



METROLINK®

Analyzing the Market Share of Commuter Rail Stations using LEHD Data

Using Census Data for Transportation Applications Conference,

Irvine, CA

October 26, 2011



METROLINK®

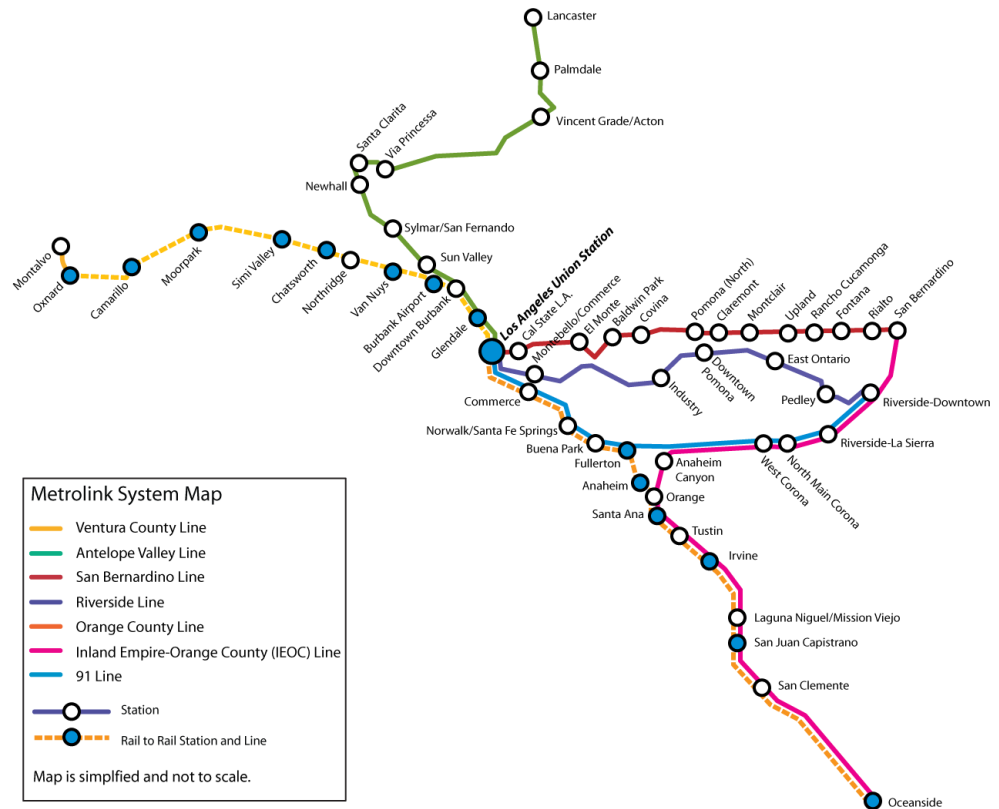
1. What is the size of Metrolink's commute market?
2. What share of the market does Metrolink capture?
3. What is the latent demand and what factors influence it?



Background

Metrolink – Southern California’s Regional Railroad

- 7 routes serving 6 counties
- 55 stations
- 512 route miles
- 164 weekday trains
- 42,000 avg. weekday trips





Commuter Rail Travel Shed Analysis

The travel shed represents the competitive market.

Station catchment area methodology:

1. Analyze travel data for current riders
 - Origin-Destination survey of current riders. (Sample size needs to be large enough to provide enough observations for each station).
 - GIS analysis of home and work locations for Metrolink riders.
2. Define station catchment areas based on trip origins/destinations
 - Catchment area covers no less than 90% of trip origins or destinations for a particular station.
 - Catchment areas based on census tract or TAZ geography.



Commuter Rail Travel Shed Analysis

Metrolink Station Catchment Areas:

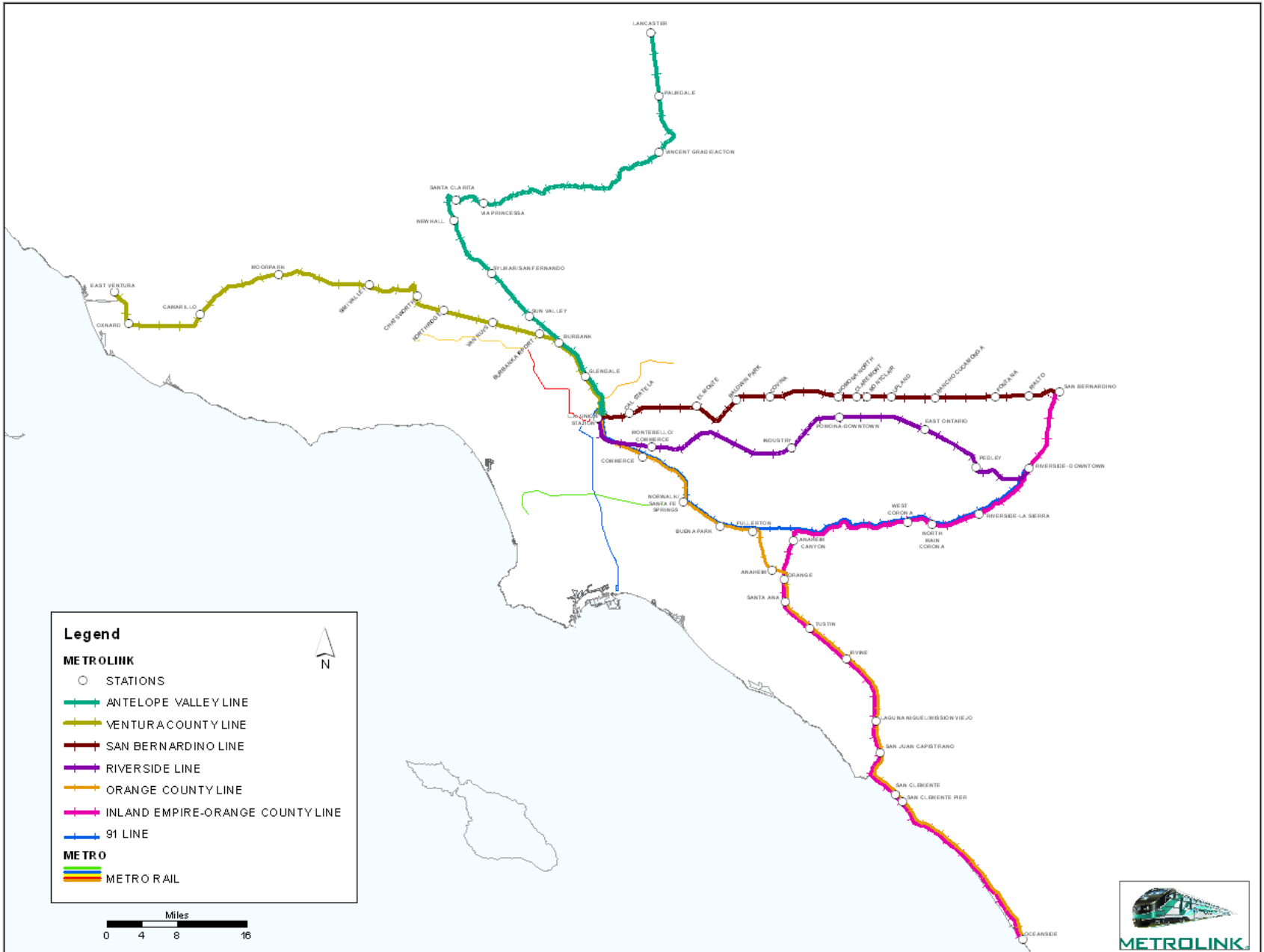
55 home catchment areas

- Average size: 73 square miles
- Station access mode: 87% drive
- Average travel distance from home: 6 miles (median 3 miles)

55 work catchment areas

- Average size: 32 square miles
- Station access mode: 54% transit, 23% walk/bike
- Average travel distance to work: 5 miles (median 1.5 miles)

METROLINK SYSTEM MAP



Legend

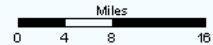
METROLINK

- STATIONS
- ANTELOPE VALLEY LINE
- VENTURA COUNTY LINE
- SAN BERNARDINO LINE
- RIVERSIDE LINE
- ORANGE COUNTY LINE
- INLAND EMPIRE-ORANGE COUNTY LINE
- 91 LINE

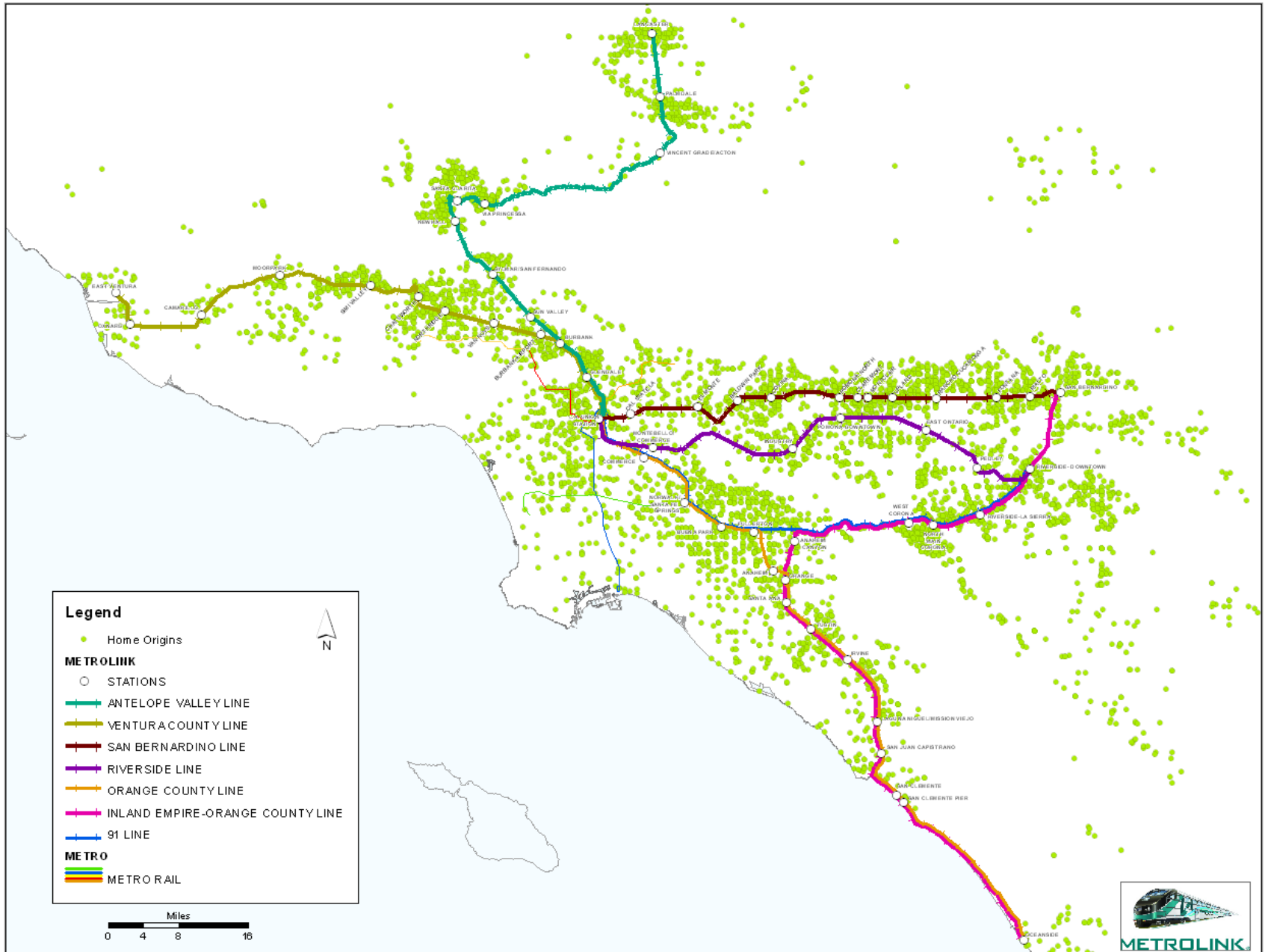
METRO

- METRO RAIL

North arrow pointing up (N).

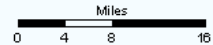


METROLINK SYSTEM MAP - RIDER ORIGINS

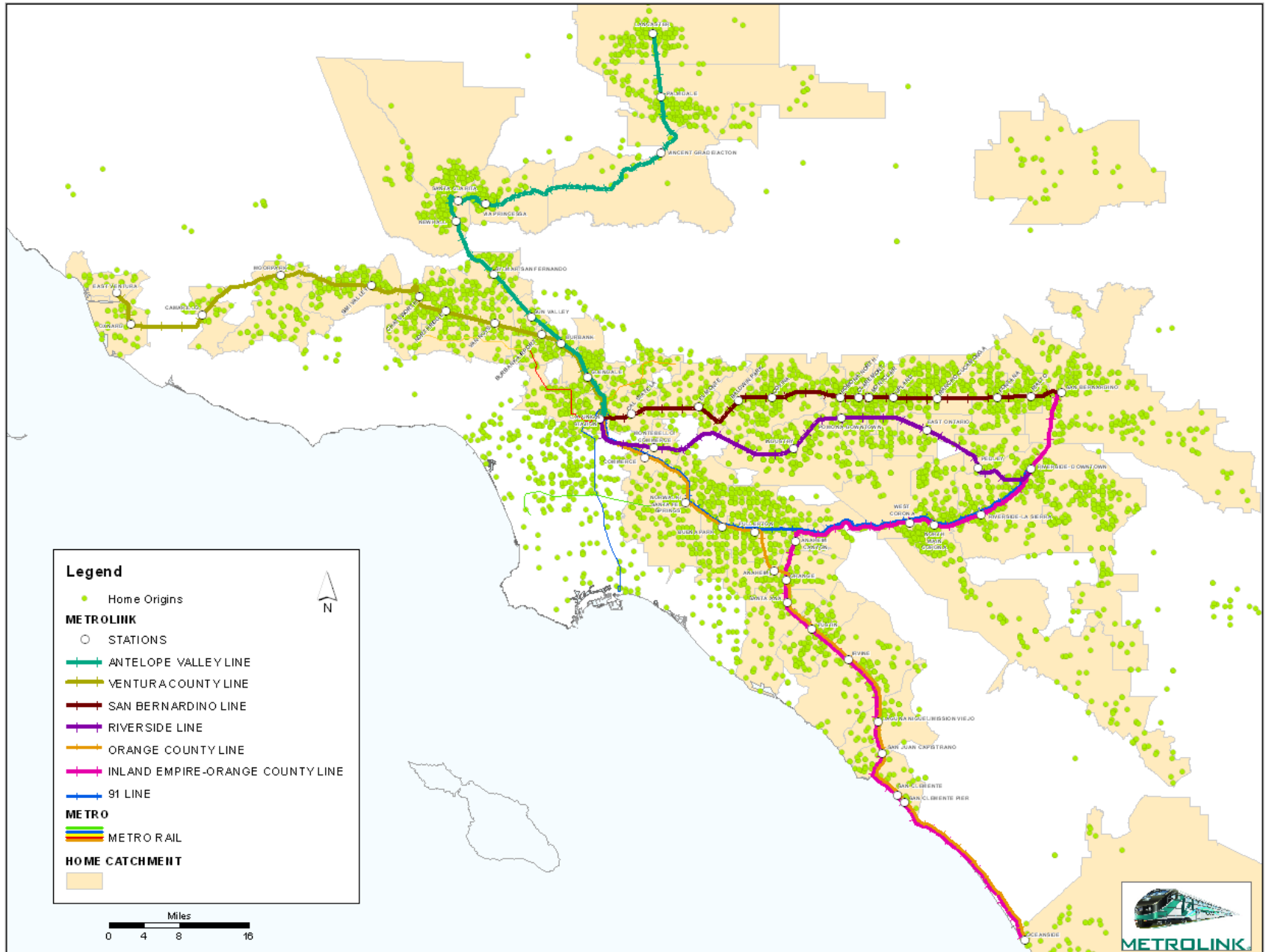


Legend

- Home Origins
- STATIONS
- ANTELOPE VALLEY LINE
- VENTURA COUNTY LINE
- SAN BERNARDINO LINE
- RIVERSIDE LINE
- ORANGE COUNTY LINE
- INLAND EMPIRE-ORANGE COUNTY LINE
- 91 LINE
- METRO
- METRO RAIL



METROLINK SYSTEM MAP - HOME CATCHMENT AREA



Legend

- Home Origins
- METROLINK**
- STATIONS
- ANTELOPE VALLEY LINE
- VENTURA COUNTY LINE
- SAN BERNARDINO LINE
- RIVERSIDE LINE
- ORANGE COUNTY LINE
- INLAND EMPIRE-ORANGE COUNTY LINE
- 91 LINE
- METRO**
- METRO RAIL
- METRO RAIL
- HOME CATCHMENT





Market Share Estimation using LEHD

LEHD provides opportunity to estimate latent demand.

- On-The-Map
- Data download

The structure of the OD files is as follows:

Origin-Destination (OD) File Structure				
Pos	Variable	Type	Length	Explanation
1	w_geocode	Char	15	Workplace Census Block Code
2	h_geocode	Char	15	Residence Census Block Code
3	S000	Num	8	Total number of jobs
4	SA01	Num	8	Number of jobs of workers age 29 or younger
5	SA02	Num	8	Number of jobs for workers age 30 to 54
6	SA03	Num	8	Number of jobs for workers age 55 or older
7	SE01	Num	8	Number of jobs with earnings \$1250/month or less
8	SE02	Num	8	Number of jobs with earnings \$1251/month to \$3333/month
9	SE03	Num	8	Number of jobs with earnings greater than \$3333/month
10	SI01	Num	8	Number of jobs in Goods Producing industry sectors
11	SI02	Num	8	Number of jobs in Trade, Transportation, and Utilities industry sectors
12	SI03	Num	8	Number of jobs in All Other Services industry sectors
13	createdate	Char	8	Date on which data was created, formatted as YYYYMMDD

- Data includes both home and work census block codes, and selected age, income, and industry classifications.



Market Share Estimation using LEHD

Link LEHD data with station catchment areas

- 6 million records of primary jobs within Metrolink travel shed.
- Each record includes both work and residence census block code.
- Aggregate census blocks by station catchment area.

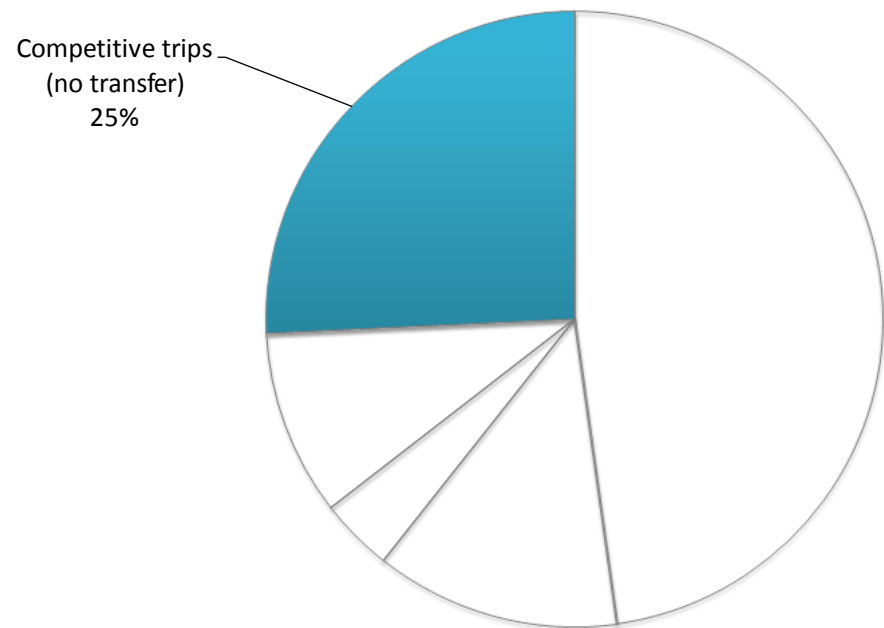


Commute Market

For jobs in the Metrolink travel shed:

Competitive commute trips:

- 25% of trips have residence and work within travel shed and require no Metrolink transfer.



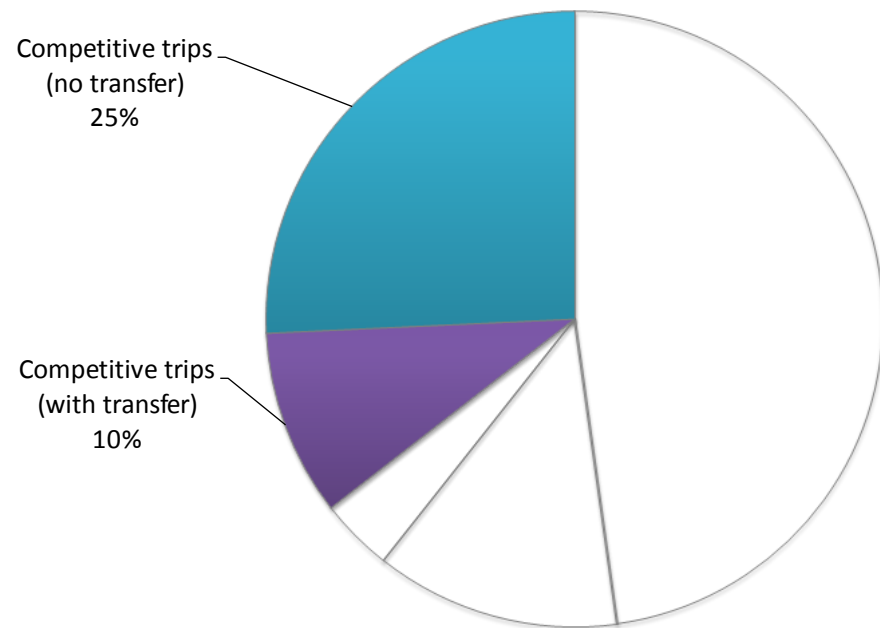


Commute Market

For jobs in the Metrolink travel shed:

Competitive commute trips:

- 25% of trips have residence and work within travel shed and require no Metrolink transfer.
- 10% of trips have residence and work within travel shed but require Metrolink transfer.





Commute Market

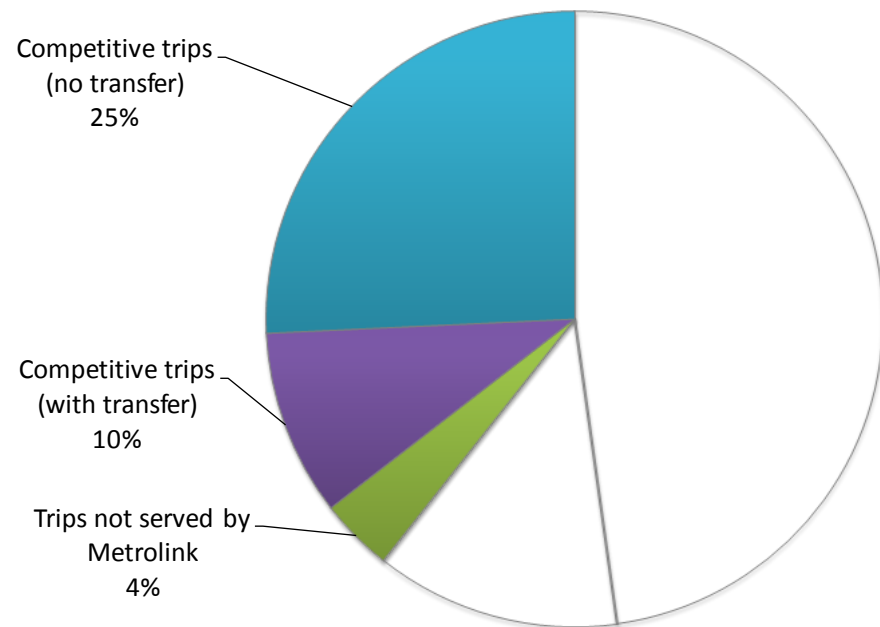
For jobs in the Metrolink travel shed:

Competitive commute trips:

- 25% of trips have residence and work within travel shed and require no Metrolink transfer.
- 10% of trips have residence and work within travel shed but require Metrolink transfer.

Uncompetitive commute trips:

- 4% have spatially uncompetitive origin-destination patterns.





Commute Market

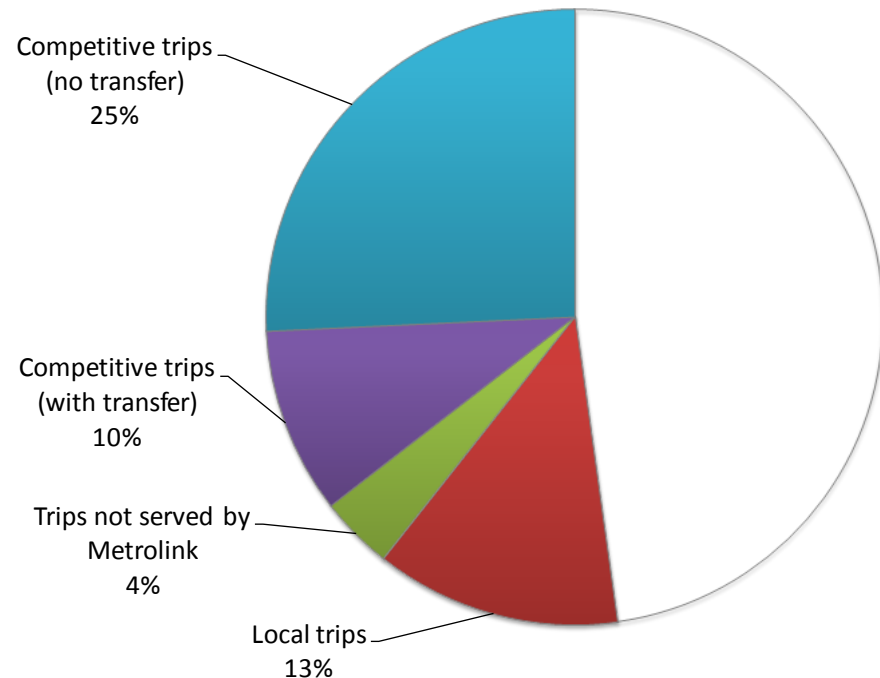
For jobs in the Metrolink travel shed:

Competitive commute trips:

- 25% of trips have residence and work within travel shed and require no Metrolink transfer.
- 10% of trips have residence and work within travel shed but require Metrolink transfer.

Uncompetitive commute trips:

- 4% have spatially uncompetitive origin-destination patterns.
- 13% live and work within same station catchment area.





Commute Market

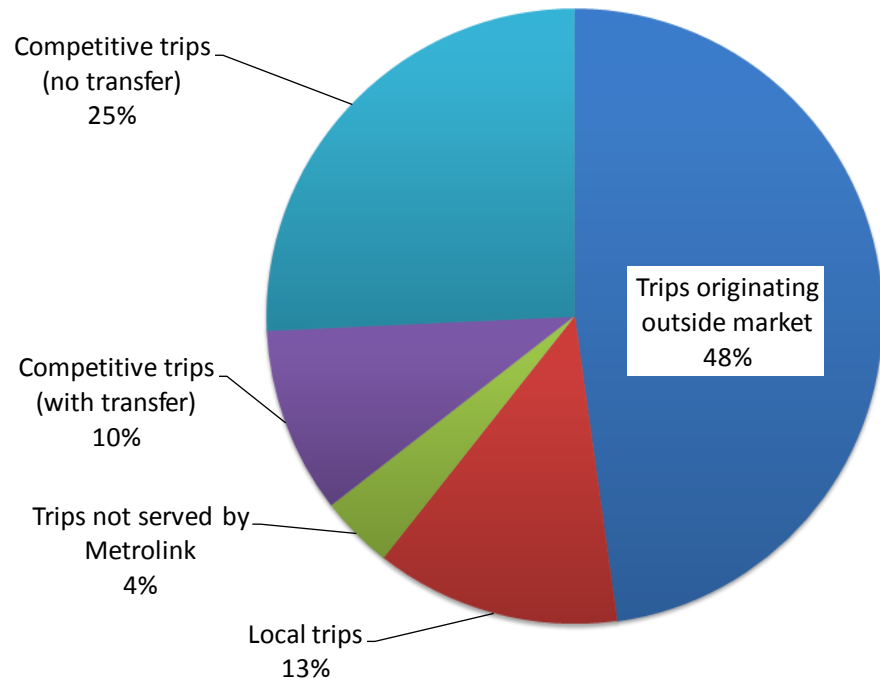
For jobs in the Metrolink travel shed:

Competitive commute trips:

- 25% of trips have residence and work within travel shed and require no Metrolink transfer.
- 10% of trips have residence and work within travel shed but require Metrolink transfer.

Uncompetitive commute trips:

- 4% have spatially uncompetitive origin-destination patterns.
- 13% live and work within same station catchment area.
- 48% of workers commute from outside the Metrolink travel shed.





Corridor Analysis

- Trip tables for all origin-destination pairs
 - a. Ridership
 - b. LEHD commute trip data
 - c. Market share calculated for each O-D pair

NUMBER OF COMMUTE TRIPS (OVER 10 MILES)												
Origin Station	Destination Station											
	LAUS	NORWLK	BUENAPK	FULRTN	ANAHEIM	ORANGE	SNTANA	TUSTIN	IRVINE	MLNGL	SCLEMTE	SJNCAP
LAUS	.	4806	1336	1727	936	1548	3239	3584	1264	455	96	164
NORWLK	22315	.	.	.	5432	5552	12670	8503	3208	935	142	219
BUENAPK	3766	.	.	.	.	4730	10385	6246	2103	527	60	102
FULRTN	6270	.	.	.	.	.	.	13403	4883	1222	118	278
ANAHEIM	1836	2209	.	.	.	.	.	.	2209	559	45	72
ORANGE	1740	1514	2331	.	.	.	.	.	3263	821	56	127
SNTANA	5273	3081	4160	.	.	.	.	.	.	2285	215	535
TUSTIN	2293	1422	1713	1705	.	.	.	.	.	1971	102	260
IRVINE	3457	1847	1664	1993	1876	4451	.	.	.	.	558	2045
MLNGL	1400	605	516	588	469	1395	4366	8041	.	.	544	.
SJNCAP	572	218	197	228	130	441	1381	2193	1892	.	.	.
SCLEMTE	738	298	223	249	168	521	1698	2588	2428	1783	.	.
OCNSIDE	9680	3336	1889	2564	1322	2766	6821	9637	4787	1856	641	794

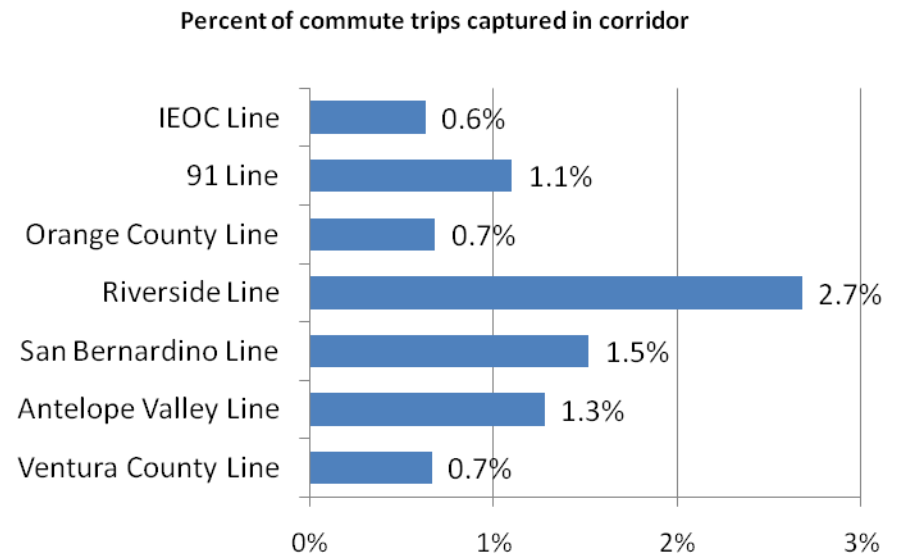


Corridor Analysis

- Metrolink's market share is 1.1% systemwide
- Ranges from 0.6% to 2.7% by corridor

Factors influencing market share:

- CBD share
- Cost
- Travel time
- Service availability
- Station access/parking
- other





Corridor Analysis

- Level of Service Analysis (LOS) is a tool to evaluate station characteristics from the customer perspective.

Ref: Transit Capacity and Quality of Service Manual (<http://www.trb.org/Main/Blurbs/153590.aspx>)

LEVEL OF SERVICE	LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
Numeric Value	1	2	3	4	5	6
COST COMPARED TO DRIVING	<90%	90% - 99%	100% - 124%	125% - 149%	150% - 199%	> 199%
TRAVEL TIME COMPARED TO DRIVING	<50%	50% - 74%	75% - 89%	90% - 109%	110% - 149%	> 149%
SERVICE SPAN	> 14 HRS	12 - 14 HRS	10 - 12 HRS	8 - 10 HRS	2 - 8 HRS	< 2 HRS
WALK SCORE	> 90	70 - 89	60 - 69	50 - 59	40 - 49	< 40
PARKING UTILIZATION	< 40%	40% - 59%	60% - 69%	70% - 79%	80% - 99%	> 99%
AVERAGE HEADWAY PEAK	21 - 50 MIN	51 - 59 MIN	60 - 79 MIN	80 - 109 MIN	110 - 160 MIN	> 160 MIN
TRANSIT CONNECTIONS (AT DESTINATION)	Multiple (3+) bus agencies, with multiple (6+) bus routes and/or rail lines	One or more bus agencies with multiple (6+) bus routes and/or rail lines.	At least 1 bus agency with 3+ bus routes and/or rail lines.	1-2 transit agencies with 1-2 routes.	One or two bus or rail lines.	0 - 1 bus routes
FREEWAY ACCESS (AT ORIGIN)	1+ freeway less than 1 mile	1 freeway less than 1 mile AND 1+ freeways greater than 1 mile	1 freeway less than 1 mile	1+ freeway greater than 1 mile	1 freeway greater than 1 mile	0 freeways



Corridor Analysis

- LOS ratings were coded numerically, weighted by LEHD data, and averaged for each station to help identify service quality issues.

Origin Station	Ridership	Capture Rate	Level of service: Travel time	Level of service: Cost	Level of service: Service span	Level of service: Transit connections	Level of service: Freeway access	Level of service: Walk access	Level of service: Parking availability	Level of service: Service frequency (headway)
LAUS		7.7%	1.0	1.7	2.0	3.0	2.0	3.5	.	1.5
NORWLK	823	0.6%	2.0	3.2	2.0	2.3	3.0	3.2	4.0	1.5
BUENAPK	611	1.3%	2.2	4.3	2.0	2.7	4.0	3.0	6.0	1.7
FULRTN	1,477	2.8%	2.5	3.2	2.0	2.4	2.0	4.3	6.0	1.8
ANAHEIM	556	4.5%	2.2	3.1	2.4	2.2	2.0	3.9	1.0	1.5
ORANGE	820	3.1%	2.1	3.8	2.0	2.3	3.0	4.2	4.0	1.0
SNTANA	867	1.4%	2.1	3.0	2.0	2.4	2.0	3.5	1.0	1.1
TUSTIN	844	2.5%	2.5	3.1	2.0	2.6	2.0	2.9	5.0	1.1
IRVINE	1,318	1.7%	2.2	3.3	1.8	2.9	2.0	2.8	2.0	1.3
MLNGL	355	1.6%	2.8	3.2	1.2	2.9	1.0	3.7	2.0	1.7
SJNCAP	187	2.8%	2.9	3.2	2.2	2.6	6.0	3.9	5.0	2.4
SCLEMTE	140	1.6%	2.8	2.8	2.4	2.7	3.0	3.6	1.0	2.3
OCNSIDE	561	1.0%	2.6	1.0	2.4	2.5	3.0	3.4	4.0	2.8



METROLINK®

Thank you



Henning Eichler, AICP, PRC
Manager of Research & Planning
Southern California Regional Rail Authority (Metrolink)
EichlerH@scrra.net