El Dorado County
Travel Demand Model
and
SB 743 Implementation

Planning Commission Presentation
March 11, 2021

Agenda

* El Dorado County Travel Demand Model (TDM) Overview
* Senate Bill (SB) 743
* El Dorado County Implementation of SB 743

El Dorado County Travel Demand Model (TDM)

What is a travel demand model?

* Tool for understanding human behavior
* Forecasts trips onto transportation facilities
* Part of the planning process

What is a Travel Demand Model?

* Forecasts trips onto transportation facilities, roadways, highways, etc.
* Tool used by most public agencies
* Part of the planning process
* CEQA Support
* Fair Share for Impact Fees (AB 1600)
* TDM does NOT calculate LOS

TDM Underlying Assumptions

* Models try to replicate human behavior that assumes…
  * People's driving habits are predictable
  * Forecasts to where people live and where they work are reasonable
  * existing conditions are accurately reflected
  * external factors are known and under our control
* As things change model will be updated

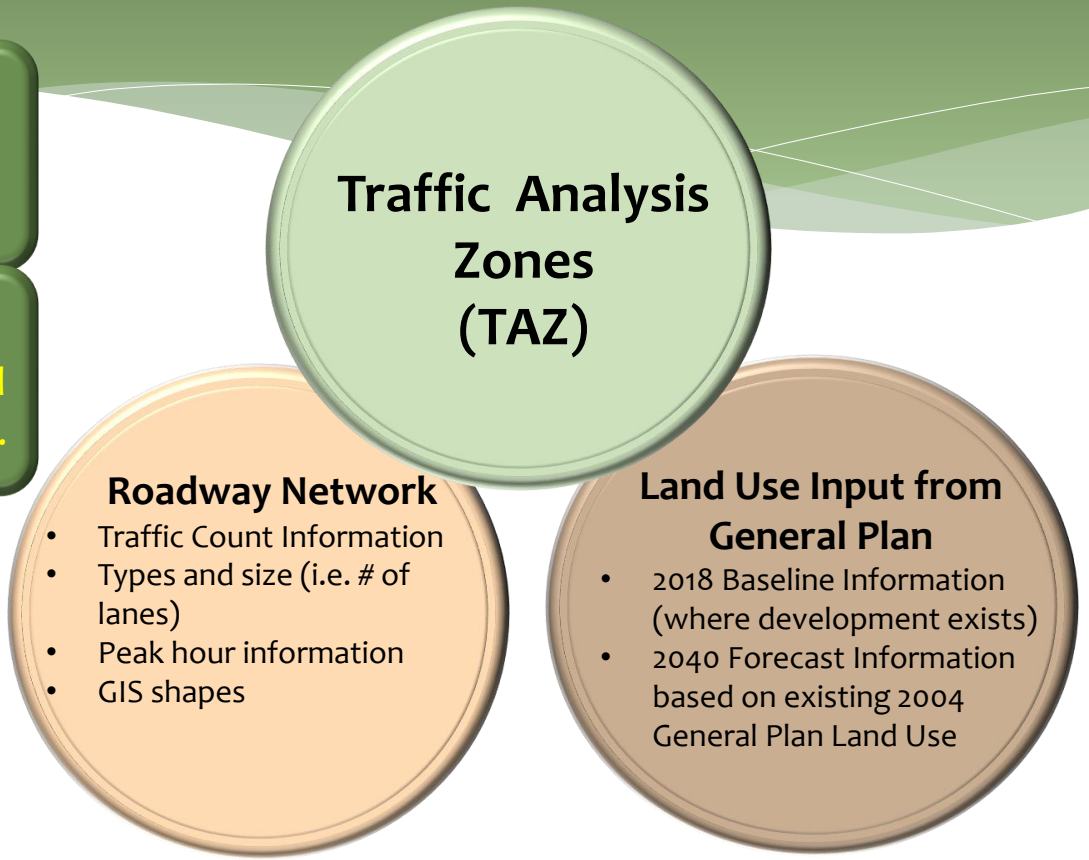
Why are Models Important?

* Models are the heart of Transportation Planning
* They help guide the development of Transportation Plans
* They help us to understand the impact that development has on our roadways
* They guide future investment strategies
* Models allow us to make informed decisions

Components of Model

1. Land use forecast does not equal entitlements; it is a planning tool only.

2. Land use forecast is reviewed annually and updated every 5 years.



Travel Demand Model Inputs:

Residential

- Persons per household
- Workers per household
- Auto ownership

Non-residential

- Manufacturing employees
- Office employees
- Medical employees
- Education employees
- Other employees
- K-12 enrollment
- College enrollment

Model Transportation Modes

Drive Alone

HOV 2+ Occupants

Park and Rides

Transit, Walk Access

Walk

Bicycle

How is our data organized?

It is subdivided into special zones commonly referred to as:

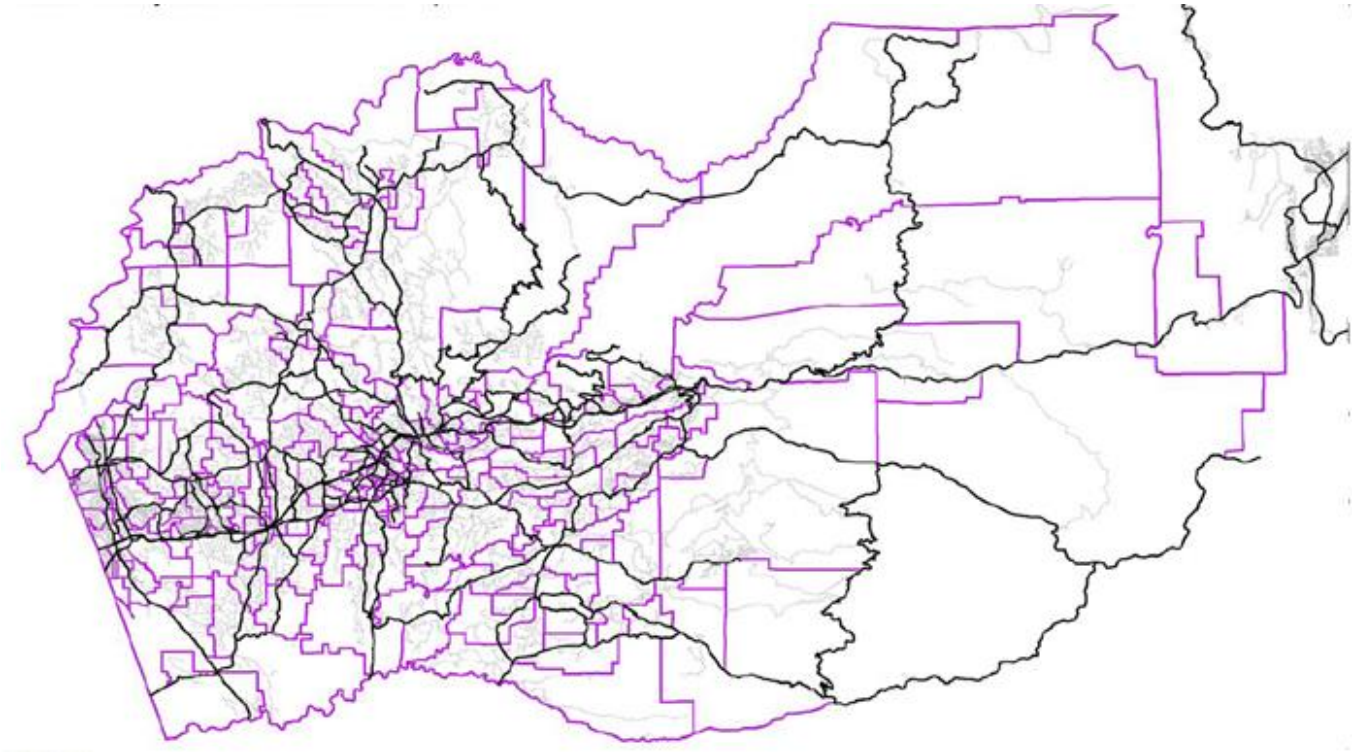
Traffic Analysis Zones

TAZs for short

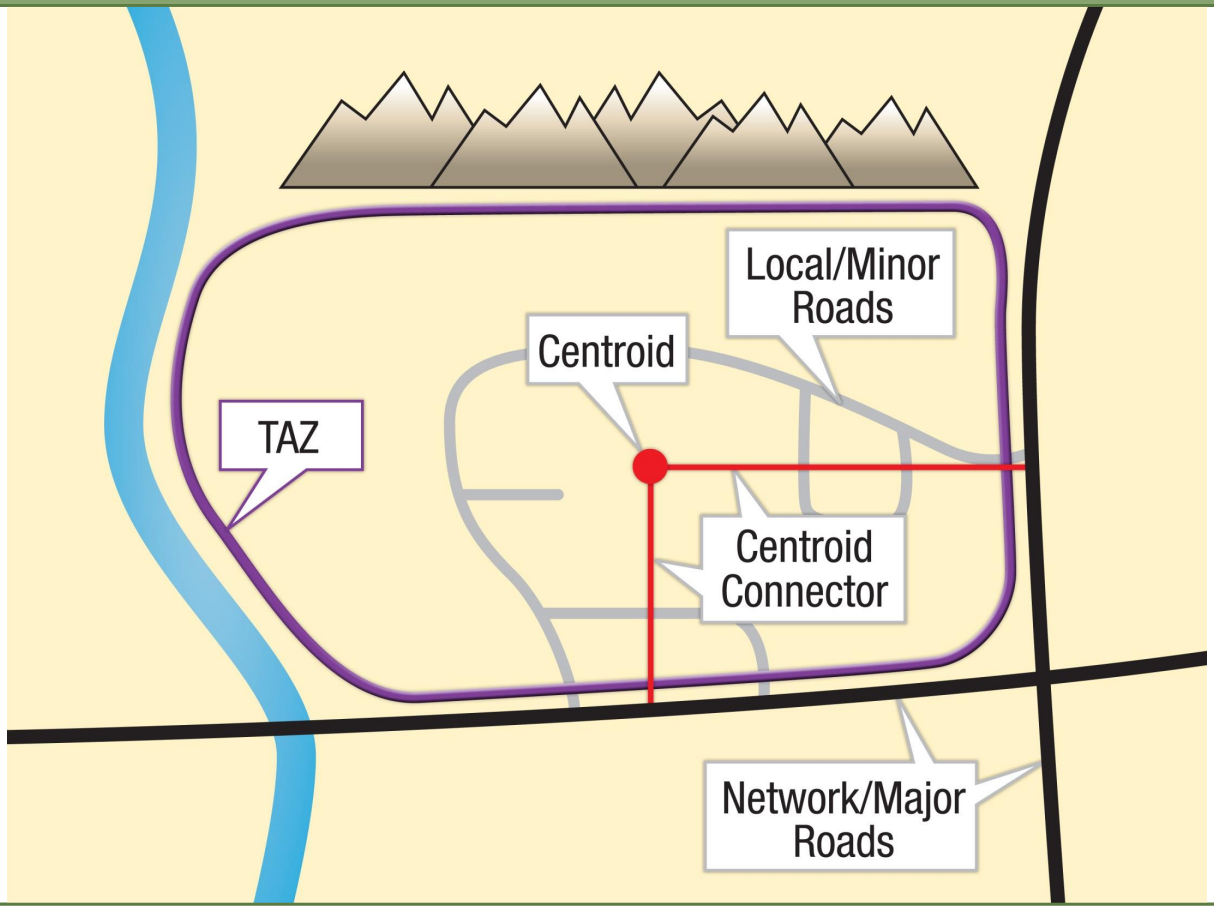
What is a TAZ?

* Used as a "data bucket" taking into account a Geographic Area where Data is Stored
  * Population
  * Employment
  * School Enrollment
* Basis for loading the travel demand model

El Dorado County TAZ Map

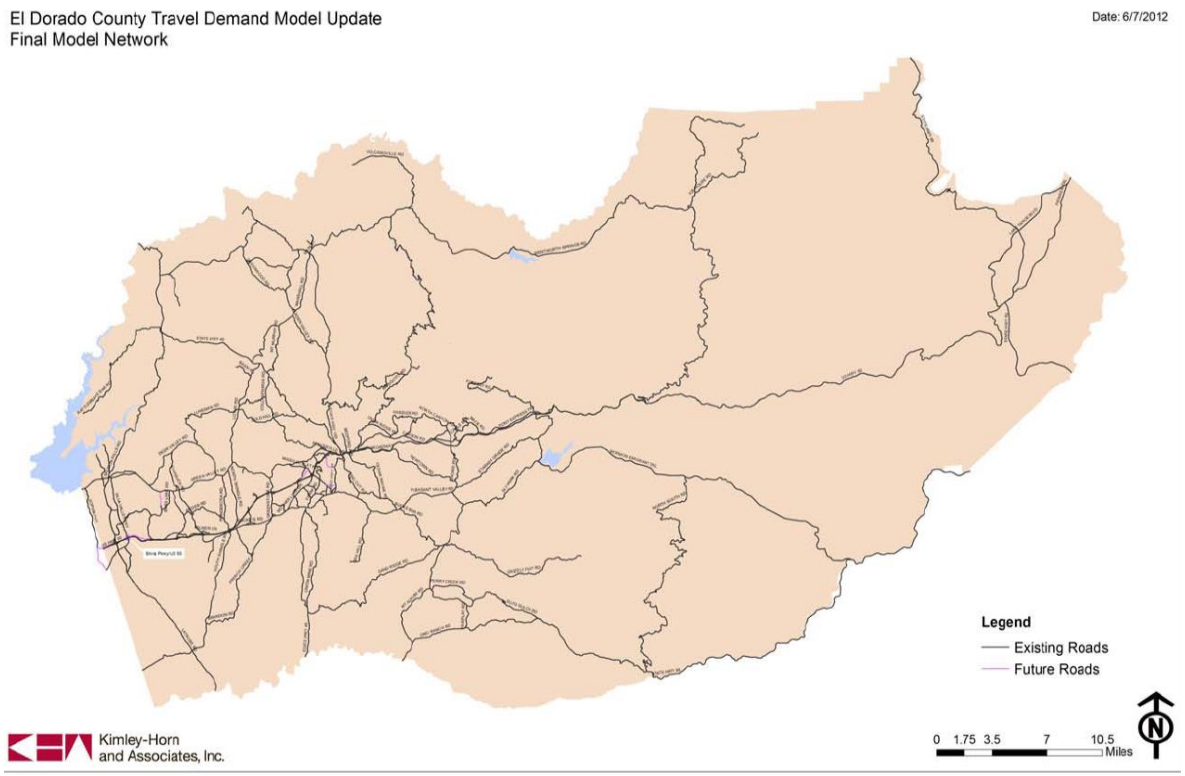


TAZ Driver Information

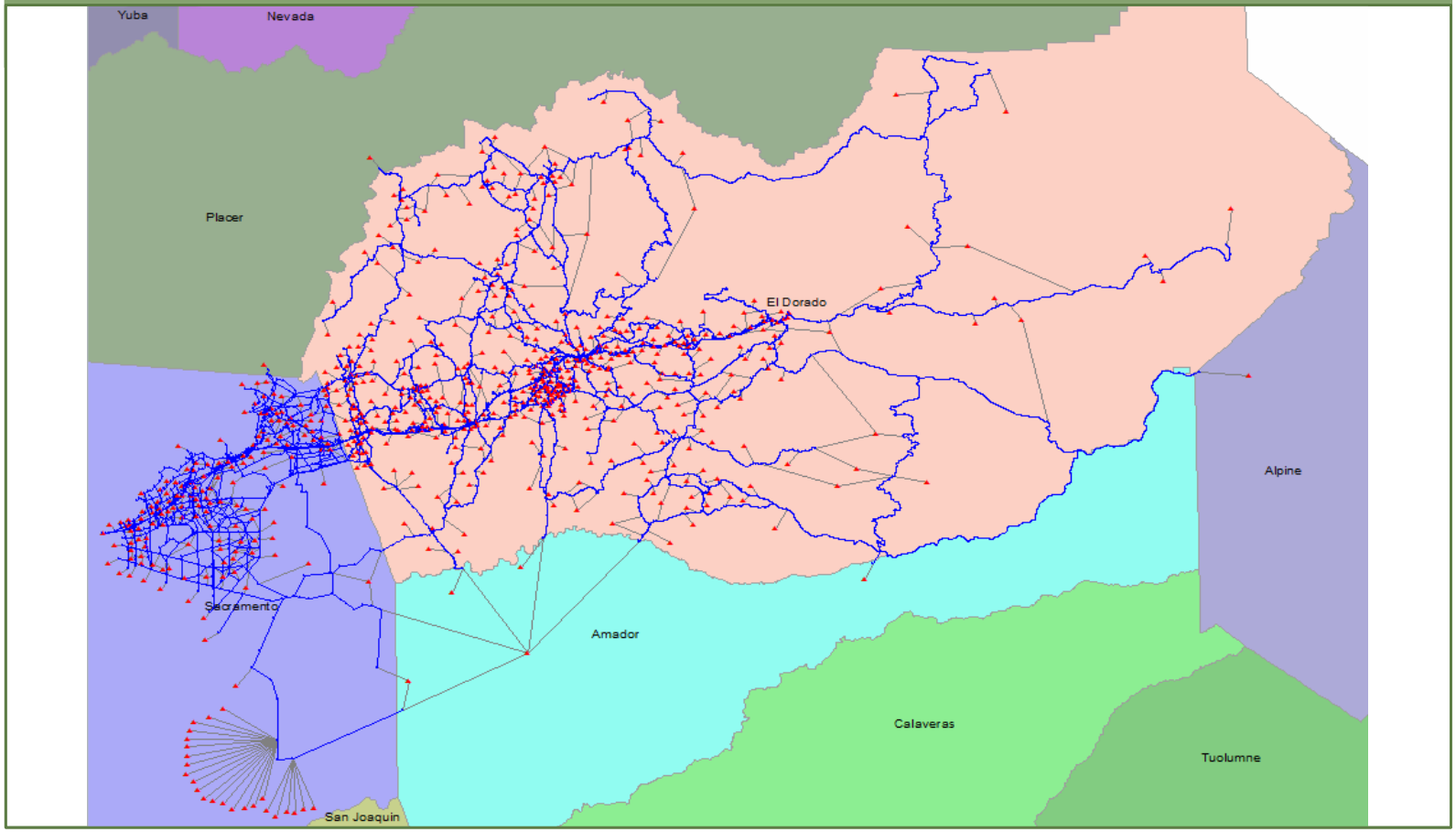


Roadway Network

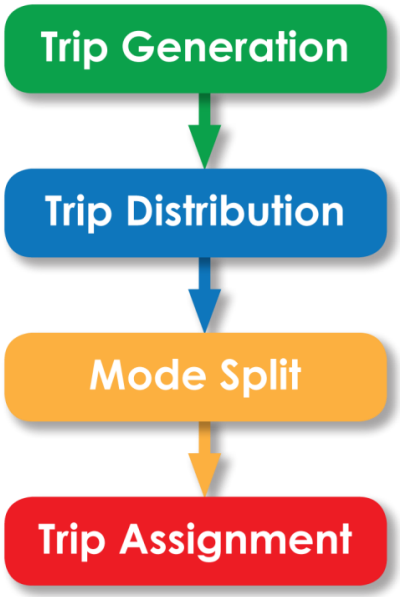
* Estimating travel time between Traffic Analysis Zones
* Traffic assignments
* Understanding of how trips are distributed, and
* Displaying the level of traffic congestion associated with different development scenarios.



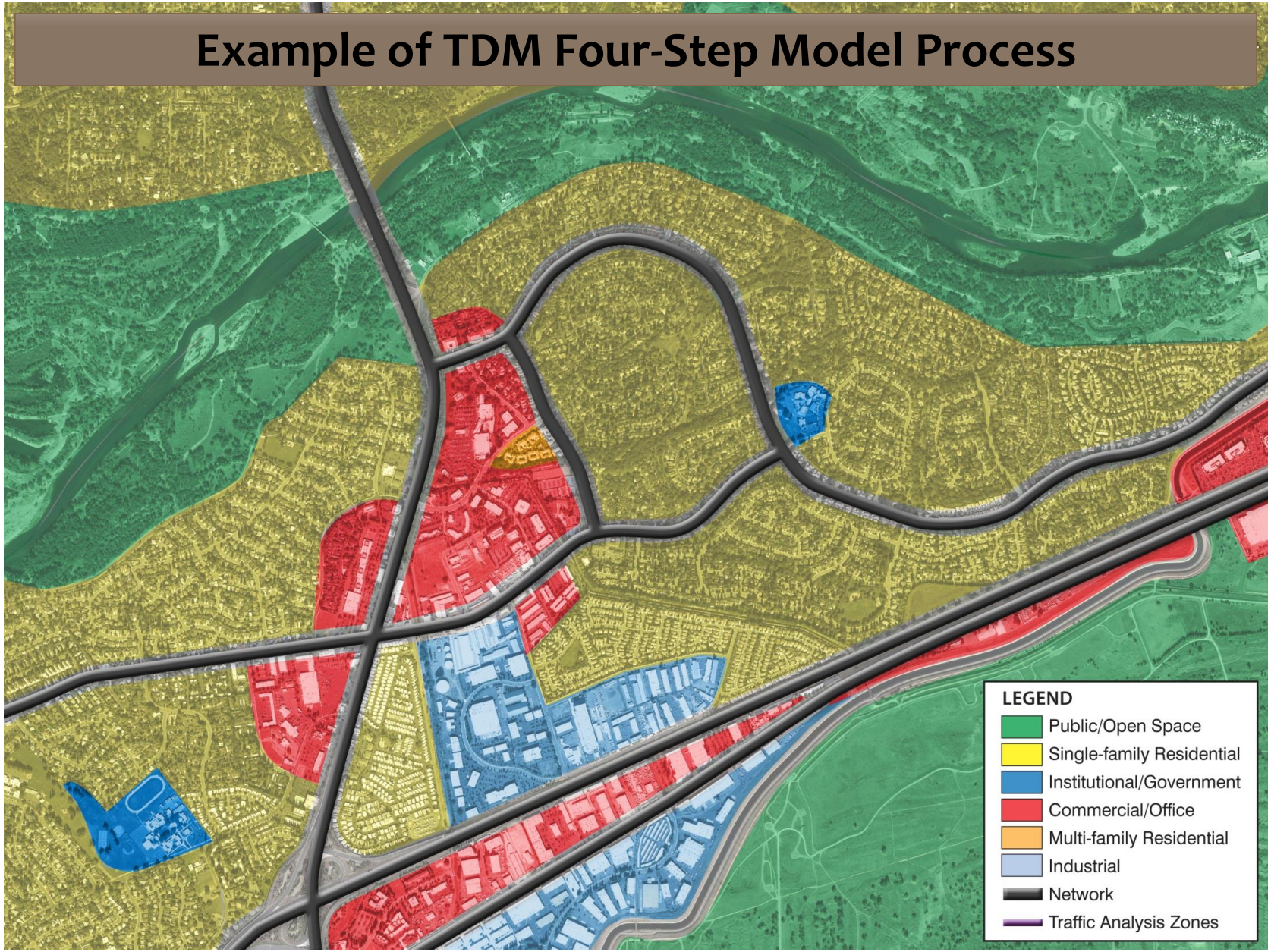
Model Extent

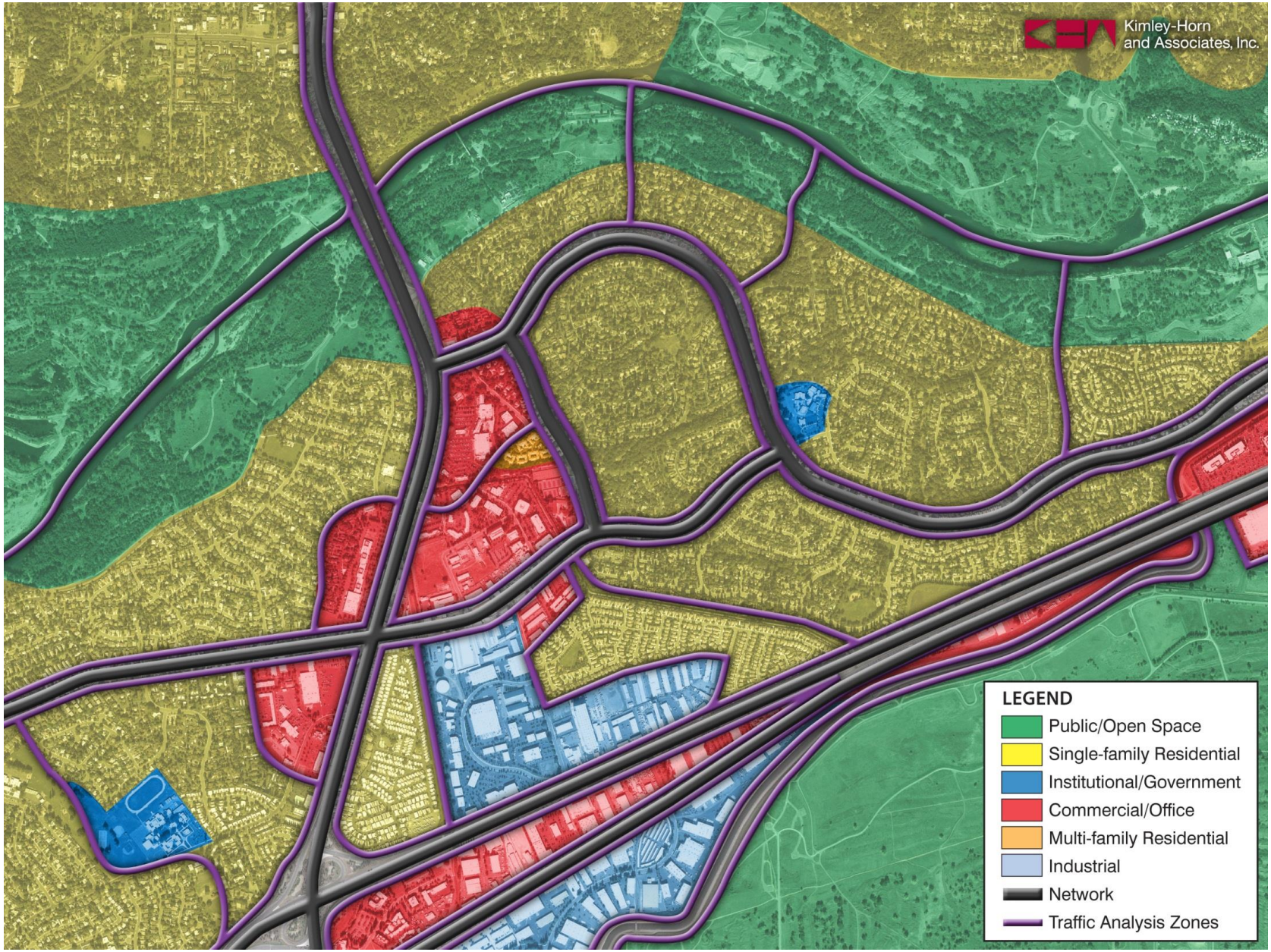


“Four Step” Model



Example of TDM Four-Step Model Process

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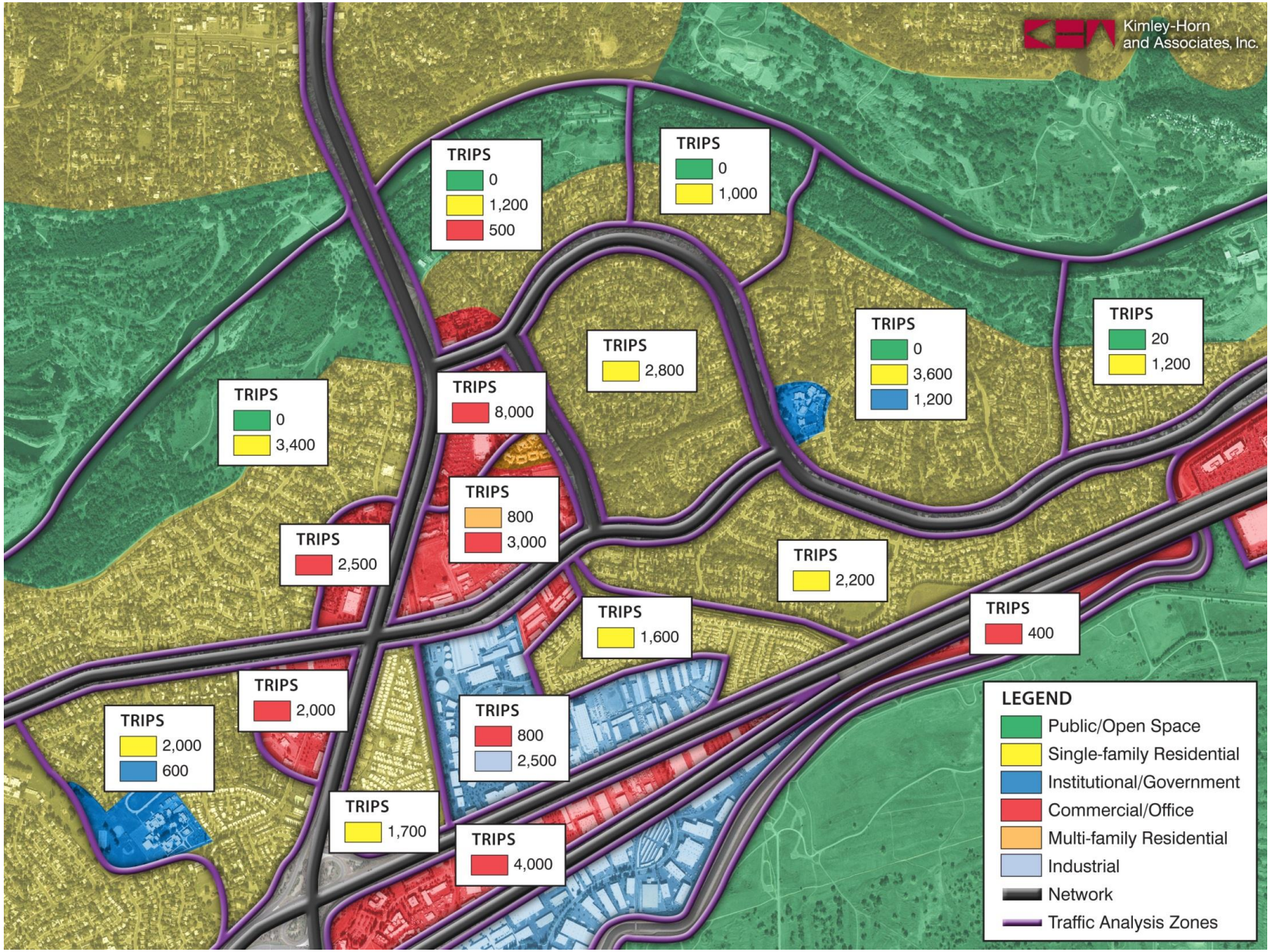
Institutional/Government
Commercial/Office
Multi-family Residential
Industrial
Network
Traffic Analysis Zones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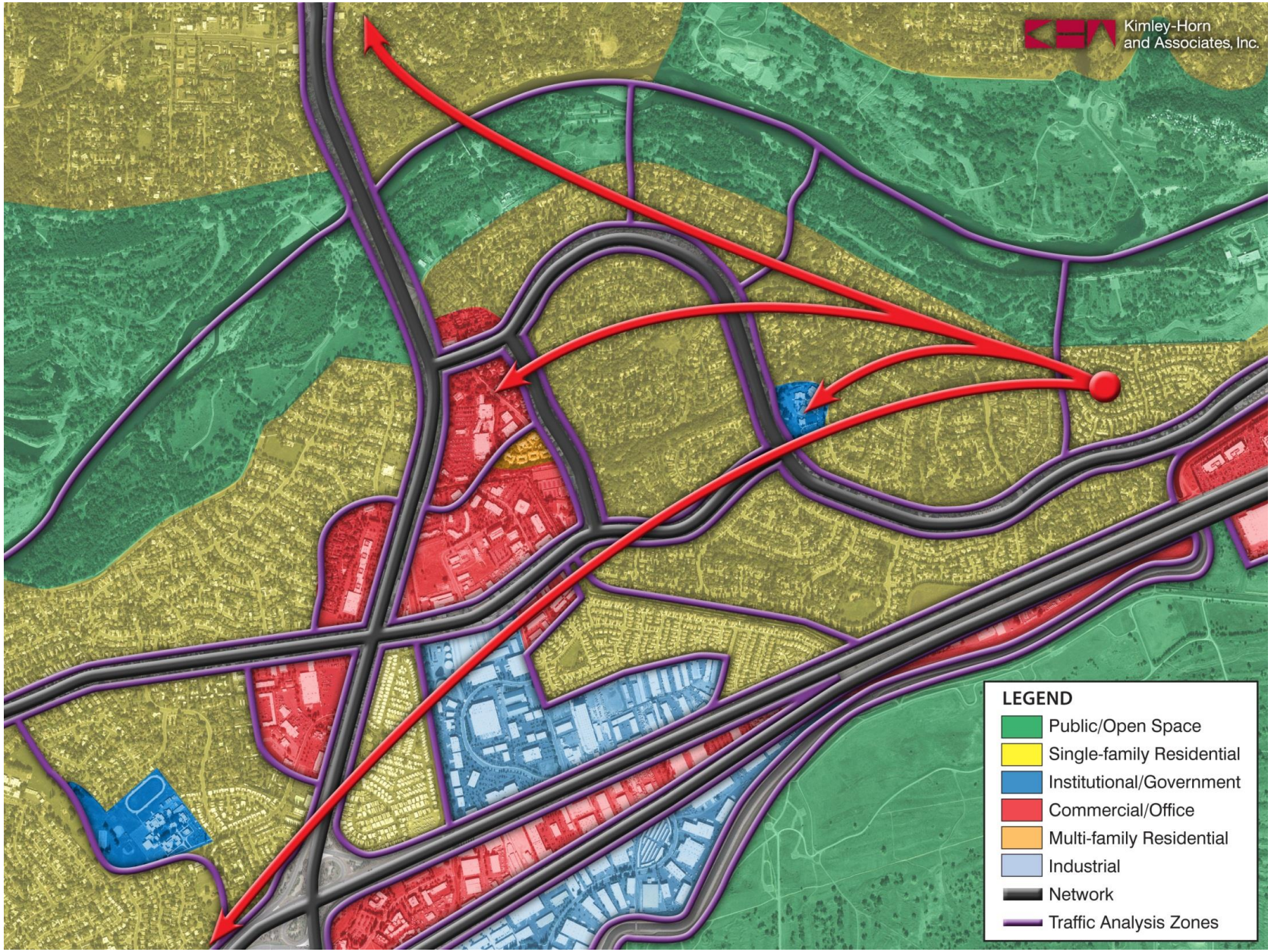
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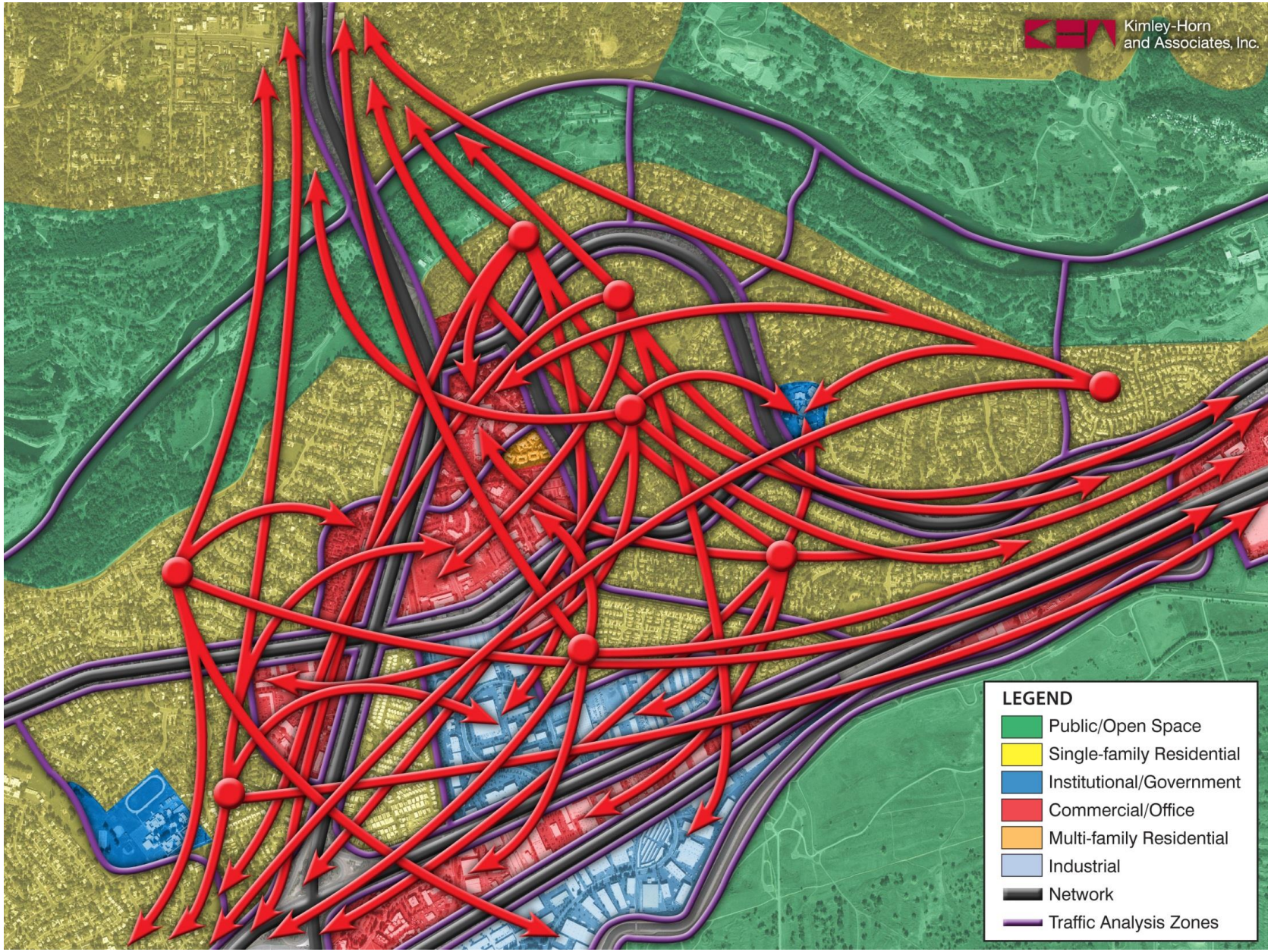
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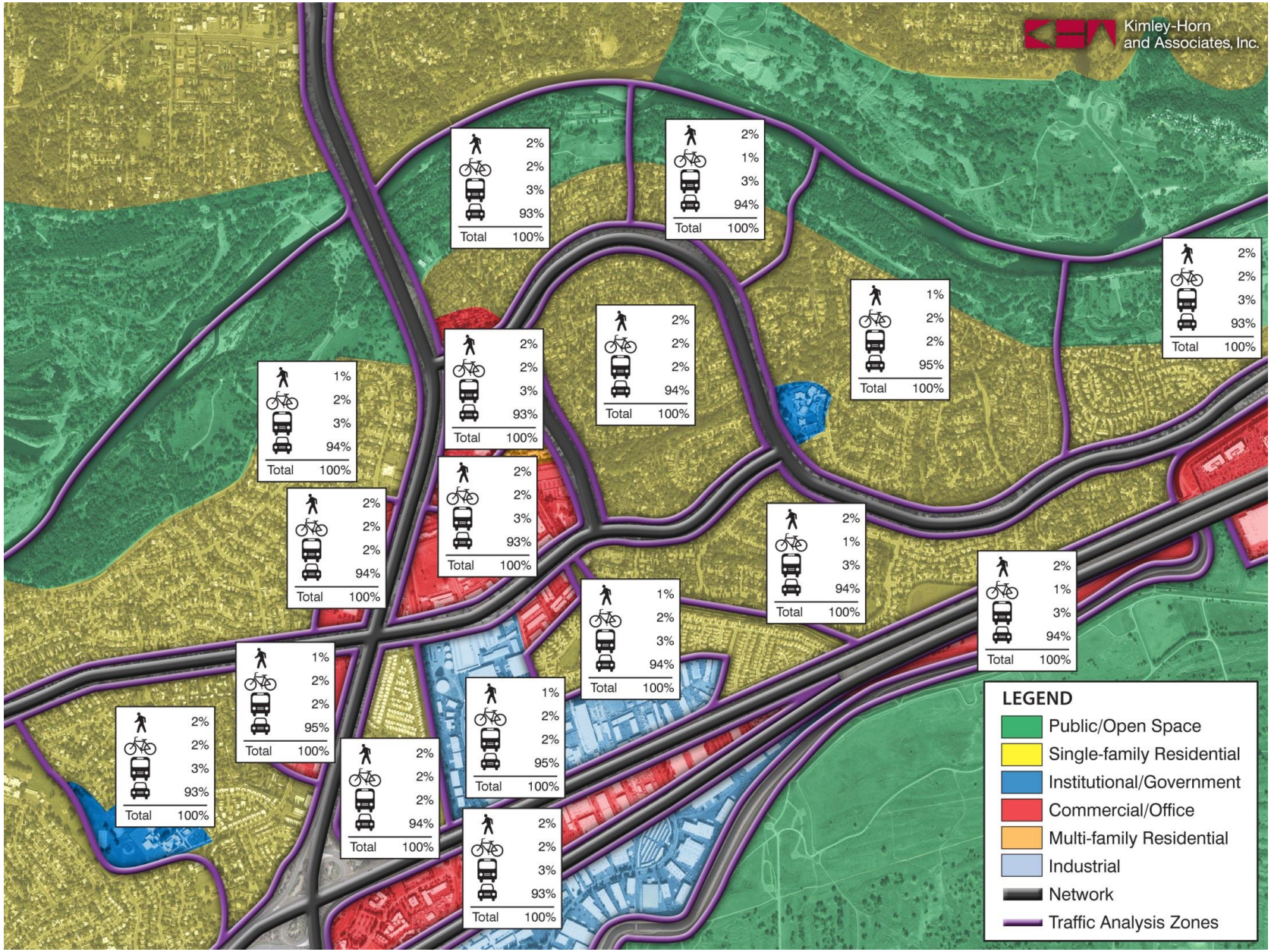
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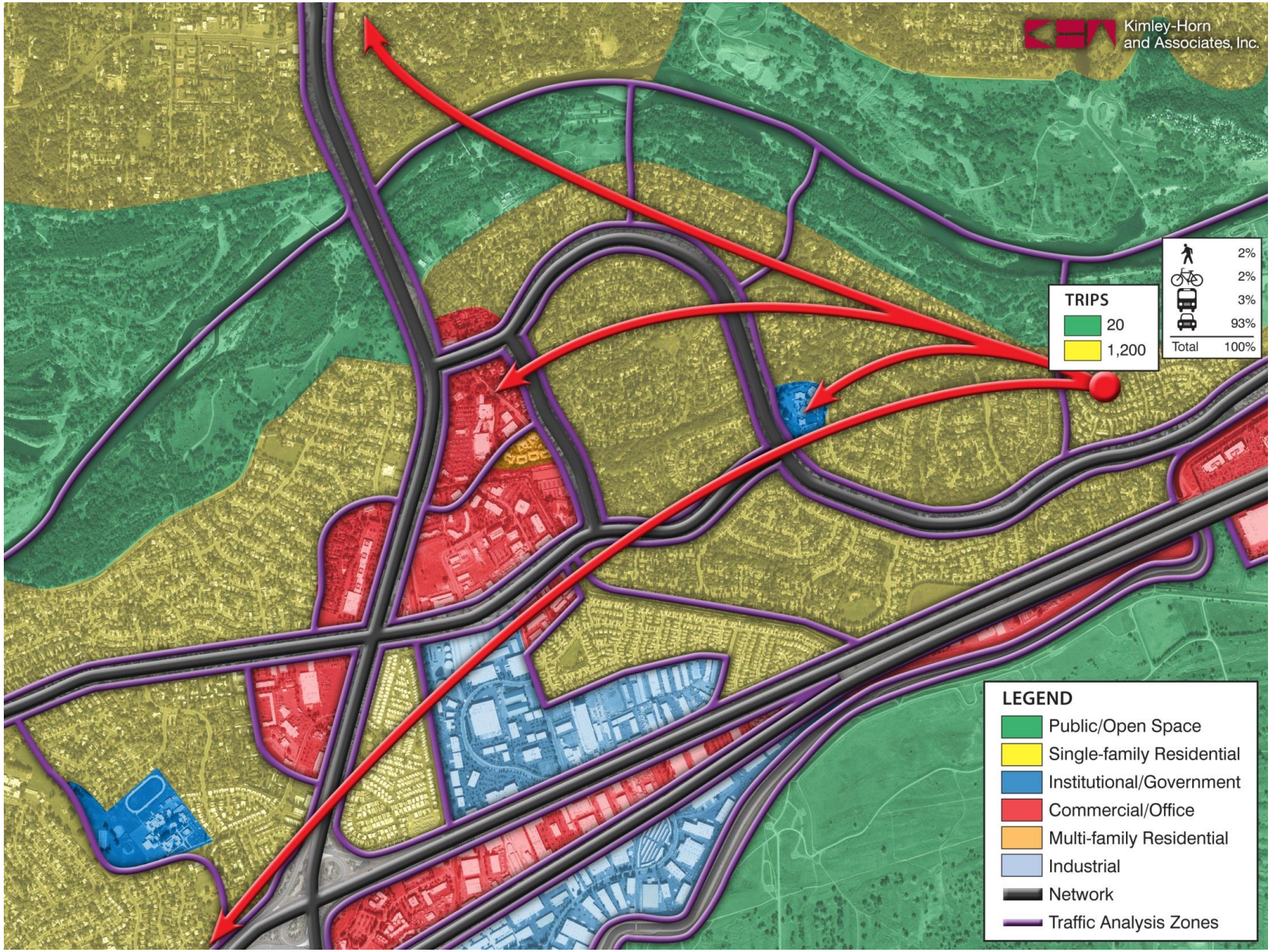
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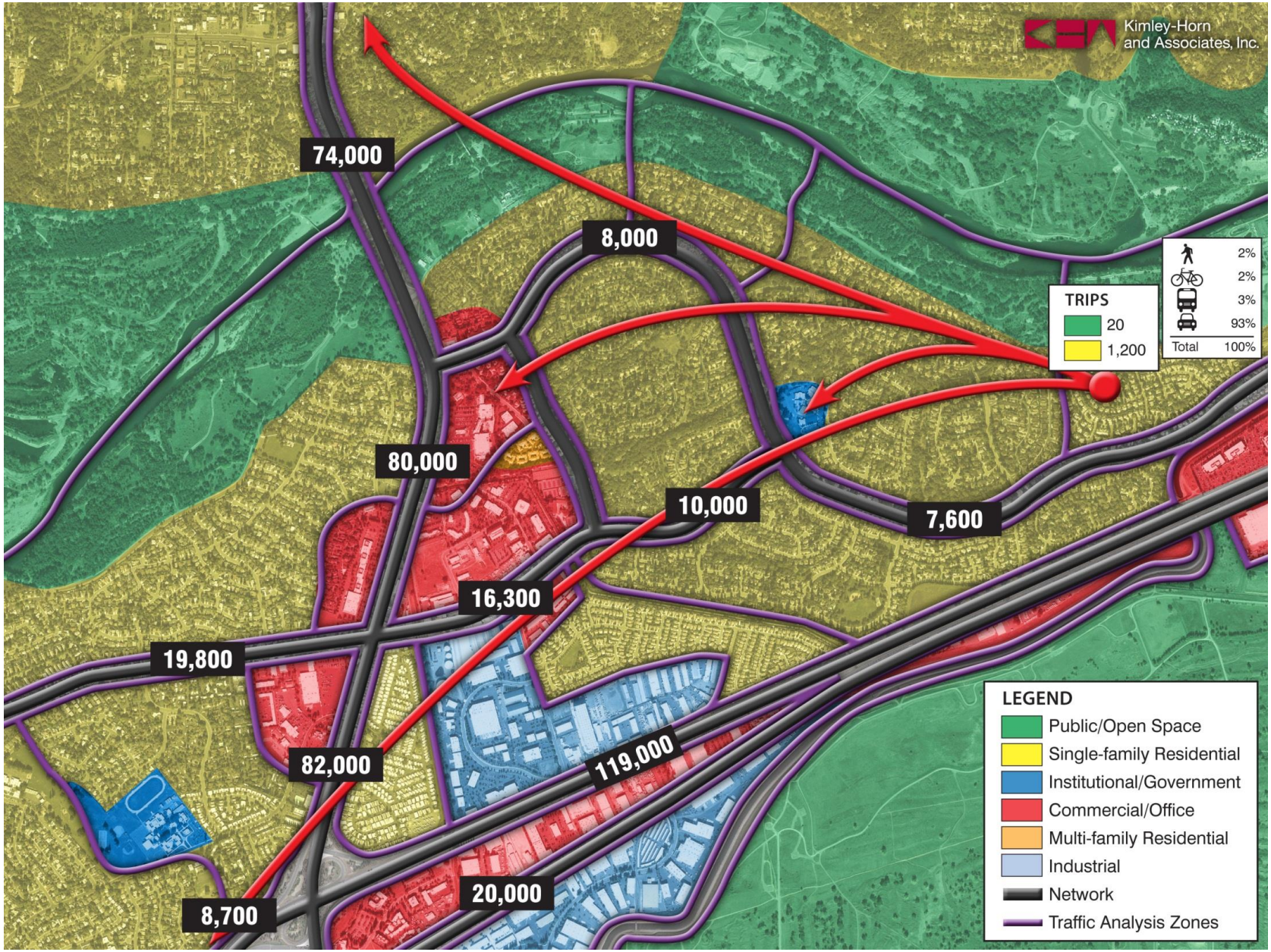
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Traffic Analysis Zones

How the Macro Model Can Help

* Evaluate road widening and road additions
* Evaluate new interchanges
* Analyze the impacts of transportation plans
* It can show impacts of large developments
* It can forecast corridor volumes
* It can be used as a basis for micro models and simulation
* It can test alternative land use plans

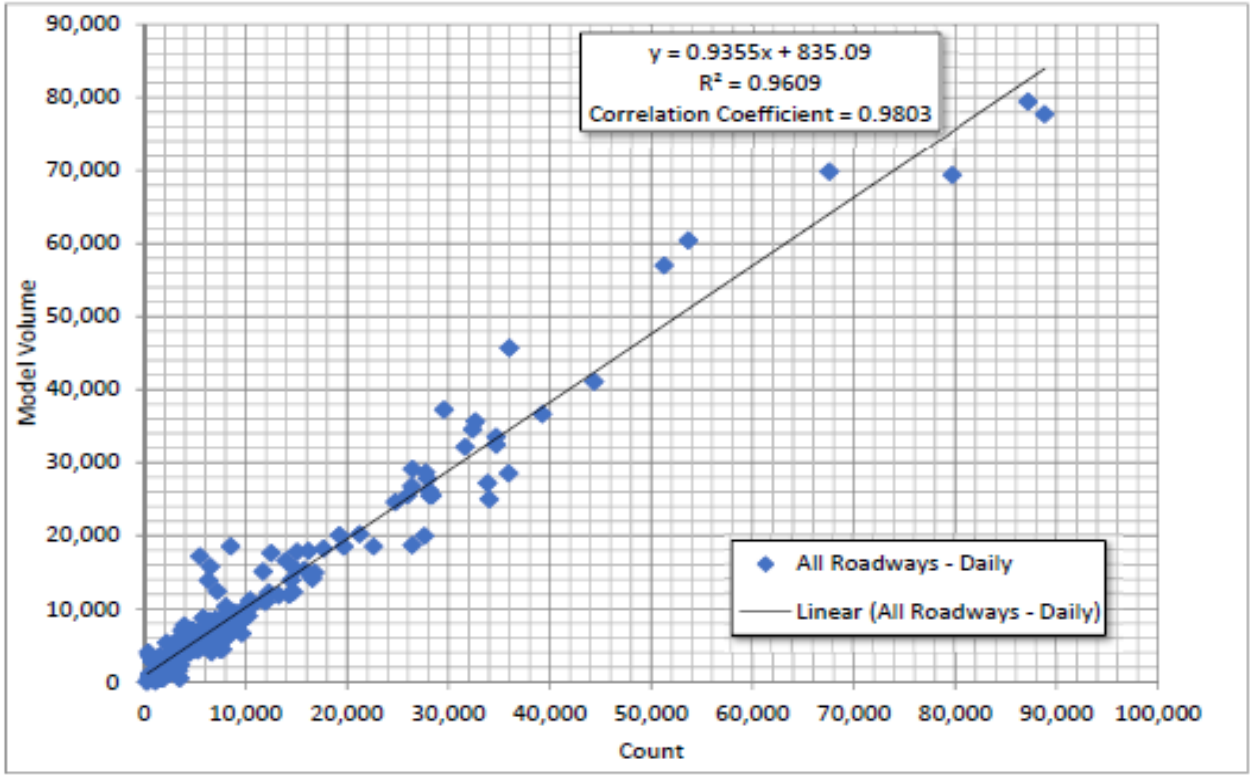
Validation Criteria Sources

Model Validation Criteria

Validation Criteria	Question
Correlation Coefficient	Is the model a good predictor in total?
Percent Error	Do we have the right amount of total traffic on roadways?
Percent Root Mean Square Error (RMSE)	Are total model errors within a reasonable range?
Screenline Analysis	Are the traffic flows between areas reasonable?
Roadway Link Validation	Are individual roadway volumes reasonable?
Peak Period Validation	Considers just the highest 4 hour periods.
Peak Hour Validation	Considers just the highest 1 hour periods.
Dynamic Validation	Is the model sensitive to change?

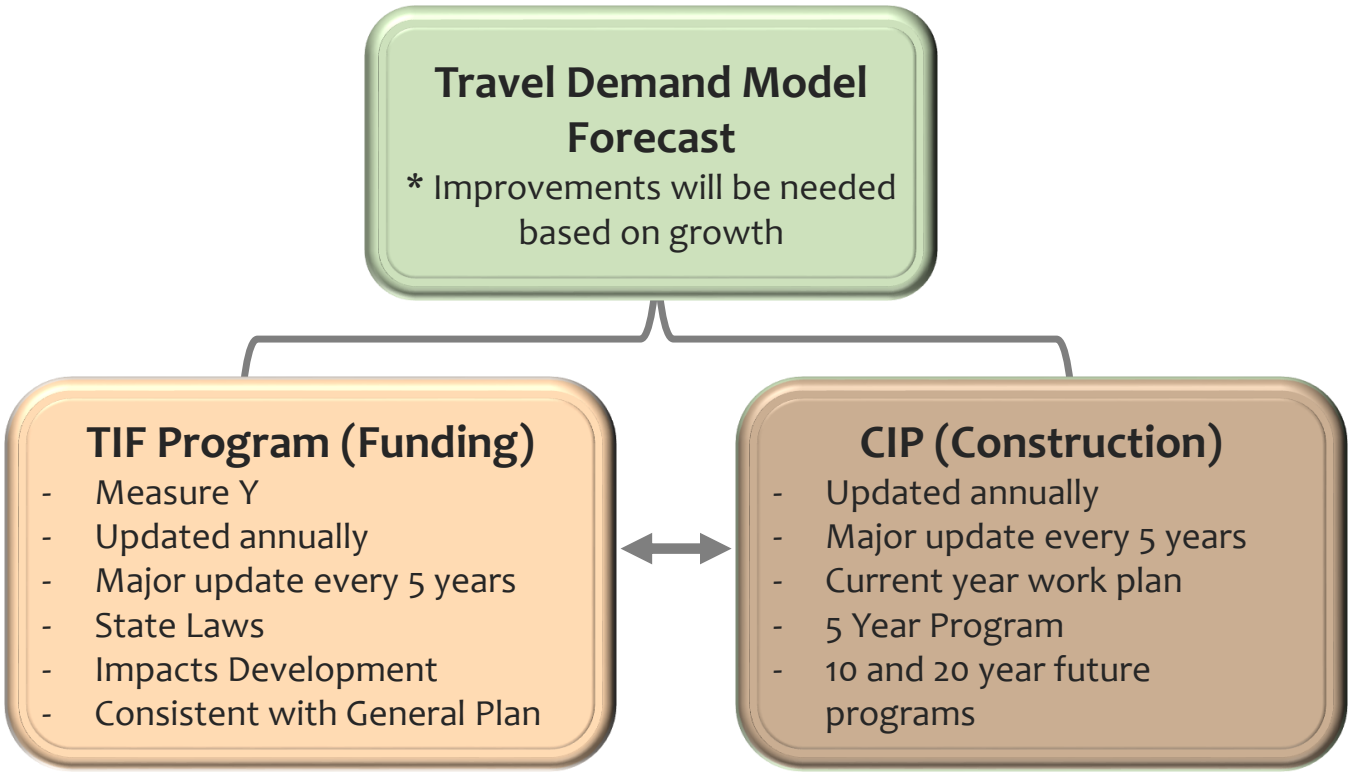
Validation tests are interrelated

Is the model a good predictor in total?



Yes - 0.96 against 0.88 goal

Travel Demand Model feeds the Traffic Impact Fee (TIF) Program and the Capital Improvement Program (CIP):

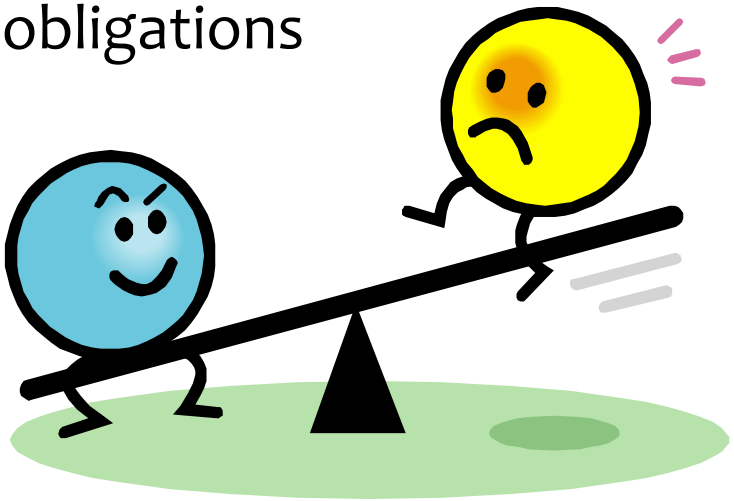


It all begins with forecasting. If we had a crystal ball, forecasting would be easy…

There are consequences in forecasting too high or too low.

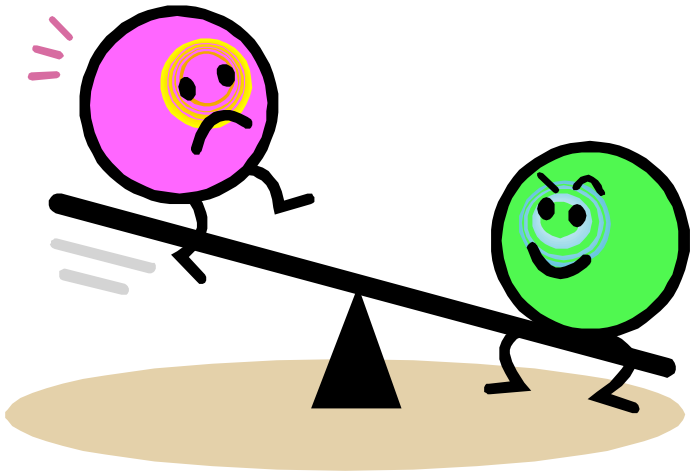
Forecasting Too High:

* Lack of revenue to complete programmed projects
* Adding new CIP projects may result in inability to repay current obligations



Forecasting Too Low:

* May lose ability to add needed CIP projects due to lack of budget

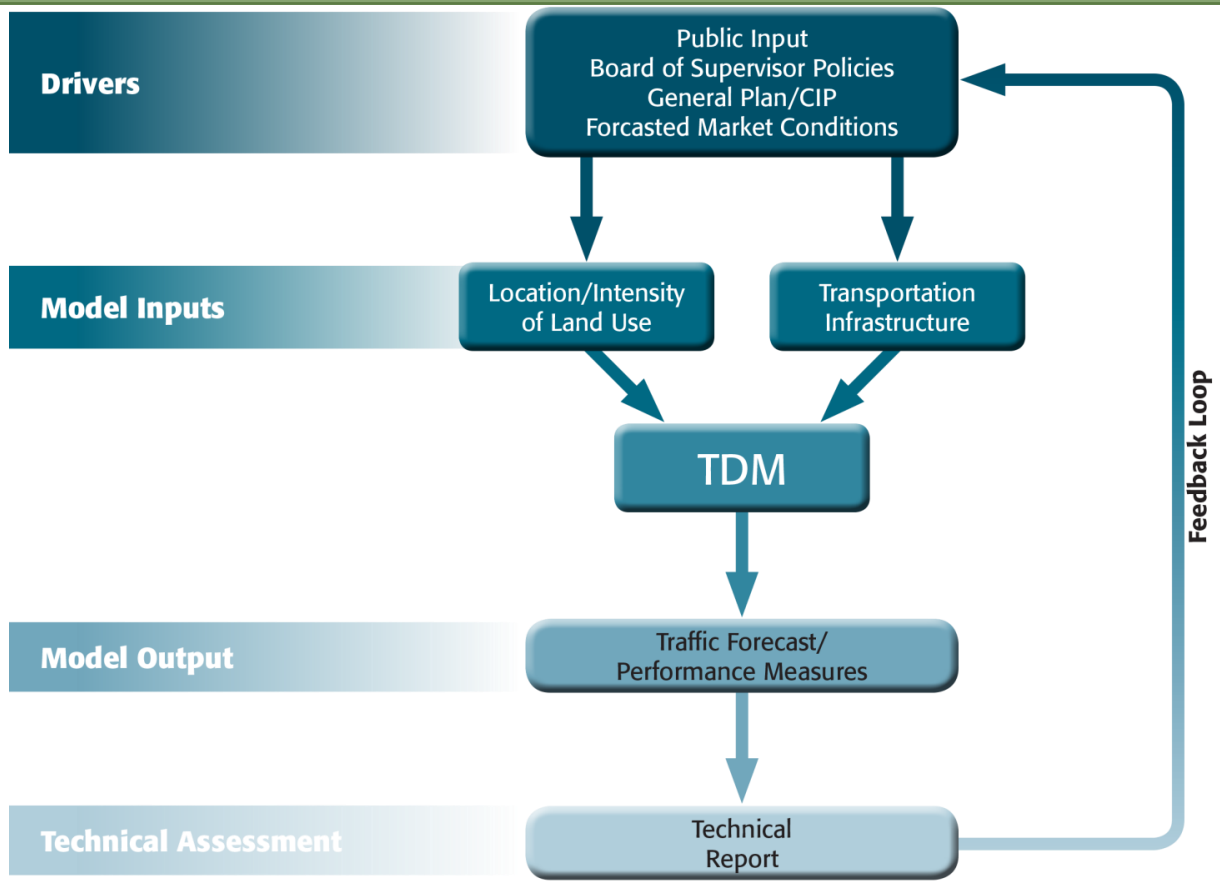


Accommodating Regional Housing Needs Allocation (RHNA)

Importance of Accommodating 2021-2029 RHNA

- Legal adequacy of the General Plan
- Local control of land use decisions
- Maintain eligibility to pursue grant funds
  (Including Transportation and Circulation Funds)

TDM and Planning Process



SB 743 | LEGISLATIVE INTENT

- **Reduce greenhouse gas emissions**

- **Balance the needs of congestion management with statewide goals related to infill development**

- **Improve public health through active transportation**

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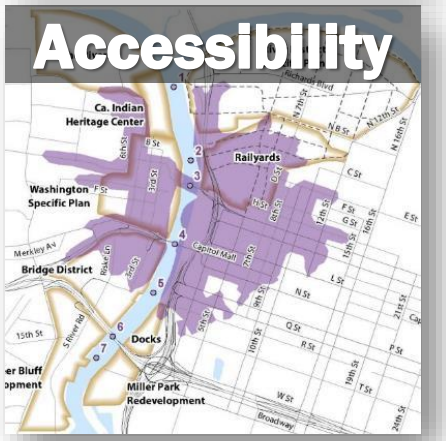
SB 743 | OVERVIEW



What SB 743 Does Do...

- Eliminates Level of Service (LOS) / Delay
- Adds Vehicle Miles Traveled (VMT)
- Methods and Thresholds Guidance

Forecasting Too Low:

- **LOS Analysis Required to Determine General Plan Consistency**
- **If impacts to transportation facilities are identified – three options to alleviate the impacts:**
  - **Pay Traffic Impact Fee (TIF) if improvements are part of the Program and the Capital Improvement Program (CIP)**
  - **Pay fair share if not in the CIP, with the County coordinating improvements**
  - **Construct improvements**

SB 743 | SHIFTING CEQA FOCUS

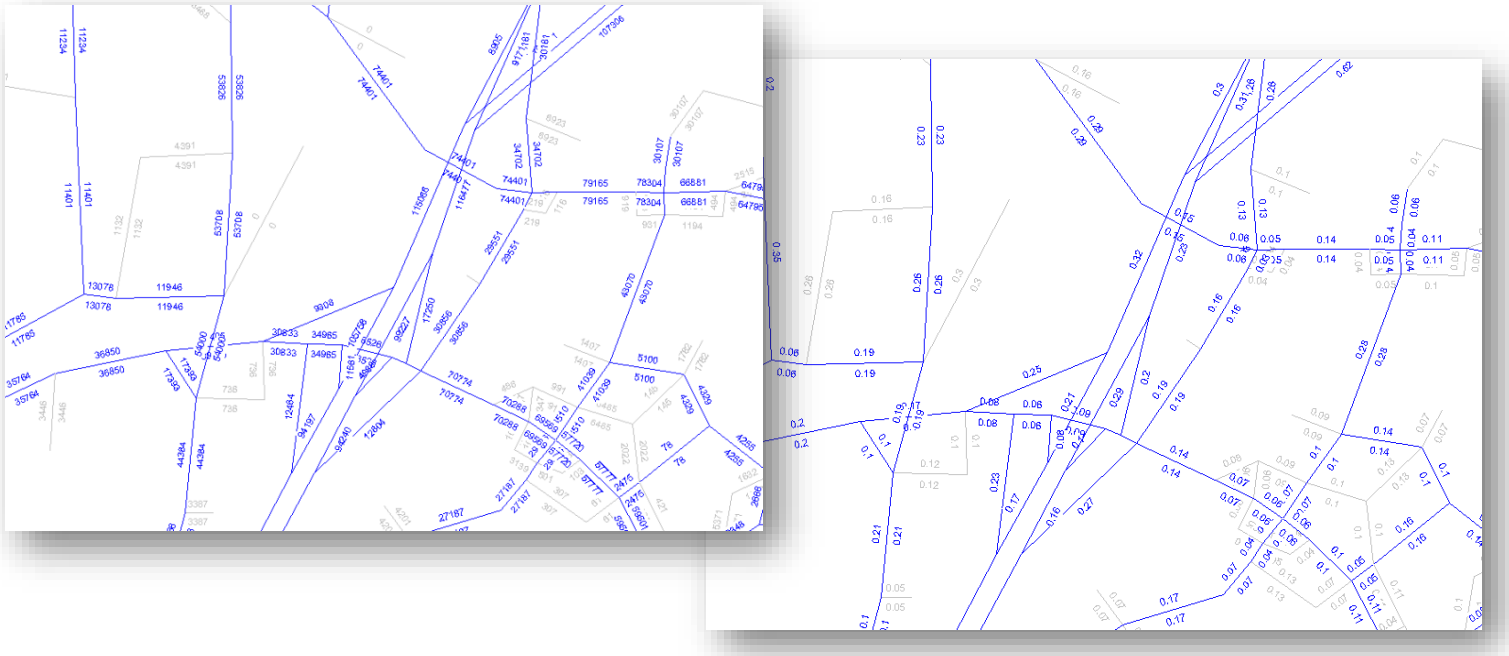
- **Traditional CEQA Focus: Measure impacts <u>to</u> driving**
- **Post-SB 743 CEQA Focus: Measure impacts <u>from</u> driving**

Higher VMT Per Capita

Lower VMT Per Capita

Methods | VMT FORECASTING

VMT = Volume x Distance or Trips x Trip Length



SB 743 | SHIFTING CEQA METRICS

Impacts measured by LOS (Traditional CEQA Focus)

- Travel time delays while driving
- Traffic congestion

Table 1: El Dorado County Peak Hour Roadway Segment LOS Criterion

		HCM 2010 Planning Level Volumes[1]				
Code	Functional Class Codes (Updated to HCM 2010)	A	B	C	D	E
2A	Two-Lane Arterial	-	-	850	1,540	1,650
4AU	Four-Lane Arterial, Undivided	-	-	1,760	3,070	3,130
4AD	Four-Lane Arterial, Divided	-	-	1,850	3,220	3,290
6AD	Six-Lane Arterial, Divided	-	-	2,760	4,680	4,710
4M	Four-Lane Multi-Highway (Two Dir.)	-	2,240	3,230	4,250	4,970
2F	Two Freeway Lanes (One Dir.)	-	2,070	2,880	3,590	4,150
2FA	Two Freeway Lanes + Auxiliary Lane (One Dir.)	-	2,610	3,630	4,520	5,230
3F	Three Freeway Lanes (One Dir.)	-	3,100	4,320	5,380	6,230
3FA	Three Freeway Lanes + Auxiliary Lane (One Dir.)	-	3,640	5,070	6,320	7,310
4F	Four Freeway Lanes (One Dir.)	-	4,140	5,760	7,180	8,310

[1] *Freeway LOS based on HCM 2010, Exhibit 10-8, Urban Area, Rolling Terrain, K-factor of 0.09, and D-factor of 0.60*

2-lane highway (and arterial 2-lane) LOS based on HCM 2010, Exhibit 15-30, Class II Rolling, .09 K-factor, and D-factor of 0.6

Arterial LOS based on HCM 2010, Exhibit 16-14, K-factor of 0.09, posted speed 45 mi/h

Volumes are for both directions unless noted

El Dorado County Community Development Agency. 2014. *Transportation Impact Study Guidelines.* https://www.edcgov.us/Government/longrangeplanning/DOT/tis-guidelines/documents/TIS-Guidelines-November-2014-Final-01-08-14.pdf (pg. 11)

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SB 743 | EDCTC SPONSORED IMPLEMENTATION PLAN

- **In 2018, the El Dorado County Transportation Commission (EDCTC) hired Fehr & Peers to perform work to assist the County and the City of Placerville with implementation of SB 743.**
- **Fehr & Peers worked in direct partnership with County, City and EDCTC staff to review the existing General Plan policies, travel demand model metrics and other technical elements.**
- **The Plan was accepted by the EDCTC on August 1, 2019.**

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SB 743 | EDCTC SPONSORED IMPLEMENTATION PLAN

- **The Plan produced an analysis tool for use by the jurisdictions that is based on the El Dorado County TDM.**
- **The Plan proposed using the County's Community Region Boundaries to set the thresholds instead of the Sacramento Area Council of Governments (SACOG) region.**
- **Updates to the TDM were needed to easily produce the analytics in the appropriate metrics to complete the transportation analysis for a CEQA document.**

SB 743

El Dorado County Travel Demand Model Update

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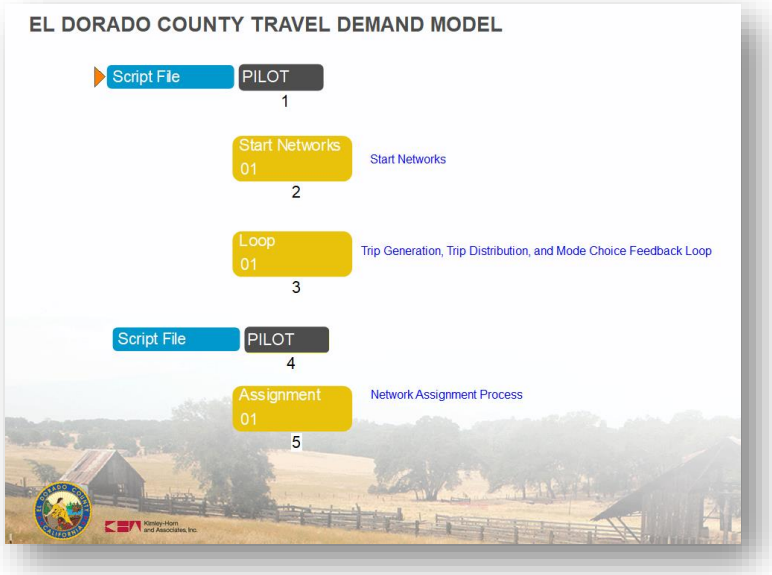
EDCTDM | VMT FORECASTING

- **El Dorado County Travel Demand Model**
  - **Can estimate project generated VMT and the project's effect on VMT**
  - **Existing (2018) and future year (2040) conditions based on the General Plan**



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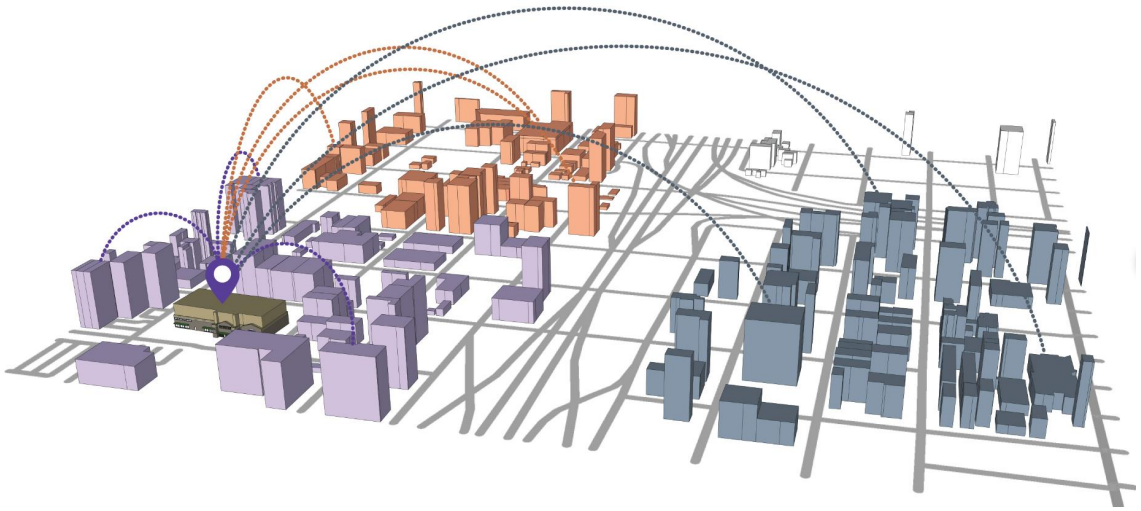
EDCTDM | SB743 UPDATES

- **Enhancements made in response to SB 743:**
  - **Adjust the length of trips that travel across the EDCTDM's boundaries**
  - **Calculate SB 743 compliant VMT estimates**
  - **Enhance the models sensitivity to the built environment to test VMT mitigation measures (based on latest research)**

Methods | WHAT VMT COUNTS?

Project Generated VMT vs. the Project's Effect on VMT
Project vs. Cumulative



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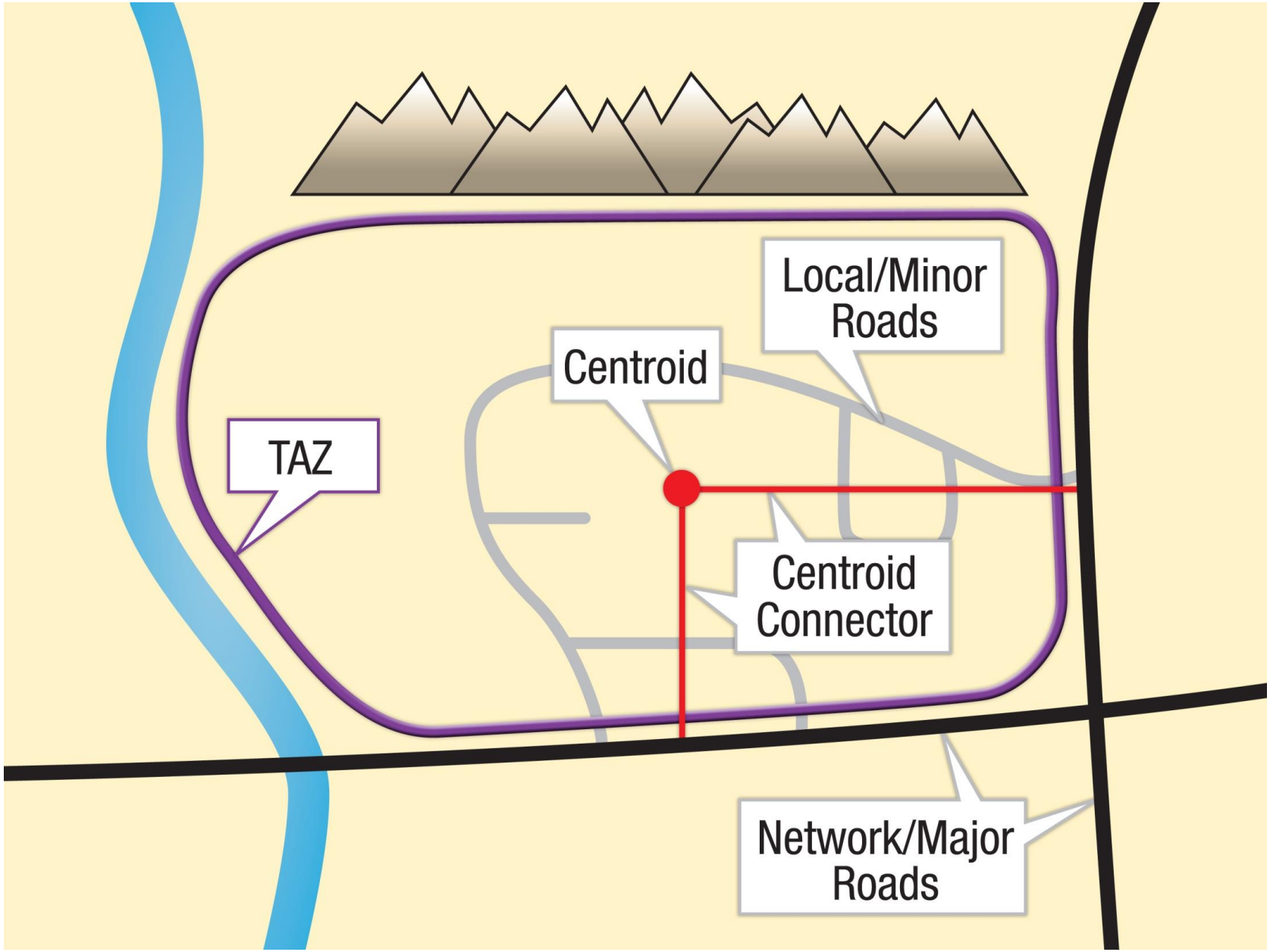
Local/Minor Roads
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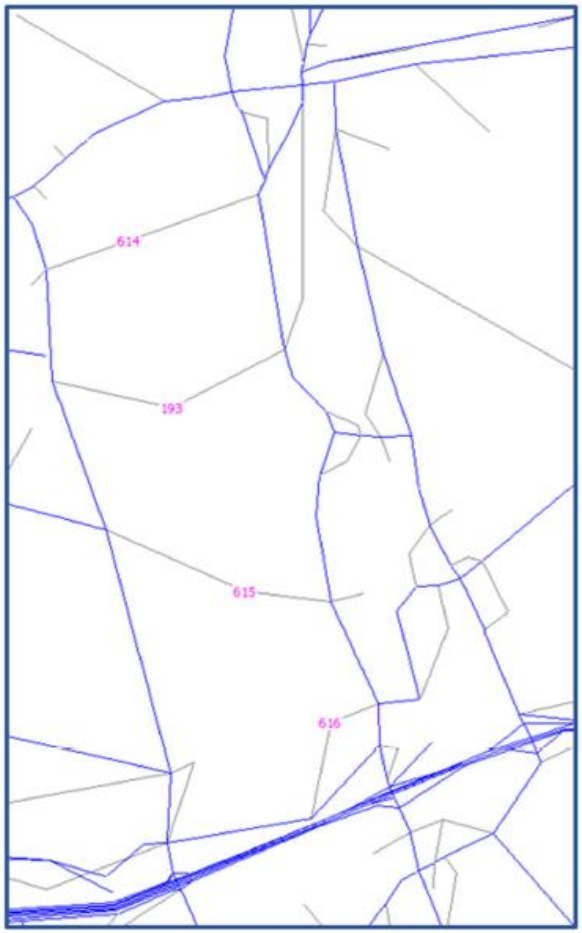
Network/Major Roads

EDCTDM Model Network Refinements

Without Modification



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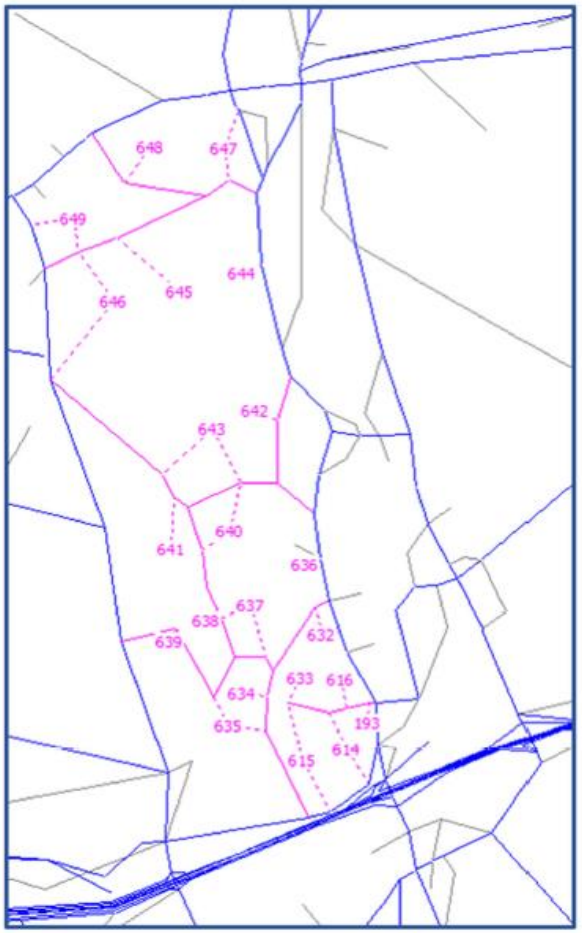

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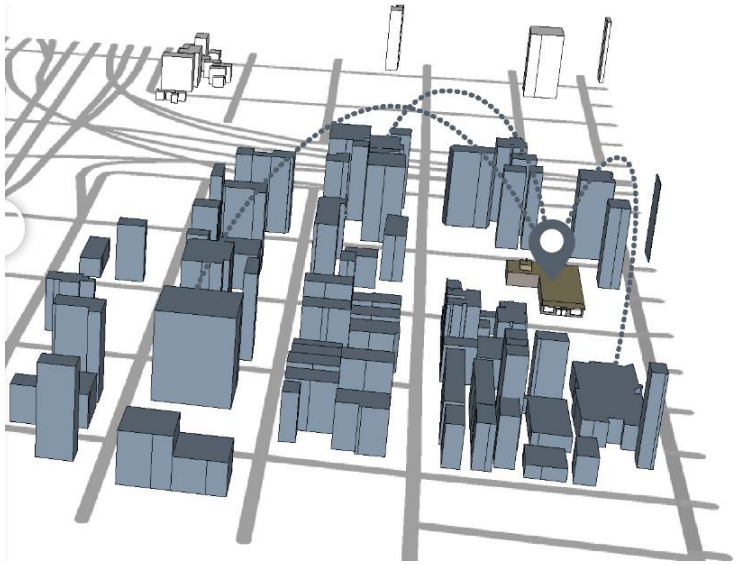

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SB 743 | METRICS & METHODOLOGIES

- **Absolute vs. Efficiency Metrics**
  - Absolute: Total VMT
  - Efficiency: Total VMT per service population
- **Project Effect vs. Project-Generated VMT**
  - Project Effect: Captures changes in existing travel patterns
  - Project Generated: Captures project traffic only
- **Qualitative Assessment**

SB 743 | POTENTIAL MITIGATION MEASURES

Provide rideshare or car-share programs

0.3 – 8.3%

Build low-stress bicycle network improvements & provide traffic calming measures

0 – 1.7%

Encourage tele-commuting & alternative work schedules

0.2 – 4.5%

Increase diversity of land use

0 – 12%

Improve pedestrian network

0.5 – 5.7%

Regional VMT Mitigation Program

Unknown

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EDC | BOARD ADOPTED THRESHOLDS

Office of Planning & Research (OPR) Technical Advisory suggested some "Screening Thresholds" for Land Use Projects, the Board of Supervisors adopted the following on October 6, 2020 with Resolution 141-2020:

- **Small Projects – projects that generate less than 100 trips/day consistent with GP Policy TC-Xe**
- **Map-based screening for Residential and Office Projects – using the El Dorado County TDM to develop screening tools**
- **Presumption of less than significant impacts near Transit Stations**
- **Presumption of less than significant impact for 100% Affordable Residential Development**

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EDC | BOARD ADOPTED THRESHOLDS

Board also adopted the following significance thresholds for land use projects:

- **a threshold 15% below the County wide average VMT/Capita for office and residential projects**
- **No net increase in total VMT for retail projects**

EDC | BOARD ADOPTED THRESHOLDS

VMT Summary by Jurisdiction – 2018 Baseline Scenario

	VMT Estimates			VMT Efficiency Metrics		
Jurisdiction	Total OD VMT	Home-based PA VMT	Home-based Work PA VMT	Total VMT per Service Population	Home-based VMT per Capita	Home-based work VMT per Employee
Unincorporated County (West Slope)	3,606,897	3,046,839	409,693	21.5	22.5	12.8
City of Placerville	297,201	69,194	89,430	20.9	10.5	11.7

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CEQA VMT Implementation Process

- Is the project consistent with the General Plan?
- Does the project meet any of the thresholds to presume a less than significant impact?
- Conduct the project analysis using the El Dorado County TDM
- Propose mitigation measures if the analysis identifies a significant impact


Questions?