Training Series #2 – 1: Modeling Analysis – OCTAM

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Training Design

- #2-1 – Modeling Analysis
  - # 2-1-1: OCTAM Modeling Analysis
    - Select Link/Zone Analysis in OCTAM
    - Alternative Evaluation
  - # 2-1-2: Model Validation & ITAM (or ATAM?)
- #2-2 – Trip Generation
- #2-3 – VMT

Today's Training Topic – OCTAM Analysis

- Select Link/Zone Analysis in OCTAM
  - Model Setup
  - Analysis of the Outputs
- Alternative Evaluation
  - Performance Measures

OCTAM Analysis – Select Link Analysis

- Setup in TRANPLAN

The file containing the selected link history for all the modes or load classes, for example, mode 1 or load class 1 is drive-alone for non-toll (free) facilities

```
$EQUILIBRIUM HIGHWAY LOAD
$FILES
   INPUT FILE = HWYNET, USER ID = $..\net\oct34.y35.lrtp2010.Alt3M.ff.070116$
   INPUT FILE = HWYTRIP, USER ID = $oct34.y35.vtrpam.031015$
   INPUT FILE = TRNDATA, USER ID = $turns.y20_dat$
   OUTPUT FILE = LODHIST, USER ID = $oct34.y35.ama.Alt3m_Sellink.070116$
   OUTPUT FILE = SELMOD1F, USER ID = $amsel_mod1F$
   OUTPUT FILE = SELMOD2F, USER ID = $amsel_mod2F$
   OUTPUT FILE = SELMOD1T, USER ID = $amsel_mod1T$
   OUTPUT FILE = SELMOD2T, USER ID = $amsel_mod2T$
 ......
$PARAMETERS
   UROAD FACTOR = .75
   IMPEDANCE = TIME 1
   EPS=.03
   EQUILIBRIUM ITERATIONS=30
   HOV LINKS, ASSIGNMENT GROUP = 7
   TOLL LINKS, ASSIGNMENT GROUP = 0
   SELECTED PURPOSES = 1-2
   CONFAC = 0.3566
   SAVE TURNS = 14036,14037,14041,14405,14406,14411,14412,14413,14418,14419,14879,14880,
        14888,15405,15457,15483,16403,16404,16405,16960,19311,19312,24023,26406,
        26407,26666,28036,28037,28042,28043,28054,28055
   LOAD SELECTED LINKS = 14407-14409,14410-14408
   ONE WAY SELECTED LINKS = 14407-14409,14410-14408
$END TP FUNCTION
```

Loaded Network with Select link volume

Specifies a list of one-way links for which assigned volumes will be traced throughout the network.

Specifies a list of one-way links for which zonal origin-destination analysis is to be performed.

OCTAM Analysis – Select Link Analysis

- Report Select Link OD Trip Table

Specifies the selected link history file(s) generated during a selected link load.

Specifies that a trip interchange must use at least one link on the selected links list to be selected for the output trip table. Only a one-purpose trip table is built. The other setup is “AND LINKS”

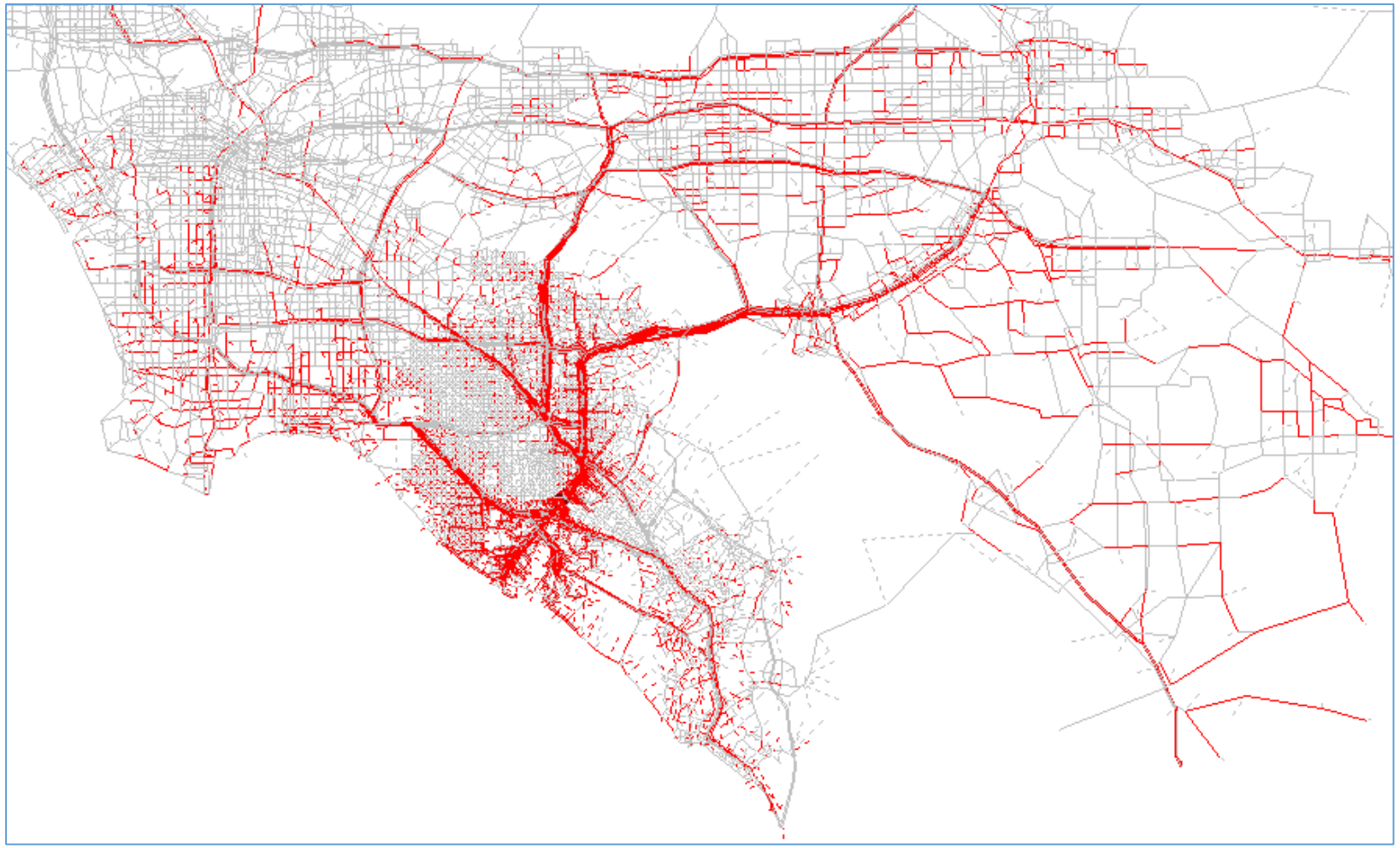
Specifies a list of one-way selected highway links for which trip tables will be generated for output on file SELVOL.

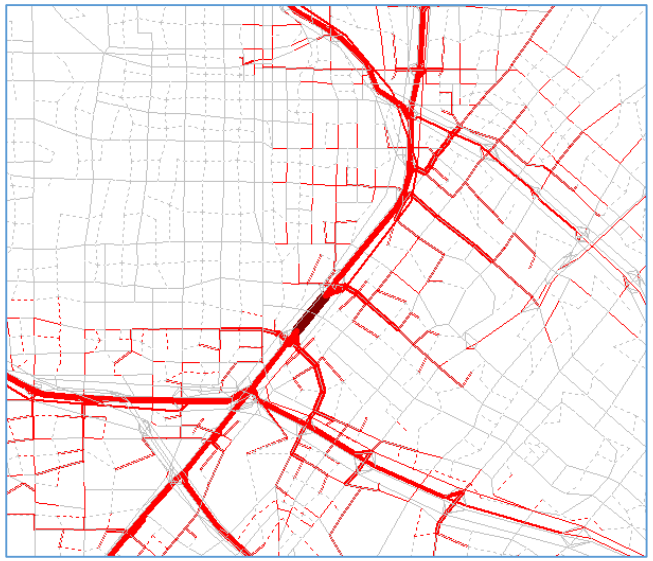
Specifies the trip purpose (one only) on the input volume file, HWYTRIP, which is to be analyzed by the function.

```
$BUILD SELECTED LINK TRIP TABLE
$FILES
   INPUT FILE=HWYTRIP, USER ID = $oct34.y35.vtrpam.031015$
   INPUT FILE=SELHIST, USER ID = $amsel_mod1F$
   INPUT FILE=SELHIST2,USER ID = $amsel_mod1T$
   INPUT FILE=SELHIST3,USER ID = $amsel_mod2F$
   INPUT FILE=SELHIST4,USER ID = $amsel_mod2T$
   OUTPUT FILE=SELVOL, USER ID = $oct34.y35.ama.Alt3m_SELTRP.070116$
$HEADERS
   BUILD SELECTED LINK TRIP TABLE
   INCLUDE ANY TRIP USING EACH OF THE TWO SELECTED LINKS ON SR-55 FREEWAY
$OPTIONS
   MINIMUM TRIP ENDS
~    OR LINKS
   PRINT TRIP ENDS
$PARAMETERS
   SELECTED LINKS = 14407-14409,14410-14408
   SELECTED PURPOSE = 1
$END TP FUNCTION
```

Select Link Volume for SR-55 NB

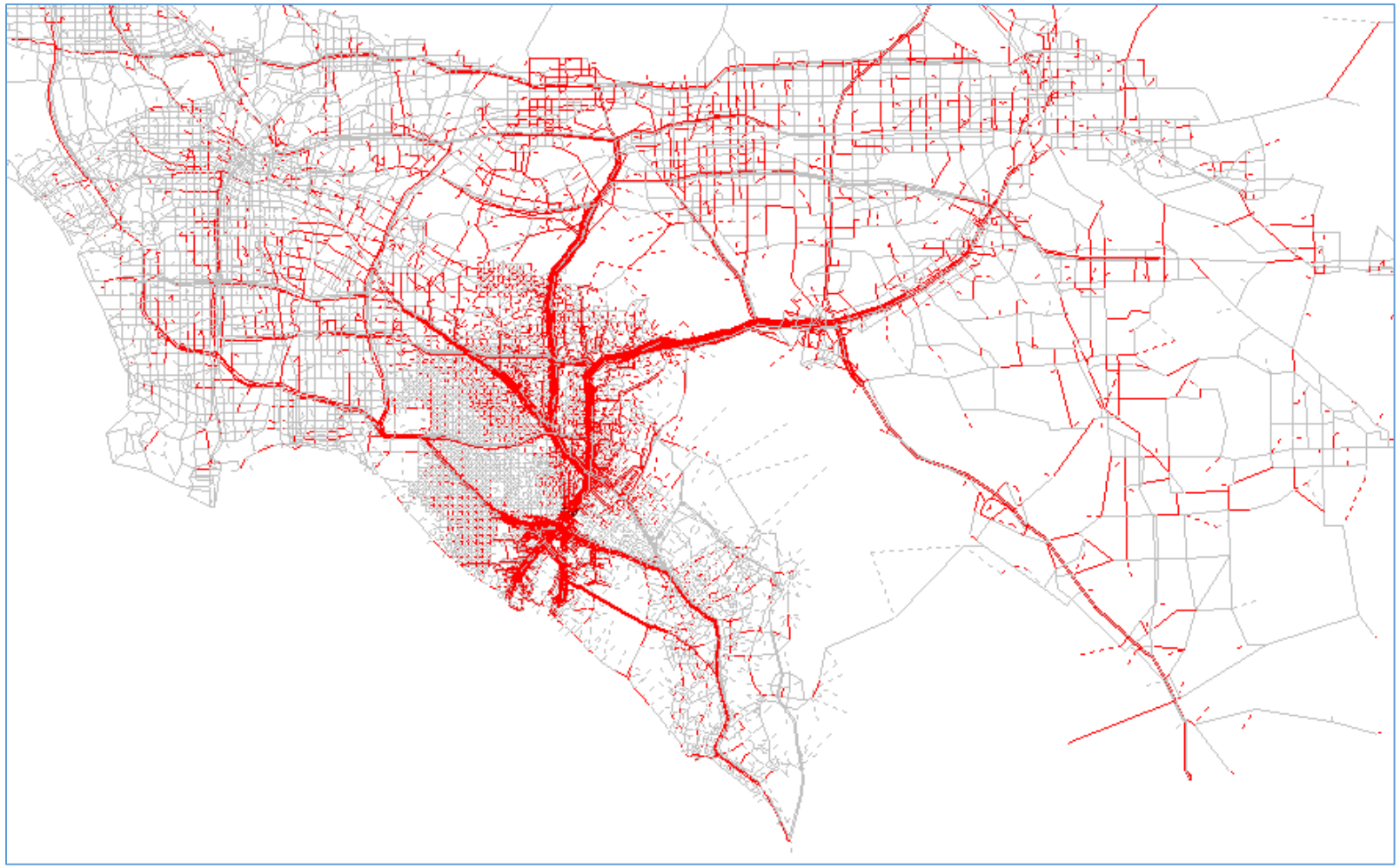
– Between McArthur and Dyer

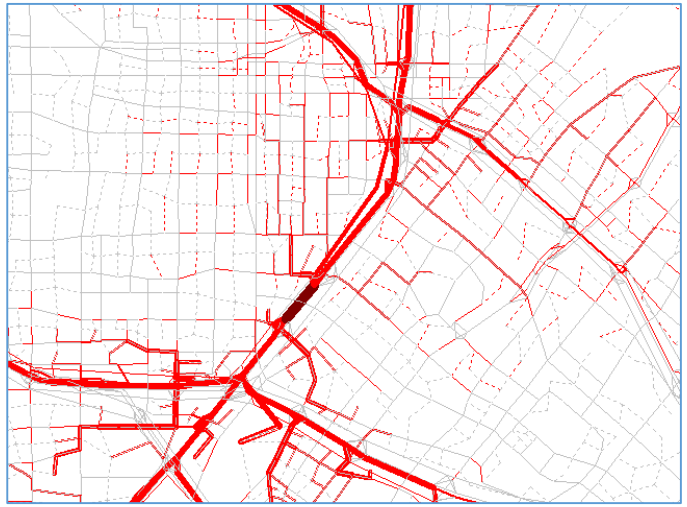




Select Link Volume for SR-55 SB

– Between McArthur and Dyer





Select Link OD Trips
– Between McArthur and Dyer

*1 SELECTED LINK ID 14407 - 14409 | 2 SELECTED LINK ID 14410 - 14408

	Sum	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149
	19929	346	35	344	89	29	291	79	126	347	17	137	19	12	5	38	7	26	1	88	96	1	47
809	325	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
810	34	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0
811	70	0	0	3	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0
812	38	0	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
813	50	0	1	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0
814	92	1	0	6	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0
815	164	5	0	11	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	2	0	1
816	99	2	0	5	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0
817	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
818	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
819	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
821	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
822	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
823	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
824	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

OCTAM Analysis – Alternative Evaluation

- Performance Measures, calculated from model outputs to evaluate the performance of alternatives
- Encompass a wide range of categories
  - Mobility
  - Accessibility
  - Mode Split
  - Health Environment
  - Multi-modal System Performance
  - Safety, etc.

OCTAM Analysis – Alternative Evaluation

- Mobility
  - Reduce travel times
  - Reduce travel delays
  - Reduce undesired future congestion
  - Improve reliability
  - Increase throughput
  - Improve roadway utilization

Example of Performance Measures

- Travel time between key OD pairs (by mode) including free-flow time
- VHT per capita within the study area
- VHD per capita within the study area
- Congested VMT (VMT on links with peak period V/C > 1.0)
- Person miles travelled (PMT) per lane mile
- Change in travel time index (total travel time compared to a free-flow travel time) of travelers by corridor

Model Files:

- Highway/Transit skims
- Loaded networks
- Vehicle trip tables
- SED, etc.

VMT = Volume * Distance
VHT = Volume * Travel Time
VHD = Volume * (Congested Travel Time – Free Flow Travel Time), cong.tt >= ff.tt

OCTAM Analysis – Alternative Evaluation

- Accessibility
  - Increase accessibility to destinations
  - Reduce gaps in the transportation network
  - Change in travel choice

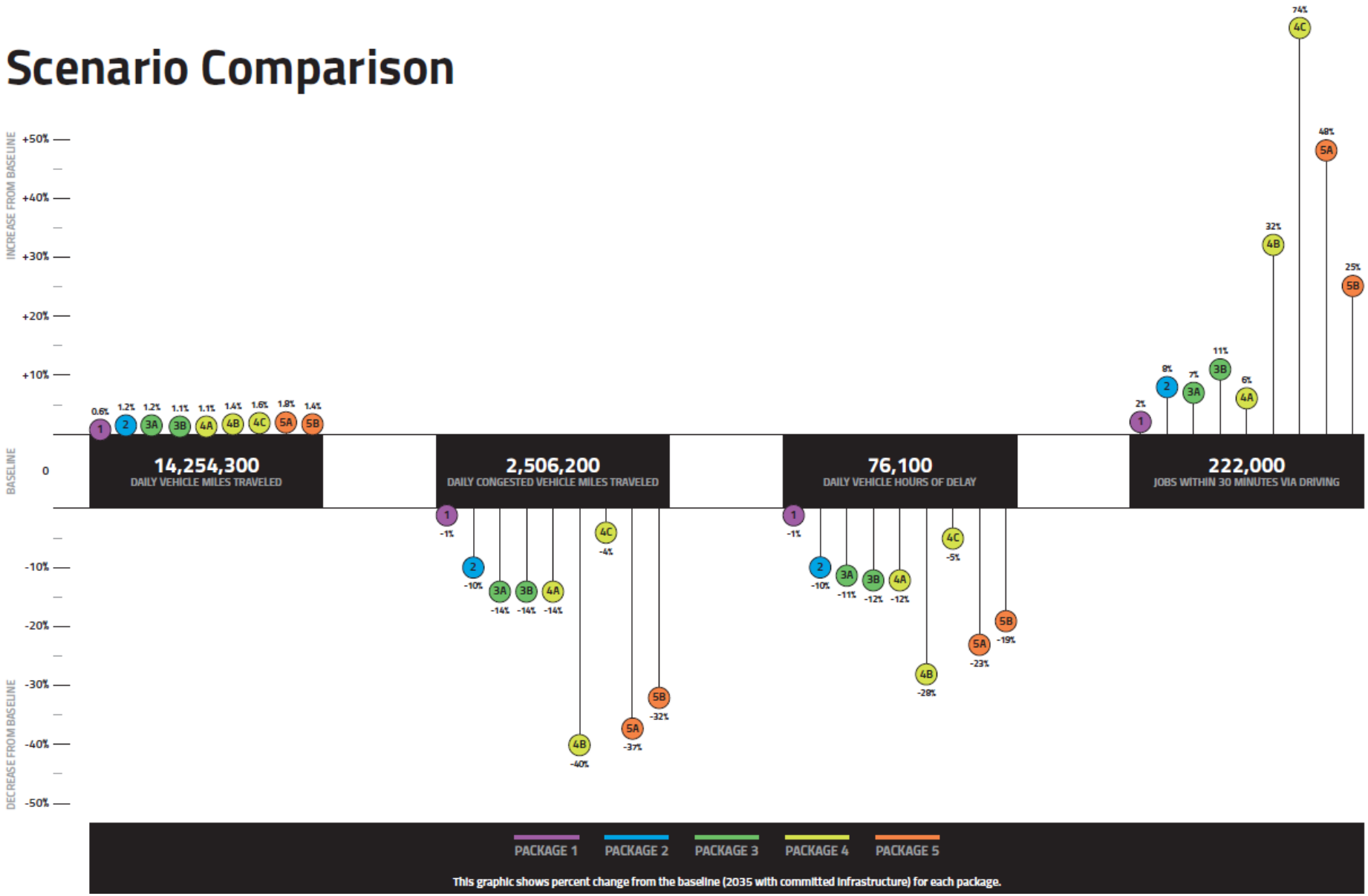
Model Files:

- Highway/Transit skims
- Loaded networks
- Vehicle trip tables
- Select link volume
- Mode choice outputs
- SED, etc.

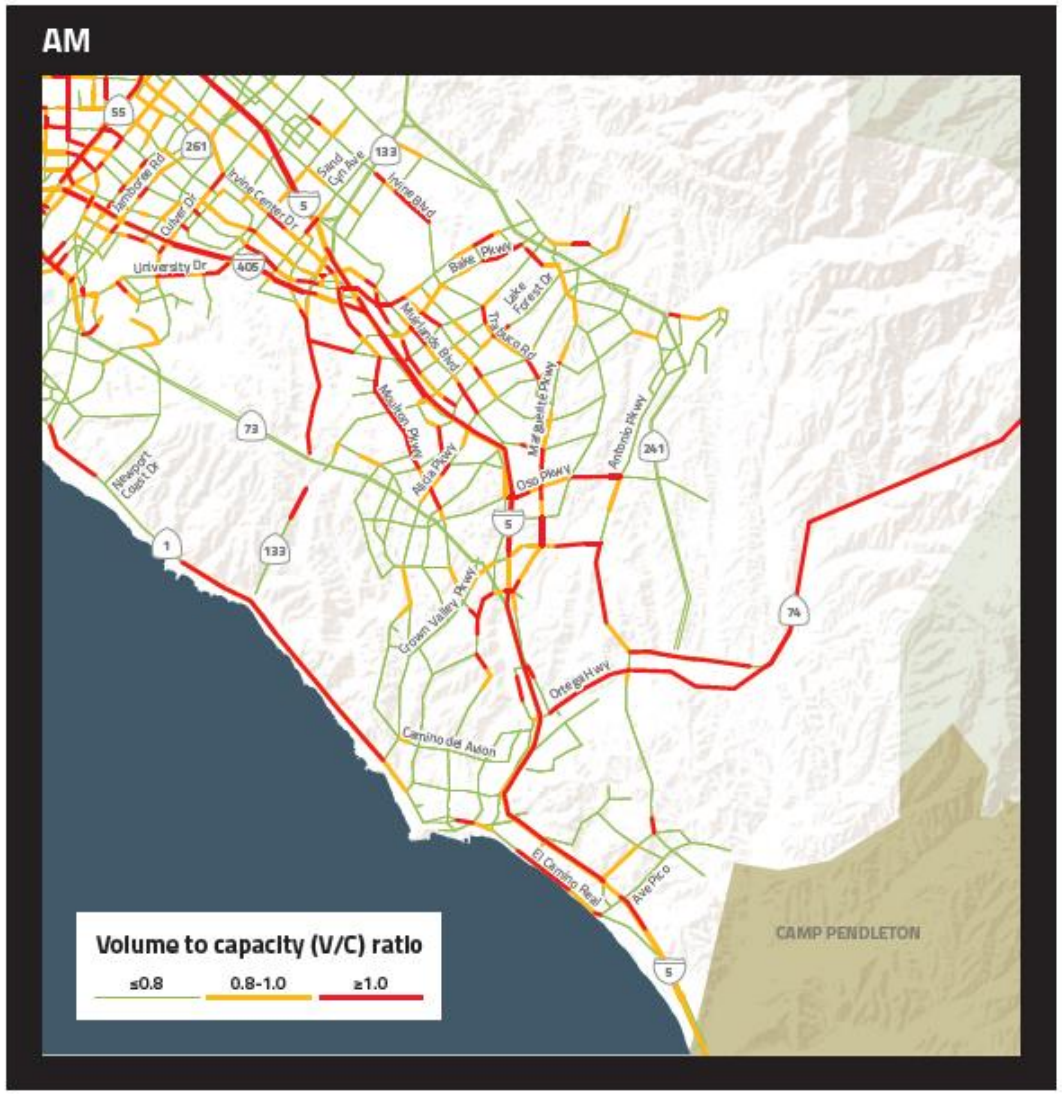
Example of Performance Measures

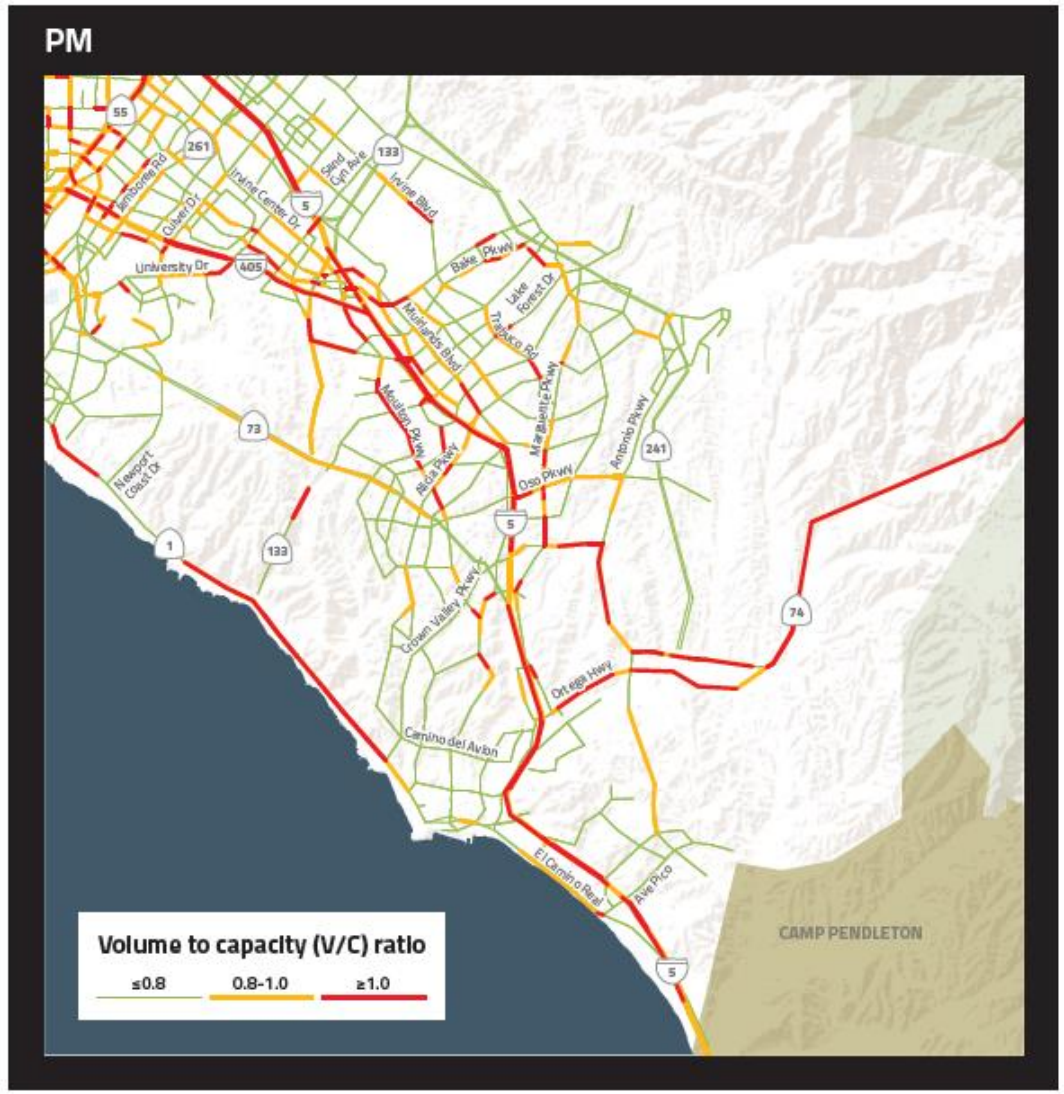
- VMT per capita within the study area
- Number of jobs within X min drive or Y min via transit for residents within study area
- Travel market map based on estimated distribution of vehicle trips using new facilities
- Number of travel choices between key origin-destination (OD pairs)

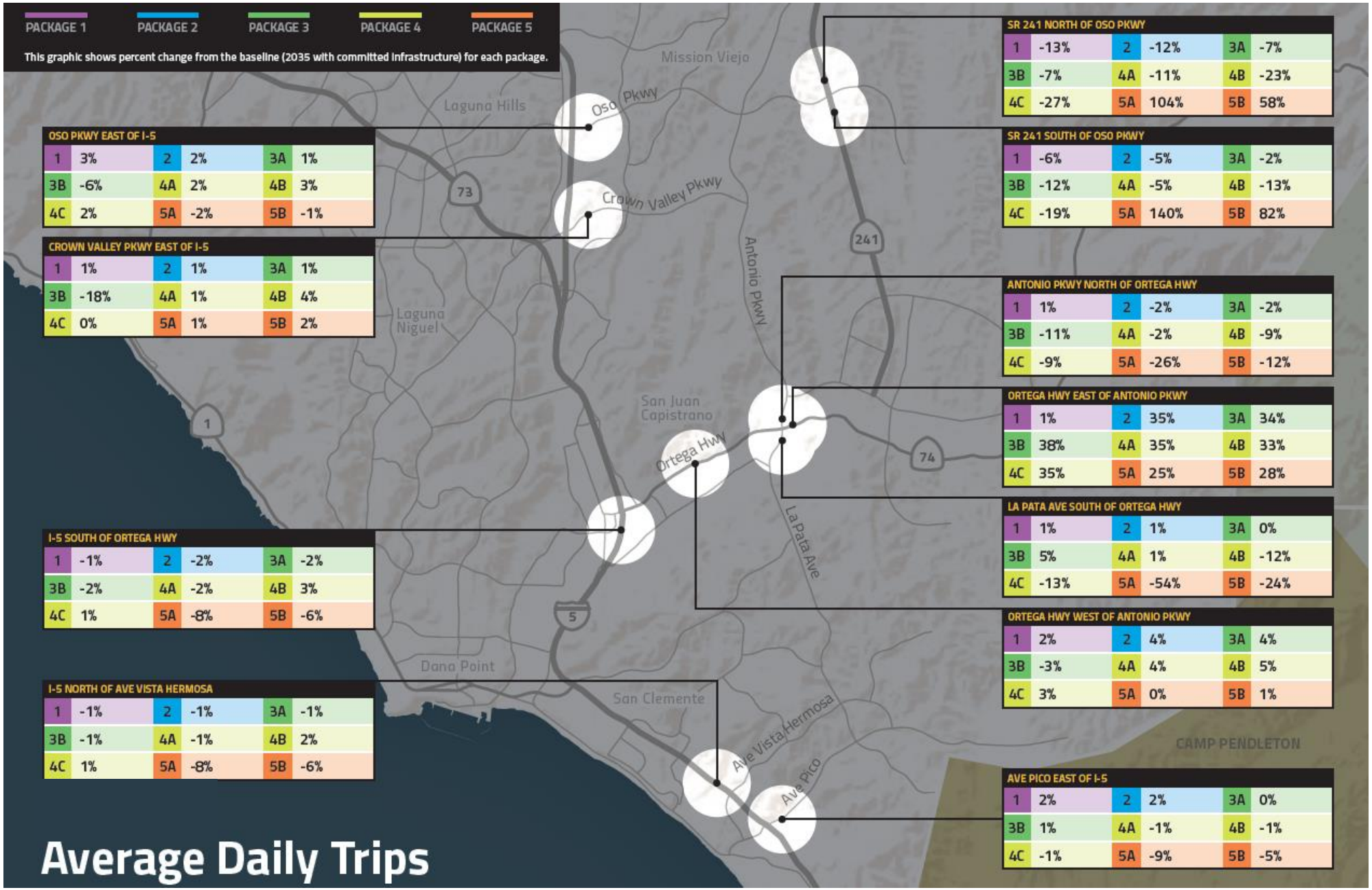
Scenario Comparison



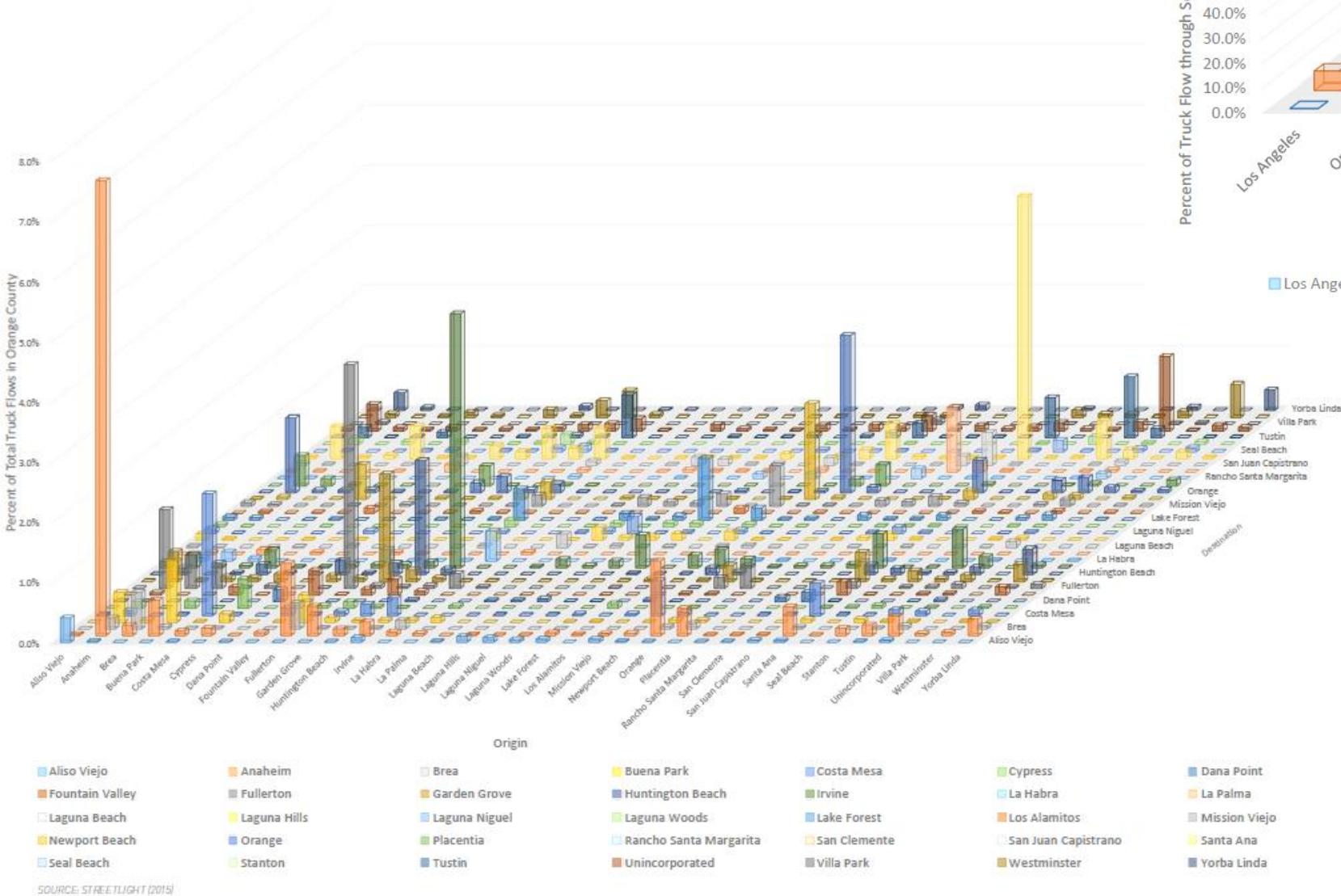
Roadway Congestion PACKAGE 1

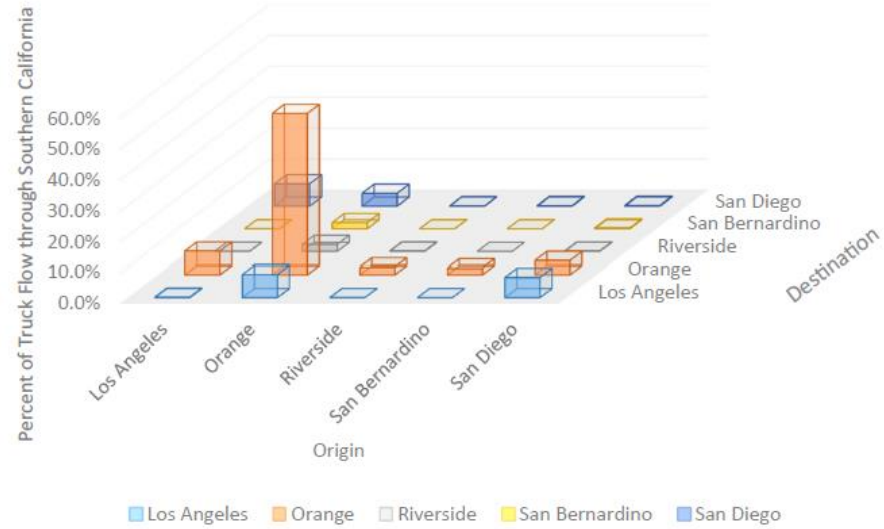





PACKAGE 1
PACKAGE 2
PACKAGE 3
PACKAGE 4
PACKAGE 5
This graphic shows percent change from the baseline (2035 with committed infrastructure) for each package.
Mission Viejo
Laguna Hills
Oso Pkwy
Crown Valley Pkwy
Antonio Pkwy
Laguna Niguel
San Juan Capistrano
Ortega Hwy
La Pata Ave
Dana Point
San Clemente
Ave Vista Hermosa
Ave Pico
CAMP PENDLETON
73
241
74
1
5
OSO PKWY EAST OF I-5
1 3% 2 2% 3A 1%
3B -6% 4A 2% 4B 3%
4C 2% 5A -2% 5B -1%
CROWN VALLEY PKWY EAST OF I-5
1 1% 2 1% 3A 1%
3B -18% 4A 1% 4B 4%
4C 0% 5A 1% 5B 2%
I-5 SOUTH OF ORTEGA HWY
1 -1% 2 -2% 3A -2%
3B -2% 4A -2% 4B 3%
4C 1% 5A -8% 5B -6%
I-5 NORTH OF AVE VISTA HERMOSA
1 -1% 2 -1% 3A -1%
3B -1% 4A -1% 4B 2%
4C 1% 5A -8% 5B -6%
SR 241 NORTH OF OSO PKWY
1 -13% 2 -12% 3A -7%
3B -7% 4A -11% 4B -23%
4C -27% 5A 104% 5B 58%
SR 241 SOUTH OF OSO PKWY
1 -6% 2 -5% 3A -2%
3B -12% 4A -5% 4B -13%
4C -19% 5A 140% 5B 82%
ANTONIO PKWY NORTH OF ORTEGA HWY
1 1% 2 -2% 3A -2%
3B -11% 4A -2% 4B -9%
4C -9% 5A -26% 5B -12%
ORTEGA HWY EAST OF ANTONIO PKWY
1 1% 2 35% 3A 34%
3B 38% 4A 35% 4B 33%
4C 35% 5A 25% 5B 28%
LA PATA AVE SOUTH OF ORTEGA HWY
1 1% 2 1% 3A 0%
3B 5% 4A 1% 4B -12%
4C -13% 5A -54% 5B -24%
ORTEGA HWY WEST OF ANTONIO PKWY
1 2% 2 4% 3A 4%
3B -3% 4A 4% 4B 5%
4C 3% 5A 0% 5B 1%
AVE PICO EAST OF I-5
1 2% 2 2% 3A 0%
3B 1% 4A -1% 4B -1%
4C -1% 5A -9% 5B -5%
Average Daily Trips

2015 Daily Truck Flows by City





SOURCE: STREETLIGHT (2015)

OCTAM Analysis – Alternative Evaluation

- Mode Split
  - Increase the number of people using transit, active transportation modes, or other mode(s) targeted to improve
  - Increase seat utilization

Example of Performance Measures

- Percent of trips by mode
- Average vehicle occupancy
- Mode share in key corridors

- Health Environment
  - Pollution reduction

Example of Performance Measures

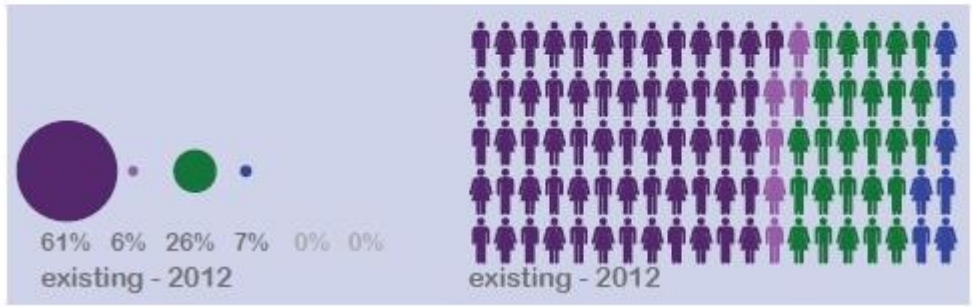
- Pollutants emissions, such as CO, NOx, PM2.5, PM10, and VOC
- Per capita greenhouse gas emissions

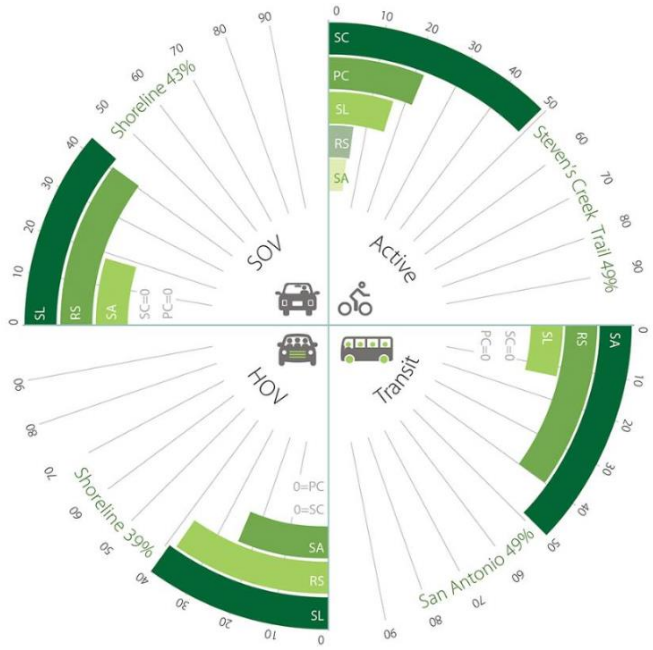
Model Files:

- Mode choice outputs
- Assignment outputs
- Emissions – EMFAC Tool

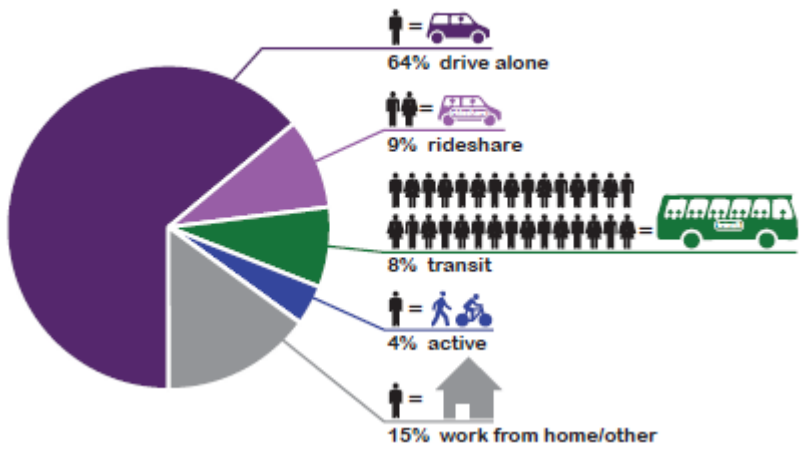
drive alone
ride share
transit
active
intercept parking
shortfall

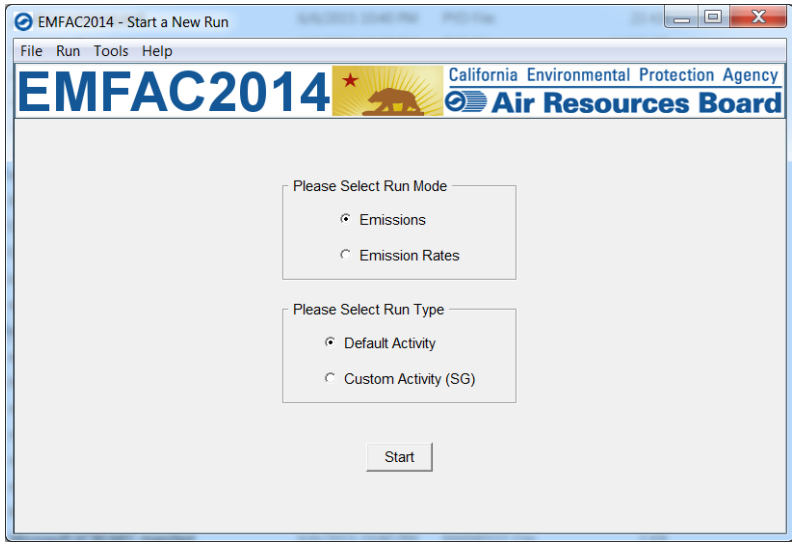
person mode split by scenario

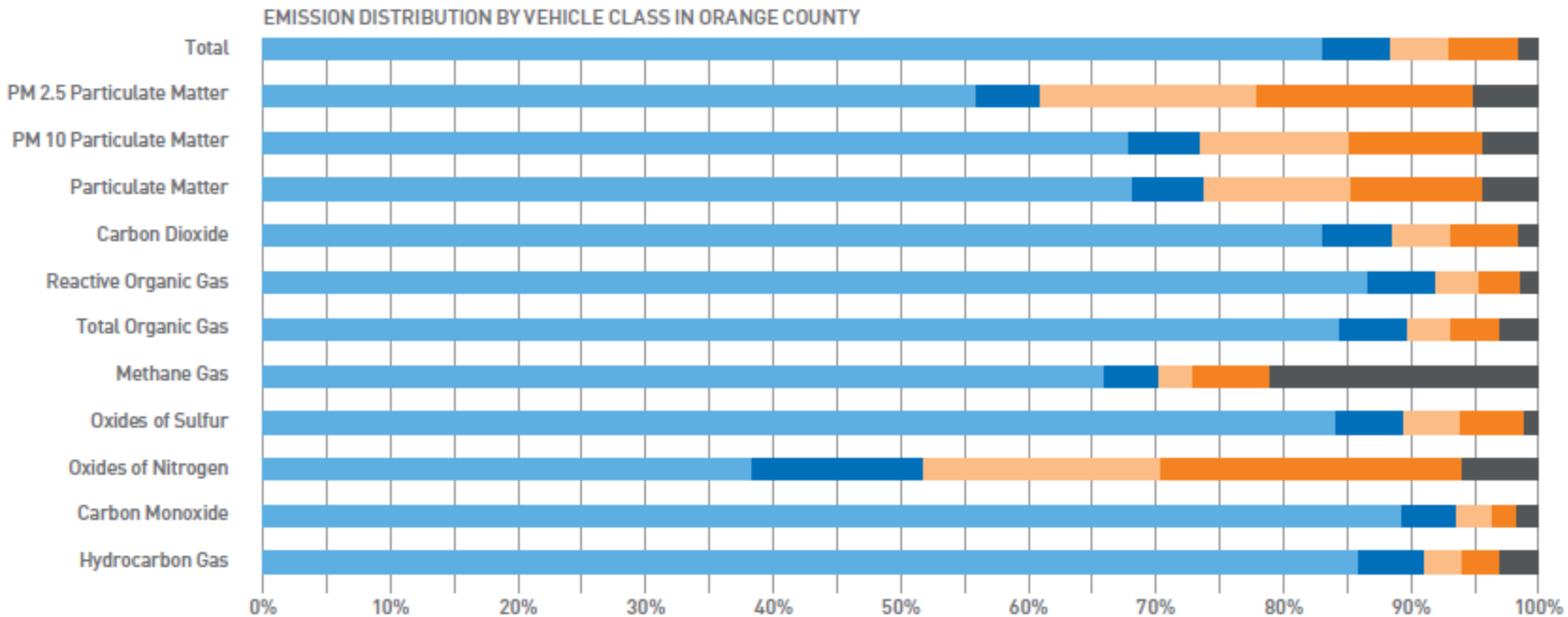




person mode split






EMISSION DISTRIBUTION BY VEHICLE CLASS IN ORANGE COUNTY
Total
PM 2.5 Particulate Matter
PM 10 Particulate Matter
Particulate Matter
Carbon Dioxide
Reactive Organic Gas
Total Organic Gas
Methane Gas
Oxides of Sulfur
Oxides of Nitrogen
Carbon Monoxide
Hydrocarbon Gas
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

OCTAM Analysis – Alternative Evaluation

- Multi-modal System Performance
  - Increase connectedness of the multi-modal system
  - Better performance of individual modes

Model Files:

- Highway/Transit skims
- Loaded network/Transit assignment outputs
- Mode choice outputs

Example of Performance Measures

- Inter-connectedness of the system, e.g., the number of access modes (pedestrian/bike, transit, auto, etc.) to the identified key locations
- Transit/auto travel time comparison between key OD pairs
- Carrying capacity (seats) by mode in north/south and east/west directions

- Safety
  - Highway collision hotspots
  - Addresses key ped/bike safety issues

Example of Performance Measures

- Identify highest highway collision locations in study area
- Identify highest ped/bike collision locations in study area

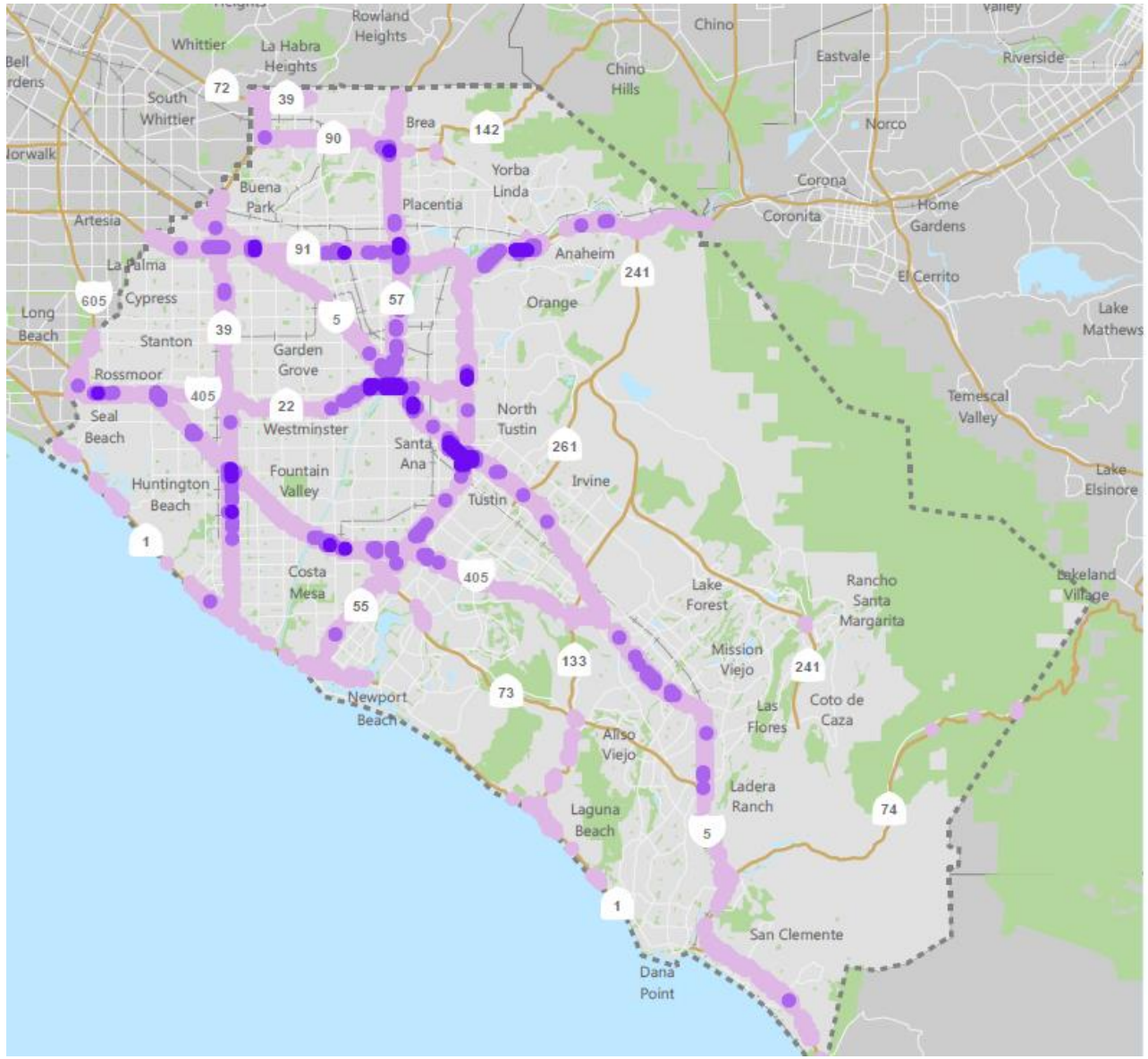


FIGURE 7

Highway Collision Clusters

Truck Network

DENSE CLUSTERS

Low

Medium

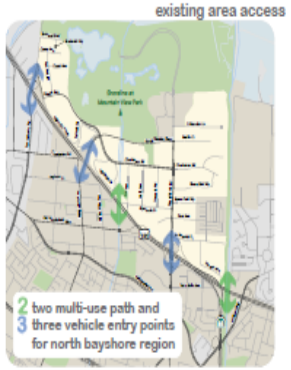
High

Only highest clusters of collisions are shown

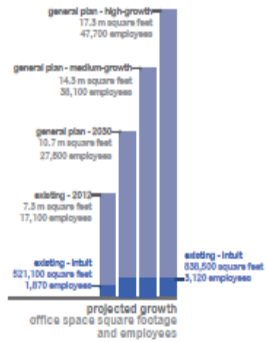
north bayshore area timeline (related studies)

- **july 2012** general plan
- **february 2013** shoreline regional park community transportation study
- **spring 2014** precise plan
- **future** mobility plans

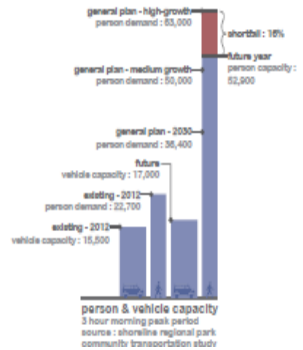
existing area access



projected growth in north bayshore

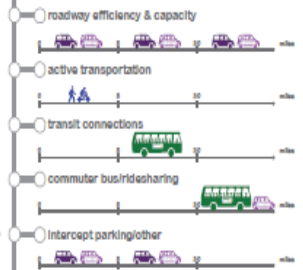


projected capacity in north bayshore

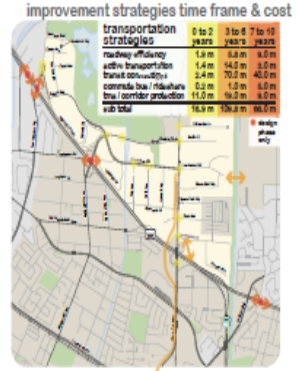


person mode split by scenario

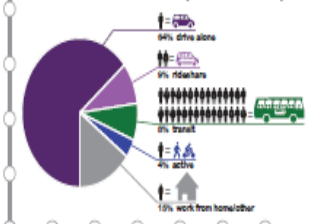
transportation improvement strategies and effected travel markets



improvement strategies time frame & cost



person mode split



summary

participation in tma
- baseline performance standards
- equitable allocation of penalty

contribution to fee
- establishing nexus and fee

Q & A