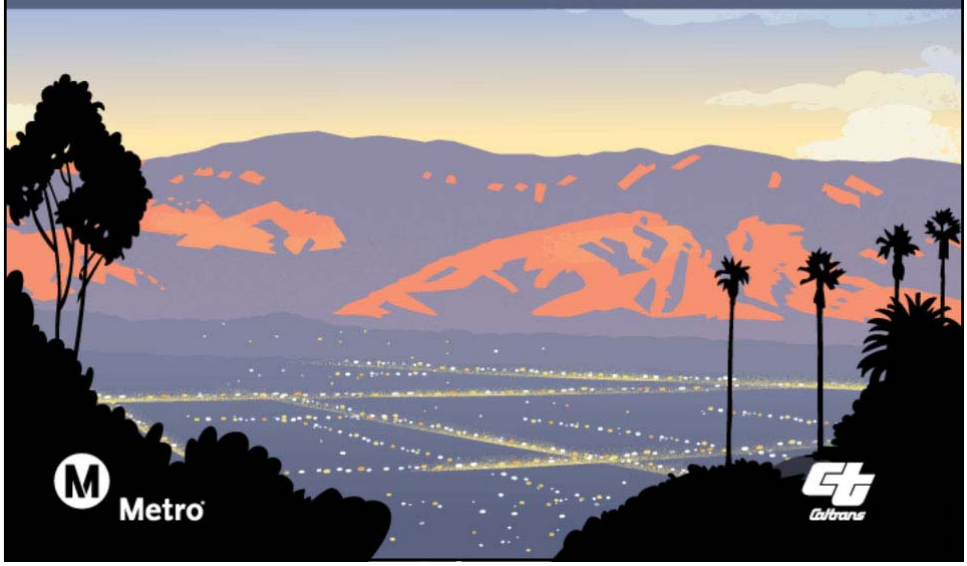
SR 710 North Study

Presentation to the Modeling Task Force – September 25, 2013

Modeling Analysis – Loren Bloomberg and Steve Weller, CH2M HILL



Agenda

1. Project Overview (Loren Bloomberg)
2. Methodology (Loren Bloomberg)
3. Validation (Steve Weller)
4. Application/Results (Steve Weller)
5. Next Steps and Discussion (Loren Bloomberg)

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Purpose and Need Statement

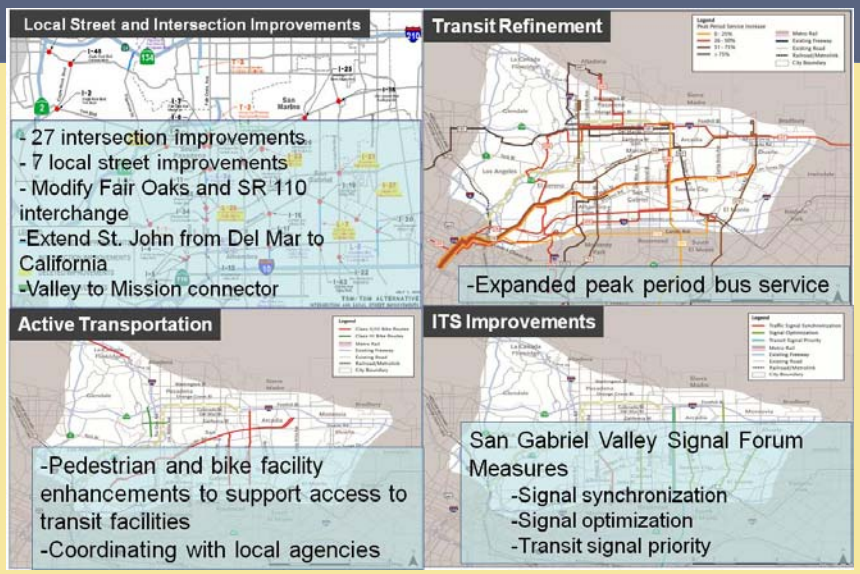
- The purpose of the proposed action is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles, including the following considerations:
  - Improve the efficiency of the existing regional freeway and transit networks;
  - Reduce congestion on local arterials adversely affected due to accommodating regional traffic volumes;
  - Minimize environmental impacts related to mobile sources

Study Area Map

Alternatives Being Studied

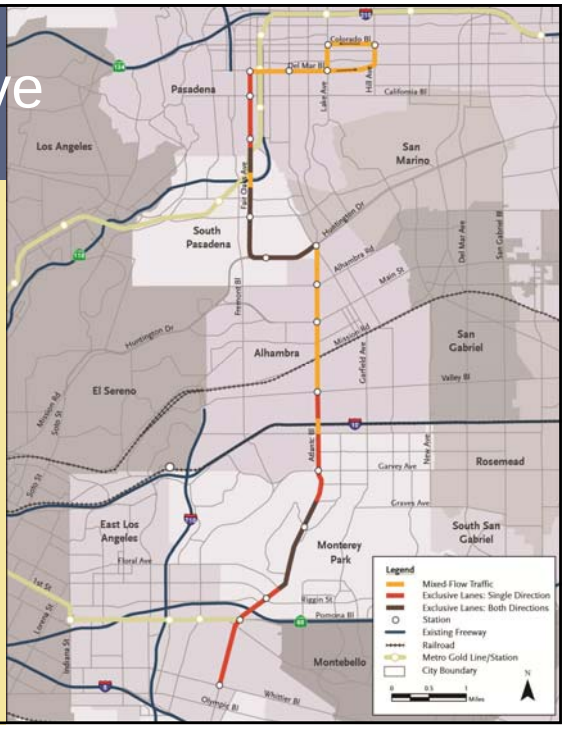
1. No Build
2. Transportation System Management (TSM)/ Transportation Demand Management (TDM)
3. Bus Rapid Transit (BRT) with TSM/TDM and bus feeder service
4. Light Rail Transit (LRT) with TSM/TDM and bus feeder service
5. Freeway Tunnel

TSM/TDM Alternative



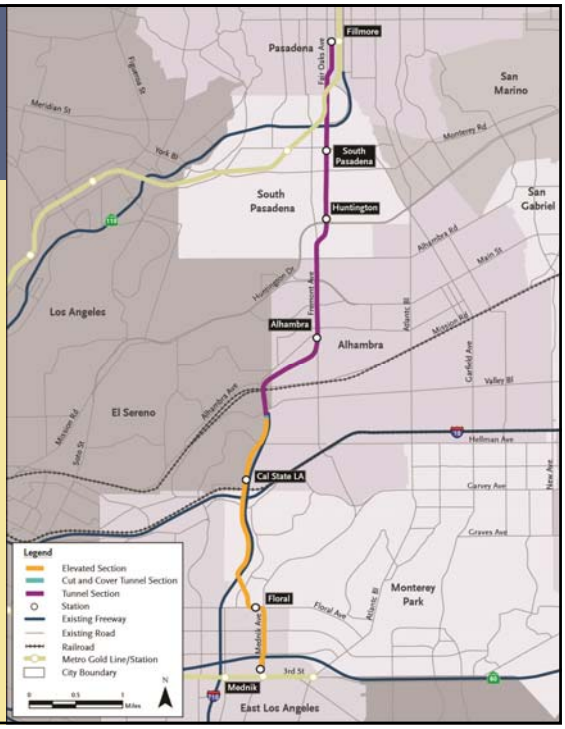
BRT Alternative

- Improve speed and reliability, comfort and convenience for the BRT trunk/spine alignment (provide rail-like service(
- Improve access and connectivity to the regional transit system
- Reduce potential effects to on-street parking
- Improve quality of BRT stations



LRT Alternative

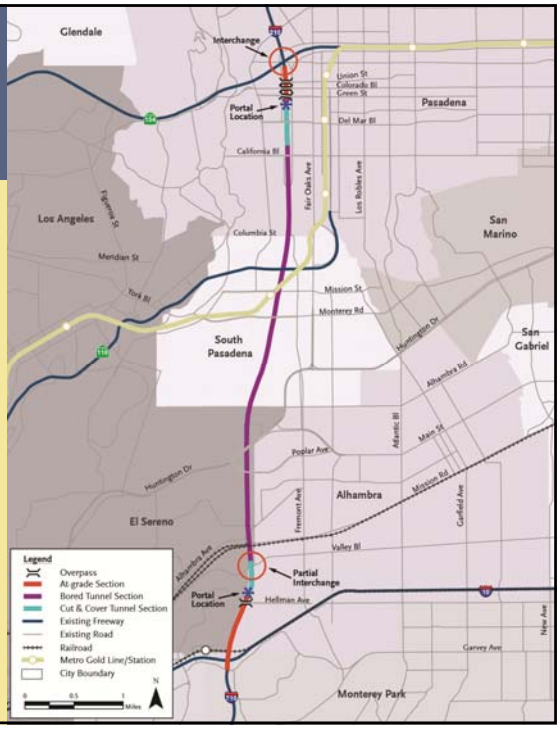
- Grade-separation (tunnel and elevated)
- Seven stations
- Grade-separated maintenance yard over Valley Boulevard
- LRT Main line, new bus feeder service and enhanced connecting bus service, active transportation, ITS, local street and intersection improvements in the TSM/TDM Alternative



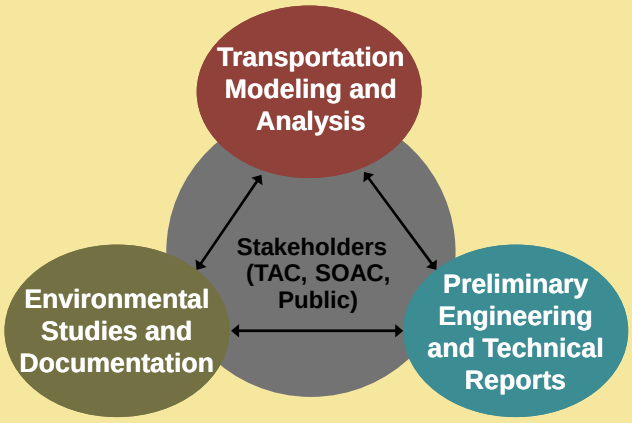
Freeway Tunnel

- A – Freeway with TSM/TDM* (dual bore tunnel)
- B – Freeway with TSM/TDM and tolls* (single and dual bore tunnel)
- C – Freeway with TSM/TDM and Express Bus through the tunnel* (single and dual bore tunnel)

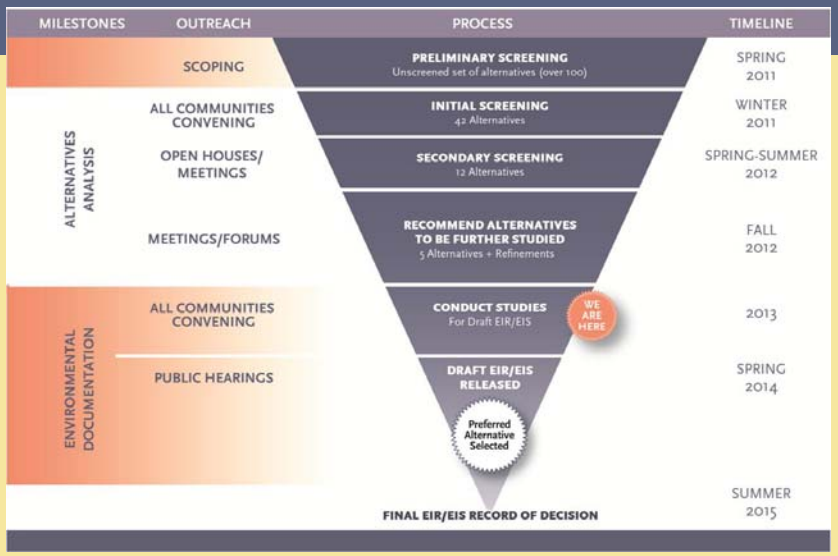
*With and without trucks studied for each



Stakeholder Engagement



SR 710 North Study Schedule



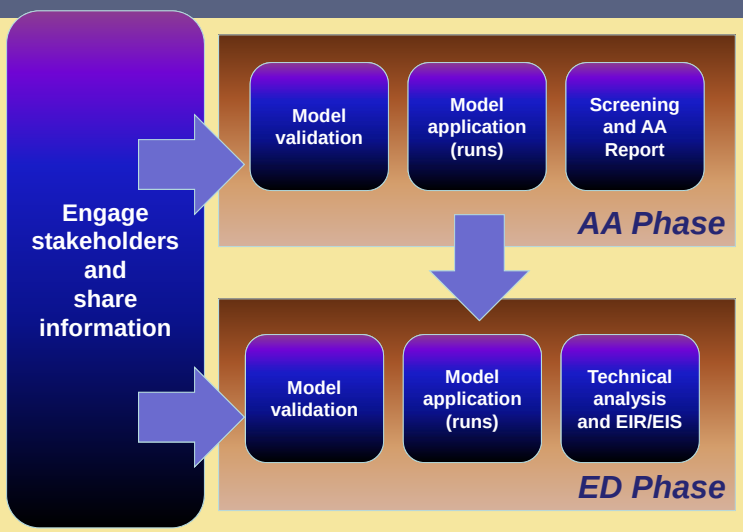
Methodology

- Two phases of work:
  - Alternatives Analysis (AA) – 2012
  - Environmental Documentation – 2013 to 2014

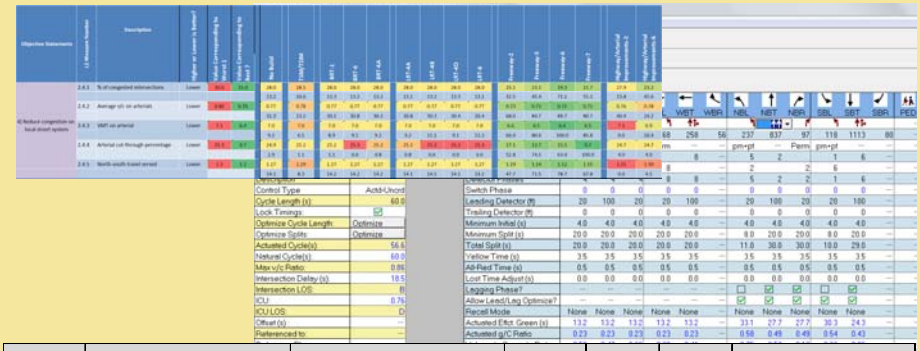
Methodology – Two Phases

- SCAG/Metro Model
- 2008/2012 RTP
- Horizon Years: 2008, 2012, 2020/2025, 2035
- Multimodal Analysis

Generalized Modeling Process



Model Outputs/Connections



Segment / Link Name	From	To	Segment / Link Length (miles)	Vehicle Speed (mph)	VMT [c]	Percent Distribution of Vehicles [d] (vehicle type/total fleet)			
						LHD Truck %	MHD Truck %	HHD Truck %	BRT Bus %
I-210-1	210 and 605 interchange east termini	211 and 605 interchange west termini							
I-210-2	211 and 605 interchange west termini	Rosemead Blvd							
I-210-3	Rosemead Blvd	San Gabriel Blvd							
I-210-4	San Gabriel Blvd	210 and 710 interchange east termini							
I-210-5	210 and 710 interchange east termini	210 and 710 interchange Mid Point							

Validation Approach

- SCAG 2012 RTP versus SCAG version 6.1
- FHWA Travel Model Validation and Reasonability Checking Manual and Caltrans Travel Forecasting Guidelines
- Bluetooth data to support travel time comparisons
- Technical guidance from Metro, Caltrans, and SCAG in bi-weekly meetings
- Transparency in modeling process and methodology

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Validation General Findings

- High peak auto volumes overall
- High freeway volumes versus arterials
- Transit trip table differences compared to survey data
- Travel times good compared blue tooth data
- Lower forecasts for 2012 models compared to 2008 models

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Validation Strategy

- Clean up highway and transit networks
- Adjust TOD factors
- Alter freeway capacities
- Toll coding updates
- Adjust transit trip tables

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Highway Validation Status: Global Count Metrics

Count/ Model Volume Difference

	AM Period	PM Period	ADT
Caltrans and FHWA Guidance:			
Freeways +/- 7%	3%	5%	14%
Major Arterials +/- 10%	14%	-14%	14%
Minor Arterials +/- 15%	9%	-26%	4%

Root Mean Square Error

	AM Period	PM Period	ADT
Caltrans Recommended Guidance: < 40			
%RMSE =	39	34	42

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Highway Validation Status: Global Count Metrics

Coefficient of Determination (R^2)

FHWA Guidance > 0.88	AM Period	PM Period	ADT
Coefficient of Determination (R^2)	0.94	0.95	0.96

% of Links within Caltrans Standard Deviations

Caltrans Guidance >= 75%	AM Period	PM Period	ADT
% of Links within Caltrans Standard Deviations	74%	81%	57%

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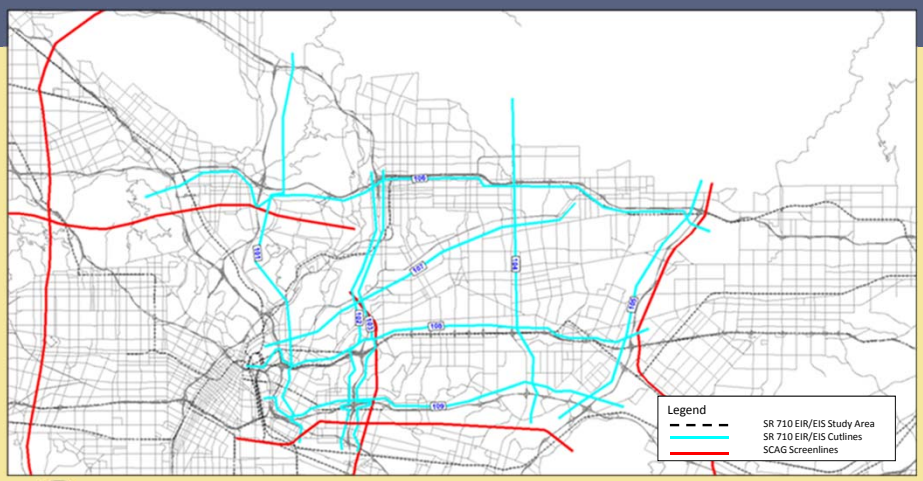
Validation Cutlines



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Highway Validation Status: Cutline Metrics

Screenline Name	#	Direction	Model Volume / Count Ratio (Relationship to Caltrans Guidance) AM Peak Period	PM Peak Period	Daily
East of SR 2 and I-5	101	EB/WB	1.11 (Exceeds)	1.08 (Exceeds)	1.20 (0.08 high)
West of SR-710	102	EB/WB	1.13 (Exceeds)	1.00 (Exceeds)	1.17 (0.04 high)
East of SR-710	103	EB/WB	1.15 (Exceeds)	1.07 (Exceeds)	1.21 (0.09 high)
East of Rosemead	104	EB/WB	1.16 (Exceeds)	0.93 (Exceeds)	1.09 (Exceeds)
West of I-605	105	EB/WB	1.04 (Exceeds)	0.94 (Exceeds)	1.06 (Exceeds)
South of SR 134 and I-210	106	NB/SB	1.05 (Exceeds)	0.77 (0.1 Low)	1.07 (Exceeds)
South of Huntington Drive	107	NB/SB	1.18 (Exceeds)	0.97 (Exceeds)	1.24 (0.04 high)
North of I-10	108	NB/SB	1.21 (Exceeds)	1.02 (Exceeds)	1.22 (0.08 high)
North of SR 60	109	NB/SB	1.15 (Exceeds)	1.04 (Exceeds)	1.23 (0.09 high)

Exceeds signifies that the model volume to count relationship exceeds the ratio stated in the guidance
Low signifies that the model volume to count relationship is below the ratio stated in the guidance
High signifies that the model volume to count relationship is above the ratio stated in the guidance

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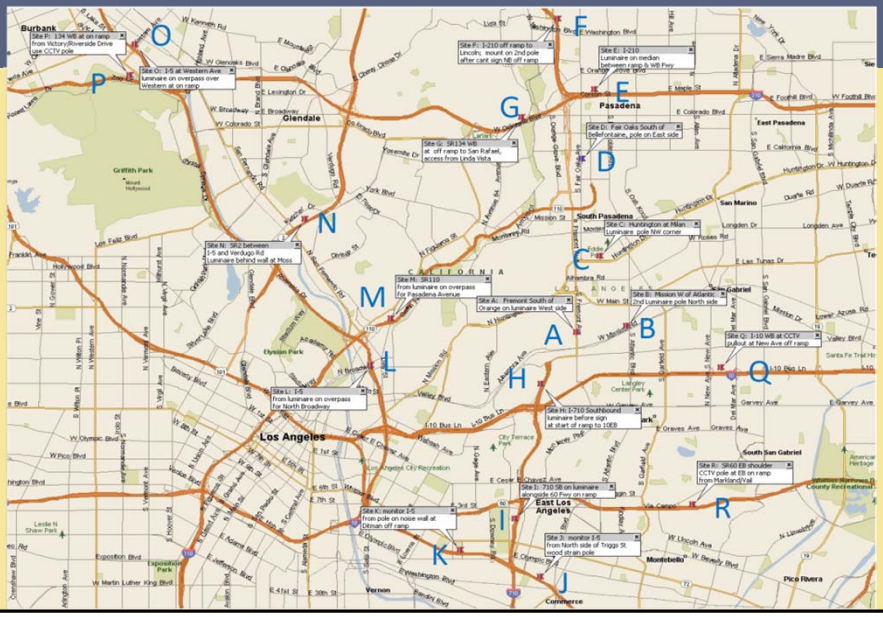
Bluetooth Sensor Location Sites



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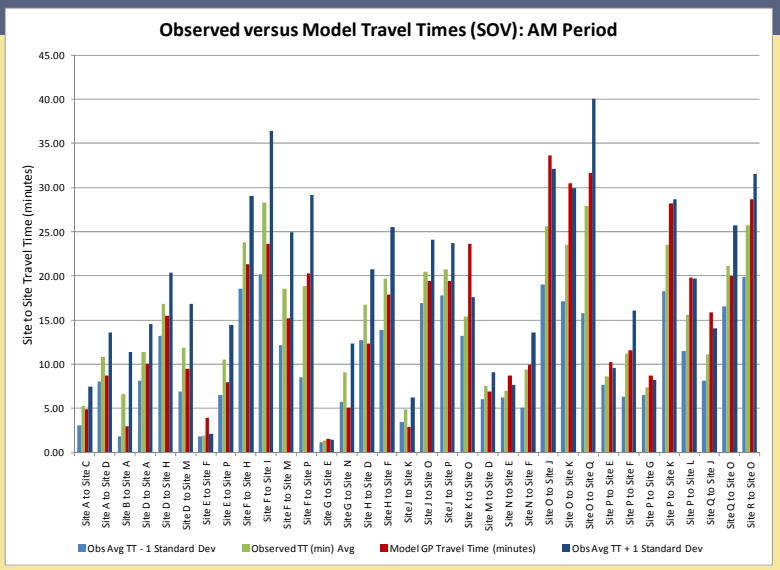
Highway Validation Status: AM Travel Time



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Transit Validation

- Completed refinement of transit parameters –
  - **Mode Priority** – implemented mode priority in non-local bus paths
  - **Bus speed functions** – separate speed curves for study area. Reduced bus speeds in study area to match observed run times.
  - **Transfer penalties** – increased transfer penalty from 3.2 min to 4.7 min. Fixed an inconsistency in transfer penalty handling between path building and mode choice.
- Study area and regional transit results improved compared to SCAG 6.1 model
- The model is generally replicating observed transit boardings by mode and route groups

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Transit Validation

	2012 Observed			2012 Modeled			Ratio		
	Peak	Off-peak	Total	Peak	Off-peak	Total	Peak	Off-peak	Total
Commuter Rail	-	-	13,000	8,500	1,400	9,800	-	-	0.76
Urban Rail	193,900	169,500	363,400	200,600	162,800	363,400	1.03	0.96	1.00
Orange BRT	14,700	12,600	27,200	14,400	13,300	27,700	0.98	1.06	1.02
MTA Bus**	80,200	77,800	158,000	102,500	57,700	160,100	1.28	0.74	1.01
Foothill Local**	21,200	12,300	33,500	23,000	16,800	39,800	1.09	1.37	1.19
Total	310,000	272,200	595,200	340,400	250,600	600,900	1.10	0.92	1.01

*Peak / off-peak splits from 2008 on-board survey
**2008 observed data

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Model Application / Results

- Run times
- Model enhancements

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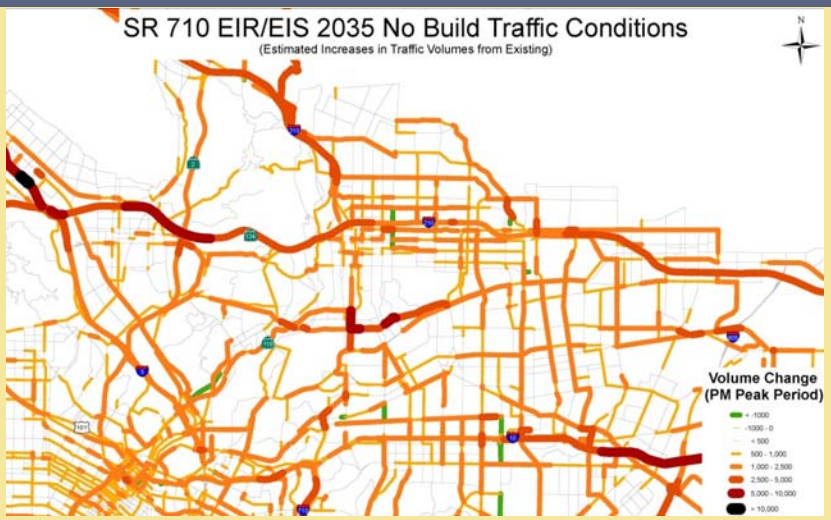
2035 No-Build vs. Existing PM Peak Volume (AA Model)



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2035 No-Build vs. Existing PM Peak Period Volume (ED Model)

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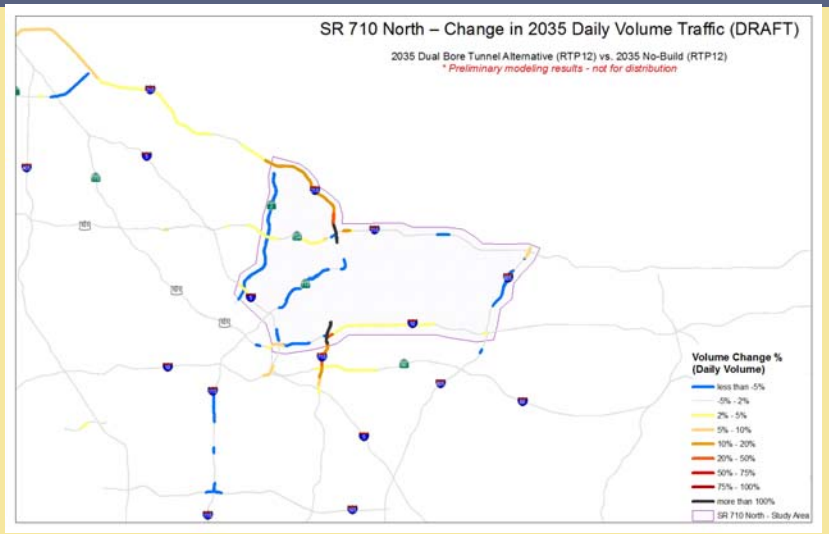
Traffic Analysis Impact Area Daily Traffic Volume



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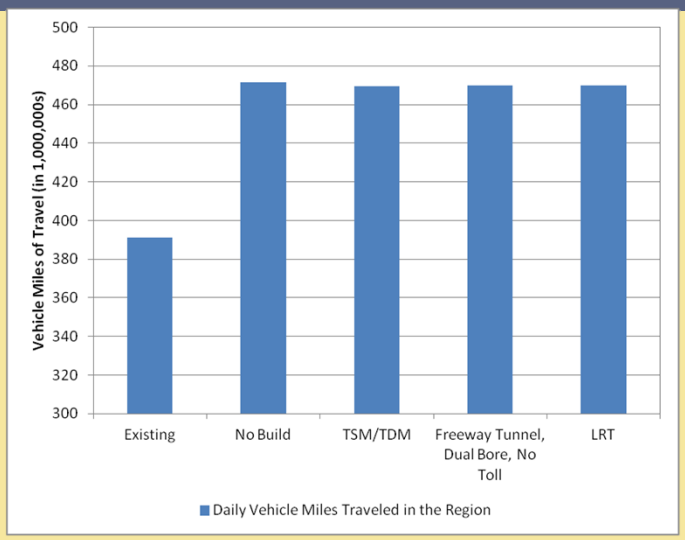
Daily VMT in the Region



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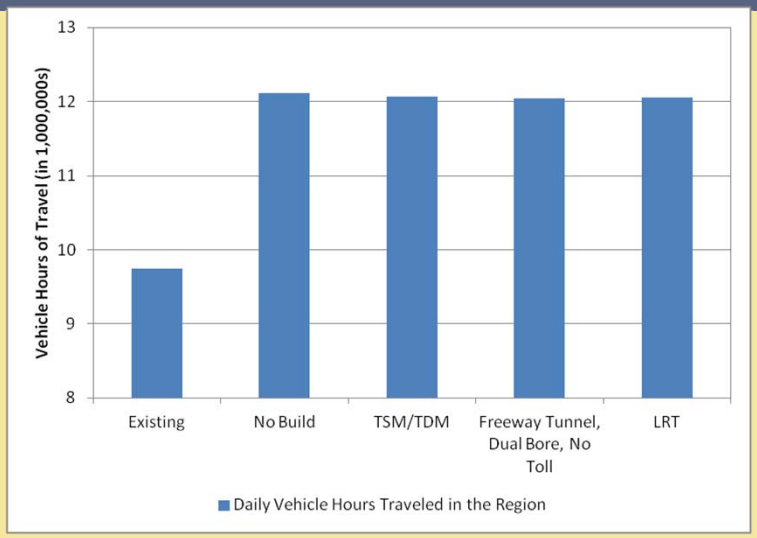
Daily VHT in the Region



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Cut-Through Trips

- AA phase: select link on multiple suspected cut-through routes
- EIR/EIS phase: separated trip table into assignment classes of cut-through or at least one end in the study area (in progress)

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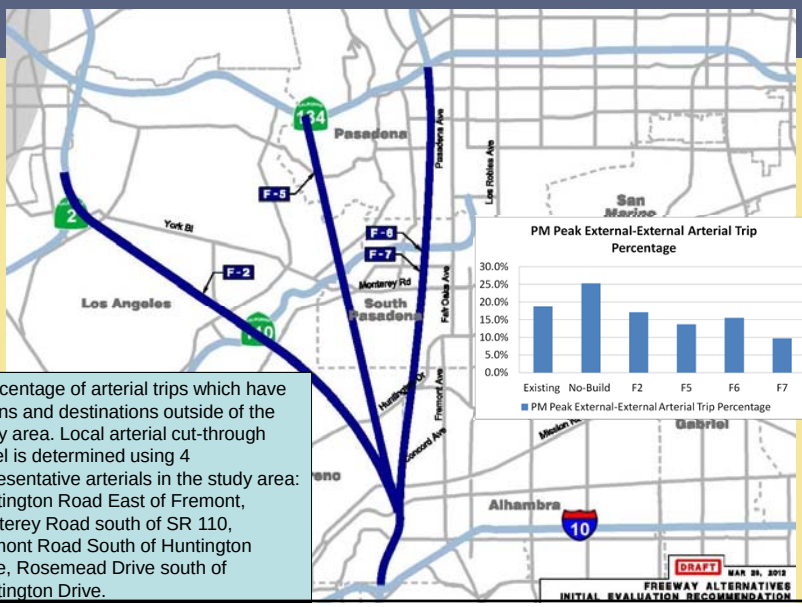
Cut-through Trips in AA Phase



*Percentage of arterial trips which have origins and destinations outside of the study area. Local arterial cut-through travel is determined using 4 representative arterials in the study area: Huntington Road East of Fremont, Monterey Road south of SR 110, Fremont Road South of Huntington Drive, Rosemead Drive south of Huntington Drive.

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Where are the vehicles coming from for the Freeway Tunnel Alternative?

Segment	ADT	Percentage of Total	AM Peak Period (SB)	Percentage of Total	PM Peak Period (NB)	Percentage of Total
SR 710 Tunnel (8 lanes, no toll)	173,800	100%	16,300	100%	23,900	100%
SR 2	36,500	21%	3,100	19%	5,300	22%
I-5	24,600	14%	1,500	9%	3,500	15%
I-605	8,900	5%	700	4%	1,600	7%
SR 110	15,700	9%	1,800	11%	1,900	8%
I-405	1000	1%	90	1%	70	0%
US 101	400	0%	10	0%	100	0%
All Freeways	87,100	50%	7,200	44%	12,470	52%
Fremont/Fair Oaks Avenue	25,900	15%	1,800	11%	3,200	13%
Huntington Drive	8,700	5%	710	4%	1,400	6%
San Gabriel Boulevard	8,300	5%	730	4%	1,000	4%
Rosemead Boulevard	8,100	5%	640	4%	1,200	5%
Los Robles Ave	6,400	4%	540	3%	990	4%
Eagle Rock Boulevard	2,000	1%	240	1%	220	1%
Other Arterials and Local Streets	27,400	16%	4,500	28%	3,400	14%
All Surface Streets	86,800	50%	9,160	56%	11,410	48%

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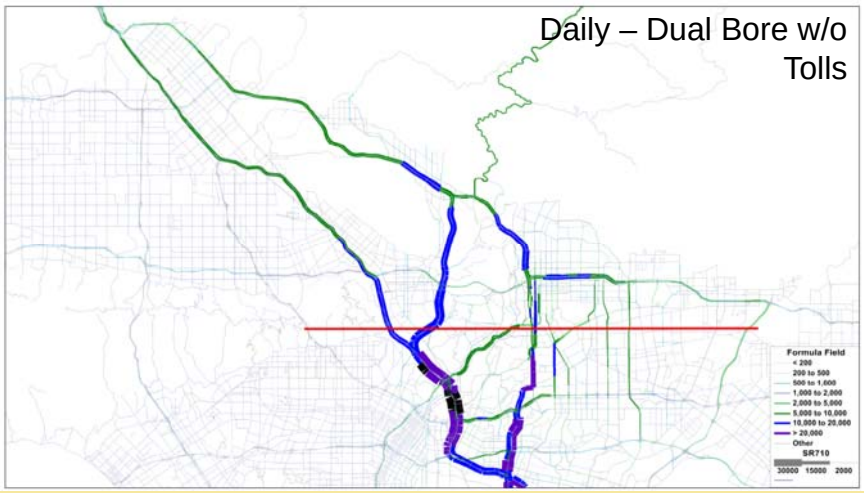
Distribution of Tunnel Trips - Daily Traffic



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Next Steps

- Complete 2035 Model Runs (Input to Environmental Analysis)
- Conduct Traffic Analysis (LOS) for Freeway and Surface Streets
- Transit, Parking, Bike/Ped Assessments
- Documentation

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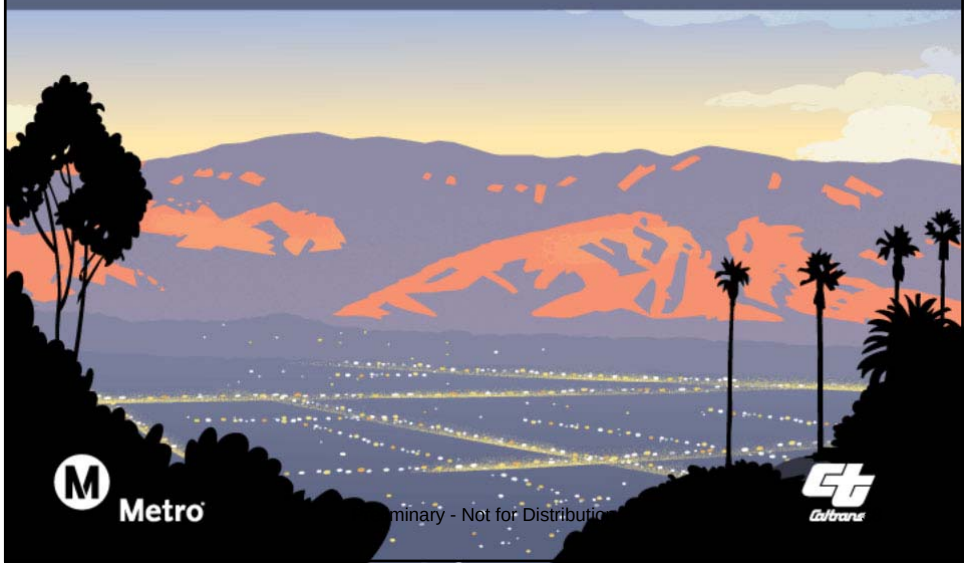
Open Discussion



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