



Traffic Impact Fee Studies for Interchanges and Developments with CUBE

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Key Discussion Topics



- ▼ Background
- ▼ Modeling Approaches with CUBE
- ▼ Useful Tools
- ▼ Examples
- ▼ Conclusions



▼ Current Problems

- Development fees
- Interchange fees
- Fee distributions among jurisdictions

▼ Trip Computation

- Computations based on the future volumes
- Computations based on incremental volumes

▼ Practical Examples

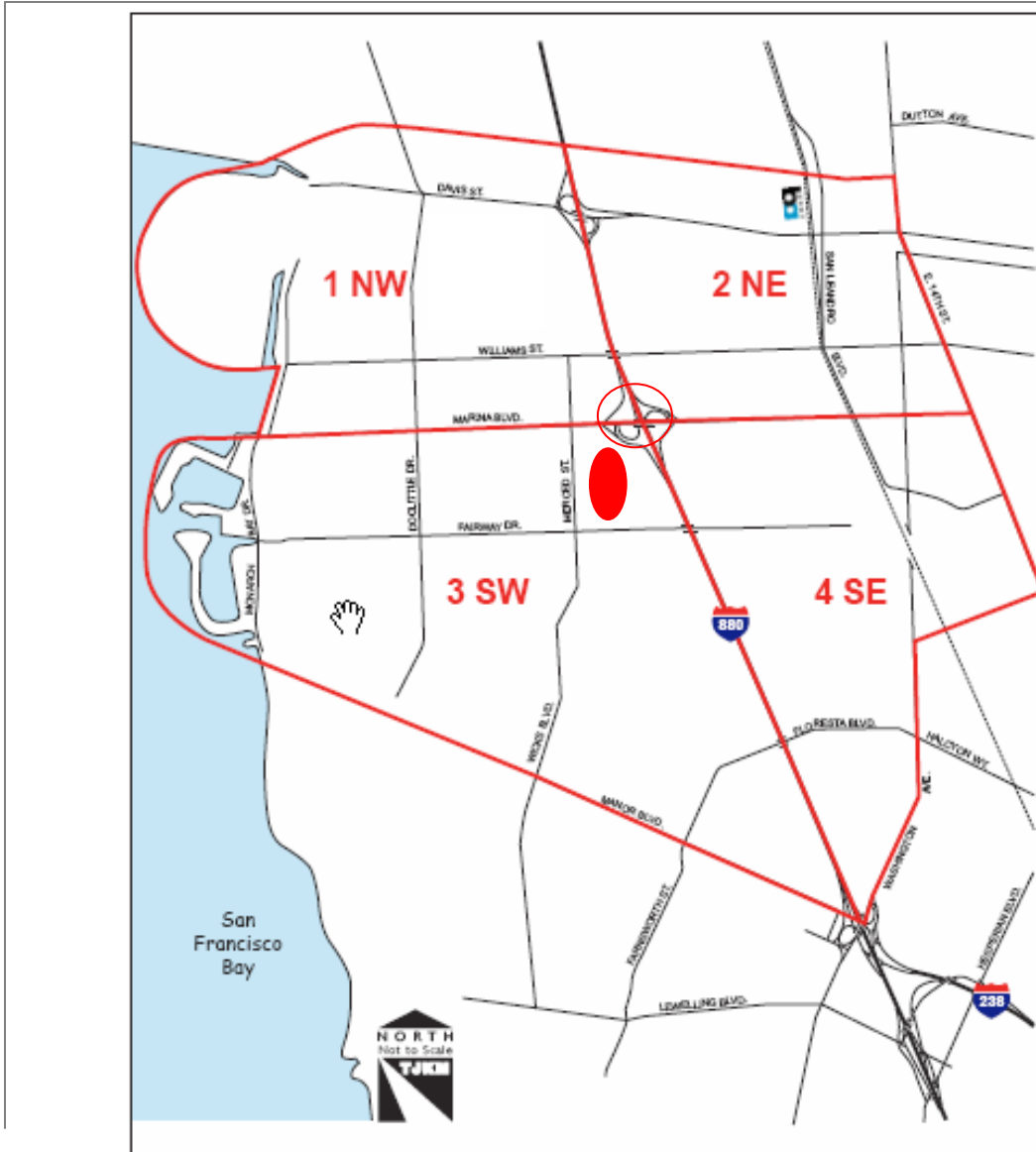
- San Joaquin County
- Alameda County
- Santa Clara County

Methodology



- ▼ Work with the staff leadership and the development community
- ▼ Develop a project traffic model
- ▼ Determine development area sites
- ▼ Determine project sites
- ▼ Determine ITE based trips
- ▼ Determine costs of these projects
- ▼ Determine cost allocation by area and project
- ▼ Calculate traffic impact fees and
- ▼ Prepare report

Project Area and Influential Areas



Method One for An Interchange



- ▼ Determine the a.m. and p.m. hour trips (A) that will share the interchange cost.
- ▼ Determine a unit cost (C) of an a.m. and p.m. peak hour trip. This is the total cost (B) of the interchange divided by A, that is, $C=B/A$.
- ▼ Compute the total trips that use the interchange and are generated and attracted to these quadrants and two developments, $D(i)$ ($i=1,2,3,4,5,6$).
- ▼ Compute the fair share of the cost for each one:
 $E(i)=B*D(i)/A$.
- ▼ Apply the unit cost C to obtain various unit costs for different land use categories .

CUBE Modeling Components

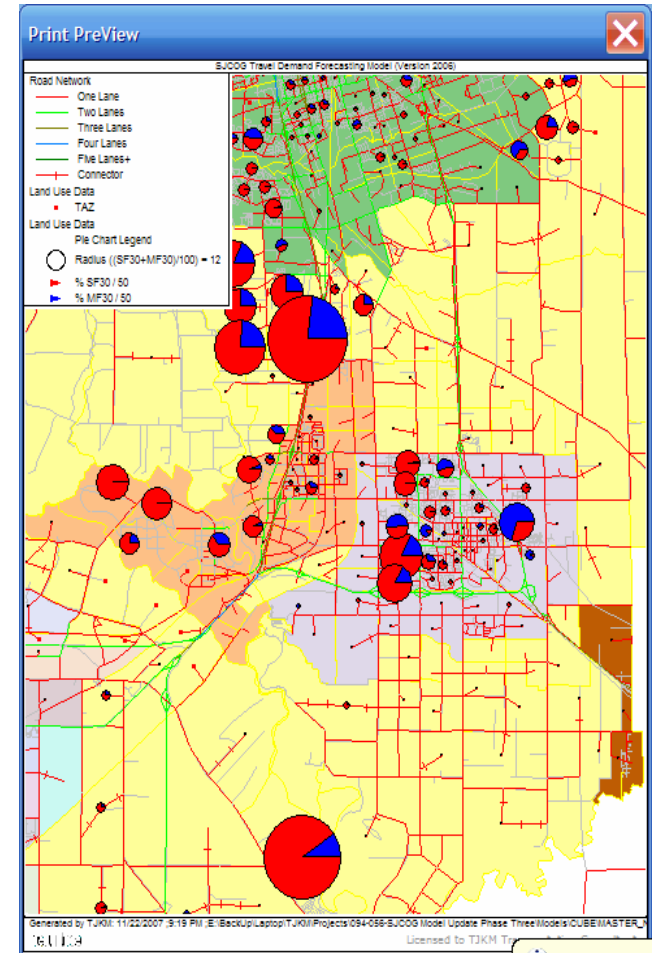
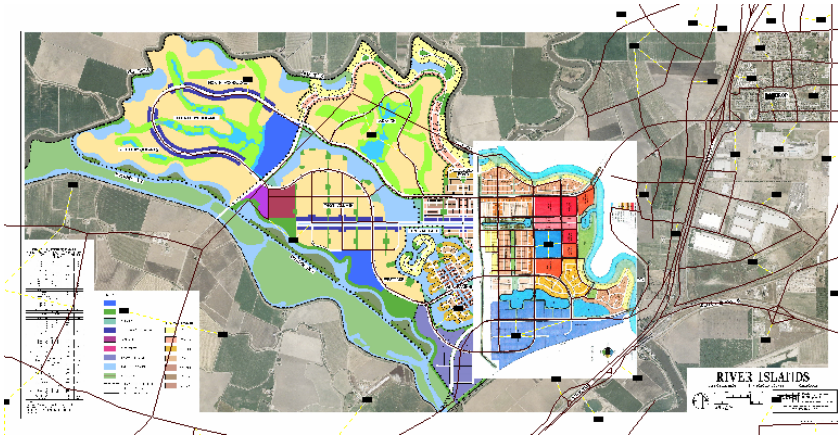


- ▼ Multi-class assignments with Selectlinkgp command tool
 - DA, S2, S3, Trucks
 - Demands by developments
 - Demands by project sites
- ▼ Matrix computations
- ▼ Frata method
- ▼ Loops
- ▼ Output list

Land Use Data Preparations



- Model land use data
- Project land use data

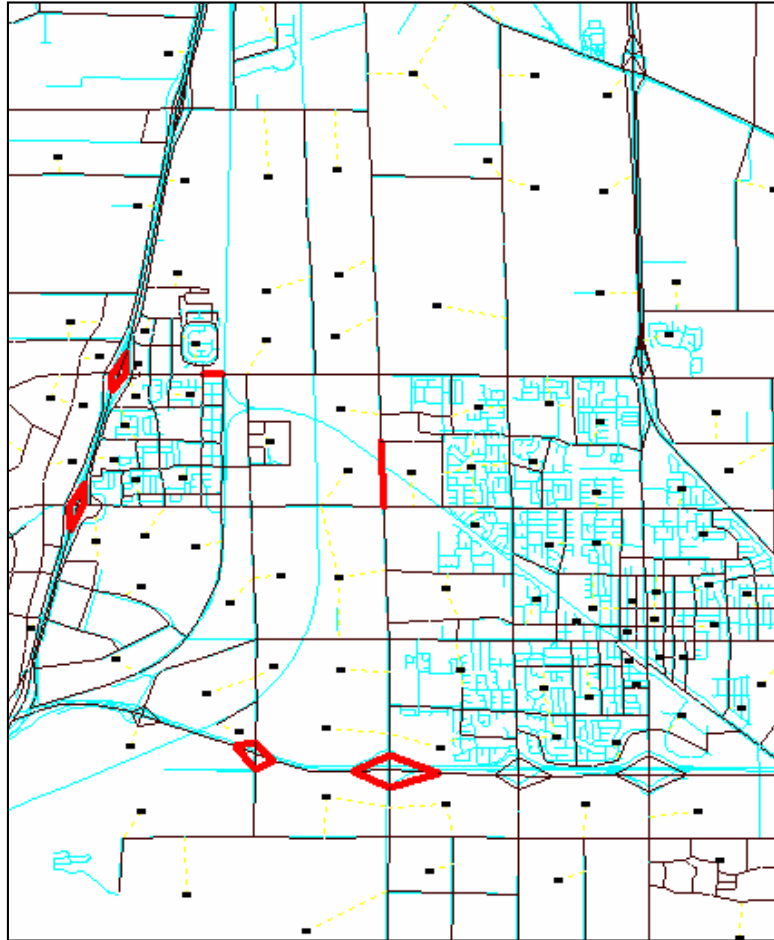


Land Use Data

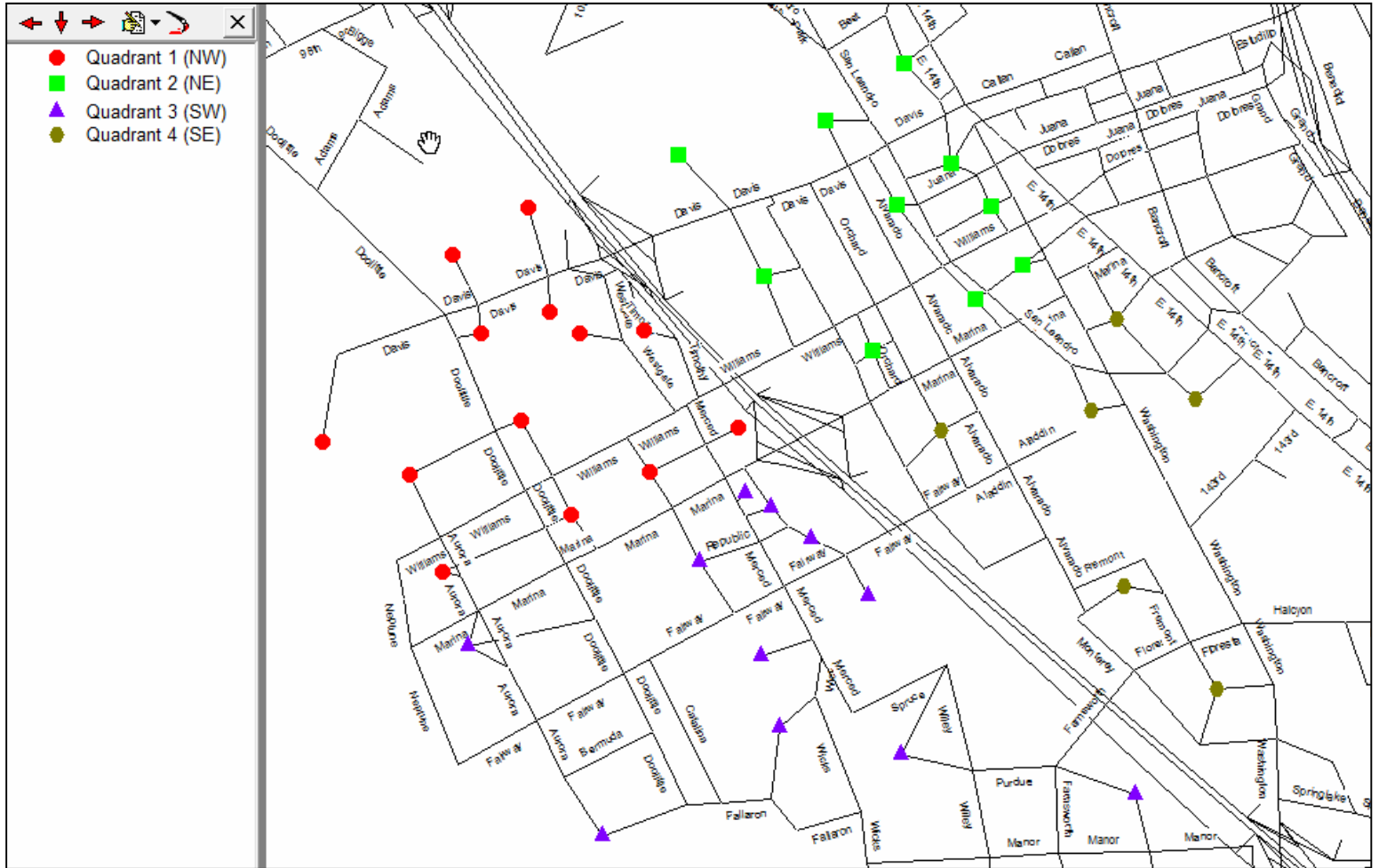


Name	Description	2005	2010	2015	2030	Growth	Annual Rate
TOTHH	Total House Units	31638	32202	36316	38647	1.22	0.86%
HHPOP	Household Population	81918	83316	93013	98859	1.21	0.85%
TOTPOP	Total Population	82832	84257	93998	99841	1.21	0.85%
EMPRES	Employed Residents	39258	41009	49410	55274	1.41	1.50%
SFHH	Single Family Households	21147	21428	22592	23829	1.13	0.55%
MFHH	Multi Family Households	10487	10778	13724	14818	1.41	1.52%
TEMP	Total Employment	43495	45872	49832	62846	1.44	1.60%
RETEMP	Retail Employment	7121	7496	8126	10393	1.46	1.65%
SEREMP	Service Employment	9228	10042	11401	15579	1.69	2.29%
OTHEMP	Other Employment	11620	12150	13027	16912	1.46	1.65%
AGEMP	Agriculture Employment	113	113	114	151	1.34	1.27%
MANEMP	Manufacture Employment	8665	9043	9663	11365	1.31	1.21%
WHOEMP	Wholesale Employment	6729	7020	7501	8446	1.26	1.00%

Modeling Network Coding



Four Quadrants in Cube



Two Project Locations



Trip Generations



<i>Phase</i>	<i>TAZ</i>	<i>DP</i>	<i>Daily</i>	<i>A.M. Peak</i>			<i>P.M. Peak</i>			<i>Total</i>
				<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>	
Two	1405	ICI Total	18,298	283	253	536	799	820	1,619	2,155
	1406	Kaiser Total	34,272	1,599	460	2,059	920	1,795	2,715	4,774
		Total	52,570	1,882	713	2,595	1,719	2,615	4,334	6,929

Results: Cost Shares



<i>Using Interchange</i>		<i>Quadrants: Total Trips</i>				<i>Projects: Total Trips</i>		<i>All Quadrants</i>	<i>All Projects</i>
		<i>1 (NW)</i>	<i>2 (NE)</i>	<i>3 (SW)</i>	<i>4 (SE)</i>	<i>ICI</i>	<i>KP</i>		
Total Trips	14,814	1,922	2,208	6,387	1,329	1,398	2,334	11,846	3,732
Percents	100.00%	12.97%	14.90%	43.12%	8.97%	9.44%	15.75%	79.96%	25.19%
Total Cost	\$27,000,000								
Cost/Trip (2030)	\$1,823								
Cost Share		\$3,502,809	\$4,023,942	\$11,641,970	\$2,421,575	\$2,547,593	\$4,253,249	\$21,590,296	\$6,800,843

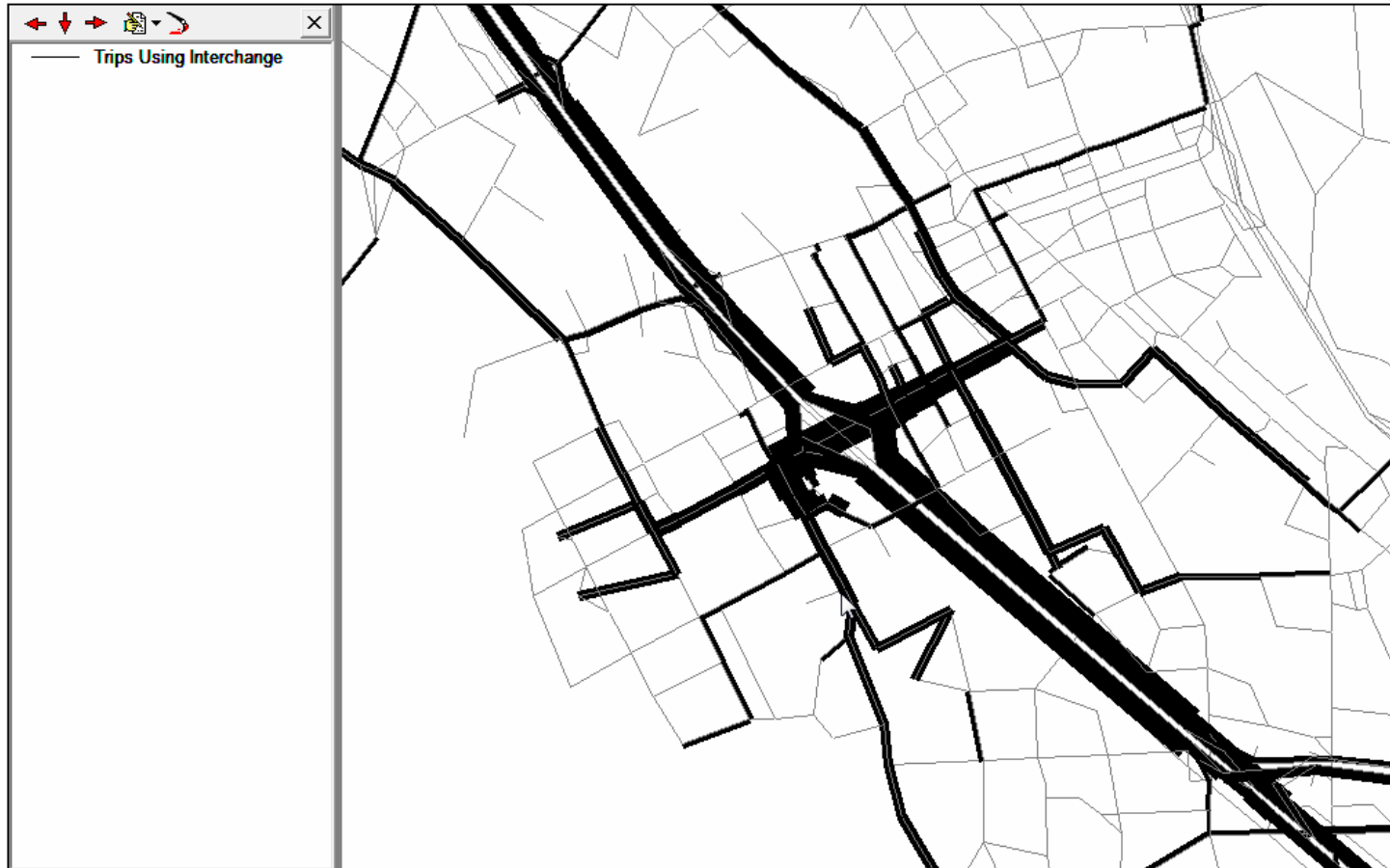
Initial Unit Cost Computation



	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>	<i>ksf</i>	<i>ksf</i>	<i>ksf</i>	<i>ksf</i>	<i>ksf</i>	<i>Room</i>	<i>Room</i>	<i>ksf</i>	<i>Position</i>
<i>Item</i>	<i>Single Family Detached</i>	<i>Apartment</i>	<i>Senior Adult Housing- Detached Housing</i>	<i>General Office Building</i>	<i>Medical-Dental Office</i>	<i>General Retail Shopping Center</i>	<i>Personal Service Specialty Retail Center</i>	<i>Financial Service Walk-in Bank</i>	<i>Motel</i>	<i>Hotel</i>	<i>Warehouse</i>	<i>Service Station Gas Station</i>
ITE Code	210	220	251	710	720	820	814	911	320	310	150	944
ITE Trip Rate: a.m.	0.75	0.51	0.22	1.55	0.53	1.00	6.84	21.49	0.64	0.67	0.30	12.16
ITE Trip Rate: p.m.	1.01	0.62	0.27	1.49	1.06	3.73	2.71	12.13	0.58	0.70	0.32	13.87
Combined ITE Trip Rate	1.76	1.13	0.49	3.04	1.59	4.73	9.55	33.62	1.22	1.37	0.62	26.03
Cost/Unit (SL)	\$3,208	\$2,060	\$893	\$5,541	\$2,898	\$8,621	\$17,406	\$61,278	\$2,224	\$2,497	\$1,130	\$47,444

The cost/unit numbers may need to be refined based on local conditions.

Traffic Volumes Using the Interchange



Conclusions



- ▼ Determine the methodologies
- ▼ Compute the fair shares