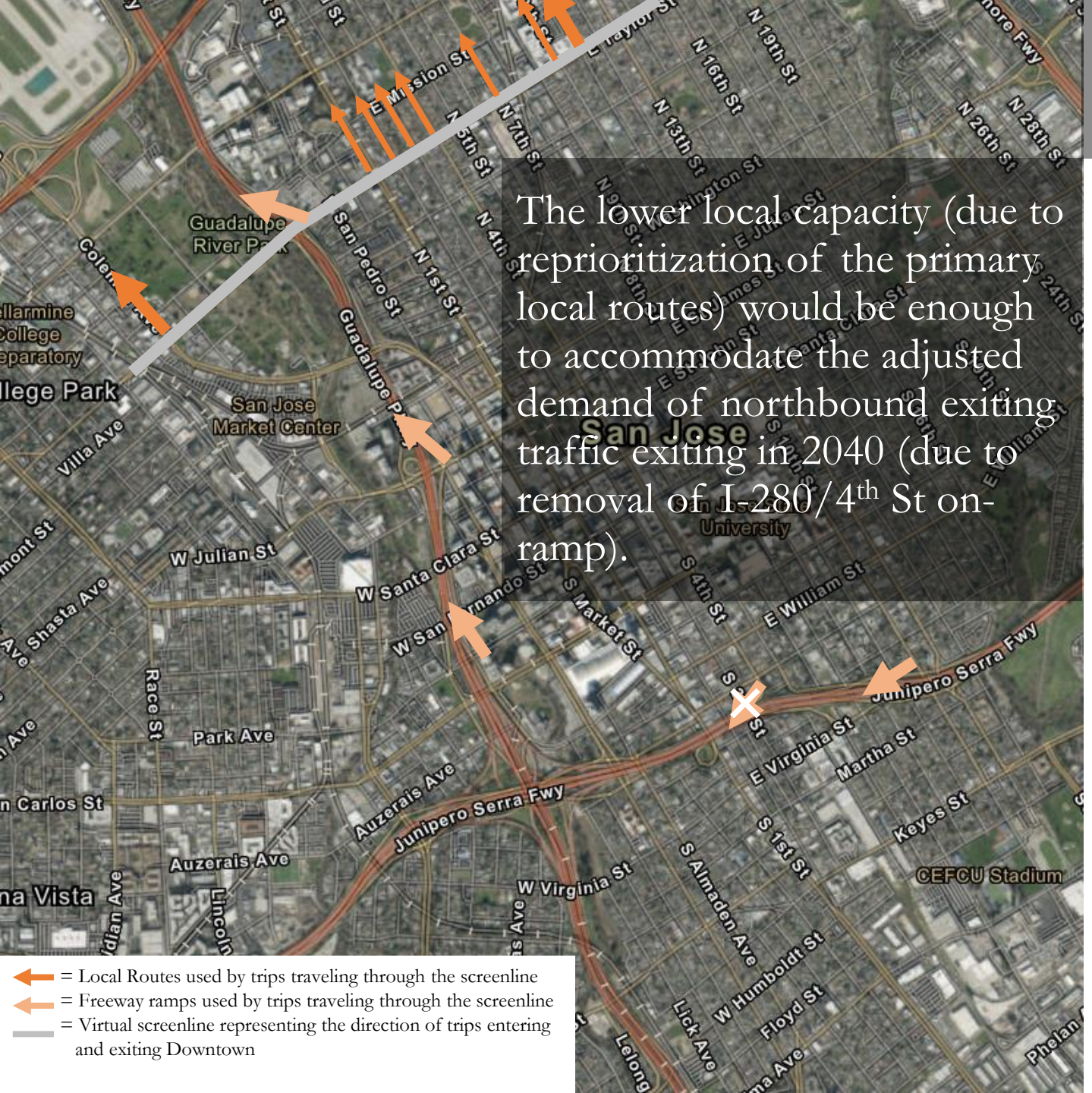
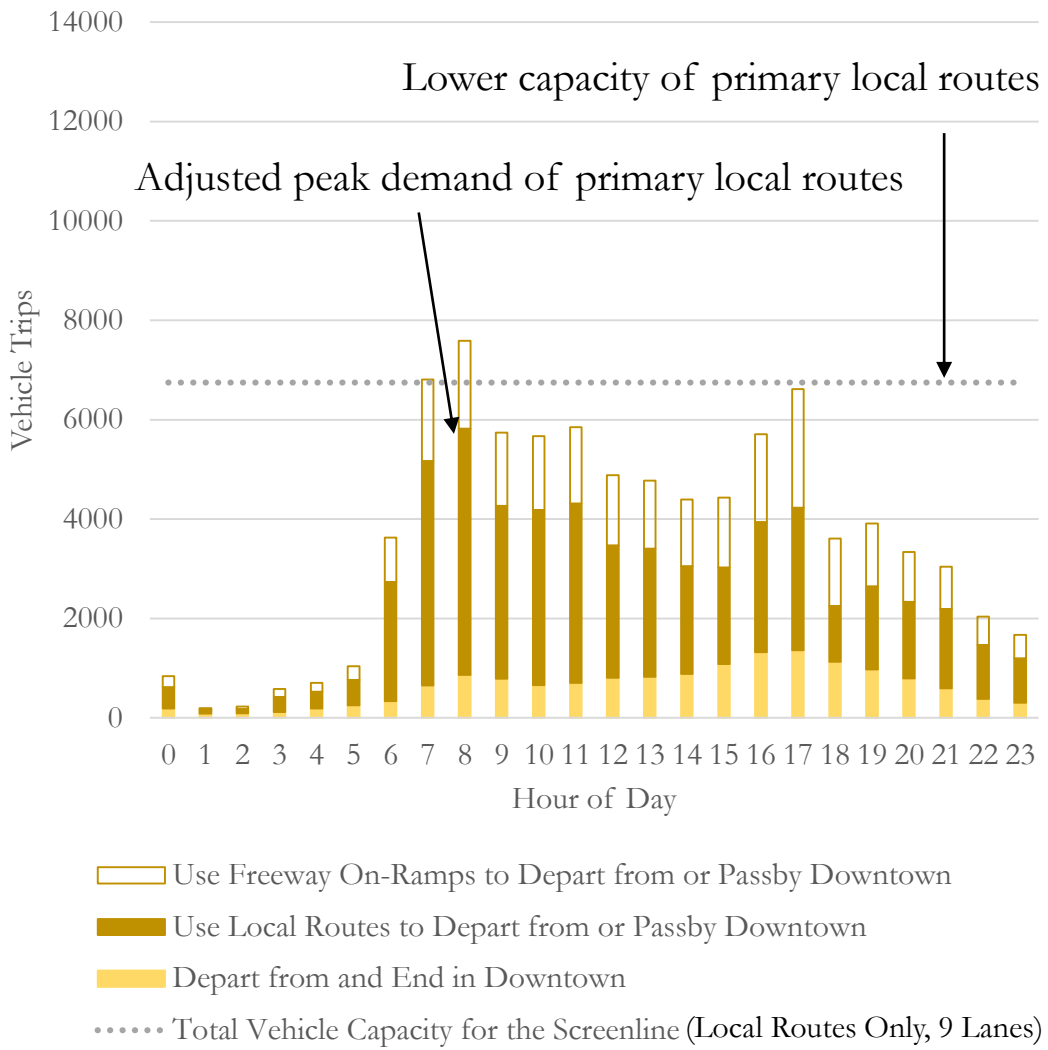
North Screenline, Northbound Traffic 2040 DTP, Weekday





Source: SJDOT

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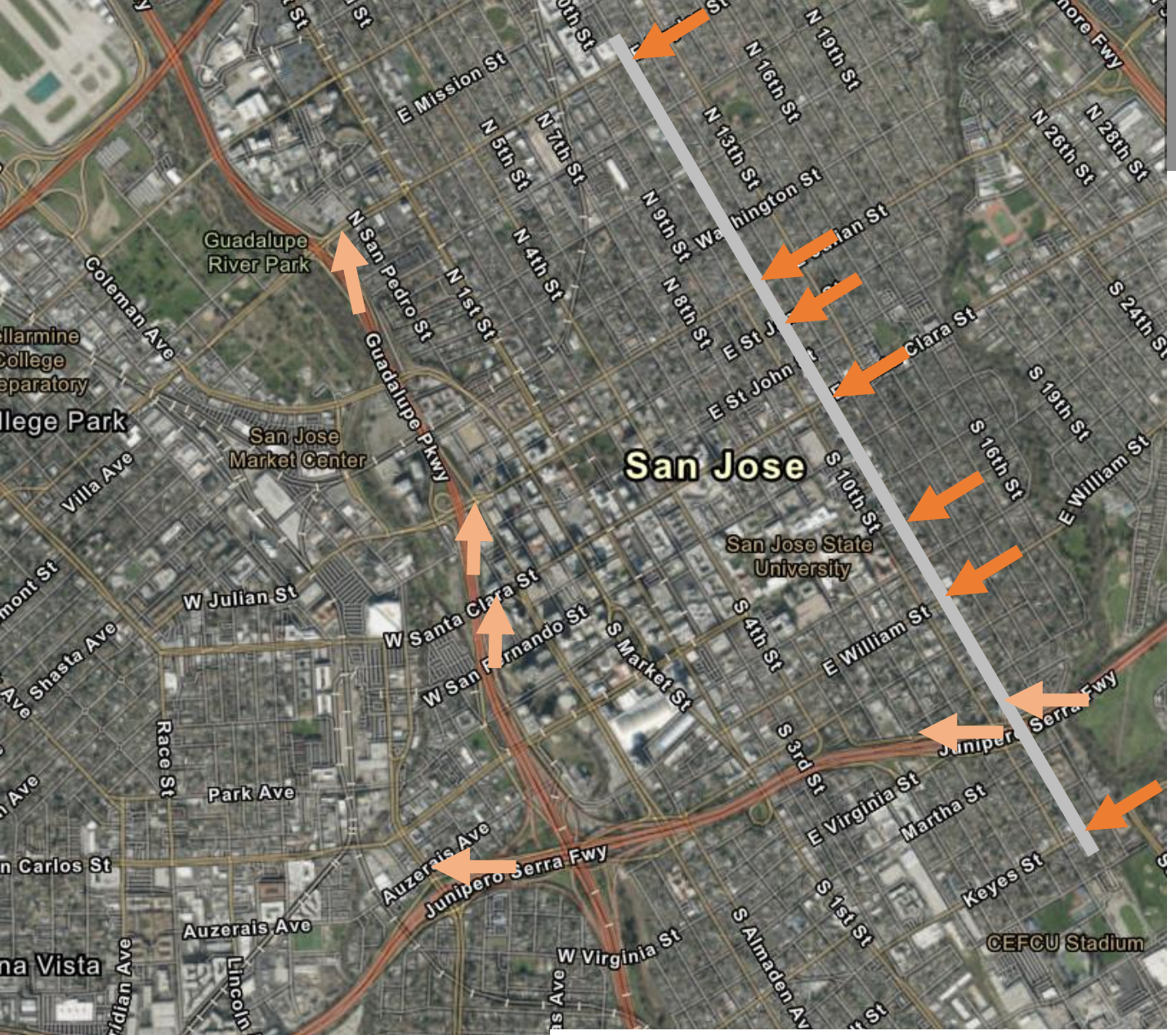
East Screenline, Westbound Traffic 2019 Weekday



Westbound traffic enter Downtown via one of 13 gateway options:

- 7 primary local routes (10 lanes)
- 3 off-ramps on SR-87
- 3 off-ramps on I-280

Not all entering traffic end in Downtown; roughly 30% drive past Downtown to elsewhere without stopping.

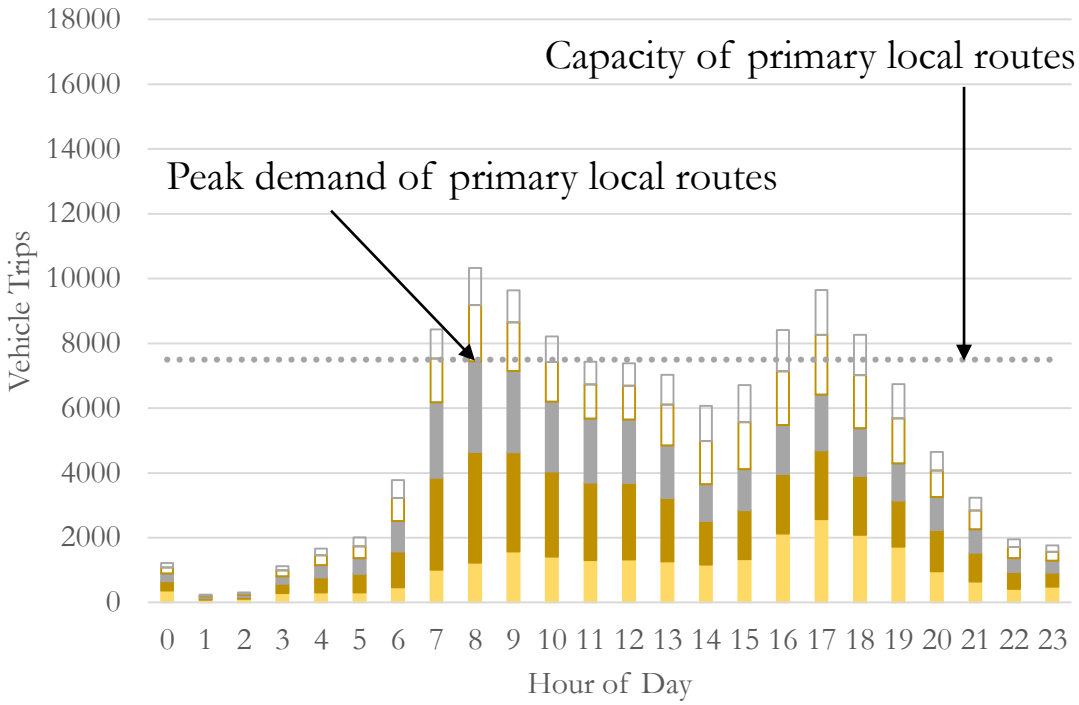
Three-quarters of entering traffic travel on primary local routes; 25% travel on northbound I-280 and use the 6 off-ramps.

DRAFT

East Screenline, Westbound Traffic 2019 Weekday

The 7 primary local routes (10 traffic lanes) almost reach a breakdown condition for the westbound traffic entering Downtown in the AM peak hour today.

= Local Routes used by trips traveling through the screenline
= Freeway ramps used by trips traveling through the screenline
= Virtual screenline representing the direction of trips entering and exiting Downtown



Use Freeway Off-Ramps to Passby Downtown
Use Freeway Off-Ramps to End in Downtown
Use Local Routes to Passby Downtown
Use Local Routes to End in Downtown
Depart from and End in Downtown
Total Vehicle Capacity for the Screenline

(Local Routes Only, 10 Lanes)

Source: SJDOT

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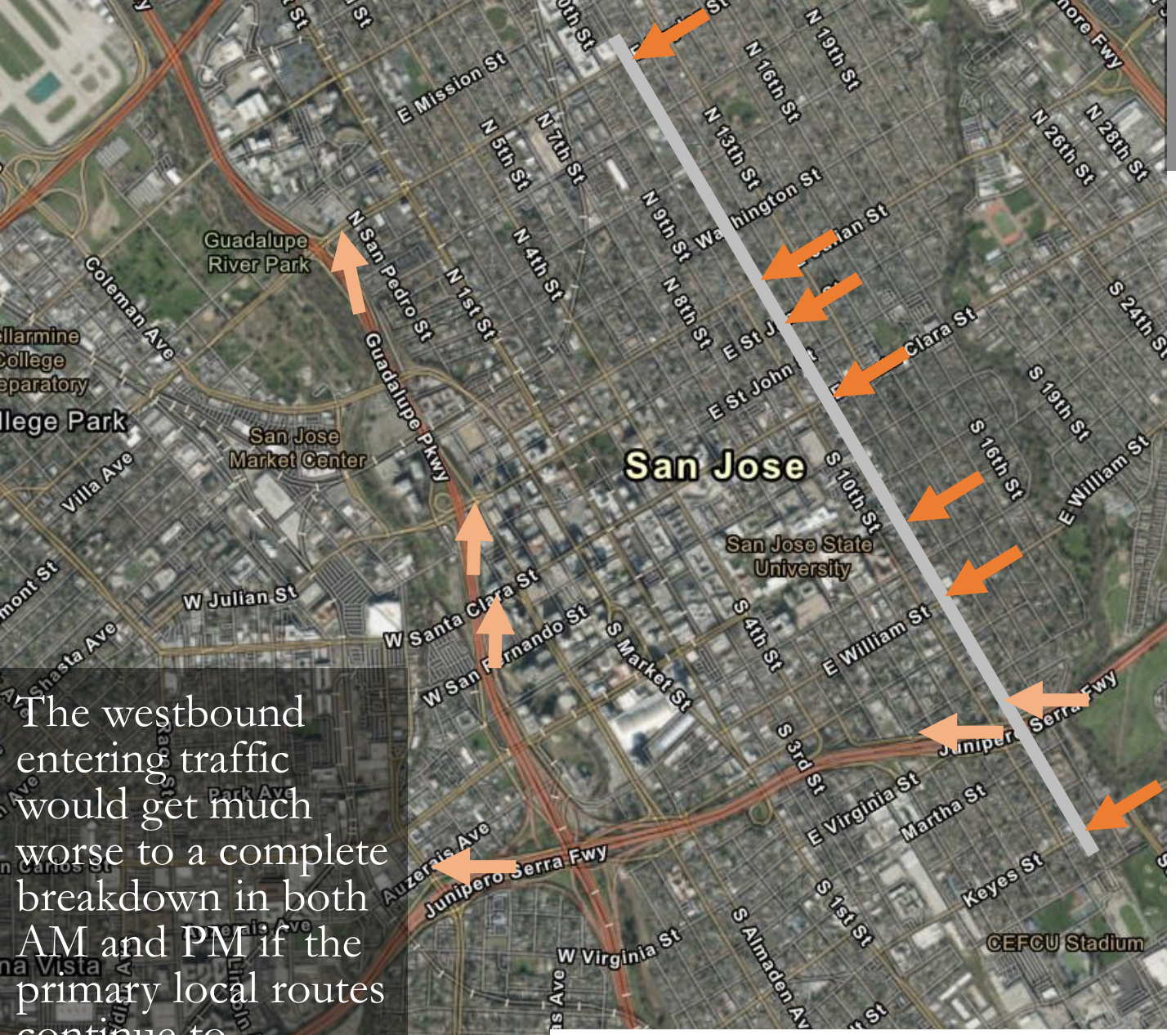
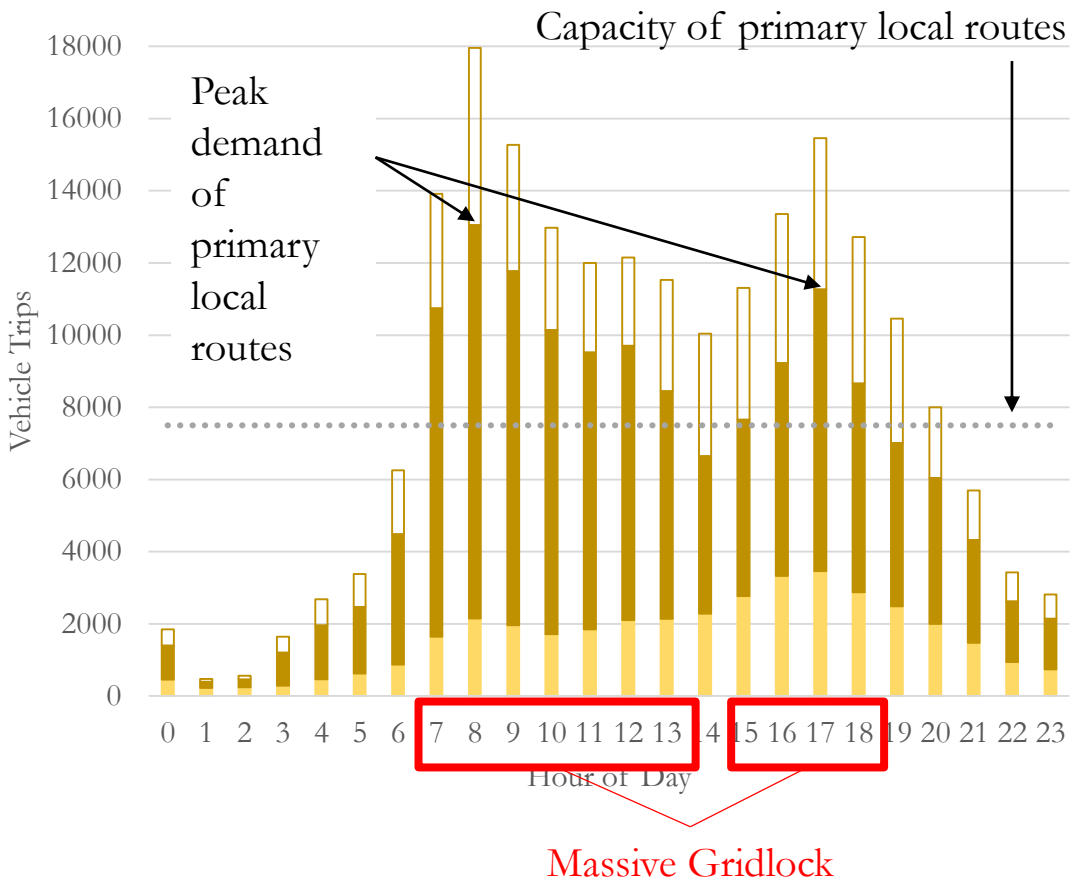
East Screenline, Westbound Traffic
2040 Baseline, Weekday



The westbound entering traffic would get much worse to a complete breakdown in both AM and PM if the primary local routes continue to prioritize vehicles in 2040.

= Local Routes used by trips traveling through the screenline
= Freeway ramps used by trips traveling through the screenline
= Virtual screenline representing the direction of trips entering and exiting Downtown



Source: SJDOT

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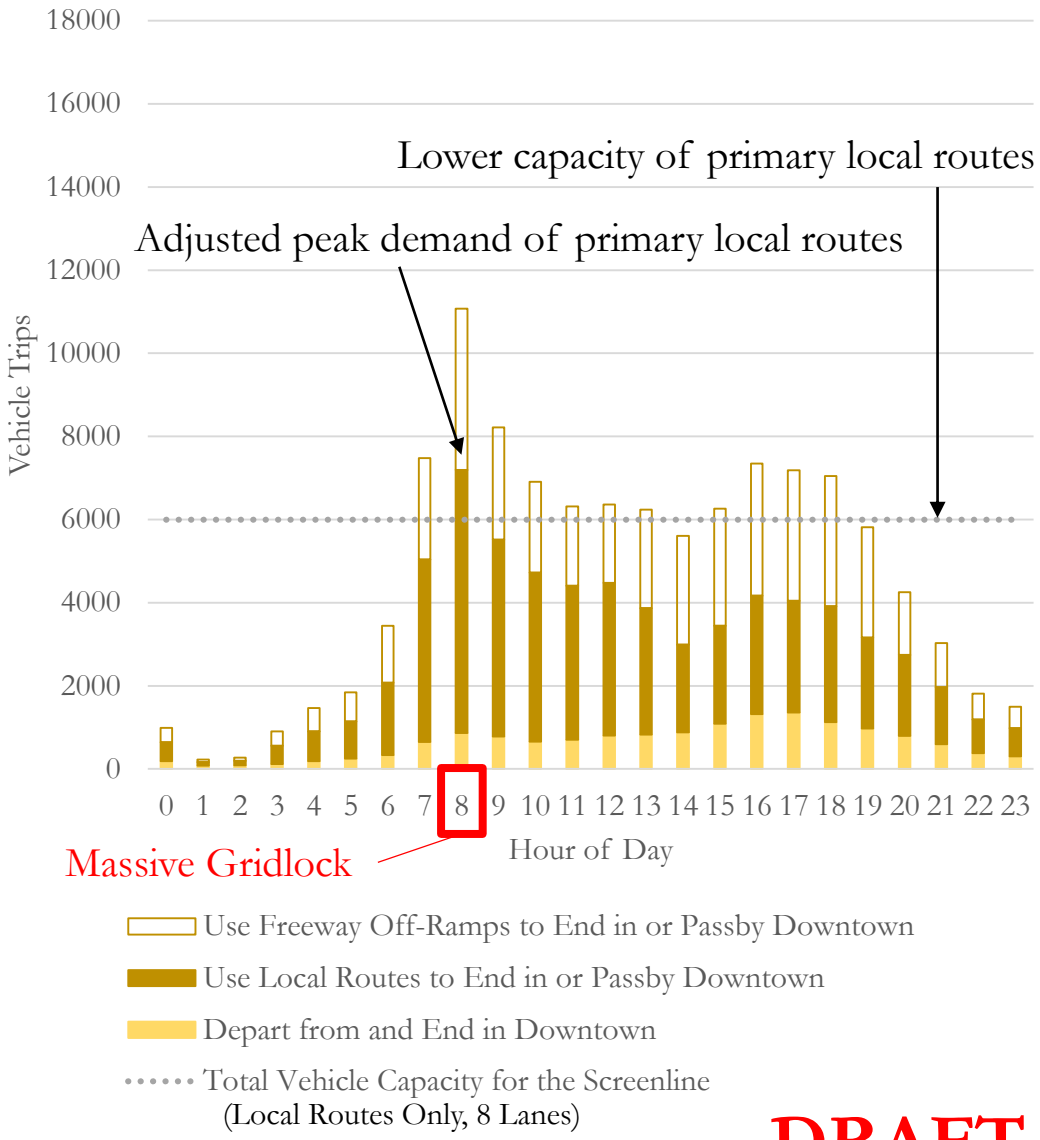
East Screenline, Westbound Traffic
2040 DTP, Weekday

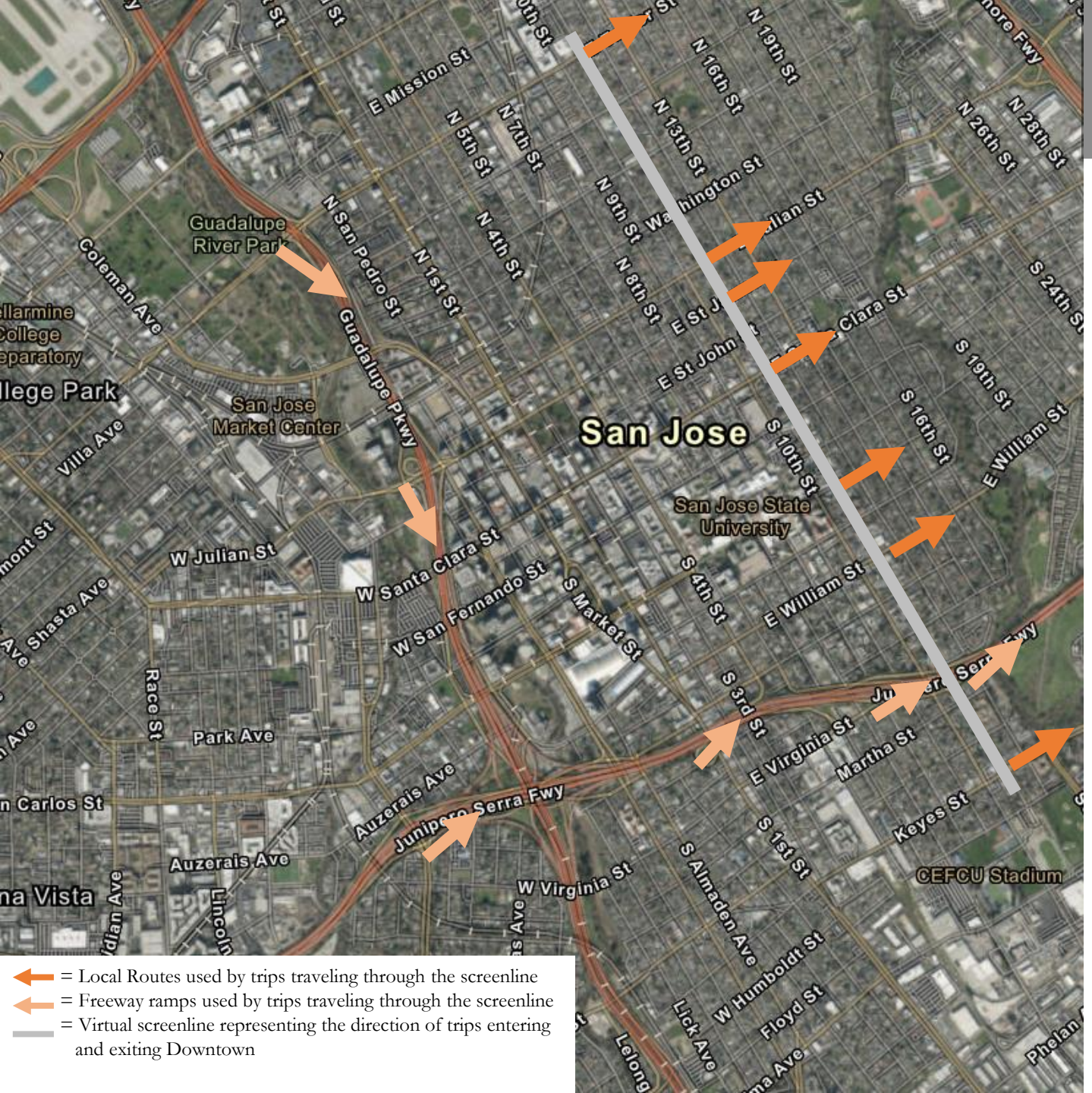
The lower local capacity (due to reprioritization of the primary local routes) could not accommodate the adjusted AM peak hour demand of westbound traffic entering Downtown in 2040. Significant congestion would still occur in that peak hour.



Source: SJDOT

DRAFT

East Screenline, Eastbound Traffic
2019 Weekday



Eastbound traffic depart from Downtown via one of 13 gateway options:

- 7 primary local routes (10 lanes)
- 2 on-ramps on SR-87
- 4 on-ramps on I-280

Not all exiting traffic originate from Downtown; roughly 30% drive past Downtown without stopping.

Two-thirds of exiting traffic travel on primary local routes; 33% use the 6 on-ramps travel on southbound I-280.

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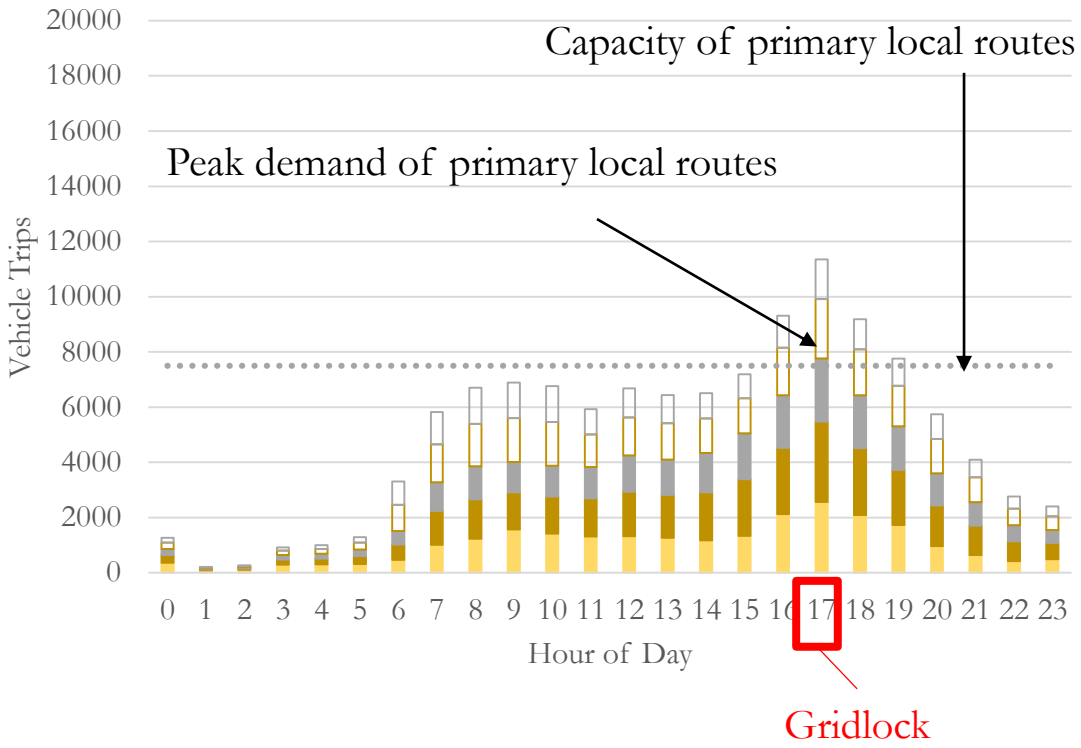
East Screenline, Eastbound Traffic 2019 Weekday

The 7 primary local routes (10 traffic lanes) reach a breakdown condition for the eastbound traffic leaving Downtown in the PM peak hour today.

= Local Routes used by trips traveling through the screenline
= Freeway ramps used by trips traveling through the screenline
= Virtual screenline representing the direction of trips entering and exiting Downtown

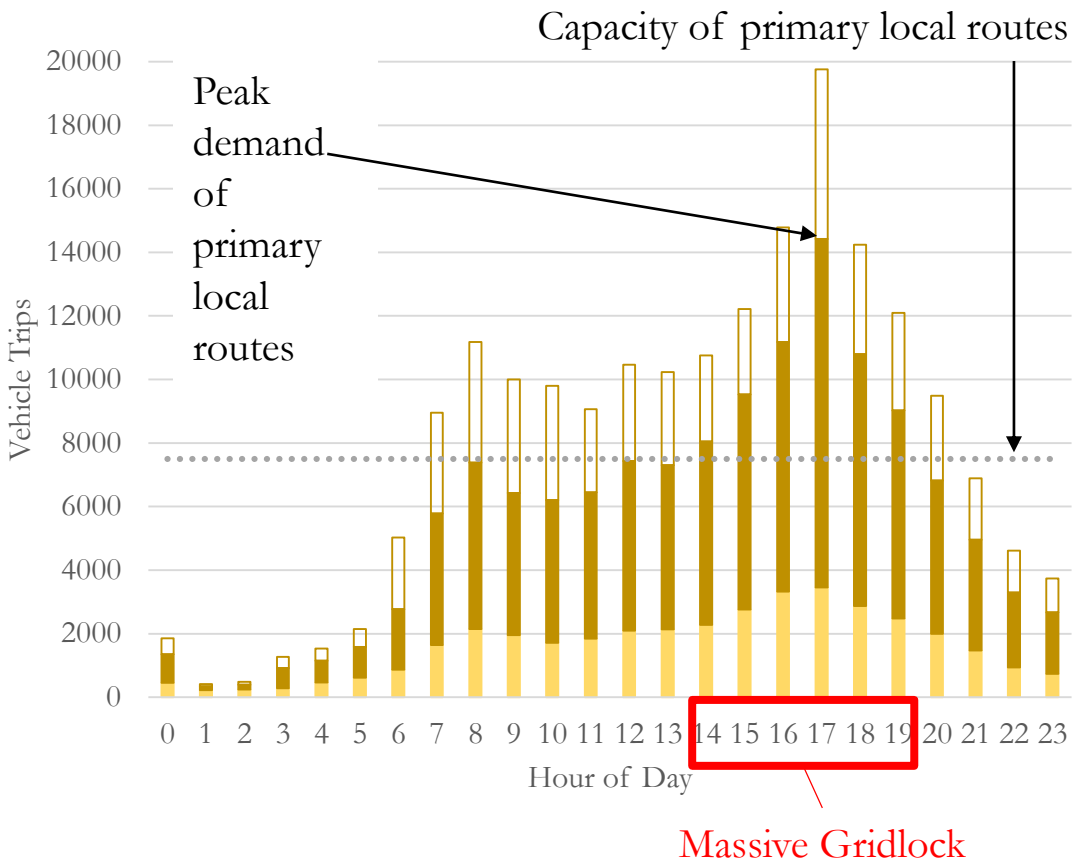


Source: SJDOT

DRAFT

East Screenline, Eastbound Traffic
2040 Baseline, Weekday

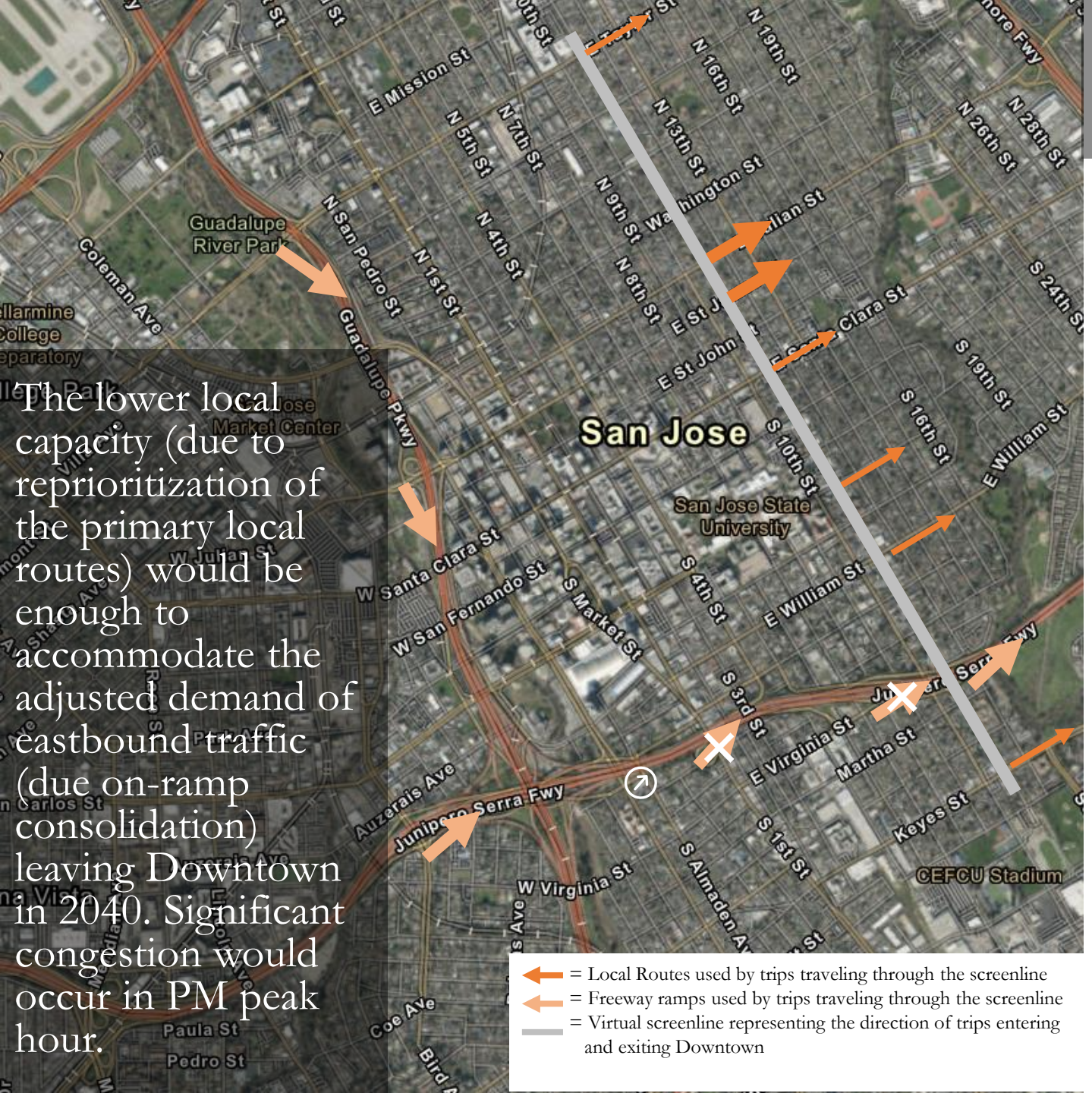
The eastbound exiting traffic would face a complete breakdown for long periods in the PM if the primary local routes continue to prioritize vehicles in 2040.



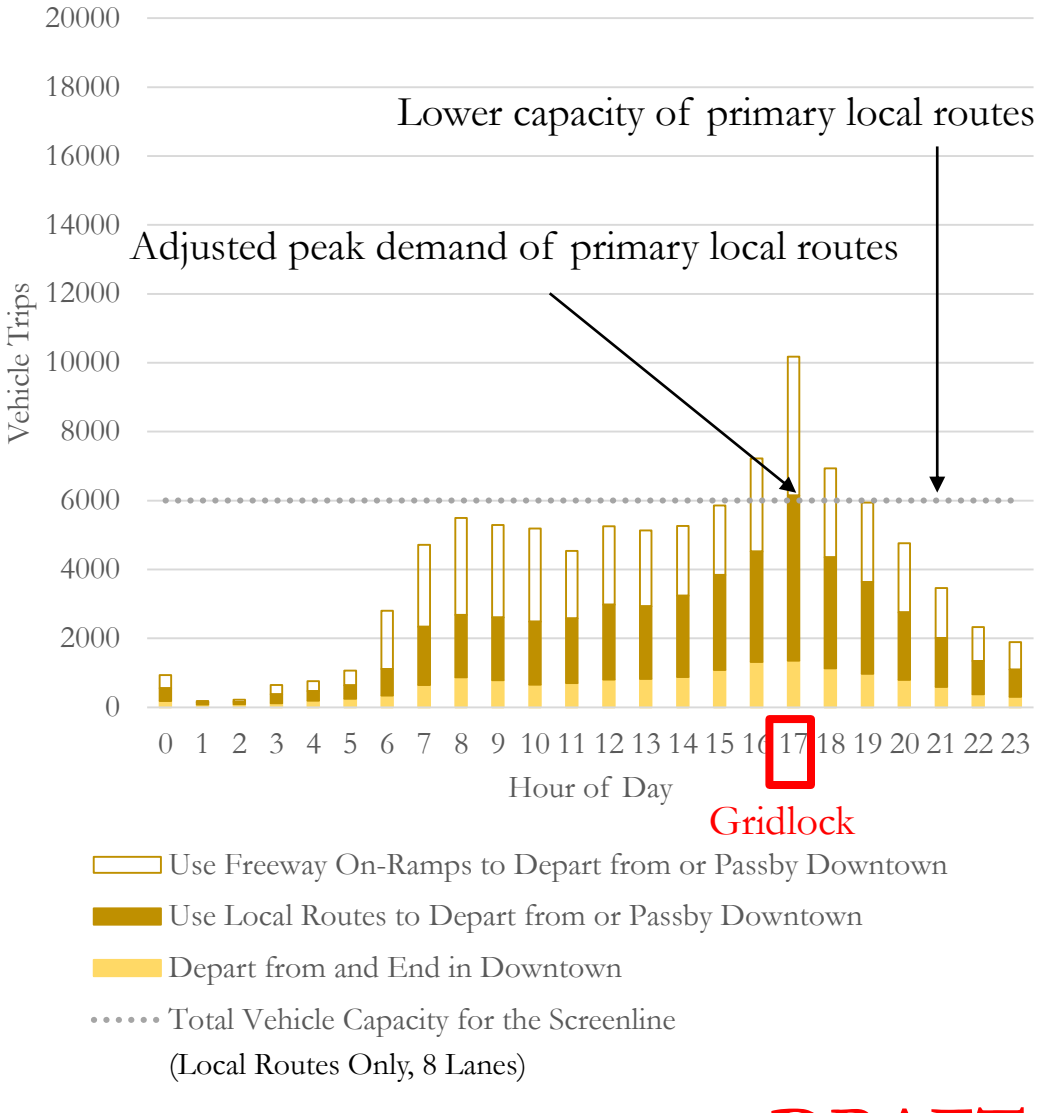
Source: SJDOT

DRAFT

East Screenline, Eastbound Traffic 2040 DTP, Weekday



The lower local capacity (due to reprioritization of the primary local routes) would be enough to accommodate the adjusted demand of eastbound traffic (due on-ramp consolidation) leaving Downtown in 2040. Significant congestion would occur in PM peak hour.



Source: SJDOT

DRAFT

West Screenline, Eastbound Traffic 2019 Weekday

Eastbound traffic enter Downtown via one of 15 gateway options:

- 8 primary local routes (12 lanes)
- 4 off-ramps on SR-87
- 3 off-ramps on I-280

Not all entering traffic end in Downtown; roughly half of them drive past Downtown without stopping.

80% of exiting traffic travel on primary local routes; 20% use the 7 on-ramps travel on southbound I-280.

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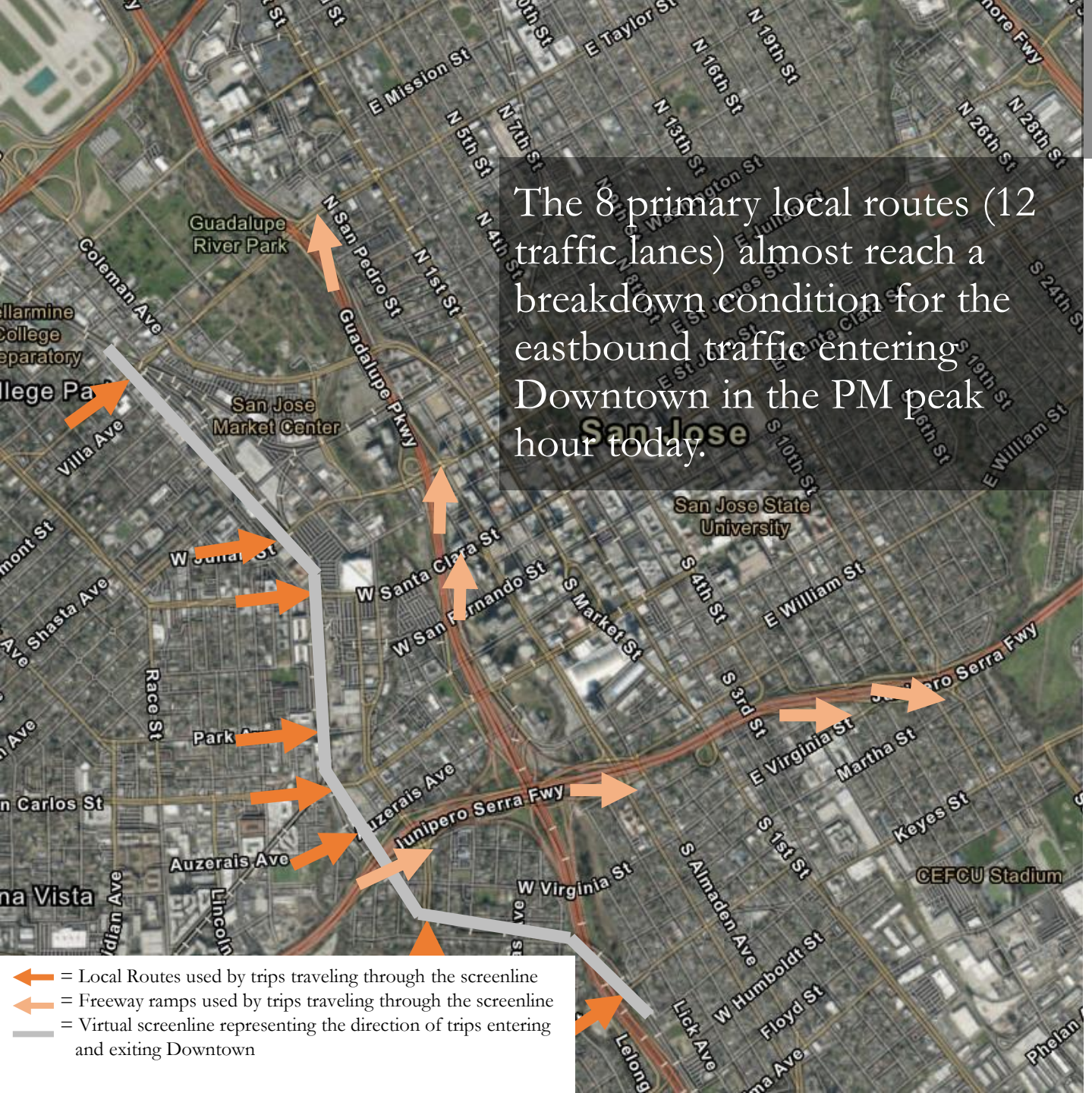
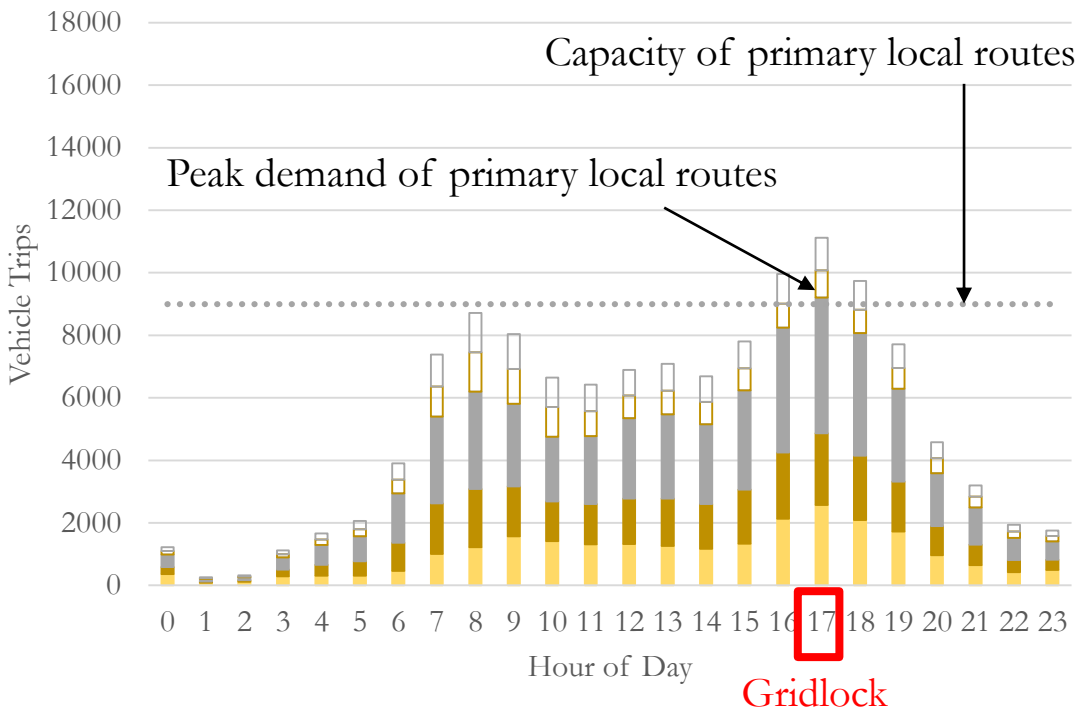
West Screenline, Eastbound Traffic 2019 Weekday



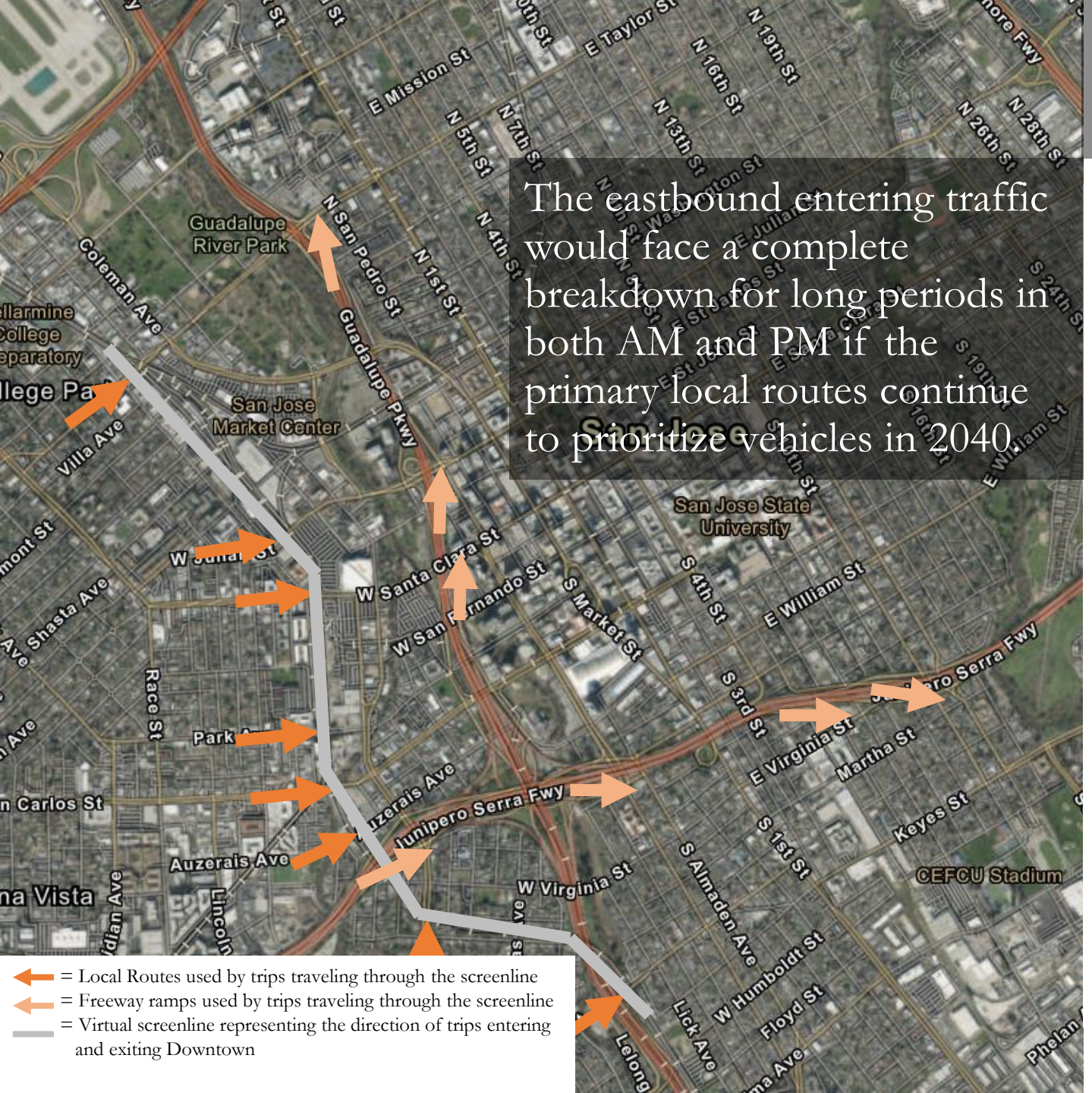


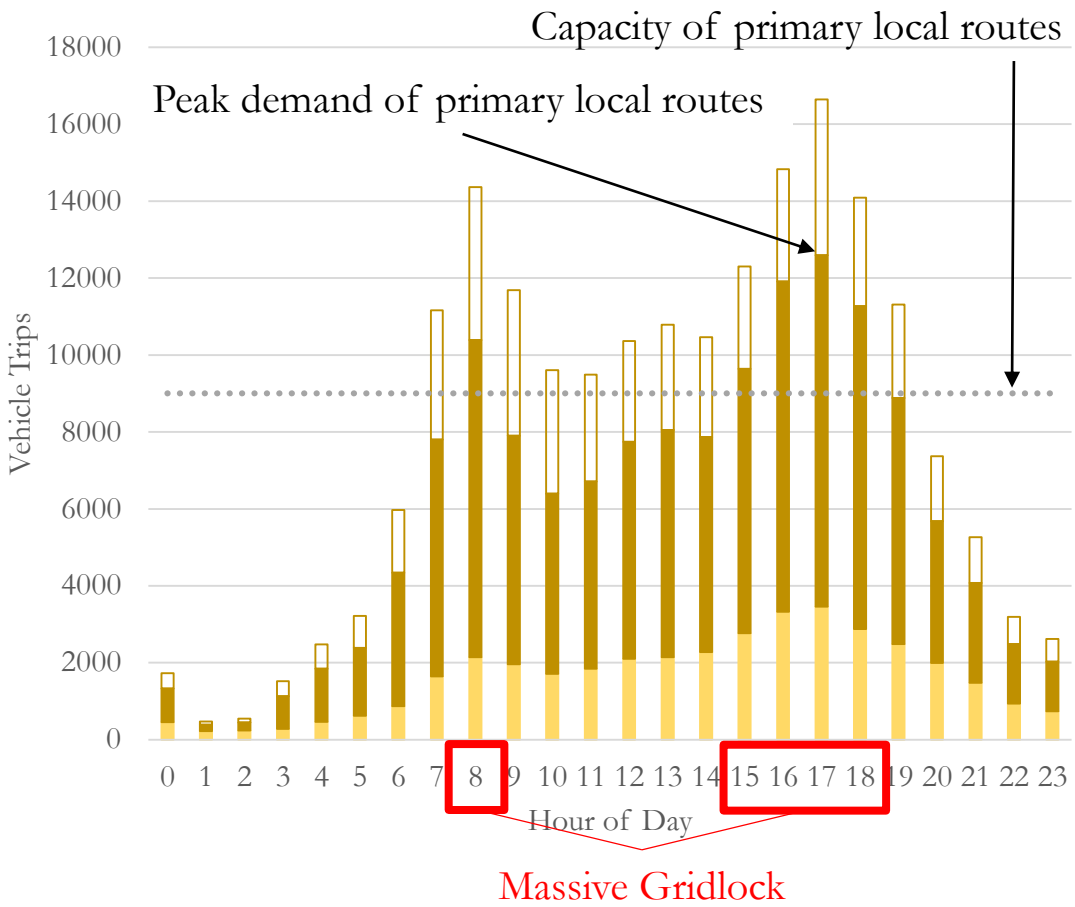
Source: SJDOT

DRAFT

West Screenline, Eastbound Traffic
2040 Baseline, Weekday

The eastbound entering traffic would face a complete breakdown for long periods in both AM and PM if the primary local routes continue to prioritize vehicles in 2040.

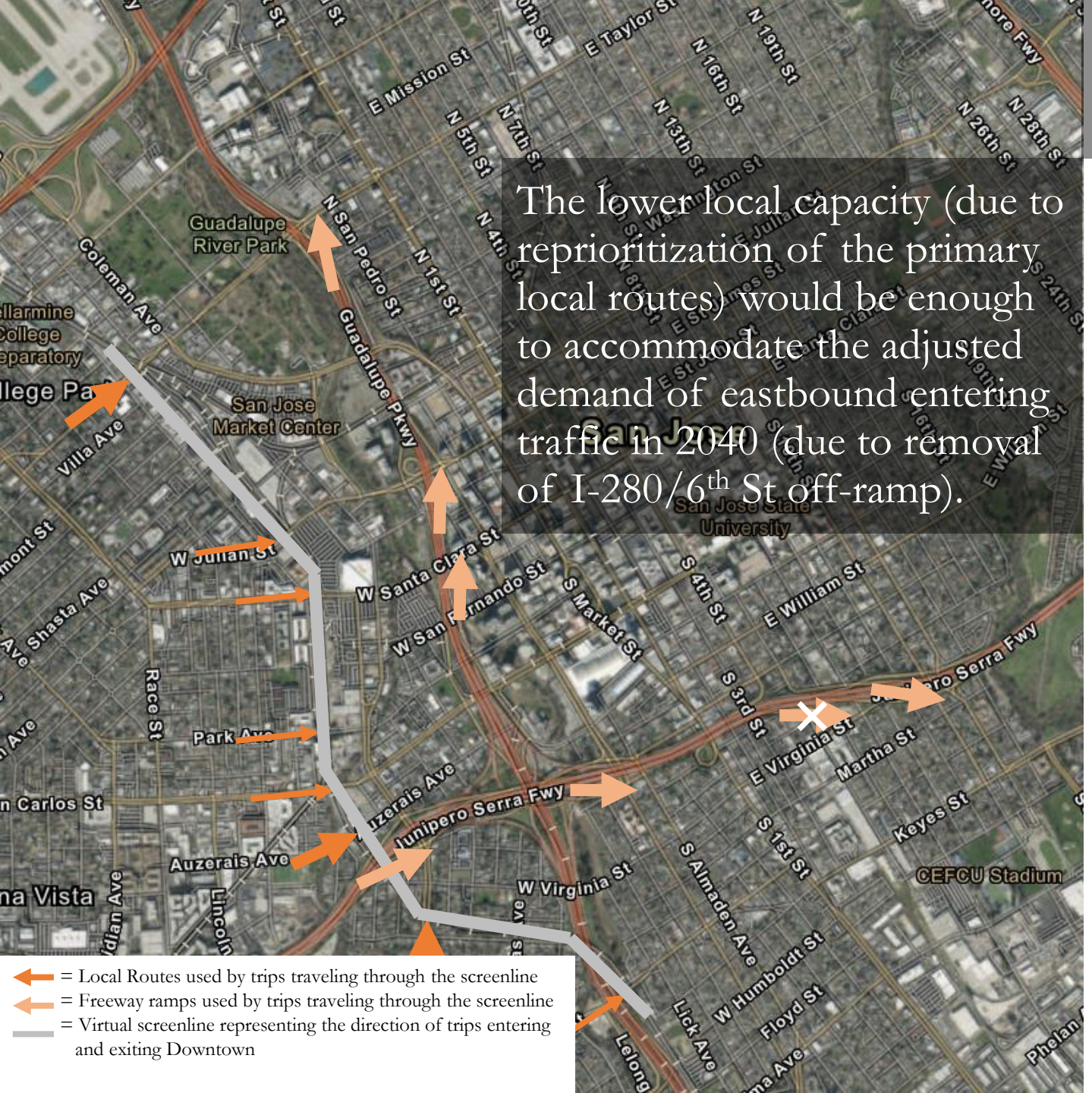


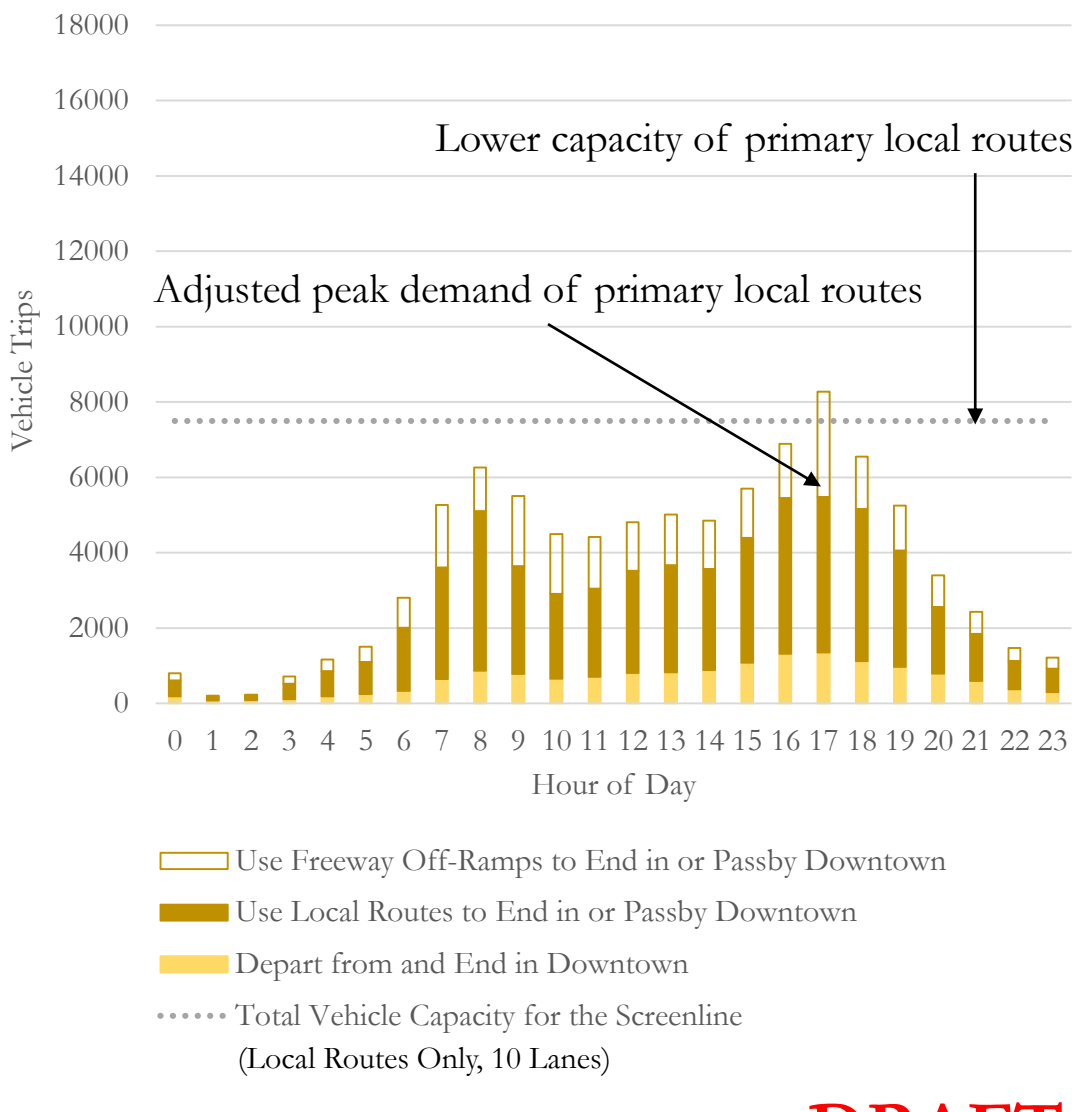


Source: SJDOT

DRAFT

West Screenline, Eastbound Traffic 2040 DTP, Weekday





Source: SJDOT

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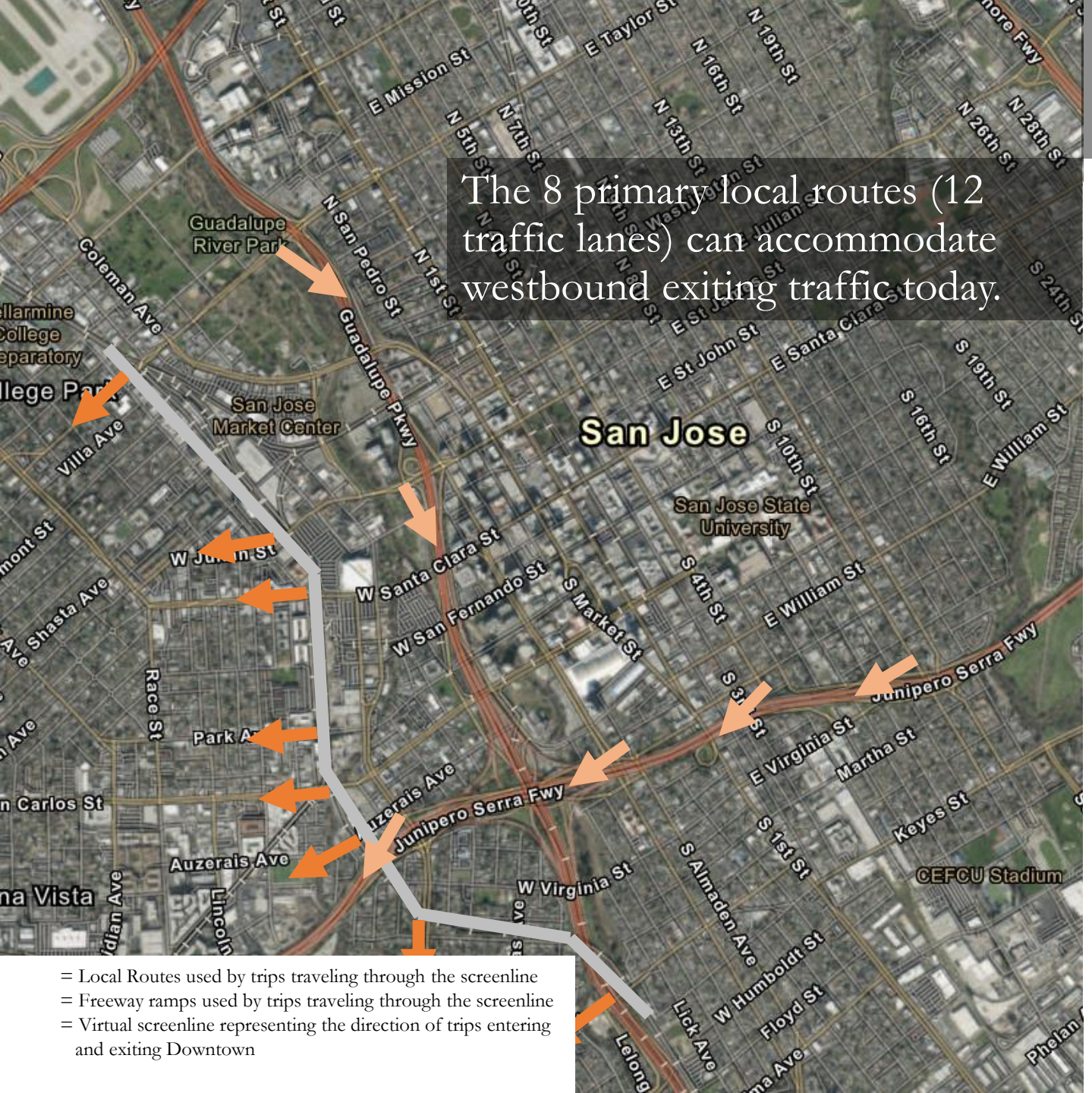
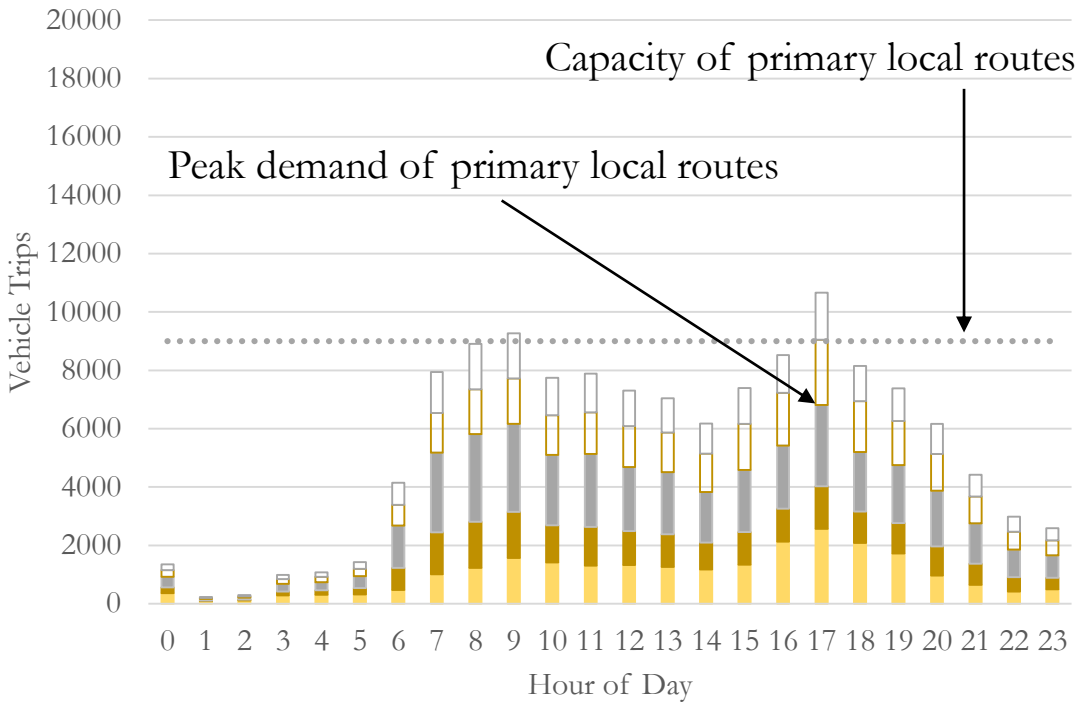
West Screenline, Westbound Traffic 2019 Weekday



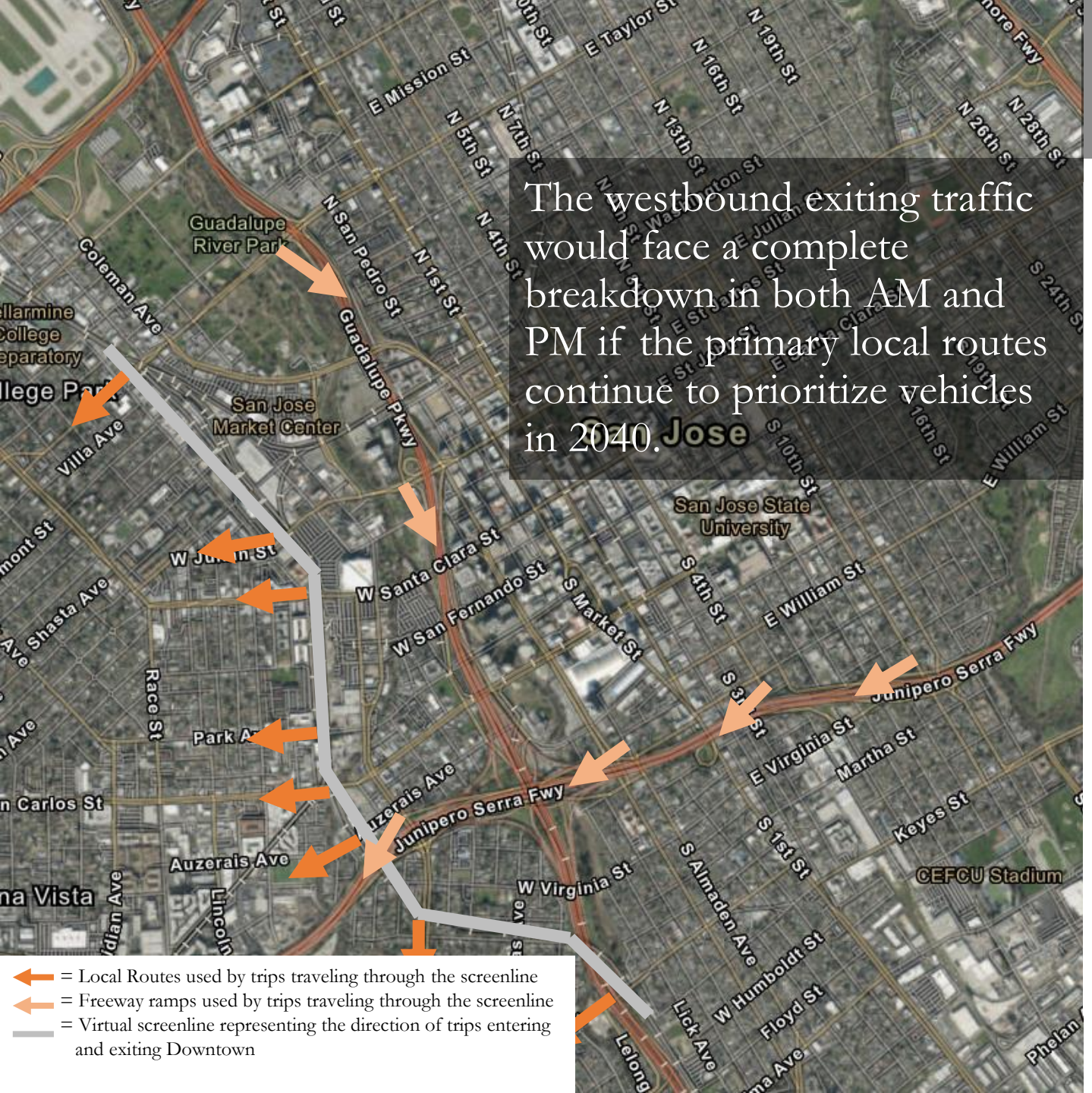


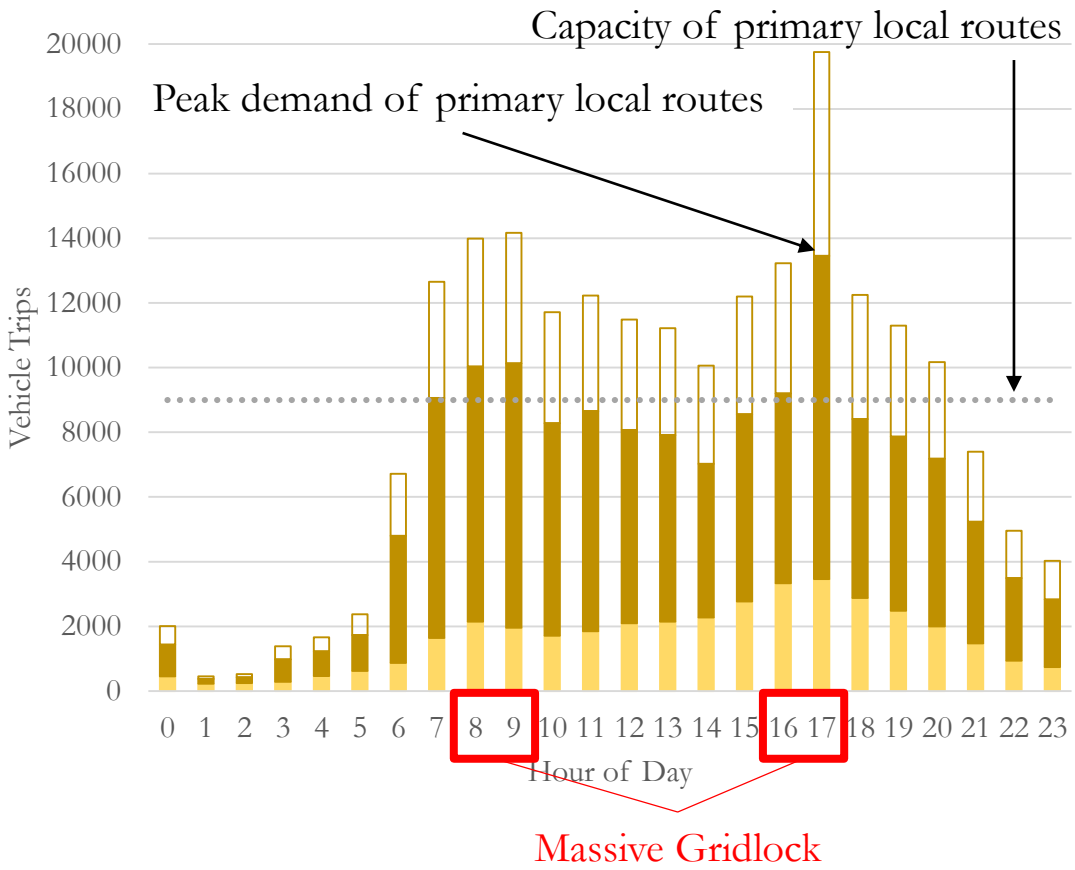
Use Freeway On-Ramps to Passby Downtown
Use Freeway On-Ramps to Depart from Downtown
Use Local Routes to Passby Downtown
Use Local Routes to Depart from Downtown
Depart from and End in Downtown
Total Vehicle Capacity for the Screenline (Local Routes Only, 12 Lanes)

Source: SJDOT

DRAFT

West Screenline, Westbound Traffic 2040 Baseline, Weekday

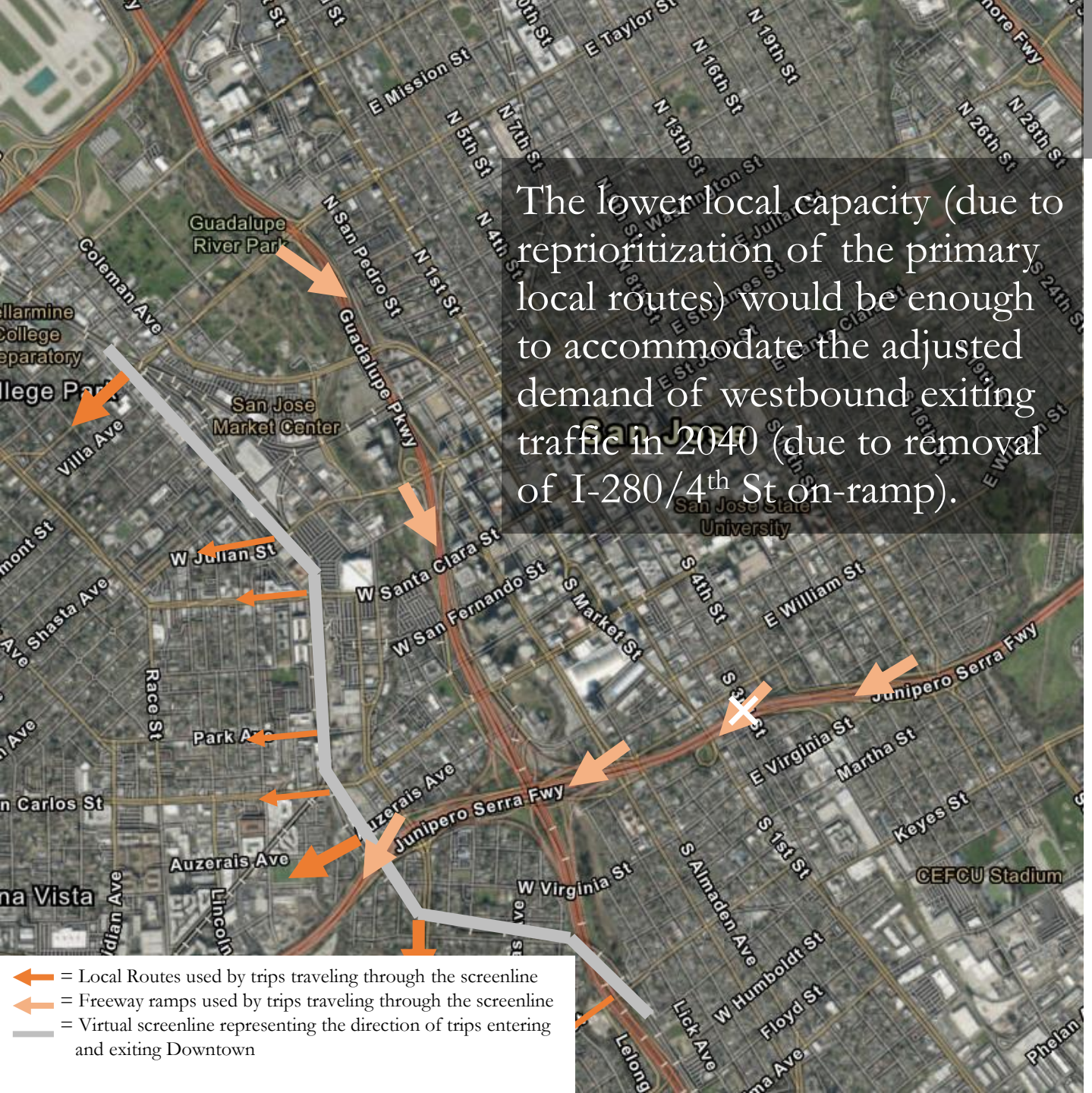


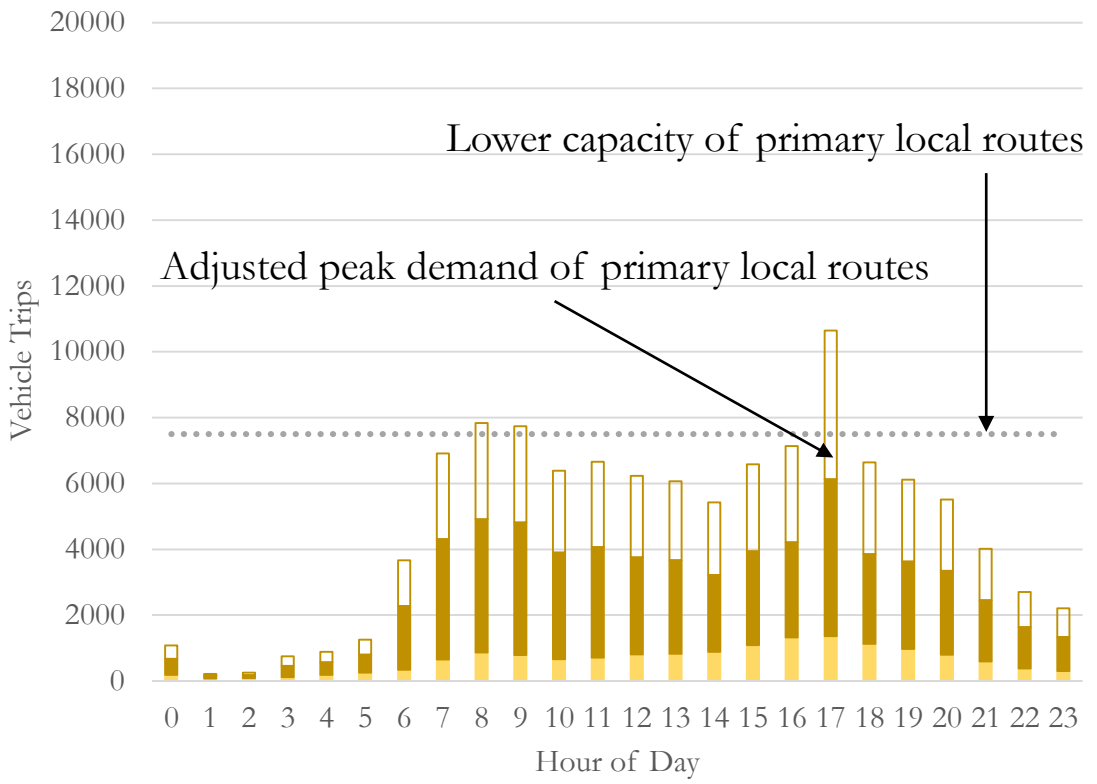


Source: SJDOT

DRAFT

West Screenline, Westbound Traffic 2040 DTP, Weekday





Source: SJDOT

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Vehicle Network Analysis Summary

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Screenline	2019 Weekday		2040 Baseline, Weekday		2040 DTP, Weekday	
	Local Route Capacity (# Lanes)	Traffic Gridlock (Direction/ Time)	Local Route Capacity (# Lanes)	Traffic Gridlock (Direction/ Time)	Local Route Capacity (# Lanes)	Traffic Gridlock (Direction/ Time)
South	9	No	9	Northbound (8-10am) Southbound (4-6pm)	9	No
North	9	Southbound (4-7pm)	9	Northbound (7-12pm, 4-6pm) Southbound (8am, 2-8pm)	9	No
East	10	Eastbound (5-6pm)	10	Eastbound (2-8pm) Westbound (7-2pm, 3-7pm)	8	Eastbound (5-6pm) Westbound (8-9am)
West	12	Eastbound (5-6pm)	12	Eastbound (8-9am, 3-7pm) Westbound (8-10am, 4-6pm)	10	No

Equity Analysis

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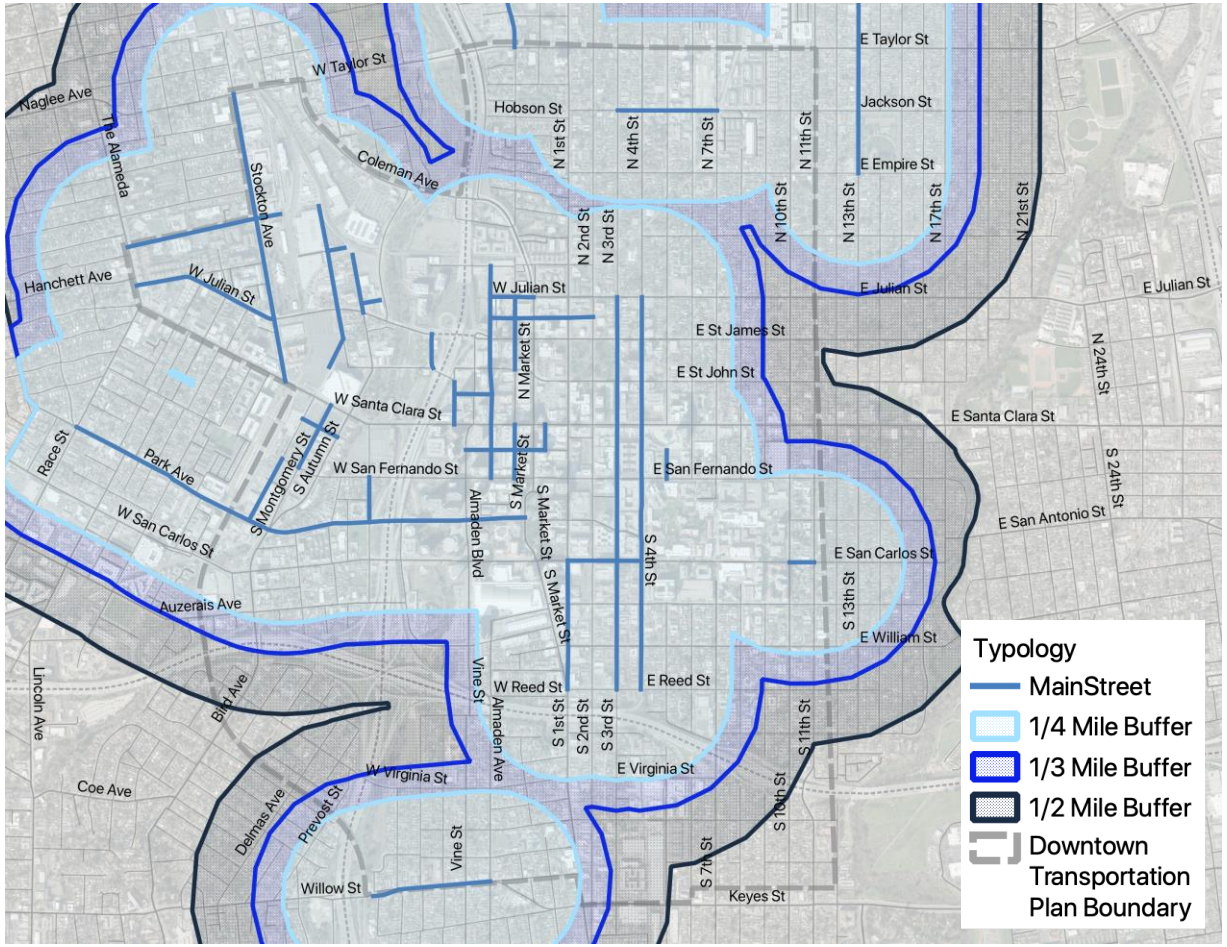
Demographic Coverage Analysis

Commerical Corridors

Typology: Main Streets

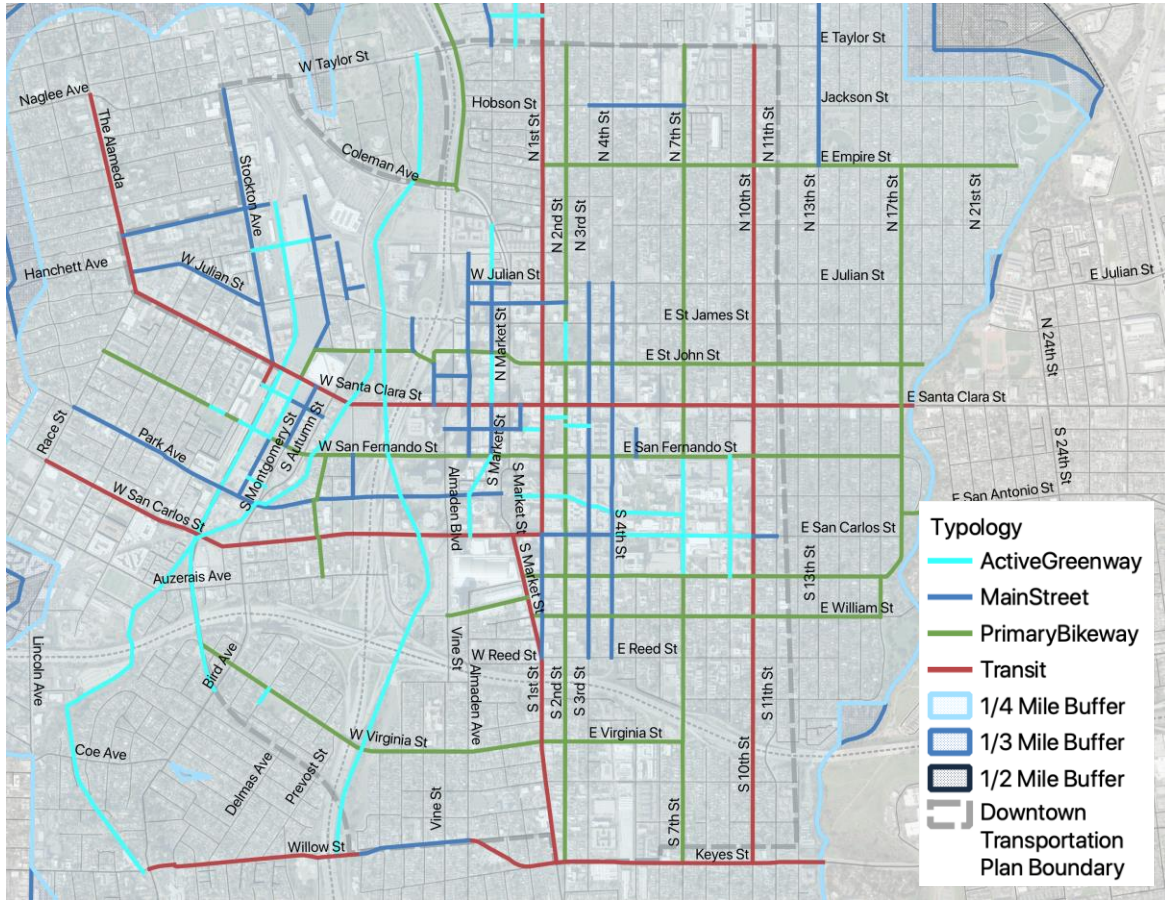


Population	Percent Coverage within 1/4 Mile	Percent Coverage within 1/3 Mile	Percent Coverage within 1/2 Mile
Total	56.19%	68.44%	85.41%
Minority Population	56.13%	68.24%	84.94%
Low Income Population	57.45%	69.54%	86.02%
Elderly Population	51.98%	64.32%	82.66%
Under 18 Population	48.06%	61.39%	81.15%
Adult Population (18-65)	58.24%	70.27%	86.54%
Car Free Population	67.78%	79.47%	91.76%
One Car Population	58.29%	71.07%	87.33%
Two Car Population	54.19%	66.30%	84.02%
Disabled Population	55.15%	68.44%	86.20%
Current Shopping Trips	**71.18%**	**82.04%**	**93.06%**
Current Recreational Trips	66.08%	77.00%	89.91%
Current Commerical Trips	**59.68%**	**71.99%**	**87.37%**
Current Commercial Loading Events	**59.82%**	**72.05%**	**87.34%**
Current Passenger Loading Trips	73.55%	83.88%	93.62%
Current Bike Trips	66.45%	77.83%	90.72%
Current Walk Trips	71.20%	81.62%	92.75%
Current Transit Trips	74.90%	85.04%	94.54%
2040 School Trips	86.54%	92.28%	96.49%
2040 Shopping Trips	**73.26%**	**84.82%**	**95.50%**
2040 Recreational Trips	70.83%	82.66%	94.32%
2040 Passenger Trips	72.96%	84.42%	95.23%
2040 Bike Trips	70.83%	82.54%	94.24%
2040 Walk Trips	70.38%	81.72%	93.29%
2040 Transit Trips	73.82%	85.14%	95.66%

Demographic Coverage Analysis

Pedestrian Network

Typology: Main Streets, Active Greenways, Primary Bike Streets, Grand Boulevards

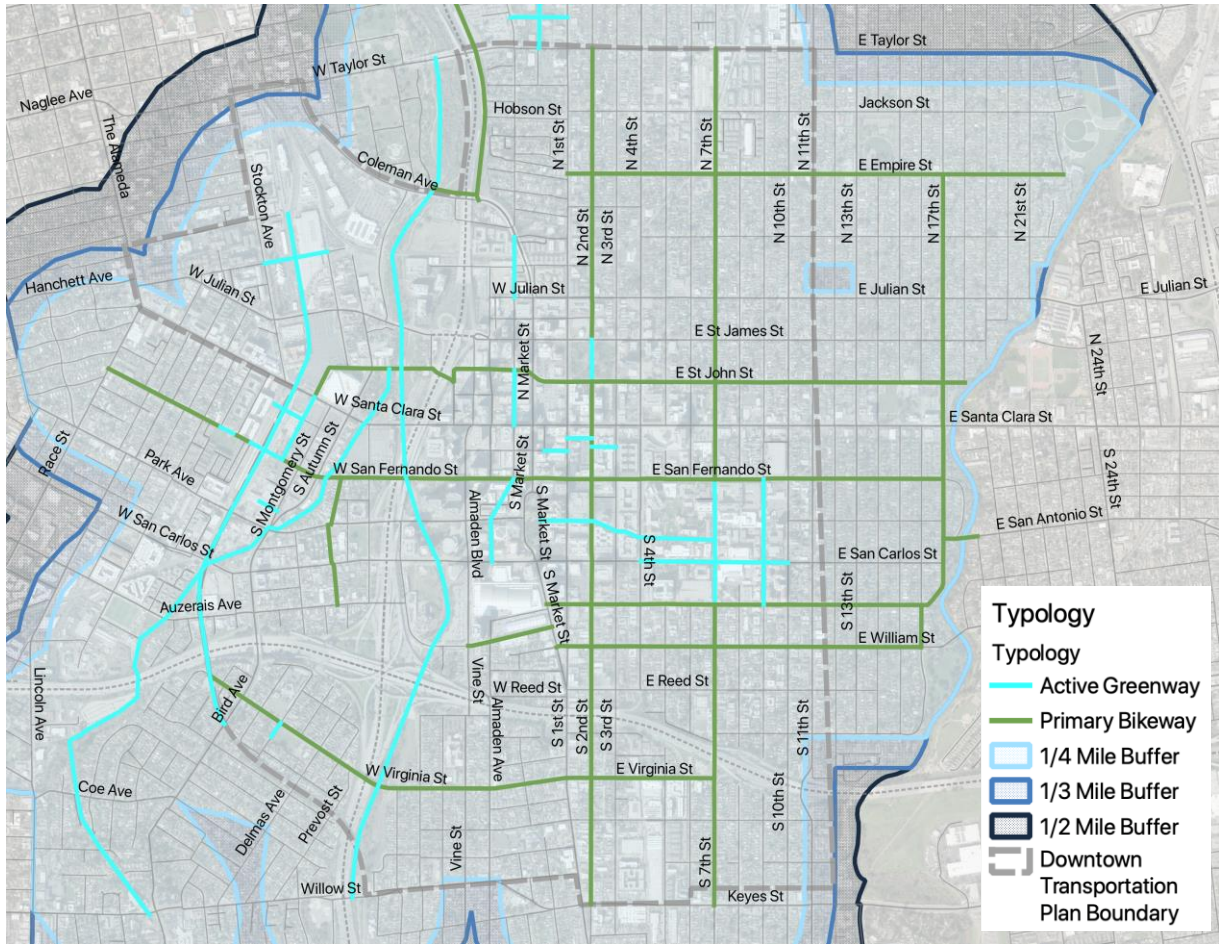


Population	Percent Coverage within 1/4 Mile	Percent Coverage within 1/3 Mile	Percent Coverage within 1/2 Mile
Total	96.61%	98.98%	99.85%
Minority Population	96.53%	99.04%	99.87%
Low Income Population	96.92%	99.25%	99.91%
Elderly Population	96.65%	99.13%	99.91%
Under 18 Population	95.94%	99.01%	99.91%
Adult Population (18-65)	96.74%	98.96%	99.83%
Car Free Population	97.72%	99.40%	99.90%
One Car Population	97.01%	99.14%	99.86%
Two Car Population	96.35%	98.88%	99.84%
Disabled Population	96.41%	98.83%	99.82%
Current School Trips	99.56%	99.86%	99.98%
Current Shopping Trips	96.68%	98.54%	99.69%
Current Recreational Trips	95.64%	98.16%	99.63%
Current Commercial Trips	91.80%	95.99%	99.11%
Commercial Loading Events	91.90%	96.03%	99.12%
Passenger Loading Trips	97.23%	98.78%	99.76%
Current Bike Trips	97.23%	98.98%	99.81%
Current Walk Trips	97.79%	99.20%	99.85%
Current Transit Trips	97.33%	98.79%	99.74%
2040 School Trips	99.18%	99.77%	99.96%
2040 Shopping Trips	95.51%	97.64%	99.46%
2040 Recreational Trips	95.30%	97.60%	99.46%
2040 Passenger Trips	95.32%	97.54%	99.44%
2040 Bike Trips	95.43%	97.66%	99.48%
2040 Walk Trips	95.22%	97.64%	99.48%

Demographic Coverage Analysis

Bike Network

Typology: Active Greenways, Primary Bike Streets

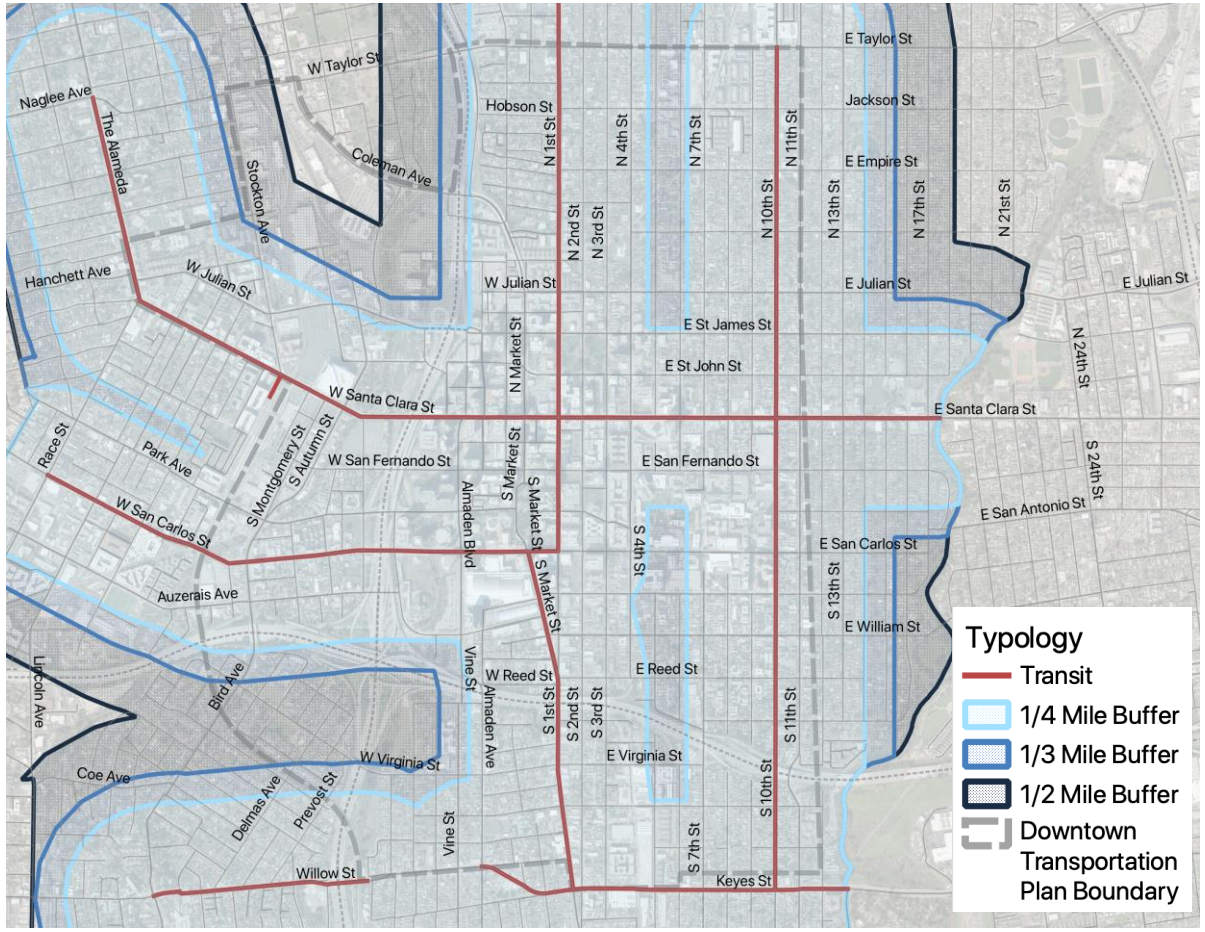


Population	Percent Coverage within 1/4 Mile	Percent Coverage within 1/3 Mile	Percent Coverage wit hin 1/2 Mile
Total	**90.62%**	**95.74%**	**99.03%**
Minority Population	90.41%	95.70%	99.10%
Low Income Population	91.26%	96.19%	99.29%
Elderly Population	90.97%	96.25%	99.27%
Under 18 Population	89.34%	95.72%	99.28%
Adult Population (18-65)	90.83%	95.68%	98.95%
Car Free Population	**94.00%**	**97.29%**	**99.51%**
One Car Population	91.39%	96.02%	99.11%
Two Car Population	89.98%	95.47%	98.95%
Disabled Population	91.71%	96.31%	99.16%
Current School Trips	98.65%	99.46%	99.86%
Current Shopping Trips	91.89%	95.34%	98.55%
Current Recreational Trips	90.97%	95.16%	98.57%
Current Commercial Trips	84.70%	90.71%	96.85%
Commercial Loading Events	84.86%	90.81%	96.88%
Passenger Loading Trips	92.28%	0.00%	98.62%
Current Bike Trips	**92.77%**	**96.46%**	**99.05%**
Current Walk Trips	93.57%	96.68%	99.09%
Current Transit Trips	93.23%	96.04%	98.73%
2040 School Trips	97.68%	98.92%	99.76%
2040 Shopping Trips	91.05%	94.30%	97.93%
2040 Recreational Trips	90.77%	94.28%	97.97%
2040 Passenger Trips	90.80%	94.16%	97.88%
2040 Bike Trips	**90.66%**	**94.24%**	**97.95%**
2040 Walk Trips	91.04%	94.55%	98.13%
2040 Transit Trips	91.61%	94.70%	98.07%

Demographic Coverage Analysis

Transit Network

Typology: Grand Boulevards



Population	Percent Coverage within 1/4 Mile	Percent Coverage within 1/3 Mile	Percent Coverage within 1/2 Mile
Total	69.35%	84.17%	94.23%
Minority Population	70.02%	85.00%	94.45%
Low Income Population	71.53%	87.29%	95.54%
Current Elderly Population	69.21%	82.48%	93.47%
Under 18 Population	67.01%	80.94%	92.70%
Adult Population (18-65)	69.82%	84.99%	94.62%
Car Free Population	**80.84%**	**93.12%**	**97.66%**
One Car Population	74.03%	87.28%	95.67%
Two Car Population	66.41%	82.08%	93.34%
Disabled Population	68.77%	83.10%	93.56%
Current School Trips	82.94%	96.96%	98.82%
Current Shopping Trips	76.85%	87.50%	94.86%
Current Recreational Trips	70.41%	83.59%	92.98%
Current Commercial Trips	61.01%	71.88%	87.13%
Current Commercial Loading Events	61.27%	72.07%	87.27%
Current Passenger Loading Trips	76.98%	88.03%	95.05%
Current Bike Trips	74.51%	87.50%	95.33%
Current Walk Trips	77.32%	90.33%	96.58%
Current Transit Trips	**78.94%**	**89.60%**	**95.82%**
2040 School Trips	84.89%	96.62%	98.82%
2040 Shopping Trips	74.82%	83.95%	92.55%
2040 Recreational Trips	73.54%	83.12%	92.28%
2040 Passenger Trips	73.81%	83.21%	92.20%
2040 Bike Trips	73.11%	83.03%	92.32%
2040 Walk Trips	73.43%	83.39%	92.40%
2040 Transit Trips	**75.28%**	**84.80%**	**93.08%**