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El Dorado County

From: Chris Gregerson, P.E., T.E., PTP
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Re: *Technical Memorandum #5: Future Year Model Change Summary*
El Dorado County Travel Demand Model Update

Date: March 1, 2019

The purpose of this technical memorandum is to document the Future Year 2040 model update for the El Dorado County Travel Demand Model (EDC TDM). This memorandum summarizes the methodologies applied, as well as the resultant modifications to the land use and roadway network model files. This update brought the planning horizon for the future year EDC TDM from 2035 to 2040.

Background

The first step of the EDC TDM update was to obtain the most recent future year model catalog from El Dorado County. The catalog contained both the land use files and roadway network for the future Year EDC TDM and reflected updates incorporated as part of the TIM Fee Update completed in 2016. While the TIM Fee Update process updated information within the County, no modifications were made to areas outside of El Dorado County (Buffer Area) or to the external zones. The effort documented in this memorandum involved updating the Traffic Analysis Zones (TAZs) and roadway network within the County and areas outside of El Dorado County (Buffer Area) from a planning horizon of 2035 to 2040.

Land Use Workshop – Residential Growth in the County

The initial steps for updating the land use within the County from 2035 to 2040 included reviewing available information regarding changes to land use plans that had occurred since the TIM Fee Update, identifying locations where additional growth will occur between 2035 and 2040, and establishing control totals for employment and housing both within El Dorado County and areas outside of El Dorado County (Buffer Area). Residential and student control totals were developed using an annual growth rate of 1.03% to grow 2035 land use totals to 2040. The resultant growth was distributed across each Community Region as well as the rural areas outside of the Community Region. **Table 1** summarizes the control totals for 2035 and 2040 as well as the resultant amount of growth that needed to be added by land use type to accomplish the update.

Table 1 – El Dorado County Control Totals for Households and Students

Year	Land Use Type				
	SFHH	MFHH	MHHH	COLL	K12
2035	61,499	3,095	8,491	921	29,263
2040	64,732	3,257	8,937	969	30,802
Growth to Spend	3,233	162	446	48	1,539

As part of the major update of the EDC TDM undertaken in 2012, the amount of land use growth each parcel could reasonably achieve was developed through an extensive parcel level analysis of vacant and underdeveloped areas where residential and employment could be situated. Once parcels were chosen, the land use growth was assigned to the corresponding TAZ within the model and the totals by community region were summed. These totals were reviewed by El Dorado County staff to determine the reasonableness of the growth by Community Region and for areas outside of the Community Regions.

Modifications were made such that the final single family residential growth was appropriately spread throughout the region and consistent with the goal of the El Dorado County’s General Plan that 75% of future single family residential growth occurs in community regions and 25% of future single family residential growth occurs in rural areas. 53% of the total single family residential growth was placed El Dorado Hills, 2% was placed in unincorporated Placerville, 9% was placed in Cameron Park, 9% was placed in Diamond Springs, 2% was placed in Shingle Springs, and 25% was placed in the rural areas. **Table 2** summarizes how many units of single family, multifamily (duplexes), and multifamily (apartments) were placed by community region and rural areas throughout the El Dorado County.

Table 2 – Household Growth by Community Region

Community Region	SFHH	MFHH (Duplexes)	MHHH (Apartments)
El Dorado Hills	1,710	0	214
Placerville	49	0	0
Cameron Park	292	0	0
Diamond Springs	290	0	212
Shingle Springs	73	10	20
Rural Areas	805	52	0
Total	3,219	62	446

As a last check, the amount of growth placed in the specific plan areas approved by the County (Bass Lake Hills, Carson Creek, Promontory, etc.) was compared against the number of approved units to ensure no specific plan would have more land use than was approved by the El Dorado County. In all cases, the total units in the model are less than what is approved for each specific plan.

Employment Growth in the County

To determine the amount of employment growth in El Dorado County between 2035 and 2040, first the annual employment growth between 2015 and 2035 from the previous model version was determined on an aggregate. This annual growth was multiplied by 5 years to determine the total growth needed to represent 2040 employment conditions in the County. This resulted in a determination that 3,946 jobs would be added in El Dorado County between 2035 and 2040. These jobs, accounting for businesses operating in a traditional fashion as well as those being increasingly operated out of personal homes, were then placed in the El Dorado County Market Areas (although no longer used as a primary planning tool by El Dorado County, Market Areas are the basis of how the original employment forecasts were developed). The overall goal of the employment distribution was to improve the Jobs-to-Housing ratio where possible as well as only placing employment growth in areas that show a historic pattern of supporting employment growth.

Employment growth was placed in El Dorado Hills, Cameron Park, Shingle Springs, Diamond Springs, Unincorporated Placerville, Coloma, Gold Hill, and Latrobe. As shown in **Table 3**, 49% of the employment growth was placed in El Dorado Hills, 17% in Cameron Park/Shingle Springs, 20% in Diamond Springs, 11% in Unincorporated Placerville, 2% in Coloma/Gold Hill, and 1% in Latrobe. Due to the uncertain nature of employment locations compared to residential locations, within each Community Region the employment growth was distributed to the TAZs based on the amount of household growth each TAZ was allocated between 2035 and 2040. The growth was allocated to each TAZ on an aggregate basis initially, and then each TAZ had its employment growth distributed by employment type based on the 2035 employment mix. **Table 4** summarizes the employment growth by employment type between 2015, 2035, and 2040. The employment totals were checked on a TAZ-by-TAZ basis against the 2016 employment totals developed

previously and summarized in Technical Memorandum #1¹. If any TAZ contained employment totals that were less than those found in 2016, indicating negative growth, the employment was matched with the 2016 employment. Employment was then reduced elsewhere in the market area to maintain control totals.

Table 3 – Employment Growth by Market Area

Market Area	Employment Growth (Total)	Employment Growth (%)
El Dorado Hills	1,946	49%
Cameron Park/ Shingle Springs	664	17%
Diamond Springs	787	20%
Unincorporated Placerville	427	11%
Coloma/Gold Hill	97	2%
Latrobe	25	1%
Total	3,946	100%

Table 4 – Employment Growth by Employment Type

Year	Employment Type				
	Retail	Office	Medical	Education	Manufacturing- Other
2015	18,384	12,889	4,192	3,443	5,495
2035	25,044	19,526	5,906	4,017	6,662
2040	26,529	20,932	6,191	4,198	7,251
Growth (2035 - 2040)	1,485	1,406	285	181	589

El Dorado County Roadway Network Update

The future year EDC TDM roadway network was updated based on a list of network modifications provided by the County. Those modifications include:

- Bass Lake Road was widened from two to four lanes between Serrano Parkway and US-50
- Cameron Park Drive was widened to four lanes between Sudbury Road and Palmer Drive
- White Rock was reduced from six to four lanes between Latrobe Road and US-50
- US-50 Auxiliary Lanes were added and removed consistent with the 2018 Traffic Impact Mitigation Fee update. The US-50 auxiliary lanes that are not included in the base year model are:
 - Eastbound, from the County Line to Latrobe Road
 - Eastbound, from Bass Lake Road to Ponderosa Road
 - Westbound, from Ponderosa Road to Cambridge Road
 - Westbound, from Bass Lake Road to Silva Valley Parkway
 - Westbound, from El Dorado Hills Boulevard to the El Dorado County Line
- Green Valley Road was reduced from four lanes to two lanes from just east of Silva Valley Parkway to Deer Valley Road. It is now only four lanes between the El Dorado County Line to just east of Silva Valley Parkway
- Country Club Drive was added between El Dorado Hills Boulevard to Tong Road
- Missouri Flat Road was widened from two to four lanes from Diamond Springs Parkway to SR 49

¹ Technical Memorandum #1: Base Year Model Change Summary. Kimley-Horn. August 3, 2018.

- Wilson Way was added
- Windfield Way was added consistent with the base year model
- Carson Crossing Road was added consistent with the base year model
- Centroid connectors were modified consistent with the base year model

Buffer Area

The part of the EDC TDM outside of El Dorado County in Sacramento County is known as the Buffer Area. This area is included in the model due to the large number of trips that cross the El Dorado County line every day and have a large impact on traffic operations within El Dorado County. This area was last updated based on the Sacramento Area Council of Governments (SACOG) SACMET model. This model is no longer maintained by SACOG and it now uses an activity-based model known as SACSIM. SACSIM’s future year model is based on 2036. However, as a part of developing a future year model for the Capital SouthEast Connector based on SACSIM and land use forecasts for the buffer area, a modified 2036 and 2054 model scenarios were developed. Given that SACOG is currently in the process of updating SACSIM from 2036 to 2040, the model developed for the Capital SouthEast Connector was determined to be the best available data source for the buffer area.

To develop control totals for the number of households, employees, and students contained in the Buffer Area for 2040, the Capital SouthEast Connector model was used exclusively. The yearly growth rate for the was calculated between the 2012 SACSIM model and 2036 Capital SouthEast Connector model, and then multiplied by four to represent the growth from 2036 to 2040. This four-year growth was added to the 2036 totals for housing, employment and students to obtain 2040 control totals. The 2040 control totals for households, employment, and students are summarized below in **Table 5**.

Table 5 – Buffer Area 2040 Control Totals for Households, Employment and Students

Control Total Year	Housing	Employment	K12 Students	University Students
2040	107,126	185,855	50,573	3,544

Buffer Area Land Use Update

Once the control totals were calculated, the following steps were undertaken to update the Buffer Area land use in the EDC TDM from 2035 to 2040:

1. Selecting the TAZs in SACSIM that represent the TAZs in the Buffer Area of the El Dorado County Model
2. Summarizing the land use in SACSIM for these TAZs by households, students, and employment
3. Interpolating directly between 2036 and 2054 to obtain households, students and employment to obtain 2040 SACSIM totals
4. Checking to ensure that the 2040 SACSIM values were not lower than 2012 SACSIM values due to interpolation calculations and ensuring that there was no negative growth in any TAZ
5. Factoring each TAZ by land use type (households, students, and employment) using control totals.
 - a. Each land use type was summed for its 2040 Buffer Area estimate
 - b. The estimate was divided by the control total get obtain an estimate to control total factor
 - c. This factor was then multiplied by the estimate for each TAZ’s land use
6. The factored estimates for each TAZ were then totaled and compared to the 2040 control total to check for consistency

7. SACSIM does not differentiate between household types (single family vs multifamily) and so the distribution of new housing was completed based on the 2035 distribution of housing among the three housing types
8. SACSIM also contains different employment categories than the EDC TDM includes. The employment types contained within SACSIM include education, food, retail, service, office, government, other, service, industrial, and medical. The five employment types contained in the EDC TDM include retail and non-retail where non-retail is broken out into four categories including office, education, medical, and manufacturing-other. In order to convert the SACSIM employment types to comparable categories for the El Dorado County model, food and retail employment from SACSIM were included in the retail employment for El Dorado County; office and government employment from SACSIM were included in the office employment for El Dorado County; service, other, and industrial employment from SACSIM were included in the manufacturing-other employment for El Dorado County, while medical and education employment from SACSIM were included in their respective categories within the El Dorado County employment.

Buffer Area Roadway Network Update

The roadway network in the Buffer Area was also updated from 2035 to 2040 based on the 2036 SACSIM model scenario. The projects added include:

- The Capital SouthEast Connector (White Rock Road and Grant Line Road) was coded according to the most up to date information regarding speeds, number of lanes, and classification
- The Latrobe Connector was reduced from four to two lanes
- Auxiliary lanes between the County Line and Empire Ranch Road were made consistent with the County's TIM Fee update described previously