LOS ANGELES METRO COVID-19 SERVICE RECOVERY PLANNING

presented by

Cambridge Systematics, Inc.

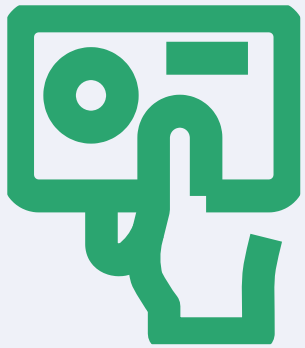
CAMBRIDGE SYSTEMATICS

May 21, 2021

PRE-COVID LA METRO NEXTGEN BUS STUDY – 2017/2019

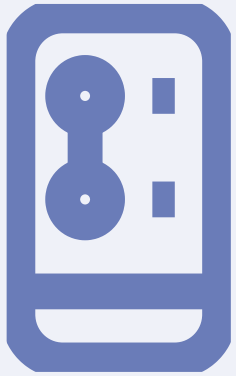
STEP 1

Use 6 months of farecard data to explain **TRANSIT** travel market



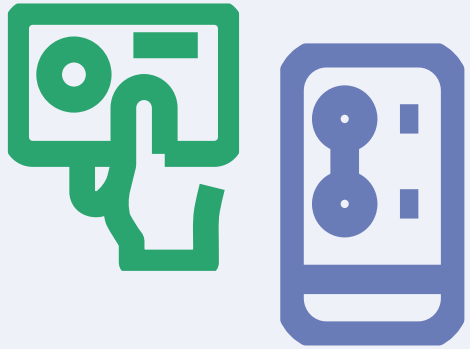
STEP 2

Use 6-months of LBS data to measure **TOTAL** travel market



STEP 3

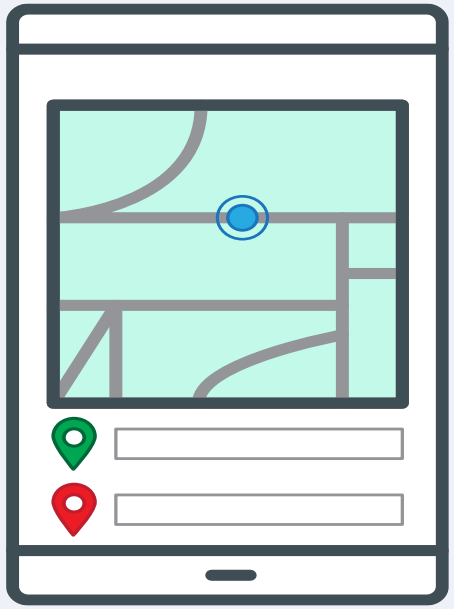
Compare **TRANSIT** travel to **TOTAL** travel in each market

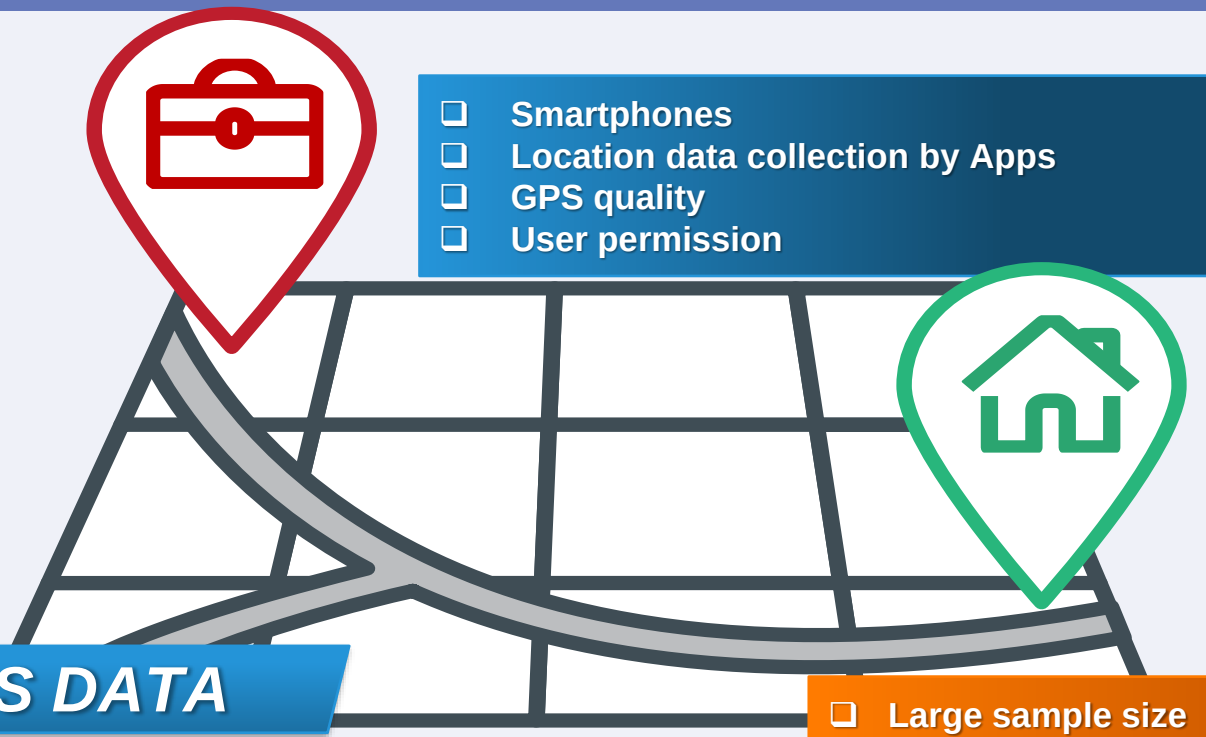


STEP 4

Use trip planners to **compare transit and driving** travel times

LOCATION-BASED SERVICES





- Smartphones
- Location data collection by Apps
- GPS quality
- User permission

LOCATION-BASED SERVICES DATA

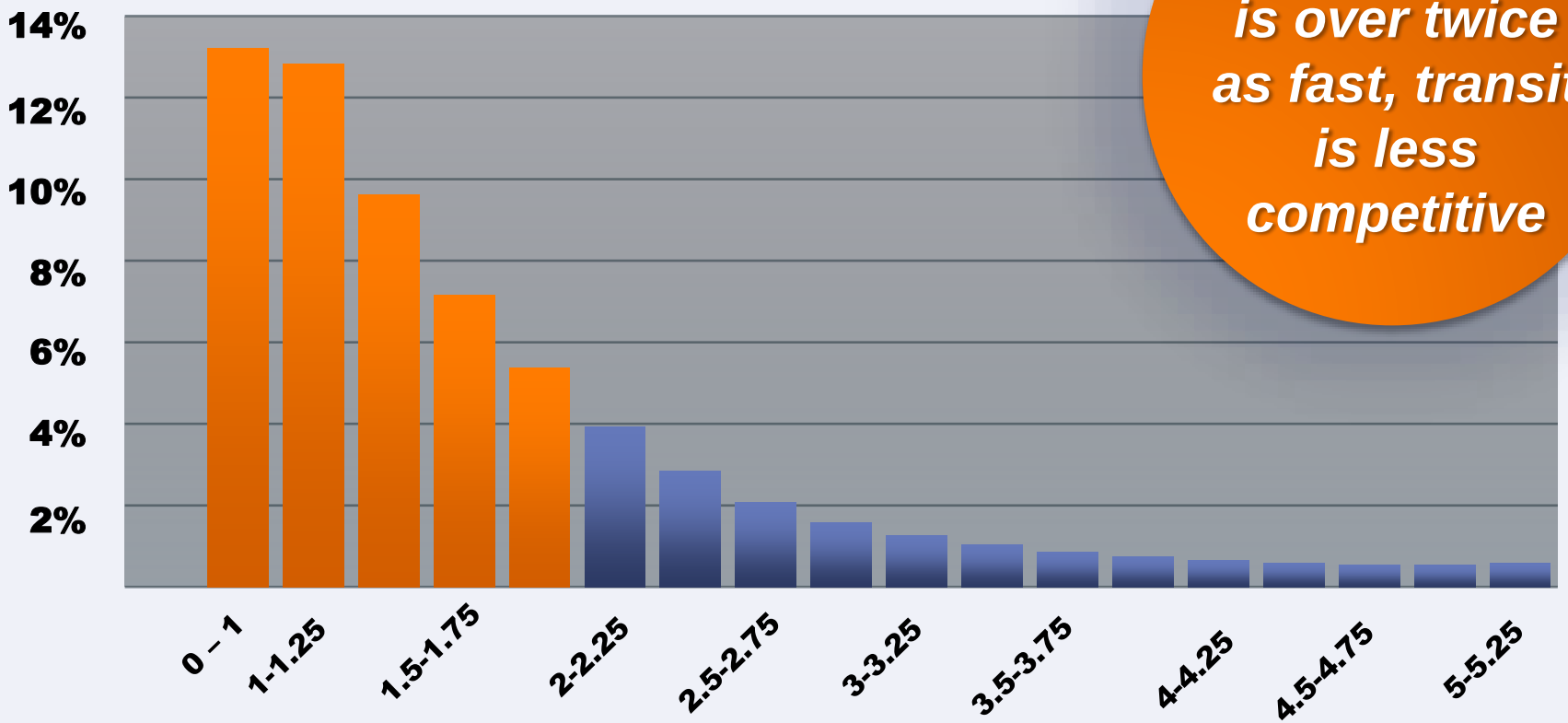
DATA CHARACTERISTICS

- Large sample size
- Messy datasets
- Spatial precision
- Persistent ID
- Anonymized

PRE-COVID LA METRO NEXTGEN BUS STUDY – 2017/2019

TRAVEL TIME COMPARISON WITH AUTO

Transit Market Share



Transit to Drive Time Ratio

When driving is over twice as fast, transit is less competitive

LA Redesign in Action

Sylmar/San Fernando Key Facts

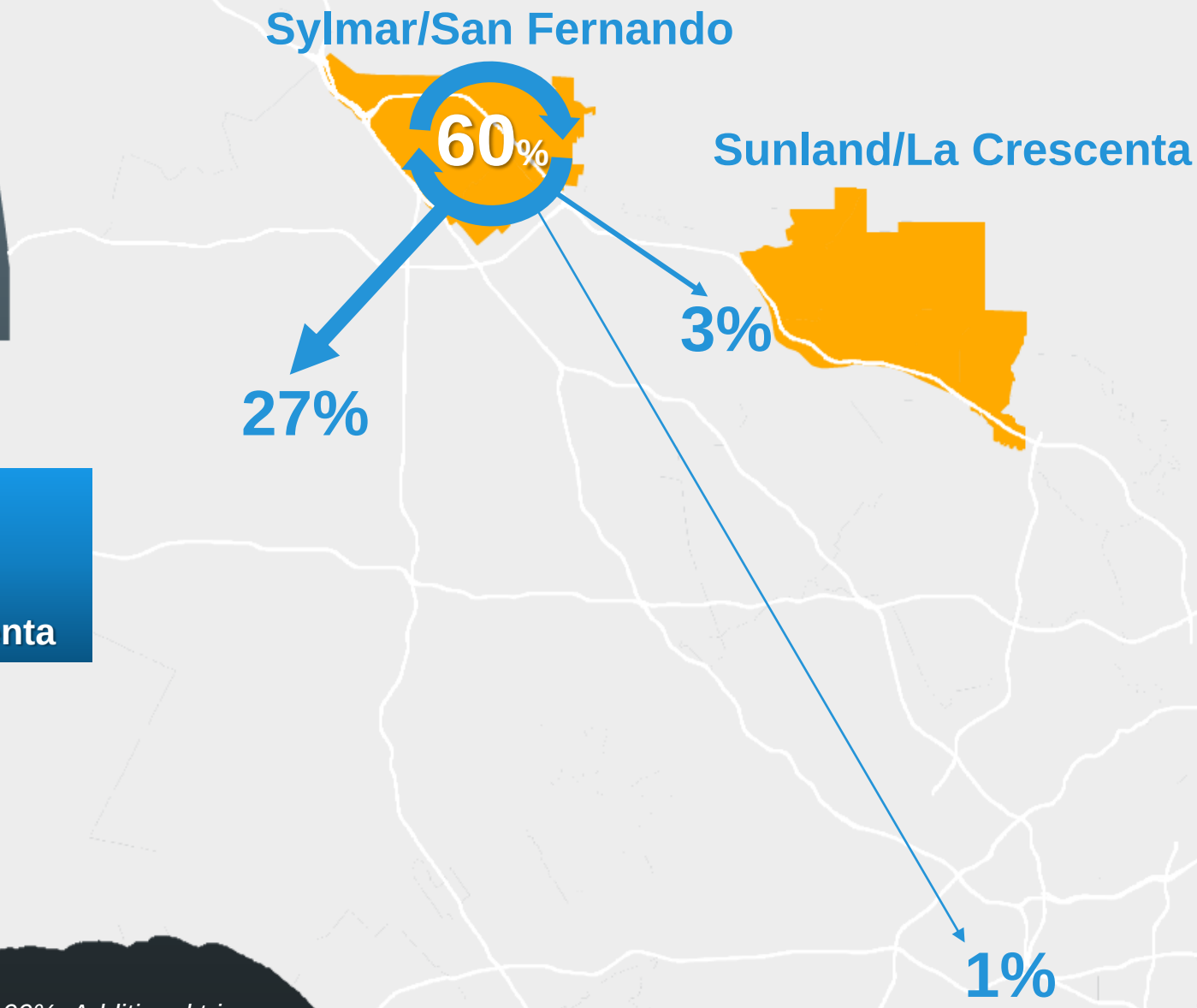
Trips: 380,000 trips

Market Share: 1.4% market share

Mileage: 76% of trips under 2.5 miles

Travel time competitiveness: 3.25-3.50

60% of trips occur within the area
27% of trips are to the Valley
1% of trips are to Downtown LA
3% of trips are to Sunland/La Crescenta



Percentages do not equal 100%. Additional trips dispersed throughout the County.

LA Redesign in Action

Sunland/La Crescenta Key Facts

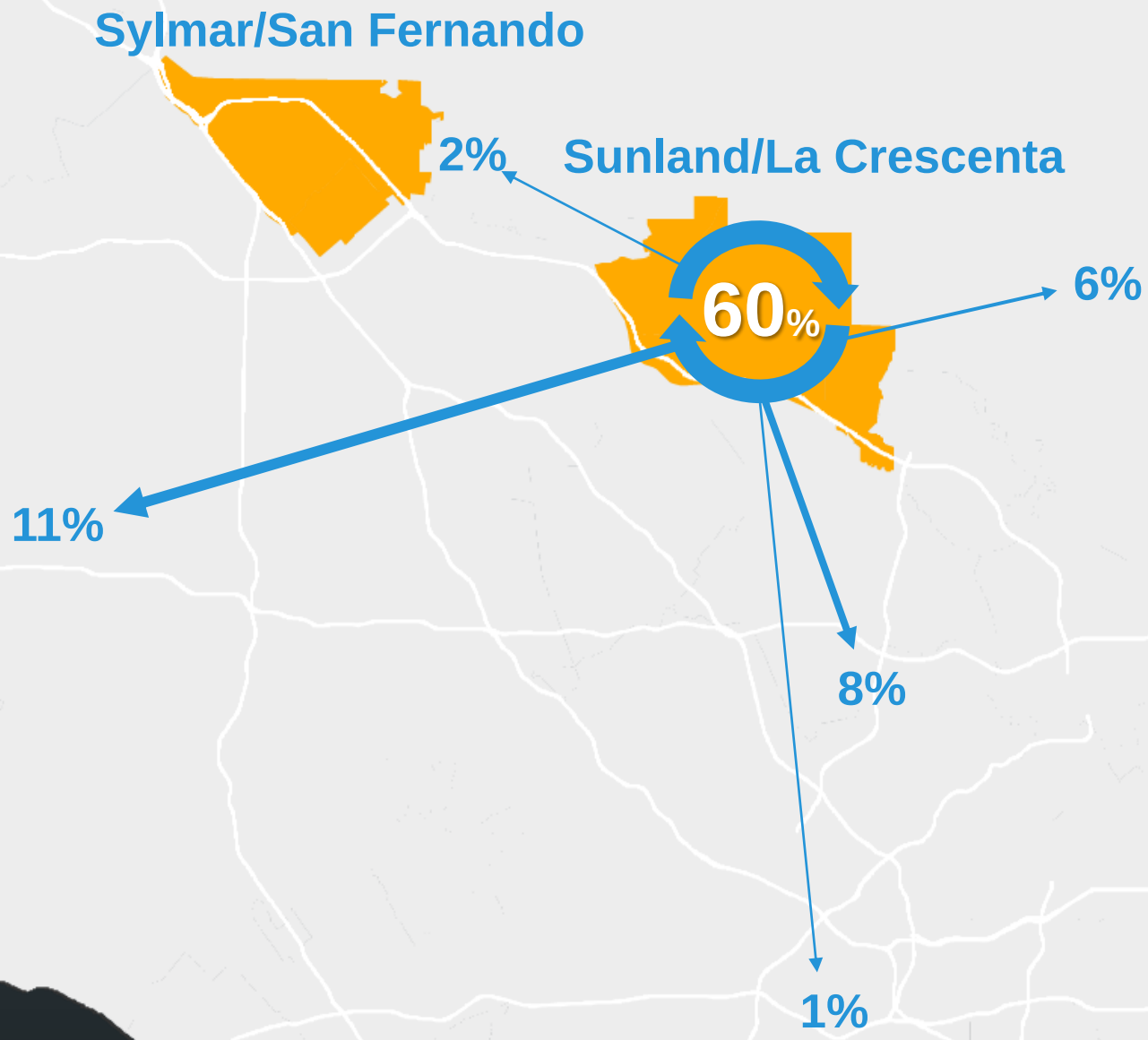
Trips: 325,000 trips

Market Share: 0.7% market share

Mileage: 44% of trips under 2.5 miles

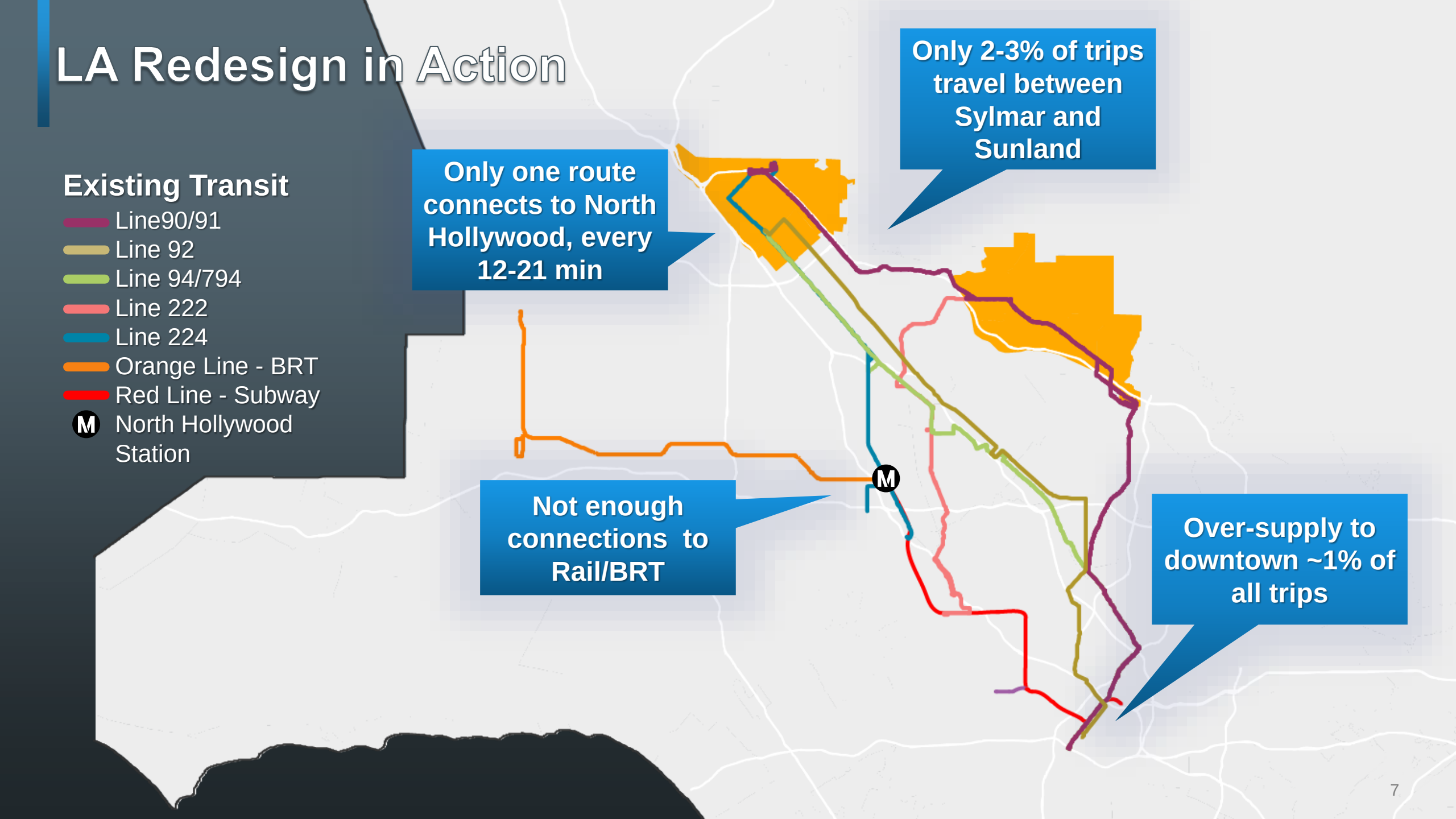
Travel time competitiveness: 3.00-3.25

60% of trips occur within the area
2% of trips are to Sylmar/San Fernando
11% of trips are to the Valley
1% of trips are to Downtown LA
8% of trips are to Glendale
6% of trips are to Pasadena

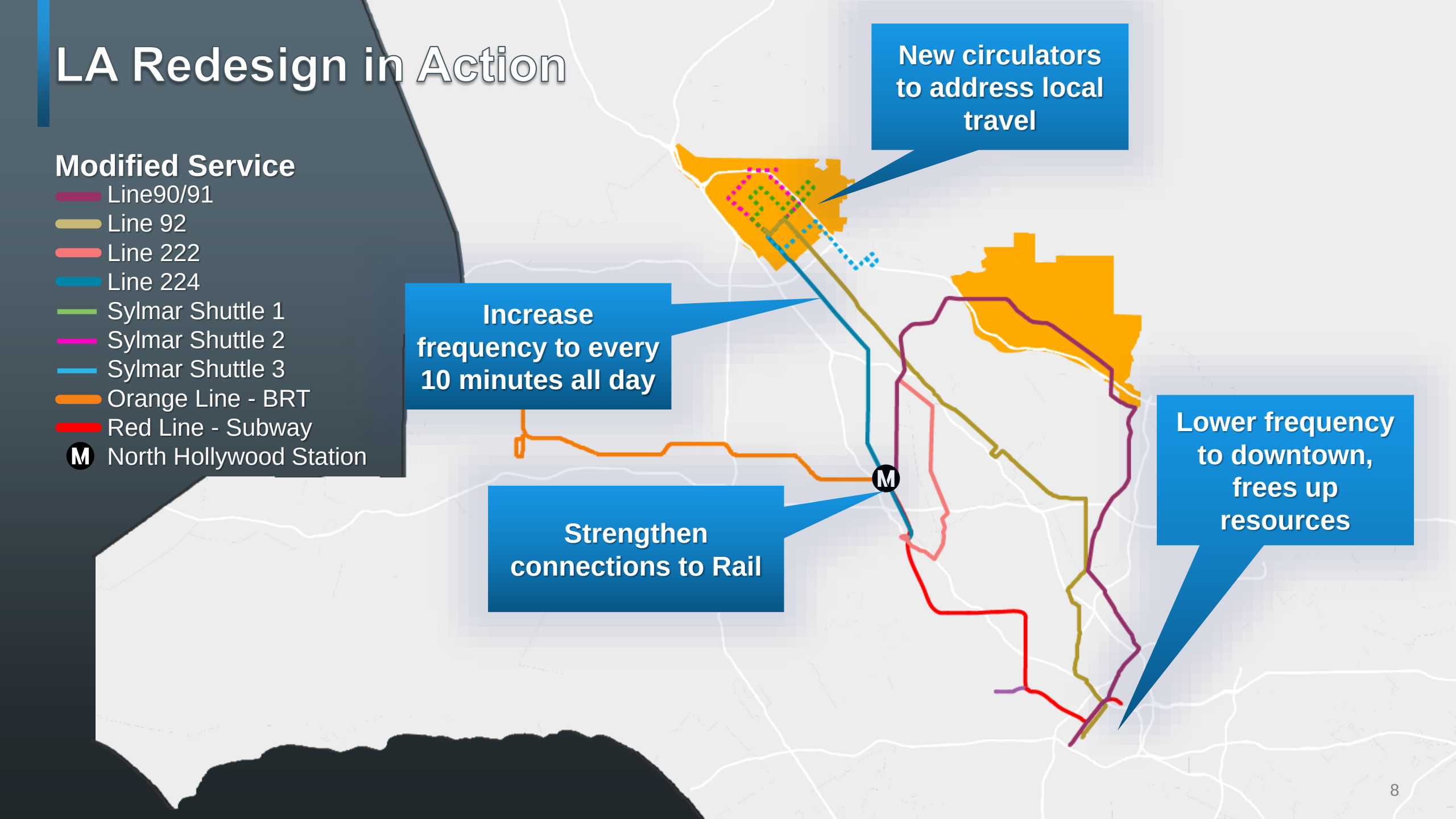


Percentages do not equal 100%. Additional trips dispersed throughout the County.

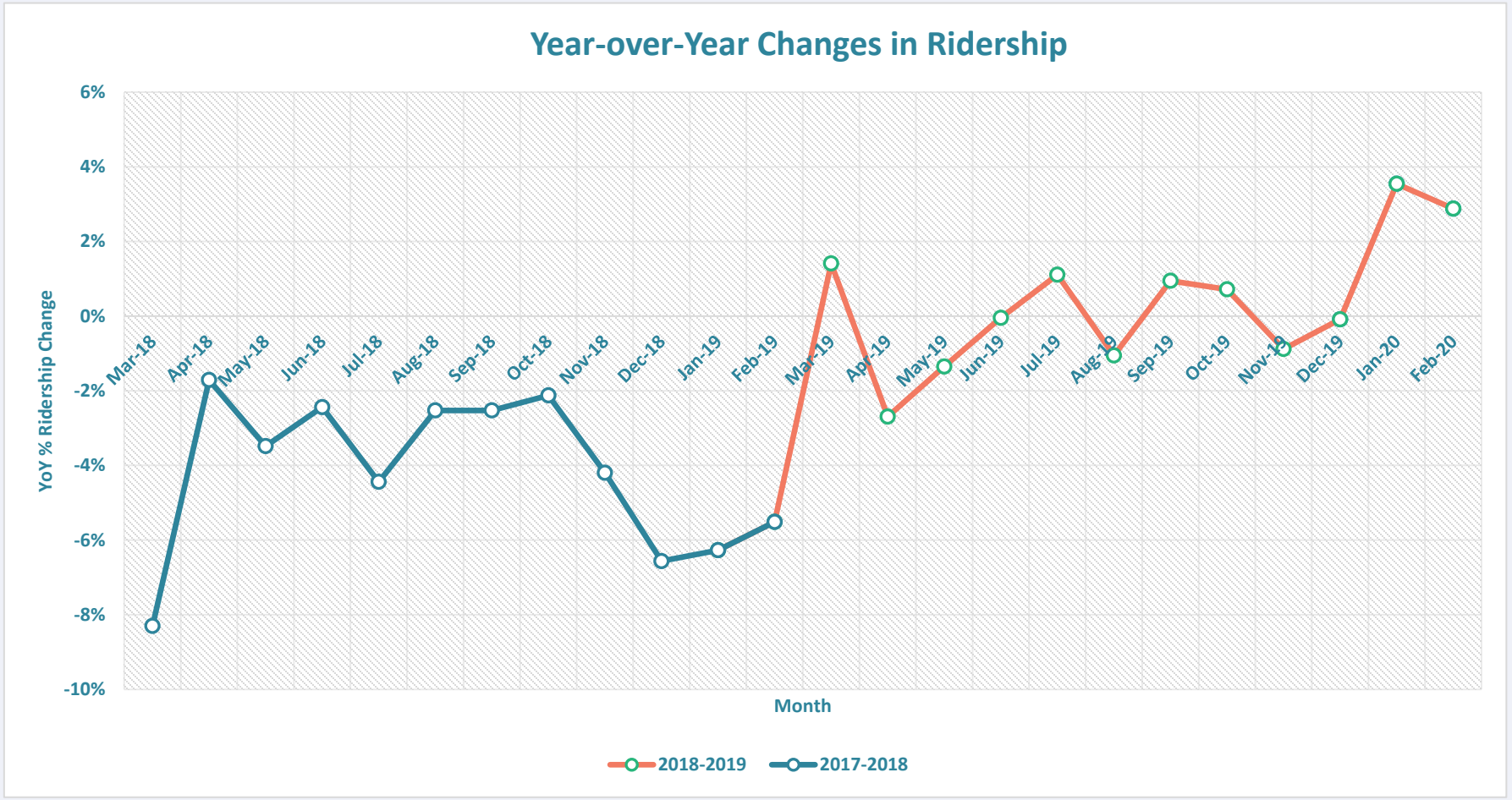
LA Redesign in Action



LA Redesign in Action



PRE-COVID LA METRO RIDERSHIP – TRENDING UPWARDS



IMPACTS OF COVID-19

BACKGROUND

- Stay-at-home orders issued in mid-March in in LA County in response to the COVID-19 pandemic.
- Overnight, LA Metro switched to an enhanced Sunday schedule without time for a thoughtful plan that mapped service against essential worker needs.
- During recovery, LA Metro was determined to implement a data-drive phased recovery that would ensure service recovery aligned with demand.
- To support this plan, LA Metro utilized “near” real-time data sources to assess the impact of pandemic on transit ridership, regional and local travel sheds, and economic activities.

WHAT BIG DATA SOURCES WERE UTILIZED?

LOCUS Travel Tracker	Location-based services (LBS) data to report weekly activity trends, stay-at-home and personal miles traveled (PMT) impacts by time of day, day of week, and geography
LOCUS Traffic Footfall	Location-based services (LBS) data to measure weekly measures of activity at major brands across industries (retail, dining, entertainment, travel etc.) to study recovery patterns
APC Dashboard	APC Data to monitor transit ridership by route, time of day, day of week, and geography and identify sections of routes with crowding issues

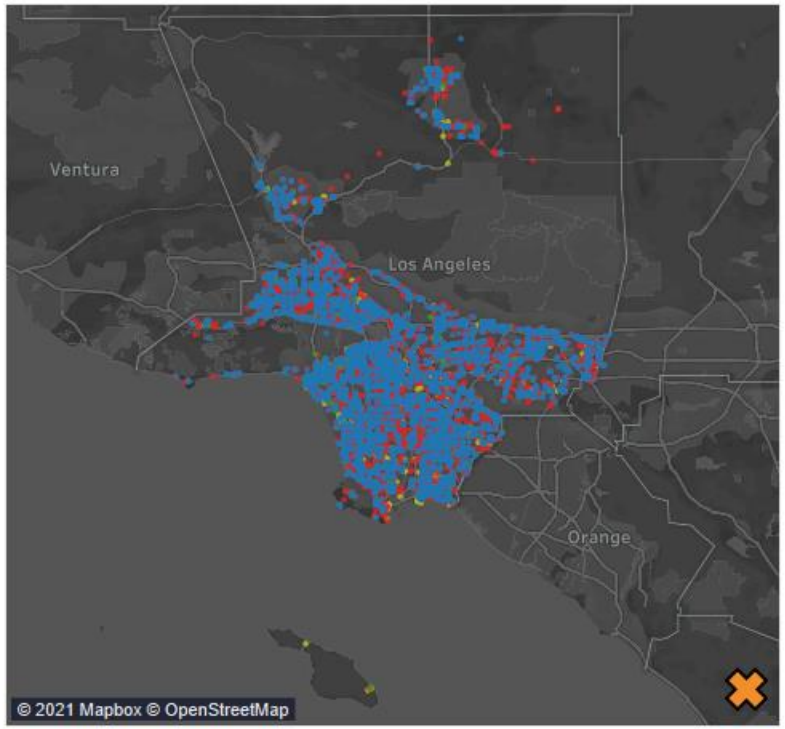
TRAFFIC FOOTFALL

Pre-processed *DAILY* visitation counts by location by brand: measure recovery over time and by specific location

- Weekly updates using Tableau dashboards
- Aggregate by neighborhood , town, or equity-focused zones
- Includes visits for over 350 brands
- All verticals – dining, retail, entertainment, travel

Traffic Footfall Tracker | Los Angeles County, CA

Markets	Submarkets	Brands	Outlets
4	42	339	12,265



Service Council
All

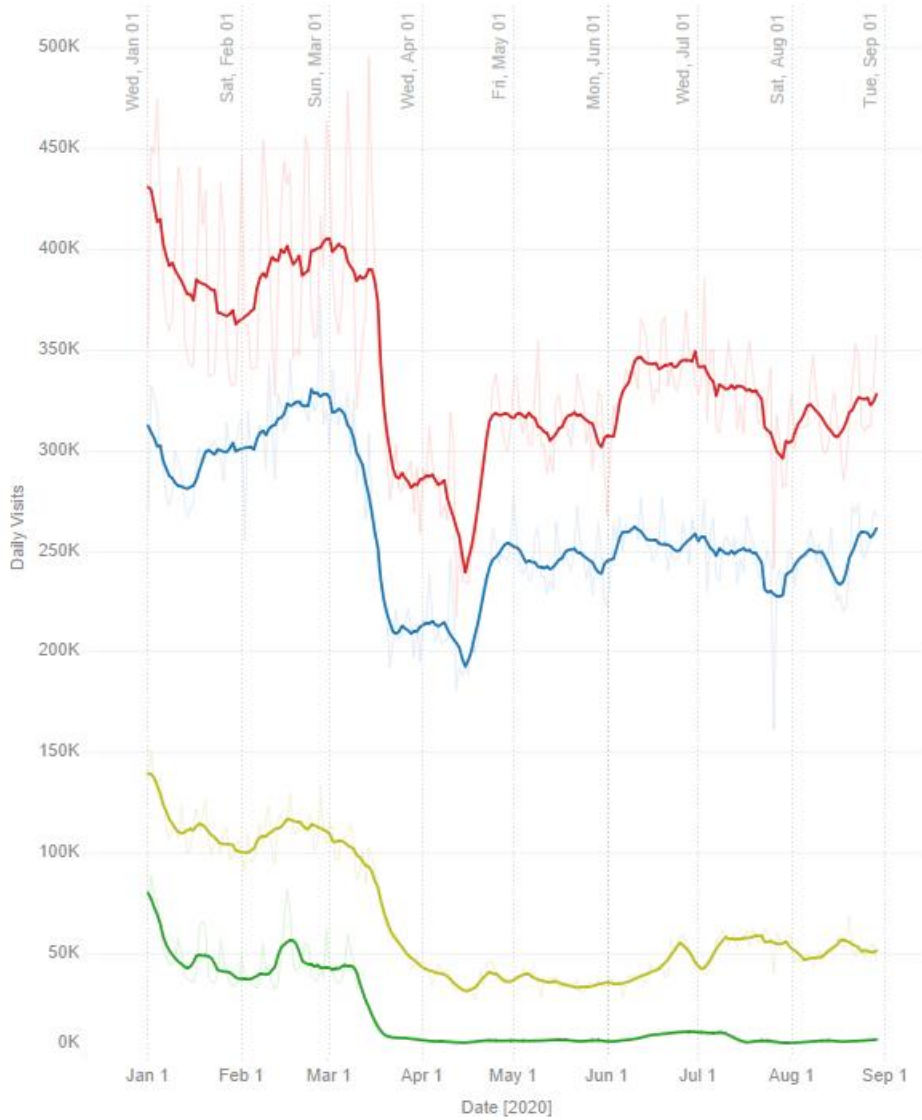
Subzone
All

POI
All

Corridor
All

Retail	162 brands in 7,271 locations
Dining	71 brands in 4,264 locations
Travel	85 brands in 746 locations
Entertainment	21 brands in 342 locations

7-day Moving Average of Daily Visits by Market Type



Retail
Dining
Travel
Entertainment

Market
Multiple values

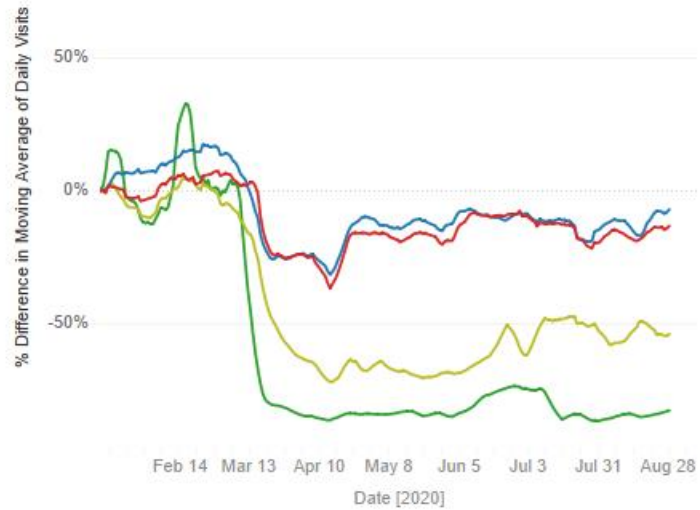
Submarket
All

Brand
All

LAMetro Location Category
All

Valid Days Threshold
Multiple values

Percent Difference in 7-day Moving Average From Jan 14, 2020

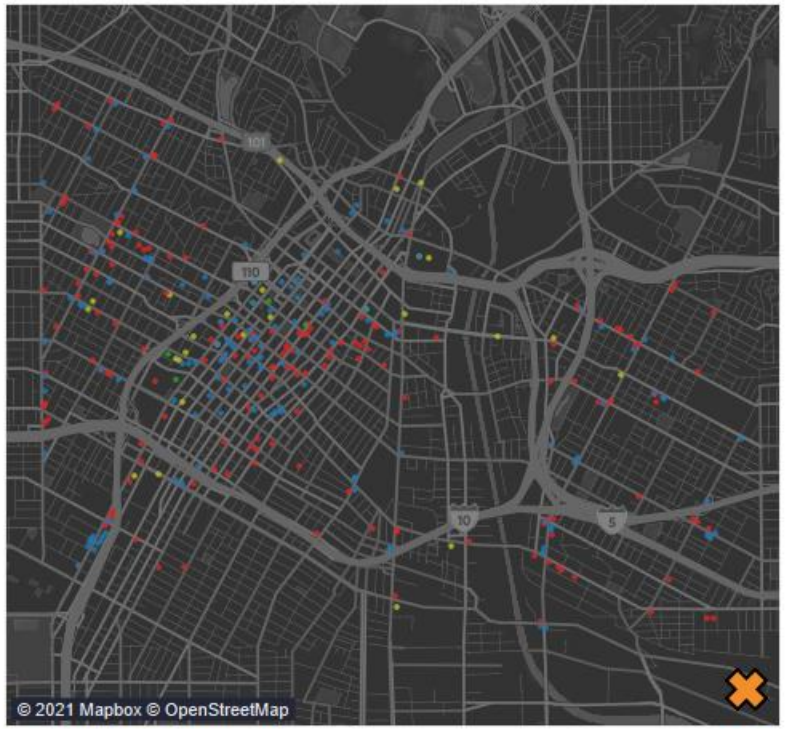


Go to Disaggregate Summaries

PlaceIQ LOCUS CAMBRIDGE SYSTEMATICS

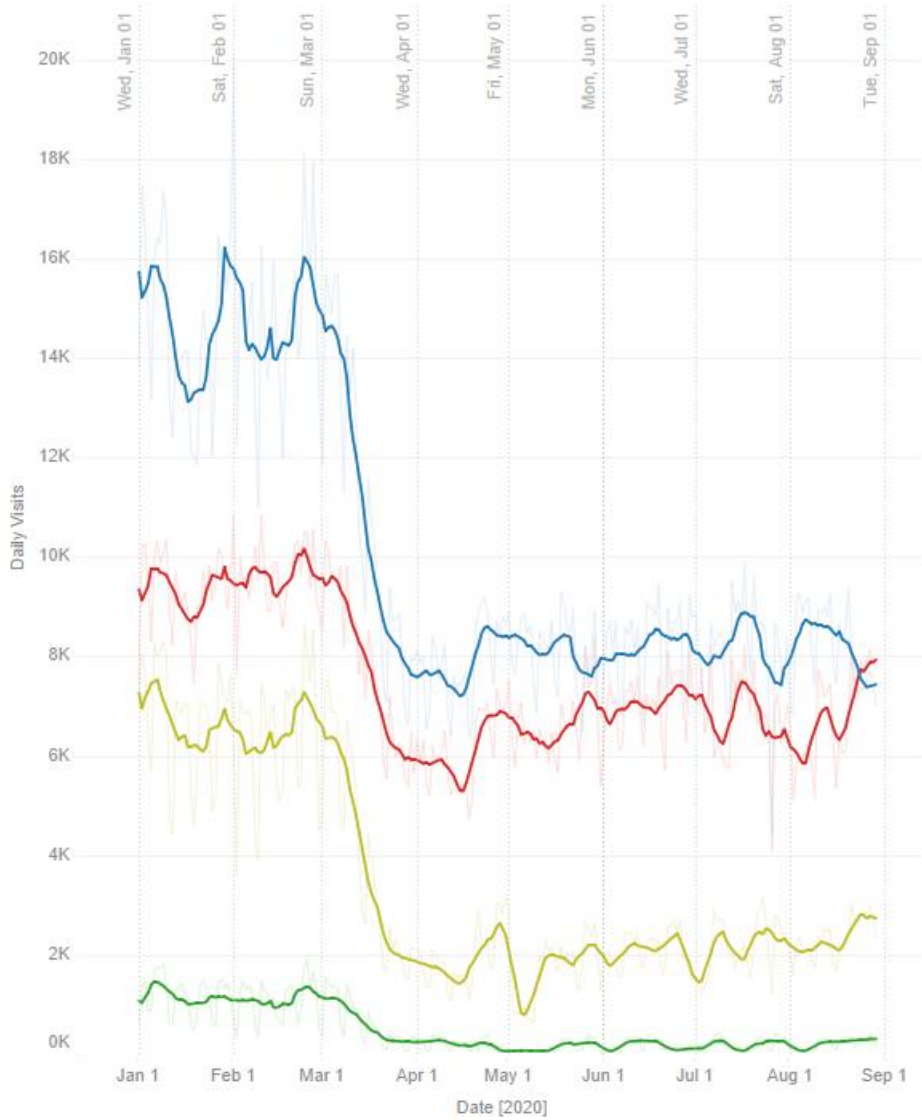
Traffic Footfall Tracker | Los Angeles County, CA

Markets	Submarkets	Brands	Outlets
4	28	112	339



Service Council: WC_Downtown/Chinatown
Subzone: All
POI: All
Corridor: All

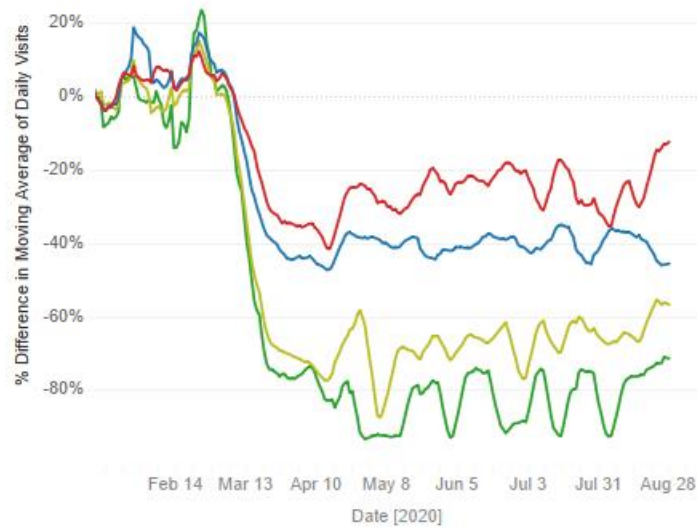
7-day Moving Average of Daily Visits by Market Type



Retail
Dining
Travel
Entertainment

Market: Multiple values
Submarket: All
Brand: All
LAMetro Location Category: All
Valid Days Threshold: Multiple values

Percent Difference in 7-day Moving Average From Jan 14, 2020

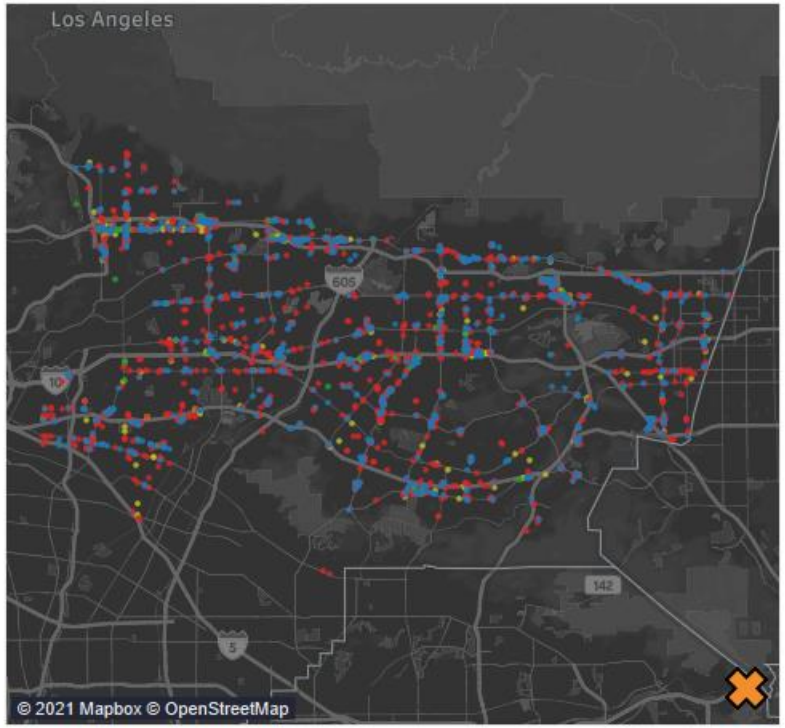


Go to Disaggregate Summaries

PlaceIQ LOCUS CAMBRIDGE SYSTEMATICS

Traffic Footfall Tracker | Los Angeles County, CA

Markets	Submarkets	Brands	Outlets
4	35	239	2,320



Service Council
San Gabriel Valley

Subzone
All

POI
All

Corridor
All

7-day Moving Average of Daily Visits by Market Type

Retail
Dining
Travel
Entertainment

Market
Multiple values

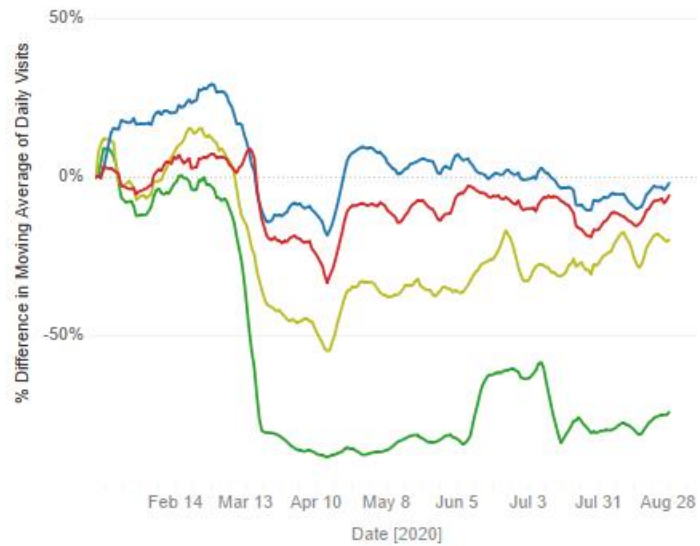
Submarket
All

Brand
All

LAMetro Location Category
All

Valid Days Threshold
Multiple values

Percent Difference in 7-day Moving Average From Jan 14, 2020



Go to Disaggregate Summaries

PlaceIQ LOCUS CAMBRIDGE SYSTEMATICS

TRAVEL TRACKER

Complementary tool to *Traffic Footfall* – *WEEKLY* Updates to understand stay-at-home trends, VMT impacts, and weekday/weekend travel

Weekly updates using Tableau dashboards

Measure travel at both home and non-home end

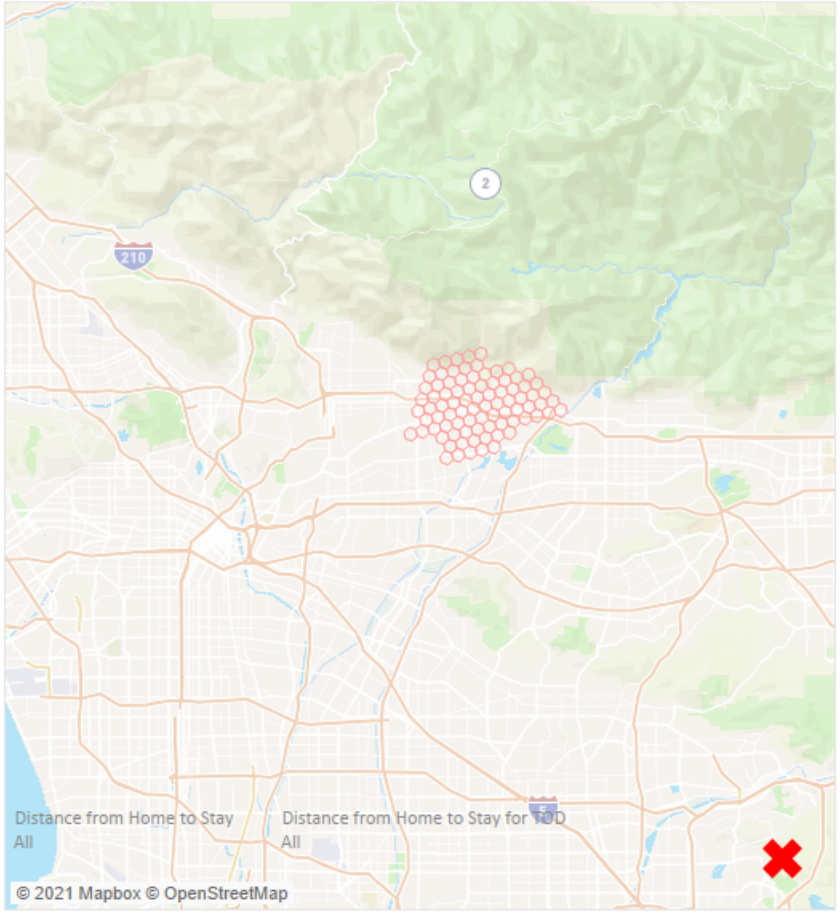
Use small hex-bins to study corridor movements

Tailor for weeks of interest e.g., school reopening week

Los Angeles, CA | Travel Tracker

	Avg. Visits	Residents	Avg. Visits/Resident	Avg. Distance Traveled, mi
Reference Week	26,938	8,656	3.11	31.04
Recent Week	13,921	6,459	2.16	9.55

Home Locations



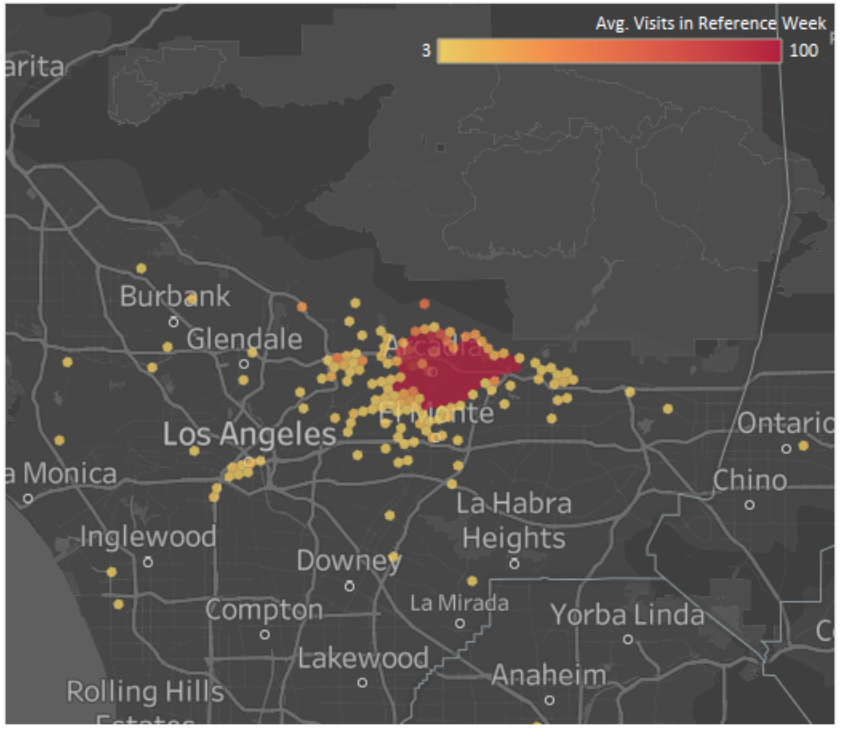
Home Service Council
San Gabriel Valley

Home Zone
Multiple values

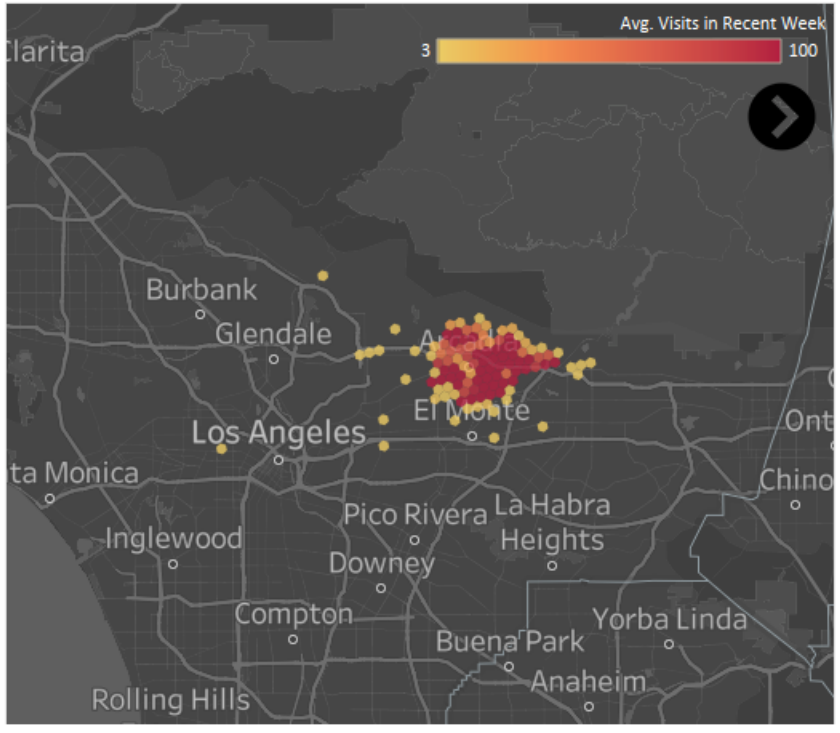
Home Corridor
All

Home POI
All

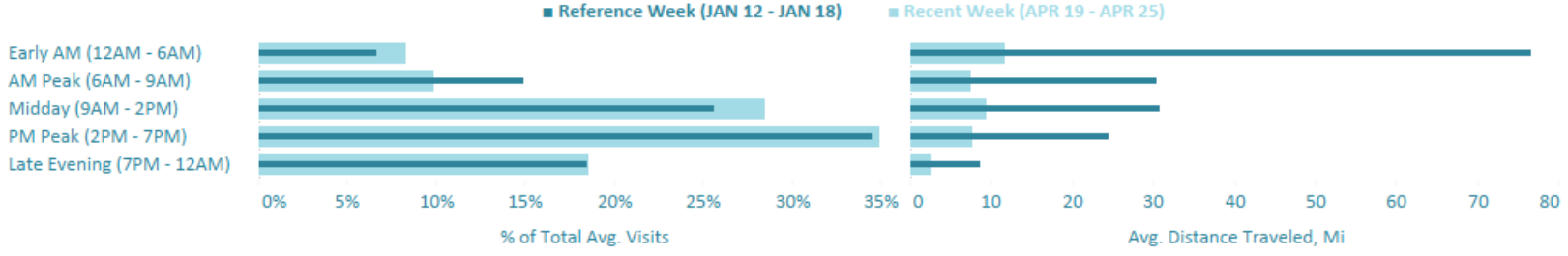
Visited Hexes in Reference Week



Visited Hexes in Recent Week



Share of **Total Avg. Visits** and **Avg. Distance Traveled, mi** by **Time of Day**



LOCUS CAMBRIDGE SYSTEMATICS

Day of Week
Weekday

Reference Week
JAN 12 - JAN 18

Avg. Visits in Reference Week
From 3

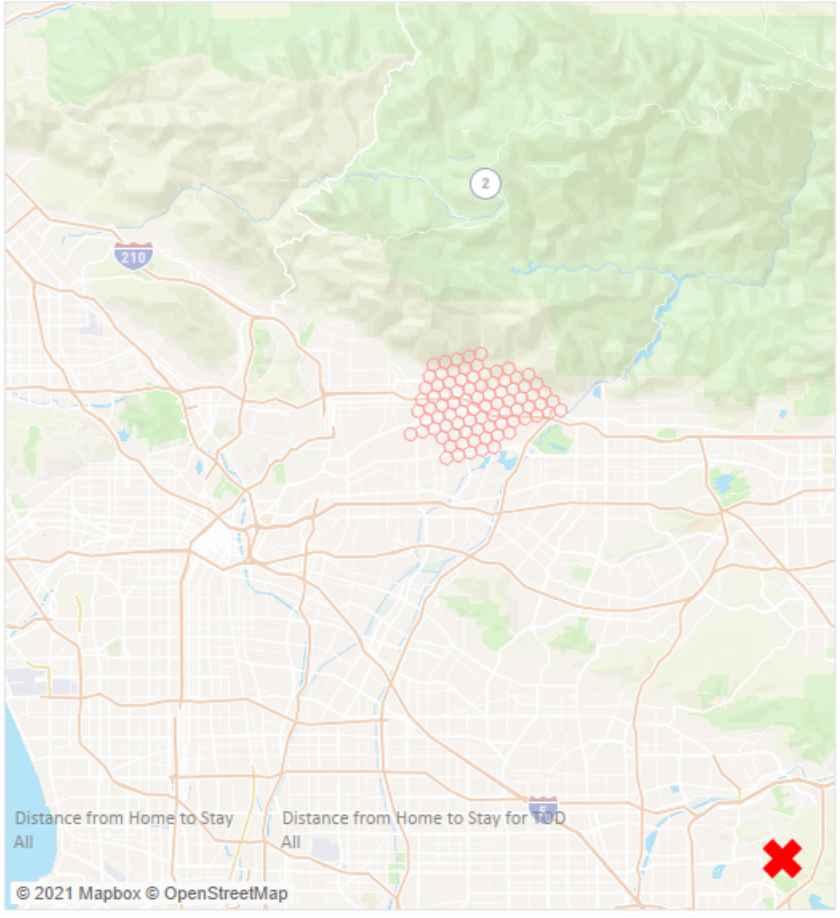
Recent Week
APR 19 - APR 25

Avg. Visits in Recent Week
From 3

Los Angeles, CA | Travel Tracker

	Avg. Visits	Residents	Avg. Visits/Resident	Avg. Distance Traveled, mi
Reference Week	26,938	8,656	3.11	31.04
Recent Week	13,994	5,676	2.47	15.75

Home Locations



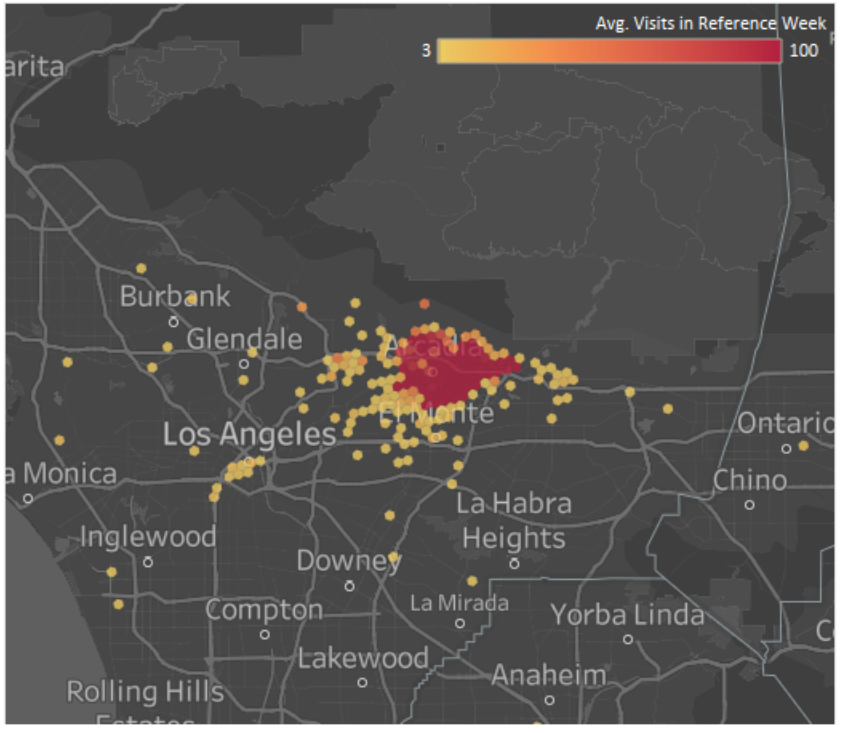
Home Service Council
San Gabriel Valley

Home Zone
Multiple values

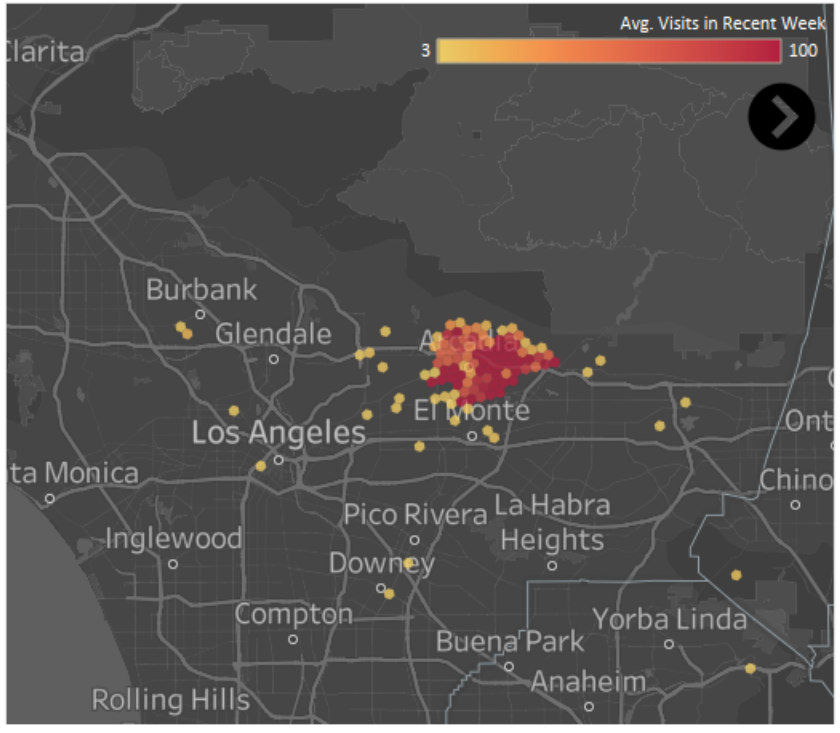
Home Corridor
All

Home POI
All

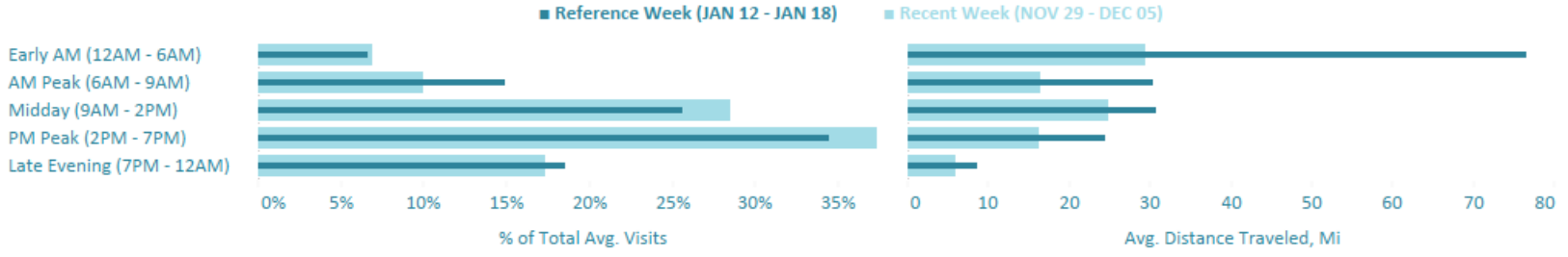
Visited Hexes in Reference Week



Visited Hexes in Recent Week



Share of **Total Avg. Visits** and **Avg. Distance Traveled, mi** by **Time of Day**



LOCUS CAMBRIDGE SYSTEMATICS

Day of Week
Weekday

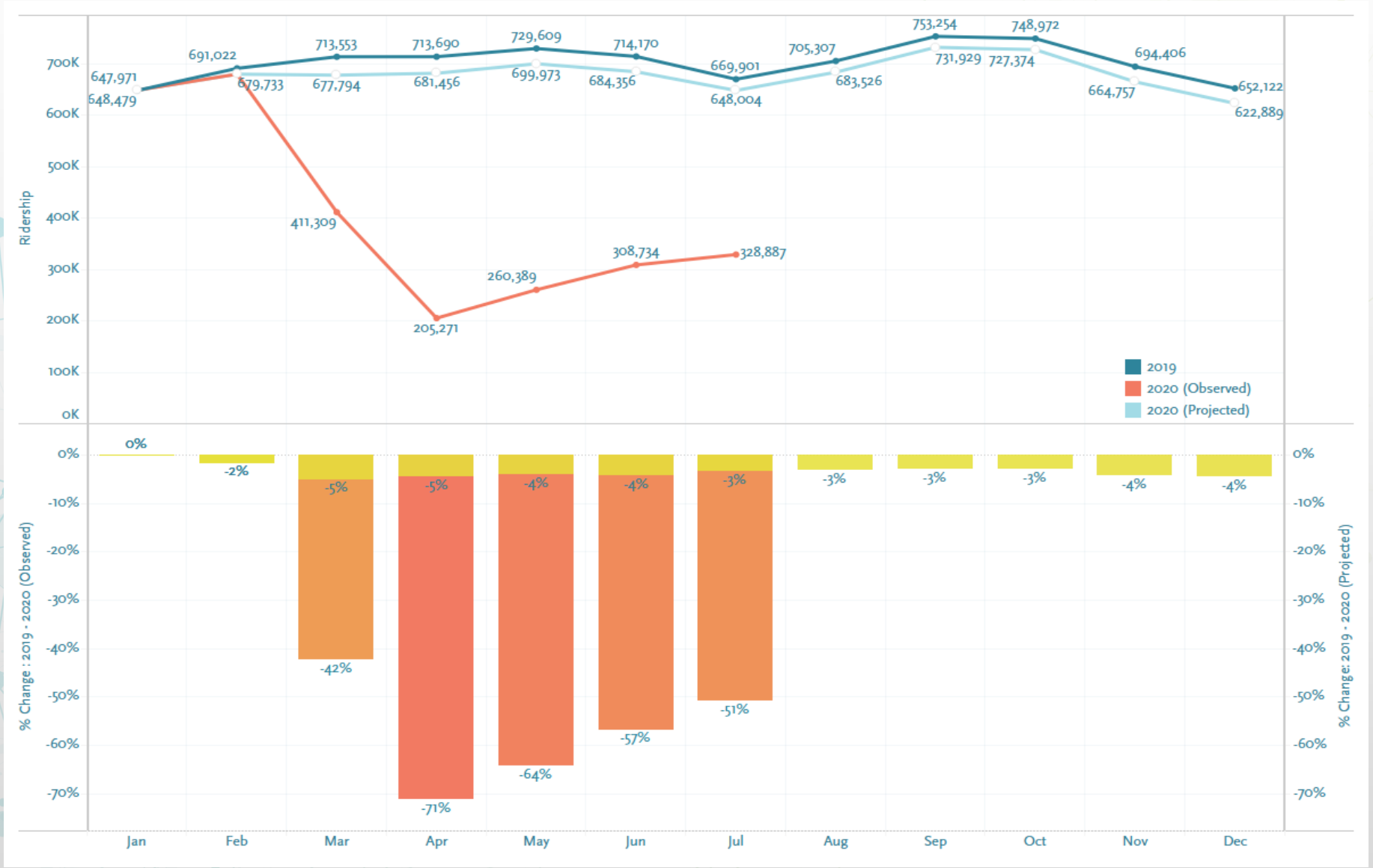
Reference Week
JAN 12 - JAN 18

Avg. Visits in Reference Week
From 3

Recent Week
NOV 29 - DEC 05

Avg. Visits in Recent Week
From 3

STUDY TRAVEL RECOVERY AGAINST GRANULAR APC DATA



Trips which have maximum load >= 0.75 * vehicle capacity

Segmented by Time of Day

% of Trips (Max Load >= Capacity)
0.0% — 75.0%

Show Trips By

# of Trips (Max Load >= Capacity)
Percent of trips which have max load >= X% of Capacity

% of Trips (Max Load >= Capacity)
Percent of trips which have max load >= X% of Capacity

Total Trips (Actual)
Number of all trips starting in that time period (regardless of their max load)

Start Hour / Start Time of Day

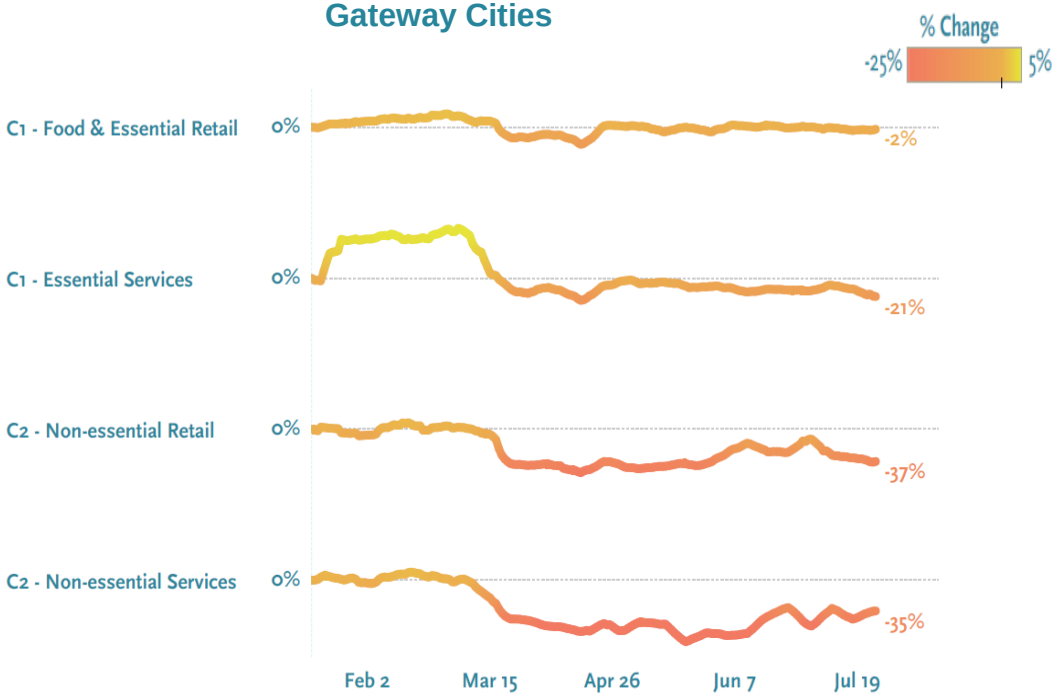
Month	Segmentation	2AM	3AM	4AM	5AM	6AM			7AM			8AM			9AM	10AM	11AM	12PM	1PM	2PM	3PM			4PM			5PM	
		2AM-3AM	3AM-4AM	4AM-5AM	5AM-6AM	6AM-6:20AM	6:20AM-6:40A...	6:40AM-7AM	7AM-7:20AM	7:20AM-7:40A...	7:40AM-8AM	8AM-8:20AM	8:20AM-8:40A...	8:40AM-9AM	9AM-10AM	10AM-11AM	11AM-12PM	12PM-1PM	1PM-2PM	2PM-3PM	3PM-3:20PM	3:20PM-3:40PM	3:40PM-4PM	4PM-4:20PM	4:20PM-4:40PM	4:40PM-5PM	5PM-5:20PM	5:20PM-5:40PM
201908	Local	1.5%	2.8%	13.4%	20.8%	28.3%	34.3%	36.4%	30.5%	27.2%	23.4%	28.6%	26.1%	31.8%	31.1%	35.4%	40.2%	45.9%	45.9%	41.9%	44.8%	41.8%	38.2%	40.2%	39.7%	46.0%	43.4%	41.2
	Express			50.0%	35.5%	46.2%	46.7%	21.4%	14.3%	20.0%	15.4%	12.5%	12.5%	0.0%	5.0%	0.0%	10.5%	11.1%	14.3%	16.7%	37.5%	38.5%	12.5%	26.7%	35.7%	42.9%	28.6%	37.5
	Rapid		0.0%	25.9%	32.1%	50.7%	43.7%	47.9%	47.1%	40.7%	32.1%	39.6%	41.3%	41.9%	32.5%	30.8%	37.5%	41.9%	34.4%	40.0%	48.3%	54.5%	47.8%	50.0%	52.7%	61.4%	63.0%	60.0
	BRT	0.0%	0.0%	11.8%	25.0%	41.2%	50.0%	57.9%	89.5%	78.6%	70.6%	76.5%	33.3%	23.1%	37.0%	40.9%	50.0%	65.0%	56.5%	13.5%	40.0%	43.8%	50.0%	38.9%	47.1%	64.7%	66.7%	66.7
	Total	1.4%	2.5%	15.3%	23.4%	33.4%	37.0%	38.7%	35.5%	31.3%	27.1%	33.0%	28.6%	32.1%	30.8%	33.8%	39.2%	44.8%	43.5%	39.8%	45.0%	43.8%	39.9%	41.2%	42.0%	49.5%	47.4%	45.7
201909	Local	1.5%	2.8%	15.4%	27.0%	45.9%	58.7%	62.7%	51.0%	44.8%	30.3%	34.6%	29.8%	32.4%	32.6%	36.4%	41.6%	49.2%	53.5%	60.3%	61.7%	58.4%	49.6%	50.2%	48.2%	49.0%	51.1%	48.7
	Express			50.0%	35.5%	46.2%	60.0%	35.7%	21.4%	20.0%	23.1%	25.0%	25.0%	12.5%	0.0%	5.6%	10.5%	11.1%	23.8%	32.0%	33.3%	38.5%	25.0%	40.0%	35.7%	57.1%	28.6%	37.5
	Rapid		0.0%	22.2%	39.4%	60.9%	60.6%	71.8%	54.4%	52.5%	47.2%	47.2%	37.0%	51.2%	35.0%	26.5%	32.5%	45.3%	42.4%	57.4%	62.1%	58.2%	55.2%	51.7%	56.4%	70.2%	66.7%	60.0
	BRT	0.0%	0.0%	17.6%	25.0%	52.9%	88.9%	78.9%	94.7%	92.9%	#####	76.5%	66.7%	53.8%	70.4%	81.8%	65.0%	85.0%	73.9%	37.8%	46.7%	75.0%	75.0%	66.7%	76.5%	76.5%	80.0%	53.3
	Total	1.4%	2.5%	17.0%	29.3%	48.8%	60.3%	64.1%	52.6%	47.3%	36.6%	39.1%	32.8%	36.3%	33.6%	35.3%	39.8%	48.6%	51.5%	58.2%	60.5%	58.4%	51.2%	50.9%	50.4%	54.2%	54.3%	50.6
202006	Local	0.0%	0.0%	1.3%	8.9%	10.2%	6.2%	4.9%	4.4%	2.5%	0.4%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.6%	0.3%	1.1%	1.2%	1.3%	1.4%	1.9%	3.2%	1.6
	Express			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
	Rapid			0.0%	3.1%	6.9%	11.1%	7.9%	1.2%	0.8%	1.4%	2.4%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.9%	5.3%	2.8%	4.7%	3.4%	2.3%	3.8%	0.0
	BRT	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%	24.1%	4.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.8%	9.8%	4.3%	3.9%	0.0
	Total	0.0%	0.0%	1.1%	7.0%	8.8%	7.2%	5.8%	3.5%	2.0%	0.6%	0.5%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.5%	0.6%	1.9%	1.4%	2.2%	2.0%	2.0%	3.2%	1.2
202007	Local	0.0%	0.0%	1.4%	3.4%	5.8%	4.7%	3.6%	3.3%	1.8%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.5%	1.1%	0.5%	0.6%	4.4%	4.2
	Express			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
	Rapid			0.0%	1.1%	2.4%	4.9%	4.5%	0.0%	2.6%	2.6%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	5.7%	0.0%	2.3%	2.8%	2.4%	0.0
	BRT	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	12.5%	0.0
	Total	0.0%	0.0%	1.1%	2.7%	4.7%	4.5%	3.5%	2.5%	1.8%	1.4%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.4%	1.3%	0.9%	0.8%	1.4%	4.2%	3.3
202008	Local	0.0%	0.0%	0.0%	3.2%	5.3%	3.0%	3.0%	2.8%	1.2%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.6%	0.5%	0.0%	2.2%	1.2%	2.0%	1.8
	Express			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
	Rapid			5.3%	2.1%	2.4%	4.9%	2.4%	4.8%	5.3%	2.6%	2.9%	2.8%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%	5.7%	7.5%	4.5%	2.8%	0.0%	0.0
	BRT	0.0%	0.0%	0.0%	17.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	12.5%	14.3
	Total	0.0%	0.0%	0.5%	3.4%	4.3%	3.2%	2.7%	3.0%	1.8%	1.9%	0.5%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.9%	1.3%	1.3%	2.5%	1.4%	1.9%	1.9
202009	Local	0.0%	1.5%	0.7%	5.2%	5.3%	3.6%	4.2%	3.4%	3.0%	1.8%	0.0%	0.0%	0.6%	0.2%	0.0%	0.0%	0.2%	0.0%	0.4%	0.6%	0.6%	0.5%	1.2%	1.6%	1.8%	3.9%	3.0
	Express			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0
	Rapid			0.0%	3.2%	0.0%	9.8%	4.8%	7.1%	5.3%	2.6%	2.9%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	2.6%	4.5%	8.6%	7.5%	7.0%	2.8%	0.0%	3.1
	BRT	0.0%	0.0%	0.0%	17.6%	25.0%	0.0%	14.3%	12.5%	22.2%	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.8%	0.0%	12.5%	12.5%	12.5%	12.5%	12.5%	25.0%	14.3
	Total	0.0%	1.4%	0.6%	5.2%	4.8%	4.6%	4.5%	4.3%	4.1%	2.3%	0.5%	0.5%	0.5%	0.2%	0.0%	0.0%	0.2%	0.0%	0.6%	0.9%	1.7%	2.1%	2.7%	2.9%	2.3%	3.9%	3.3

CASE STUDY – GATEWAY CITIES REGION

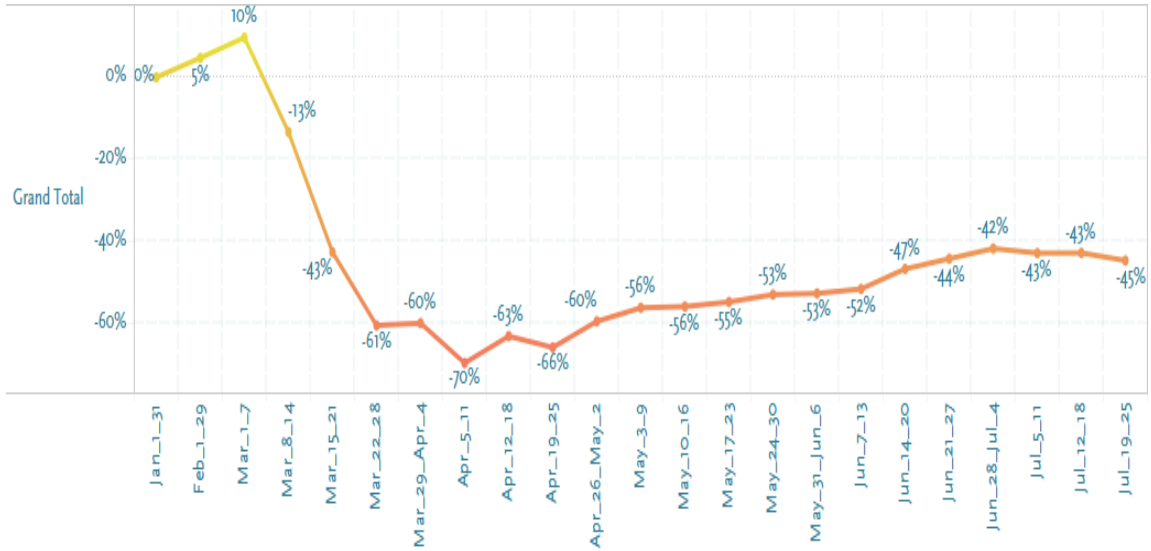
Gateway Cities

Home Location	APR 19 - APR 25	APR 26 - MAY 02	MAY 03 - MAY 09	MAY 10 - MAY 16	MAY 17 - MAY 23	JUN 07 - JUN 13	JUN 14 - JUN 20	JUN 21 - JUN 27	JUN 28 - JUL 04	JUL 05 - JUL 11	JUL 12 - JUL 18	JUL 19 - JUL 25
Gateway Cities	-15%	-12%	-12%	-12%	-9%	-5%	-5%	-6%	-6%	-6%	-7%	-8%
On Average	-16%	-13%	-13%	-13%	-12%	-6%	-6%	-7%	-7%	-8%	-8%	-9%

Resident Visits



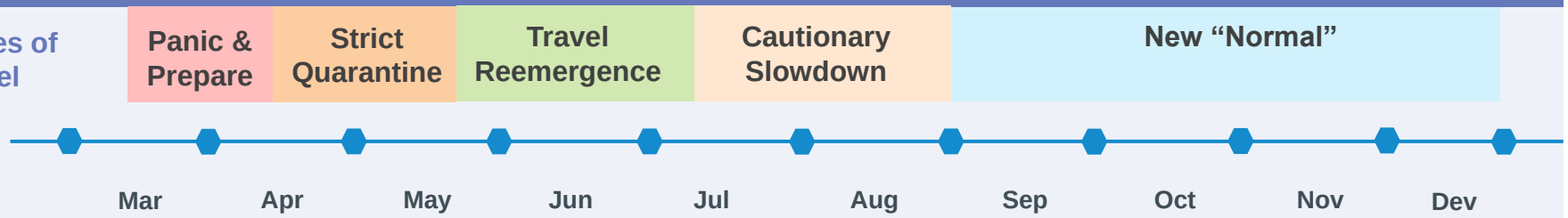
Traffic Footfall



Transit Ridership

LA METRO PHASED RECOVERY

- Identify and quantify different stages of recovery
- Maintain flexibility in service planning and adjustment
- Measure time-of-day patterns to study new travel routines
- Identify high-intensity zones to realign the service
- Support phased recovery leading into NextGen Implementation



Bus Recovery Phase	Base COVID-19 Enhanced Sunday Service	Phase 1	Phase 2	Phase 3	Phase 4
Objective	Provide for essential travel only	Increase frequency of core network for first wave of non-essential workers/students		Enhanced services	Systemwide Recovery
Timing	April 2020	May - June 2020	Jul – Aug 2020	Sept – Nov 2020	Dec 2020 – Ongoing
Service Adjustments	- Sunday Base - Add weekday Locals, Rapids	- Reduce underutilized peak service - Rightsizing routes/geos	- Focus on midday and weekends - School trips	- Implement market specific service packages where & when data shows emerging markets	- Implement routing changes as per NextGen Bus Plan - Consolidate Rapids / Locals