

# San Joaquin Valley Goods Movement Study – Phase III

*presented to*  
**Council of Fresno County Governments**

*presented by*  
**Cambridge Systematics, Inc.**

**September, 2007**  
**Fresno, California**

**Transportation leadership you can trust.**

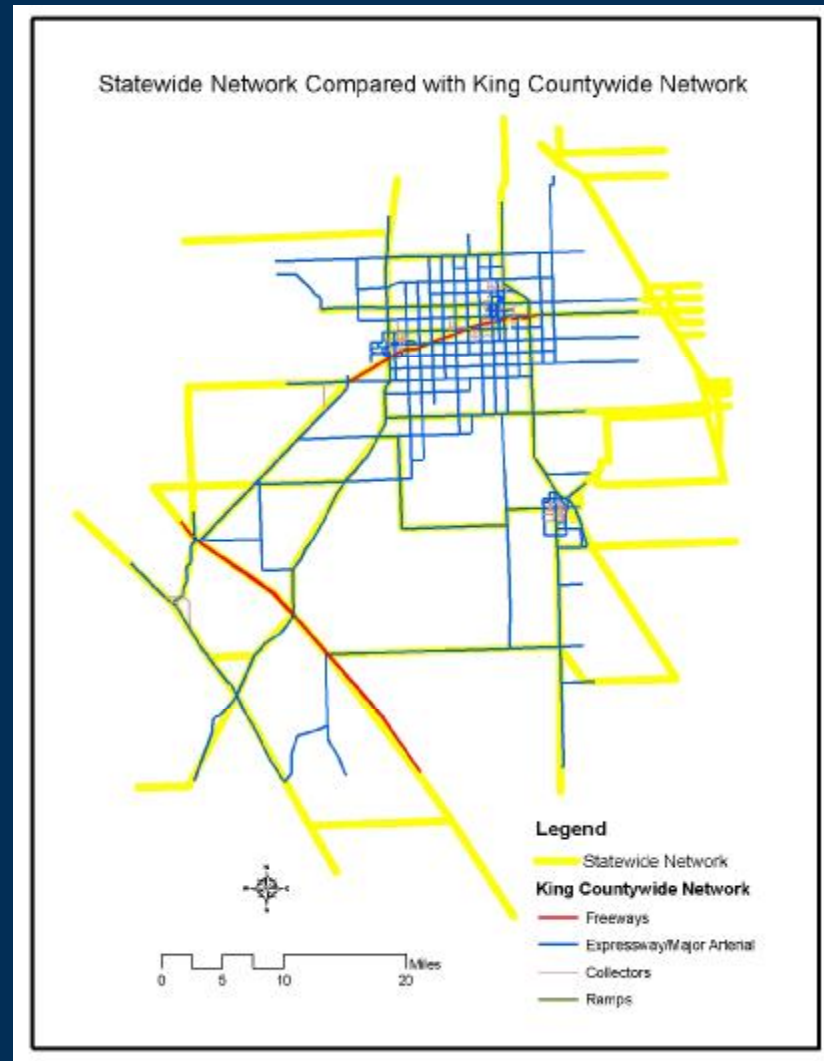
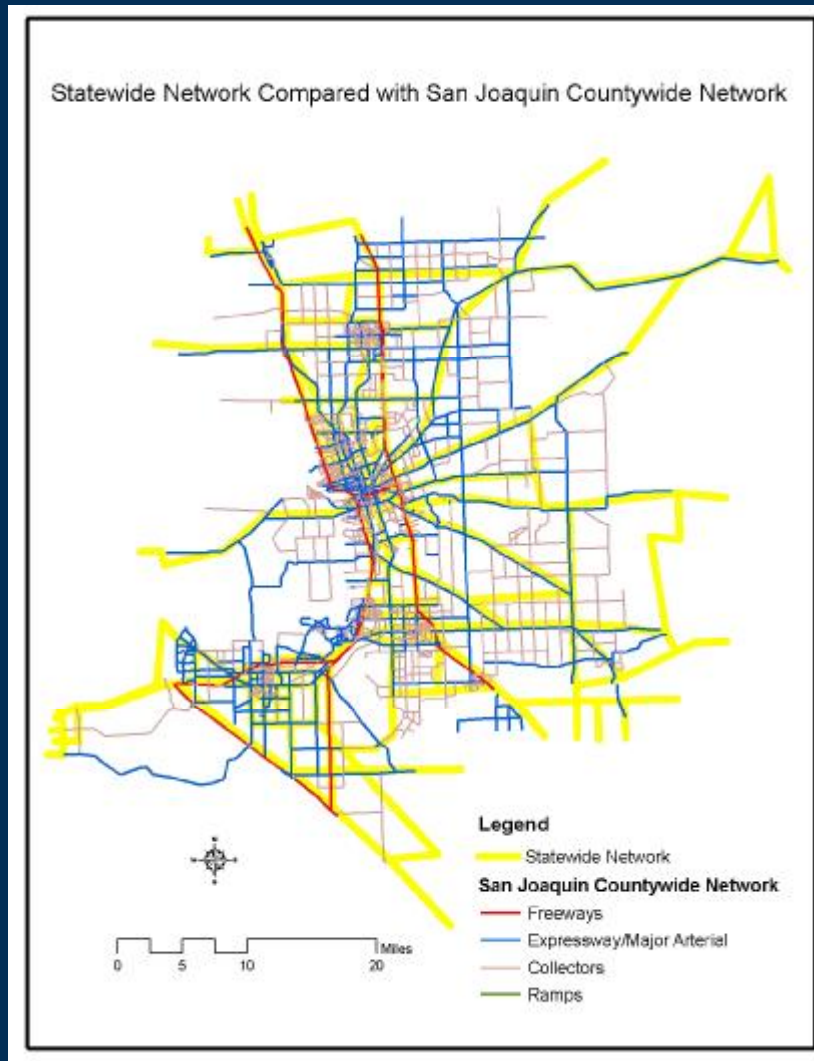
**CAMBRIDGE**  
**SYSTEMATICS**

# Outline

- **Enhance the 2000 Truck Model**
  - Highway Networks
  - Socio-economic Data
  - Truck Counts
- **Update Model Components**
  - Refine ITMS Trip Table
  - Update Non-ITMS Trip Table
  - Trip Distribution
- **2000 Model Validation**
- **2030 Forecasts**

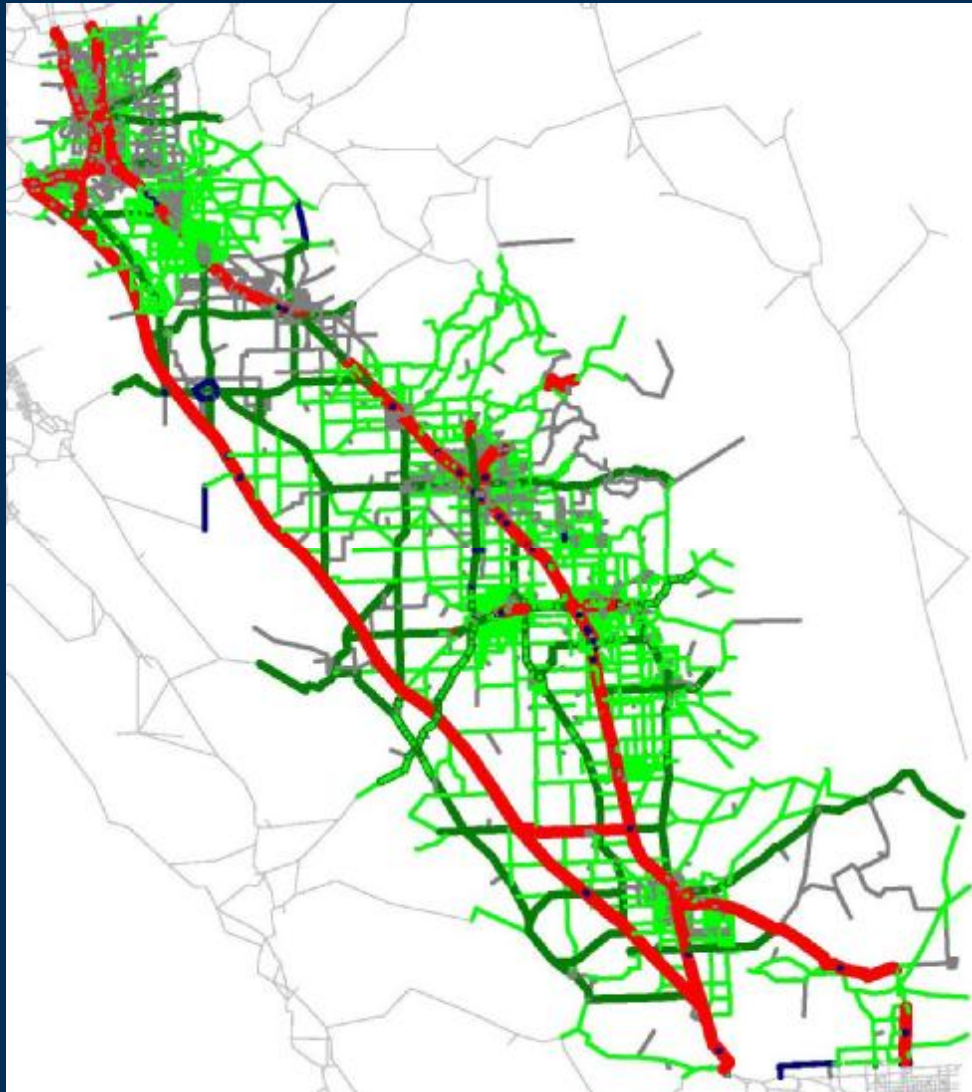
# Task 2

## Base Year Model Update – Highway Network



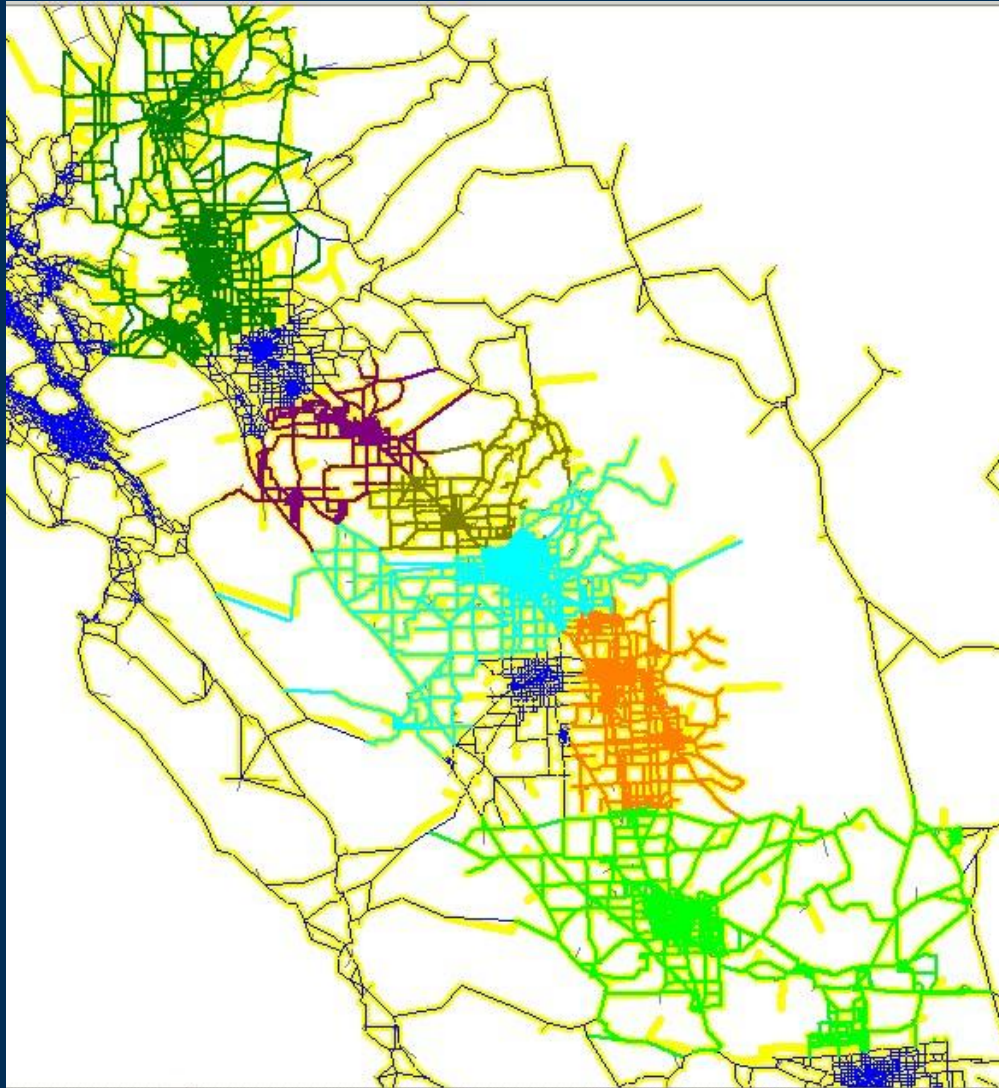
# Task 2

## Base Year Model Update – Highway Network - Existing

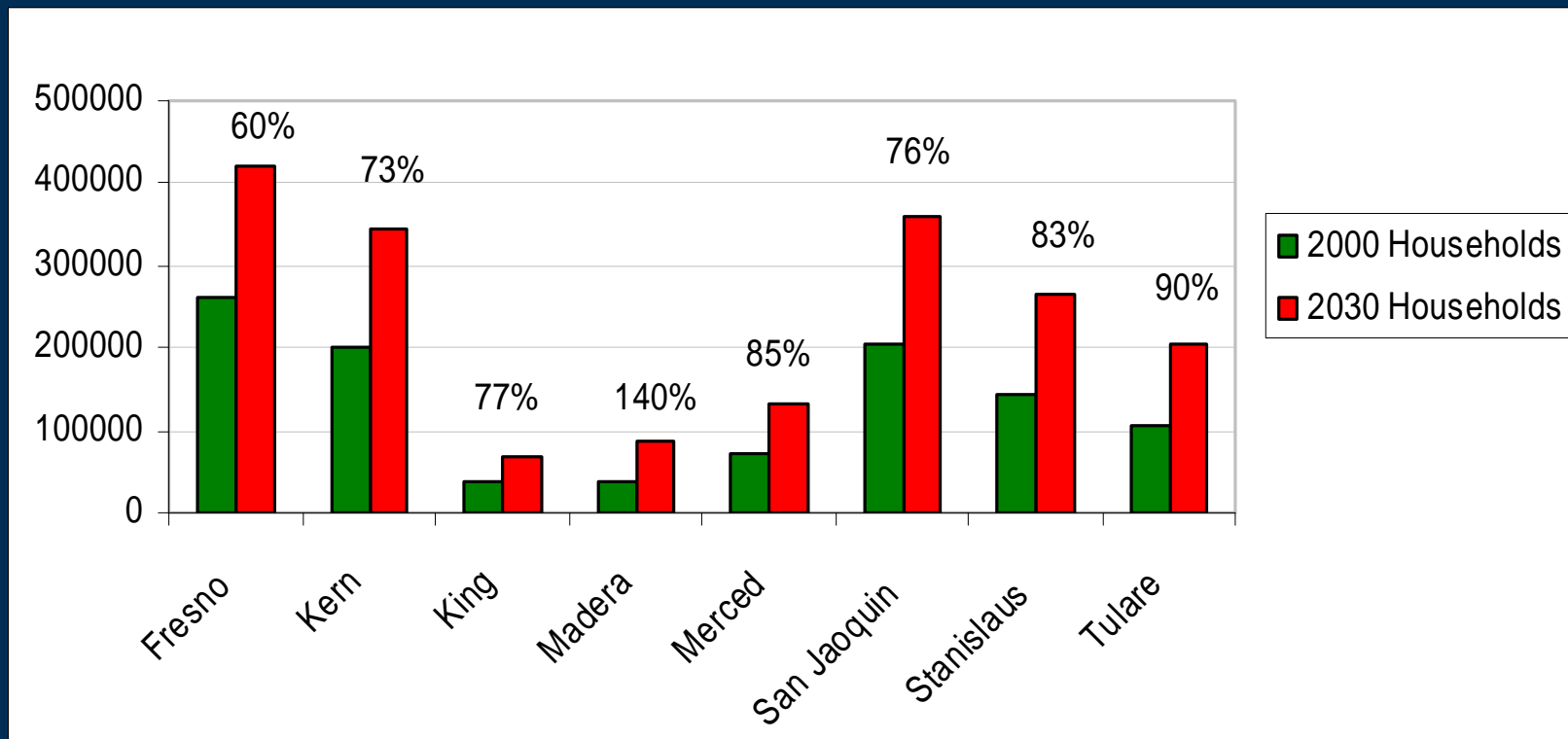


# Task 2

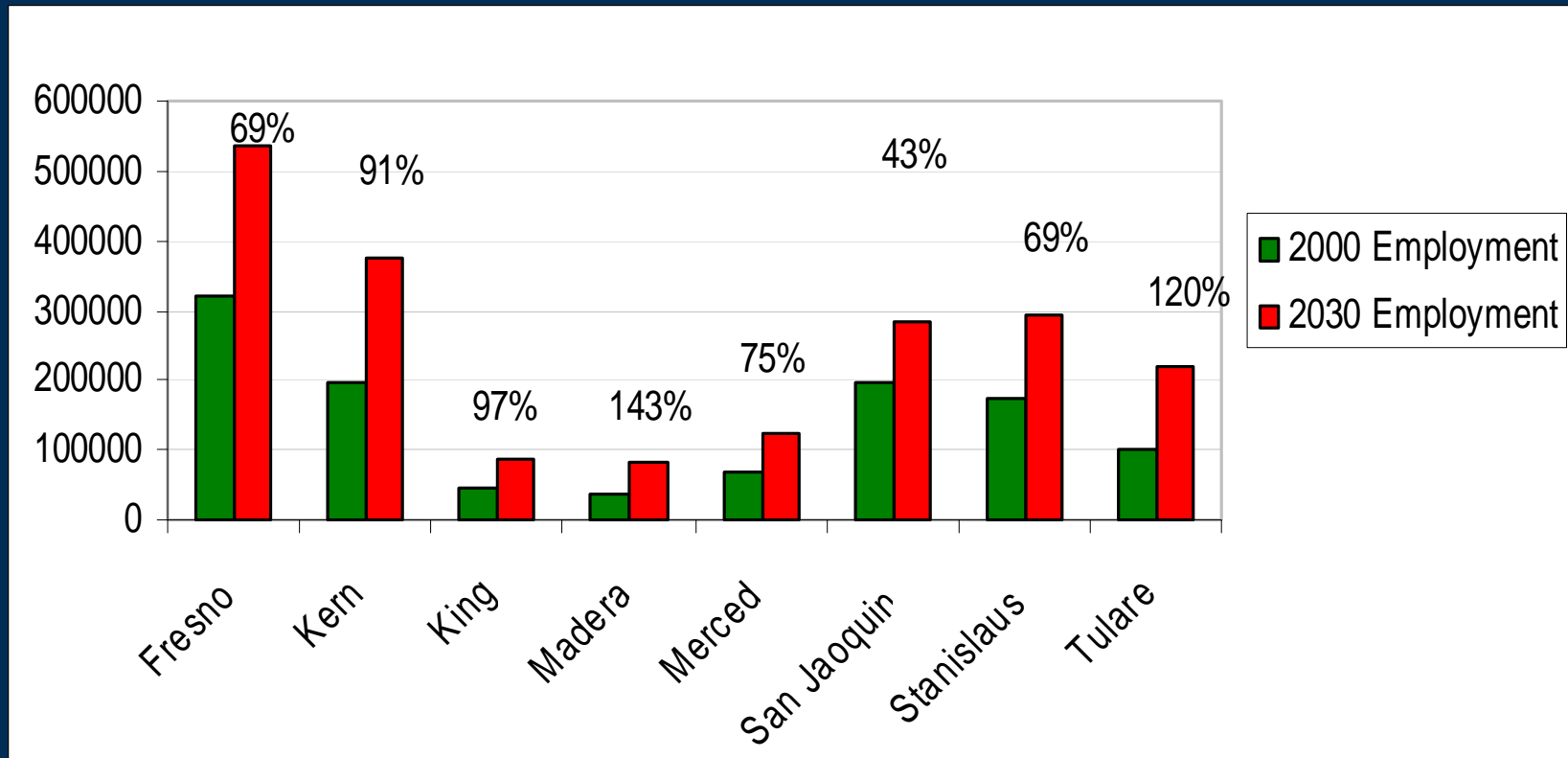
## 2030 Highway Network



# Household Data by County



# Employment Data by County



# Trip Generation for Short Haul Trips Productions

Employment Category	Production Rates		Data	Production Trips	
	Medium	Heavy	Data	Medium	Heavy
Agriculture	0.0045	0.0491	139,861	629	6,863
Mining	0.0045	0.0706	4,642	21	328
Construction	0.0051	0.0178	72,910	368	1,294
Manuf- products	0.0043	0.0552	70,216	305	3,875
Manuf- equipment	0.0043	0.0198	51,218	222	1,012
TCU	0.0105	0.0223	139,250	1,466	3,105
Wholesale	0.0129	0.0277	66,979	865	1,857
Retail trade	0.0083	0.0096	183,366	1,520	1,761
FIRES	0.0022	0.0009	362,084	796	330
Edu-Gov	0.0015	0.0014	147,252	221	208
Households	0.0018	0.0006	1,076,998	1,952	692
<b>Total</b>				<b>8,366</b>	<b>21,327</b>

# Trip Generation for Short Haul Trips Consumptions

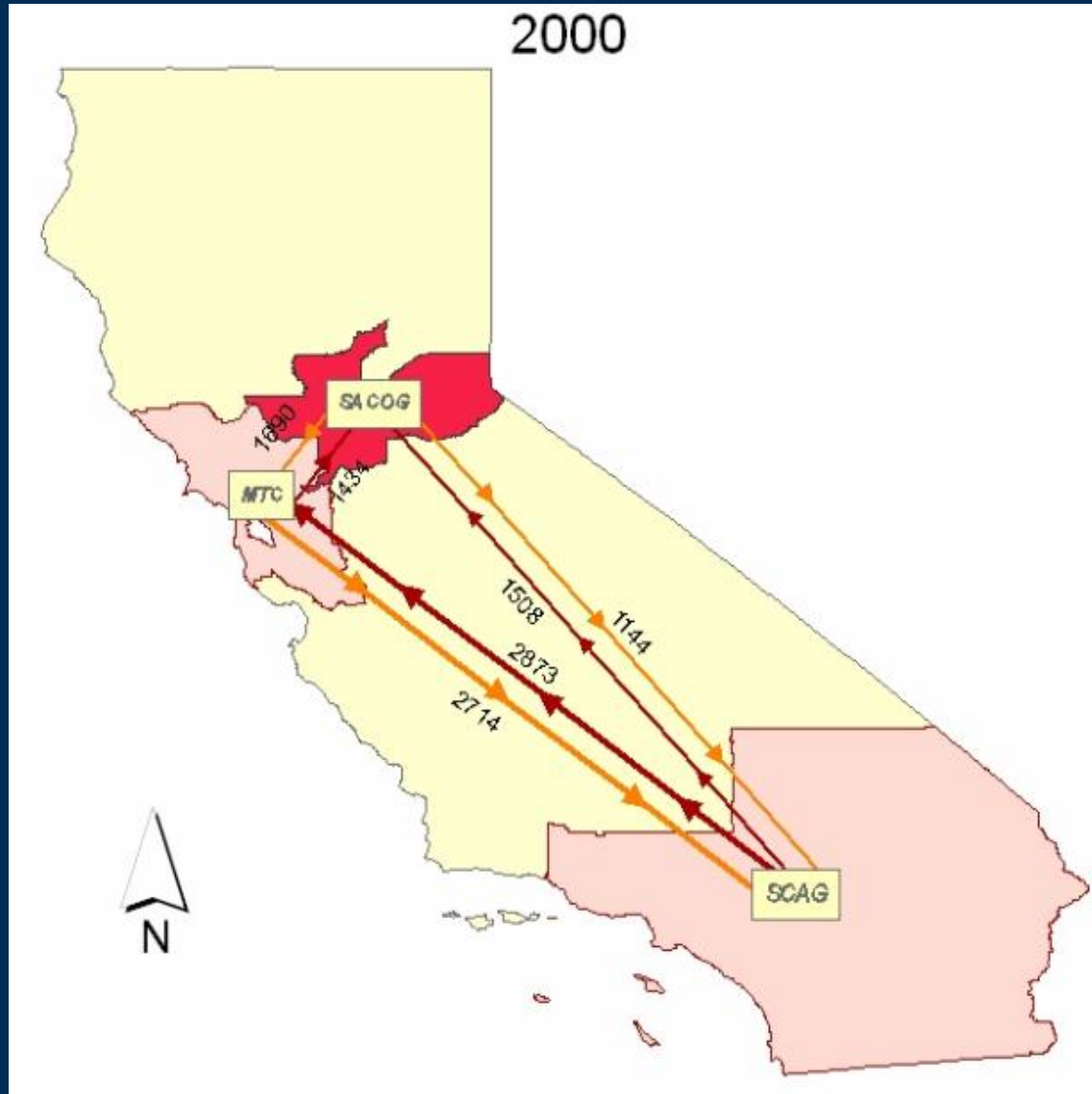
Employment / Data Category	Consumptions Rates		Data	Consumptions Trips	
	Medium	Heavy	Data	Medium	Heavy
Agriculture	0.0022	0.0126	139,861	307	1,766
Mining	0.0115	0.061	4,642	53	283
Construction	0.0072	0.0209	72,910	523	1,525
Manuf- products	0.0078	0.0401	70,216	551	2,814
Manuf- equipment	0.0078	0.0401	51,218	402	2,053
TCU	0.0077	0.0209	139,250	1,074	2,905
Wholesale	0.0025	0.0059	66,979	171	396
Retail trade	0.0008	0.0018	183,366	147	324
FIRES	0.0021	0.0048	362,084	752	1,745
Edu-Gov	0.0011	0.0038	147,252	157	566
Households	0.0042	0.007	1,076,998	4,511	7,555
<b>Total</b>				<b>8,648</b>	<b>21,932</b>

# Trip Generation for Long Haul Trips

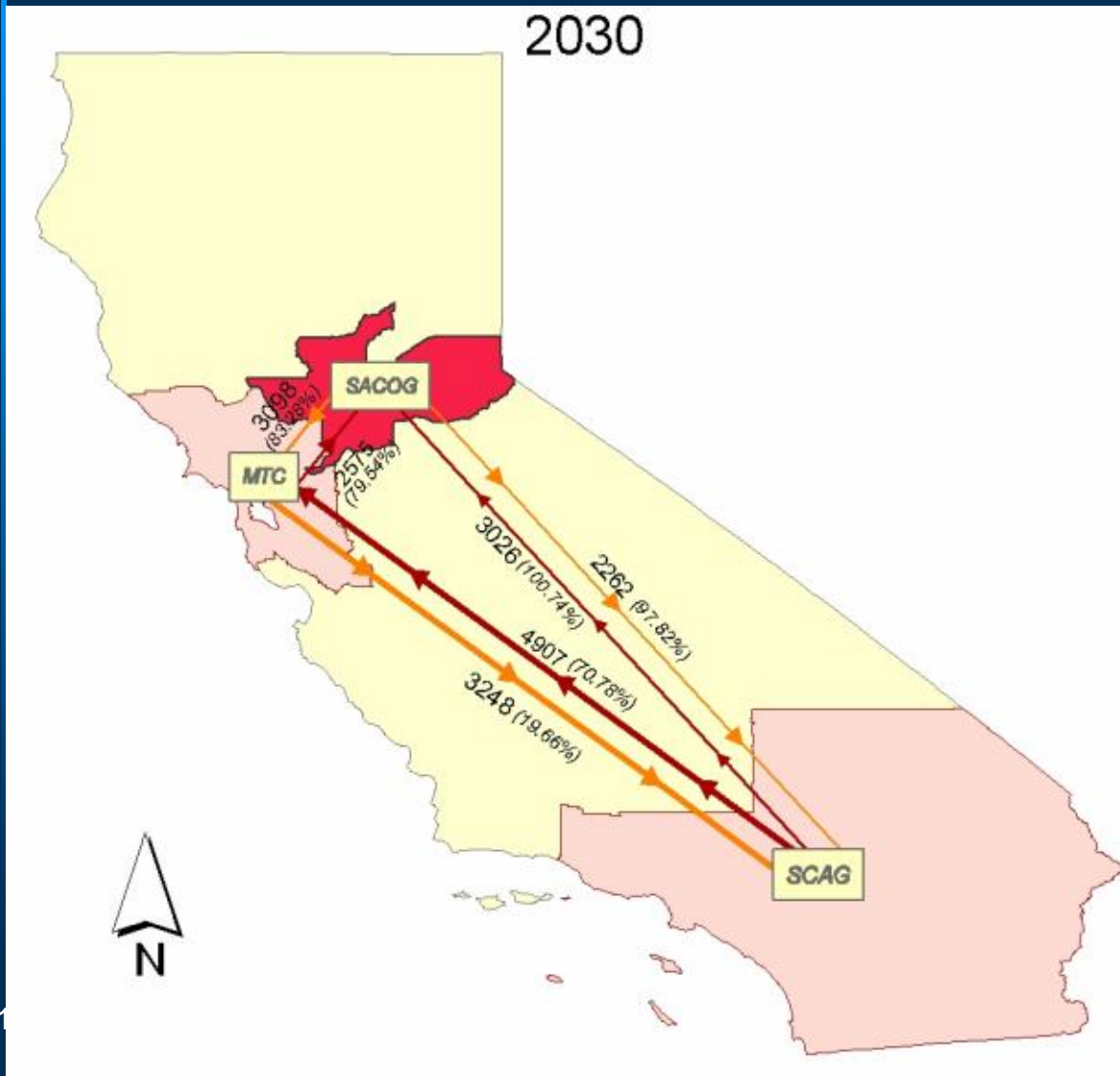
Employment / Data Category	Inbound		Outbound		Total
	Medium	Heavy	Medium	Heavy	
Agriculture	2,133	9,544	1,509	6,933	20,118
Mining	1,129	13,634	303	4,002	19,068
Manufacturing - Products	743	6,393	1,325	11,490	19,951
Manufacturing - Equipment	120	322	248	627	1,317
Wholesale	720	3,623	766	3,892	9,002
<b>Total</b>	<b>4,845</b>	<b>33,515</b>	<b>4,150</b>	<b>26,945</b>	<b>69,456</b>

Note: These trips do not include I-E, E-I and E-E Trips

# Base year (2000) and Future (2030) Through Trips



# Base year (2000) and Future (2030) Through Trips



# Task 3 Recap

## Update Model Component – ITMS Trip Generation

- **Objective:** Validate ITMS commodity flows based on comparisons with standard freight and economic data sources, and arrive at base year (2000) ITMS commodity flows
- **Process:**
  - **Selection of Standard Data Sources:** FAF 2002 (FAF2), IMPLAN, and County Agricultural Commissioners Reports (for farm products)
  - The validation process followed a triangulation approach, based on simultaneous comparisons of ITMS, FAF2, and IMPLAN.
  - **Commodity Groups:** The comparisons were performed individually for each STCC commodity group, in order to achieve a high level of accuracy in the validation
  - **Farm Products:** Additional validation step was performed by comparing ITMS flows with county farm product outputs provided by County Agricultural Commissioners reports

# Task 5 (Subtask 5.3)

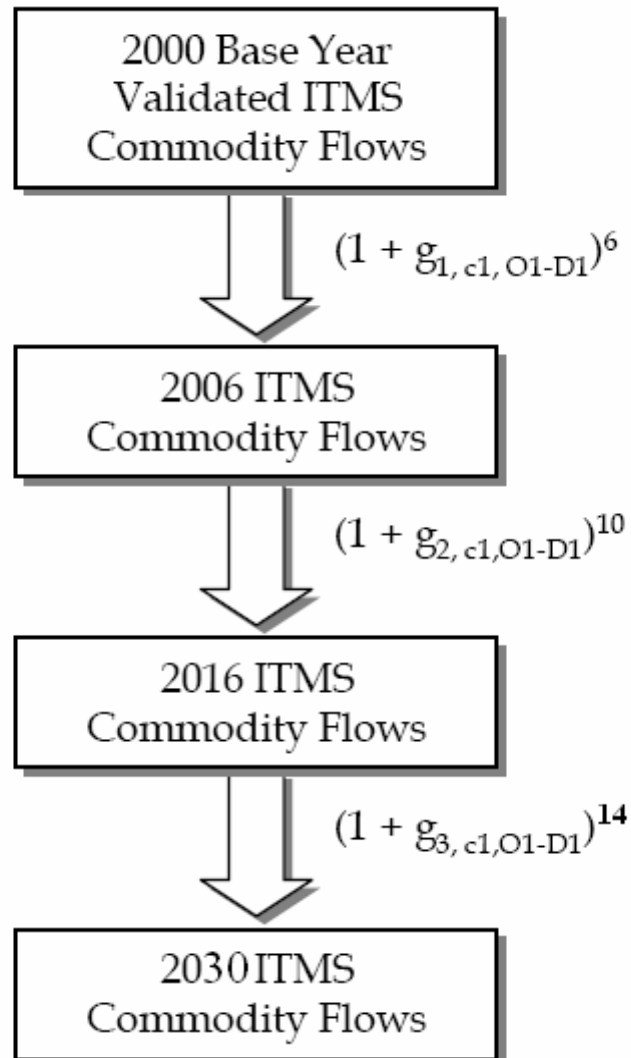
## Prepare Year 2030 Commodity Flow Data

- **Objective: Develop accurate estimates of 2030 commodity flows based on the following considerations:**
  - Ensuring an accurate base year (2000) commodity flow database to start with; and
  - Applying representative growth factors to arrive at 2030 commodity flows that are specific to O-D and commodity pairs, and reflective of future economic trends in the region
- **Procedure:**
  - Calculate growth rates from the ITMS database based on available forecasts
  - Compare these growth rates with growth rates from the FAF2 commodity flow database
  - Identify inconsistencies in ITMS growth rates and adjust accordingly, to arrive at growth rates by time period (2000-2006, 2006-2016, 2016-2030).

# Task 5 (Subtask 5.3)

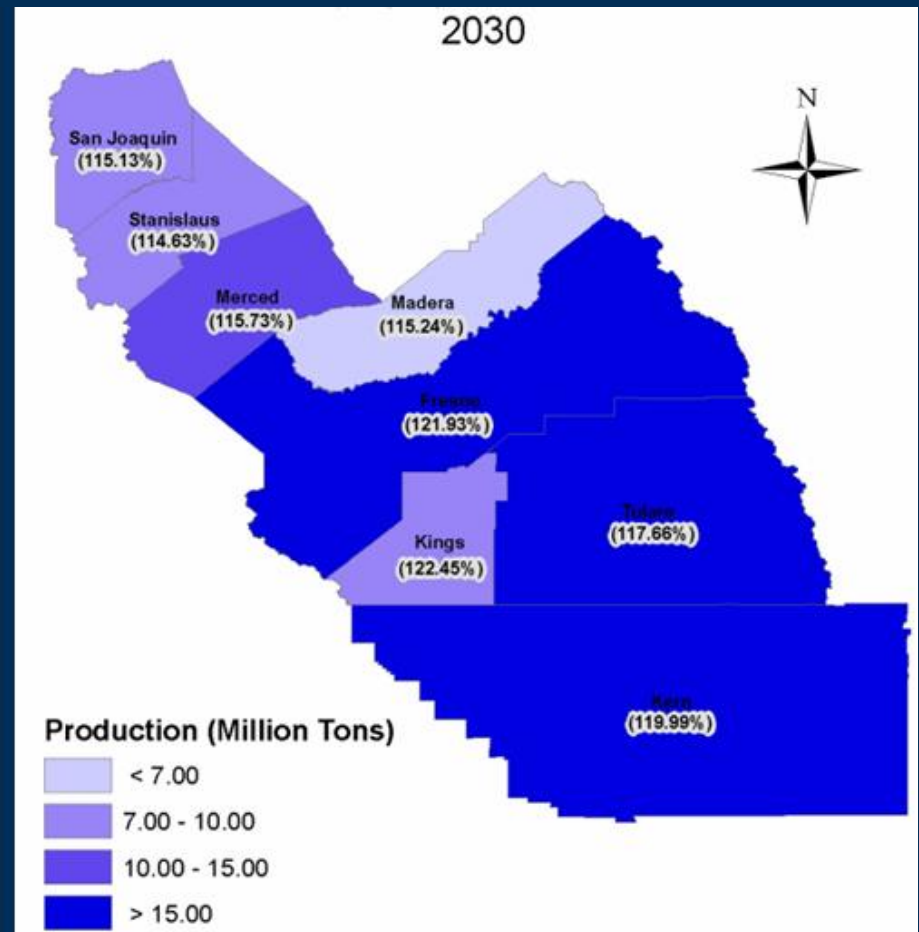
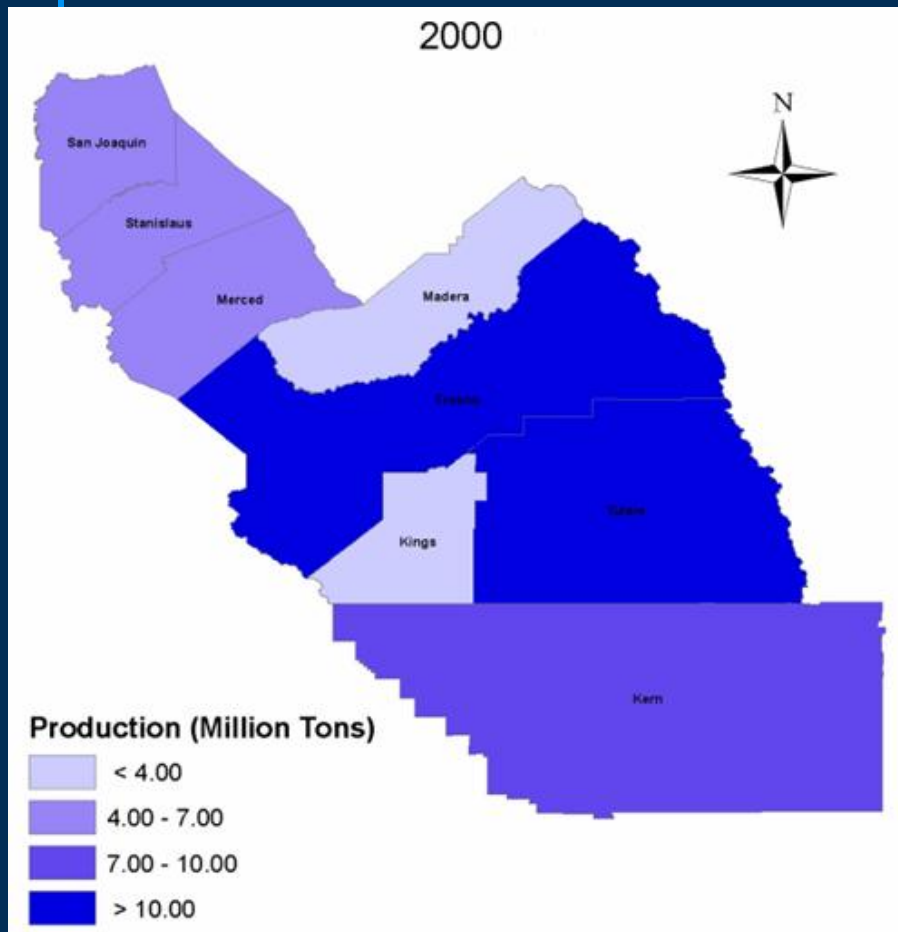
## Prepare Year 2030 Commodity Flow Data

### Commodity Flow Data Forecasting Process



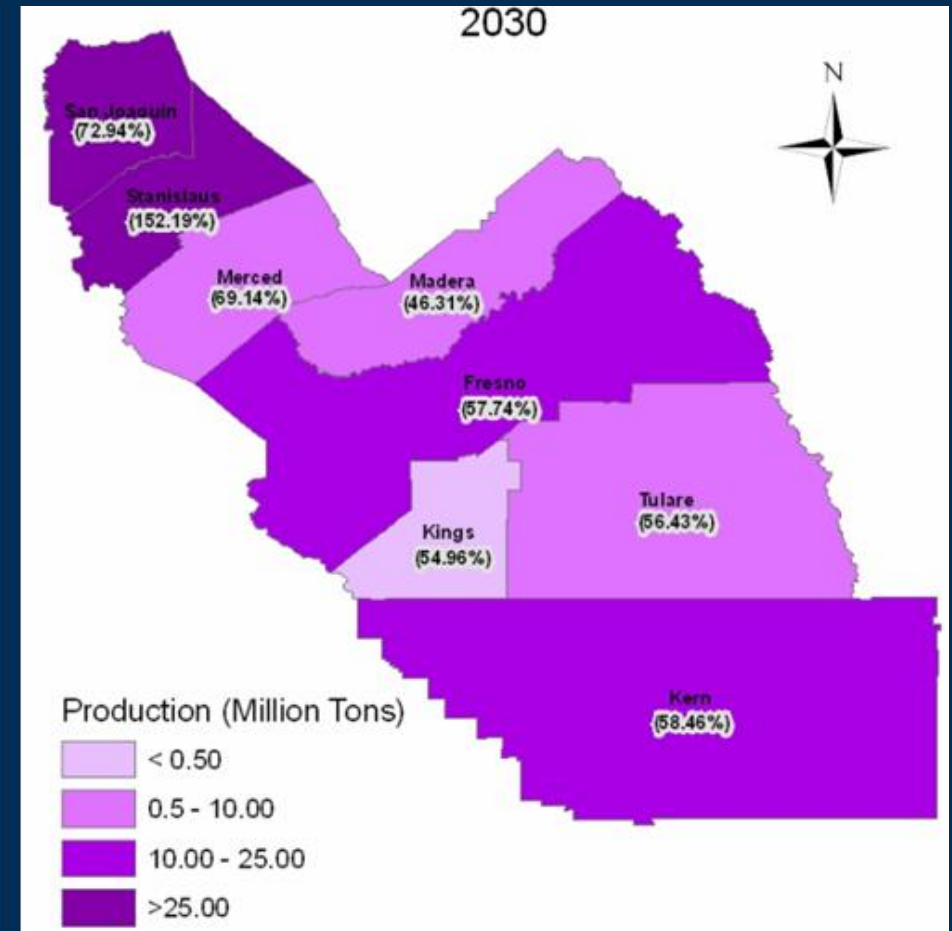
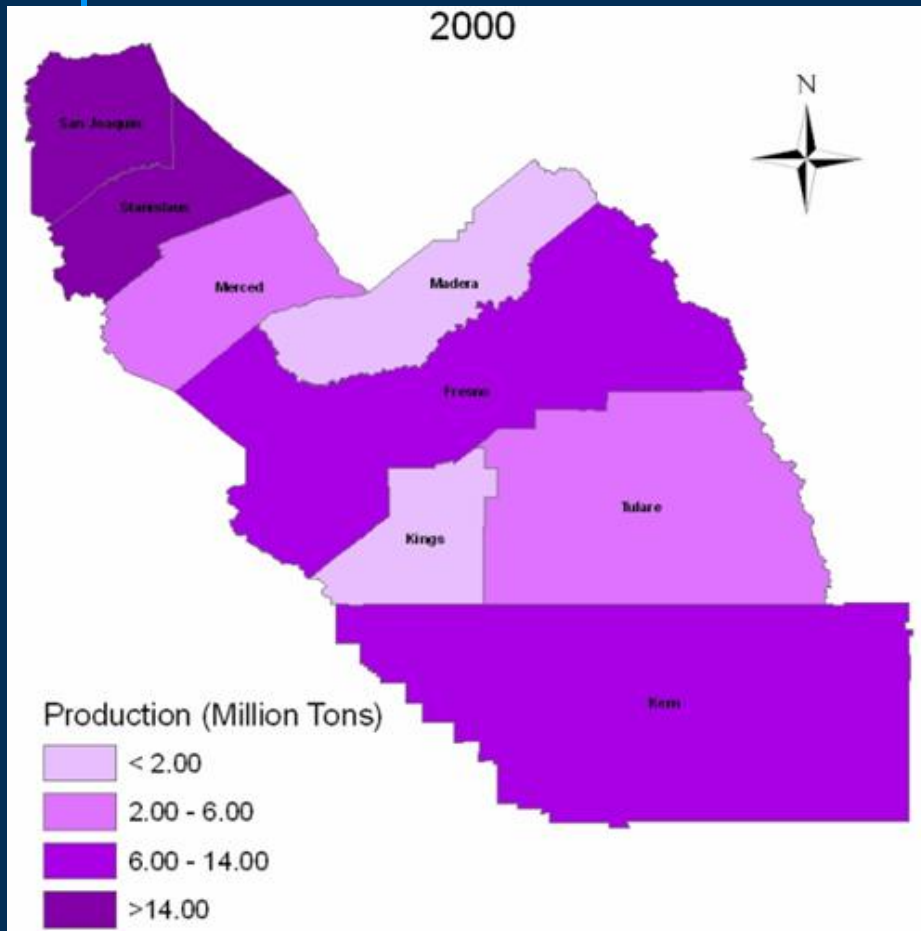
# Task 3 and Task 5 Results

## ITMS County Productions – Agricultural Products



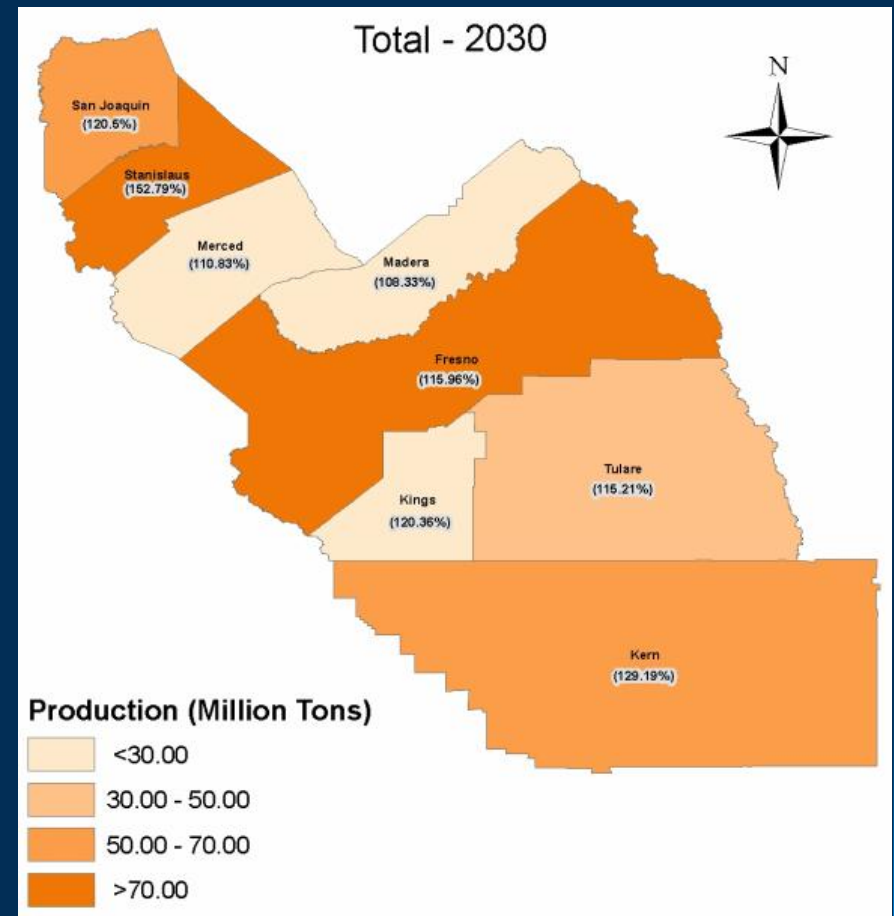
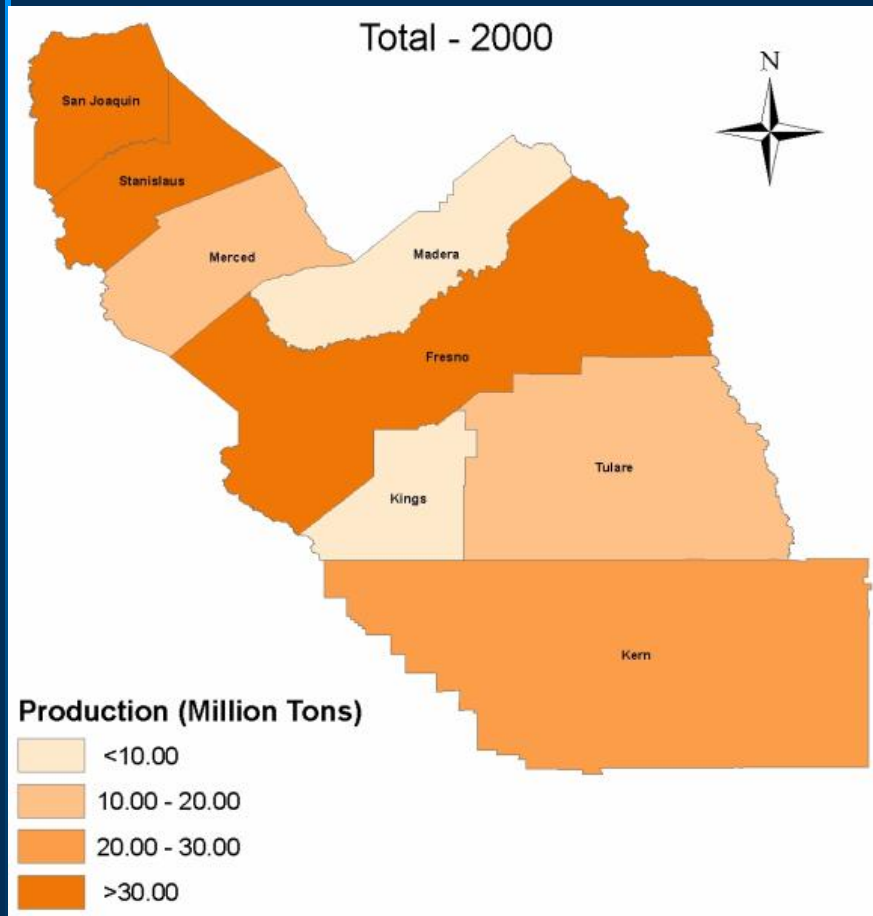
# Task 3 and Task 5 Results

## ITMS County Productions – Mining Products



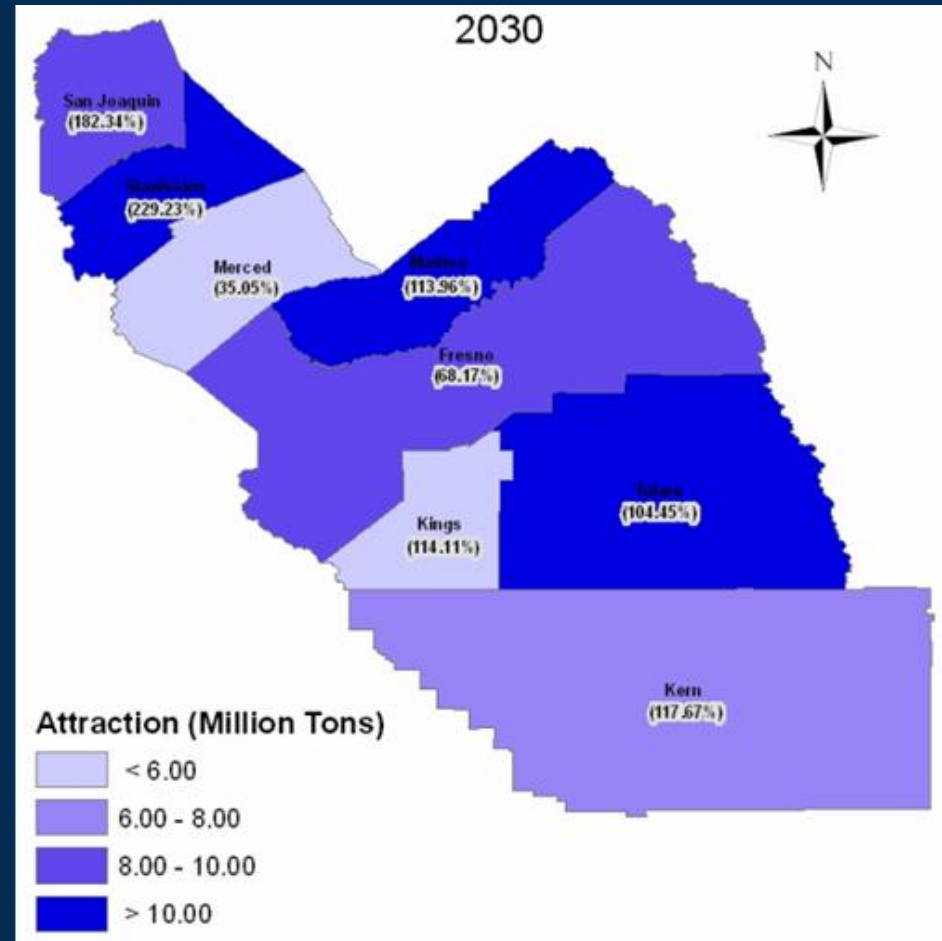
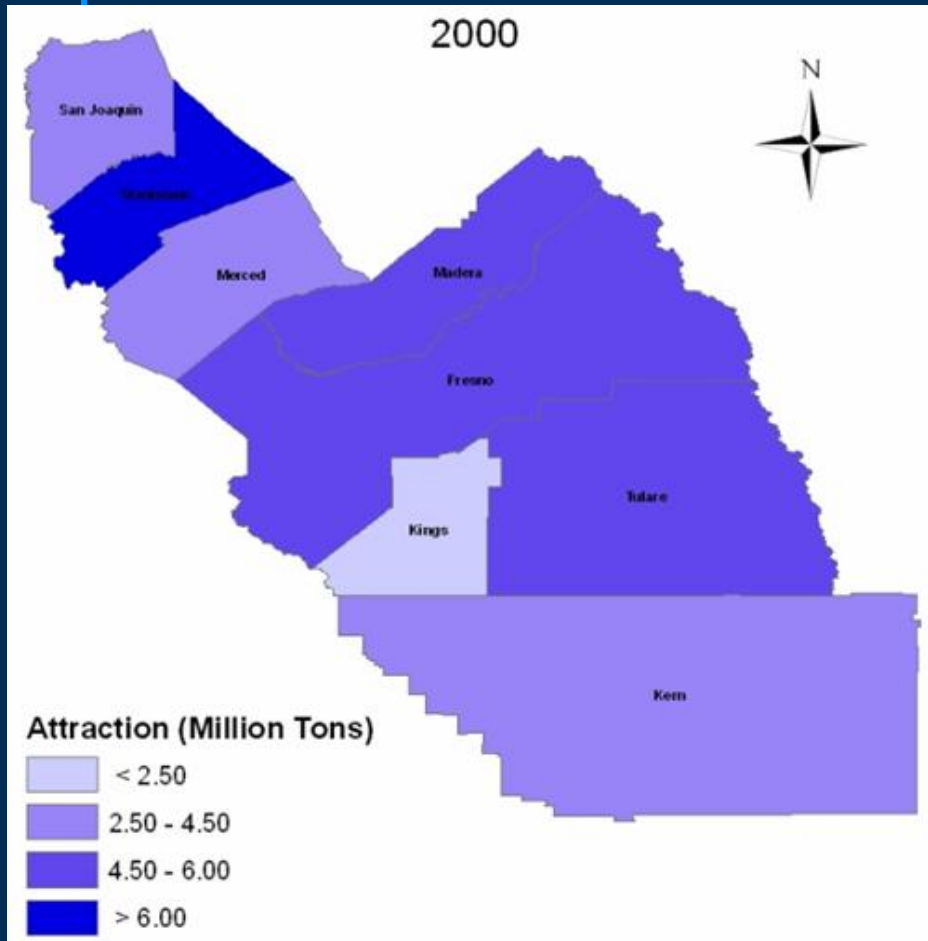
# Task 3 and Task 5 Results

## ITMS County Productions – Total



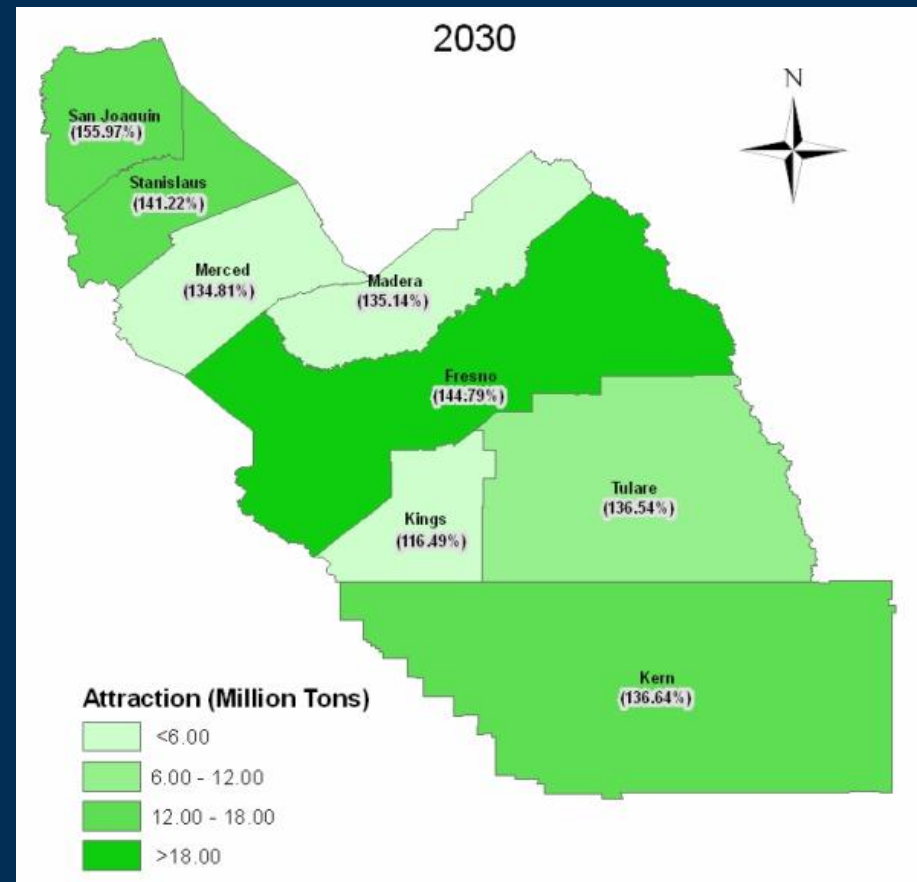
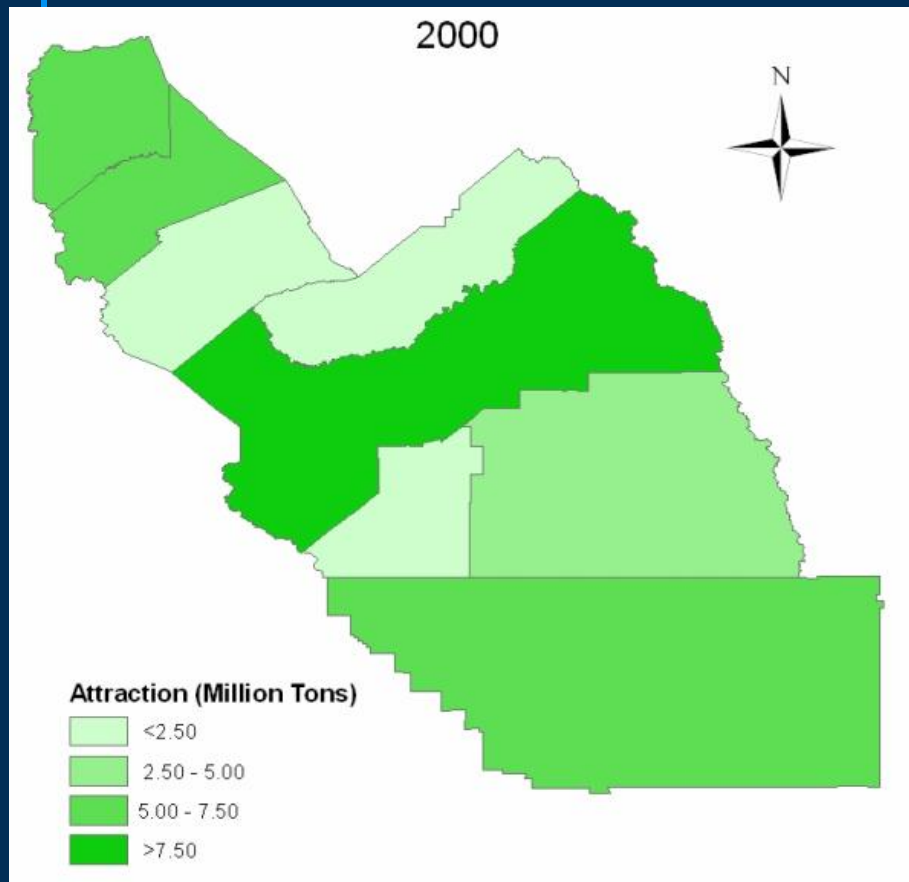
# Task 3 and Task 5 Results

## ITMS County Attractions – Agricultural Products

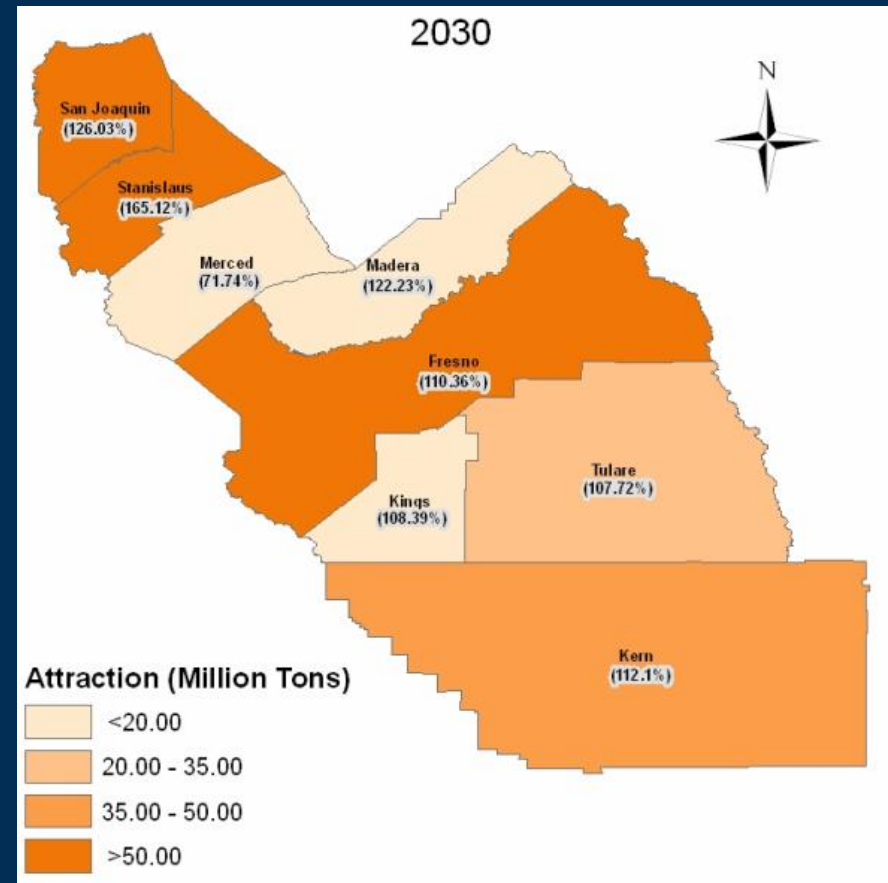
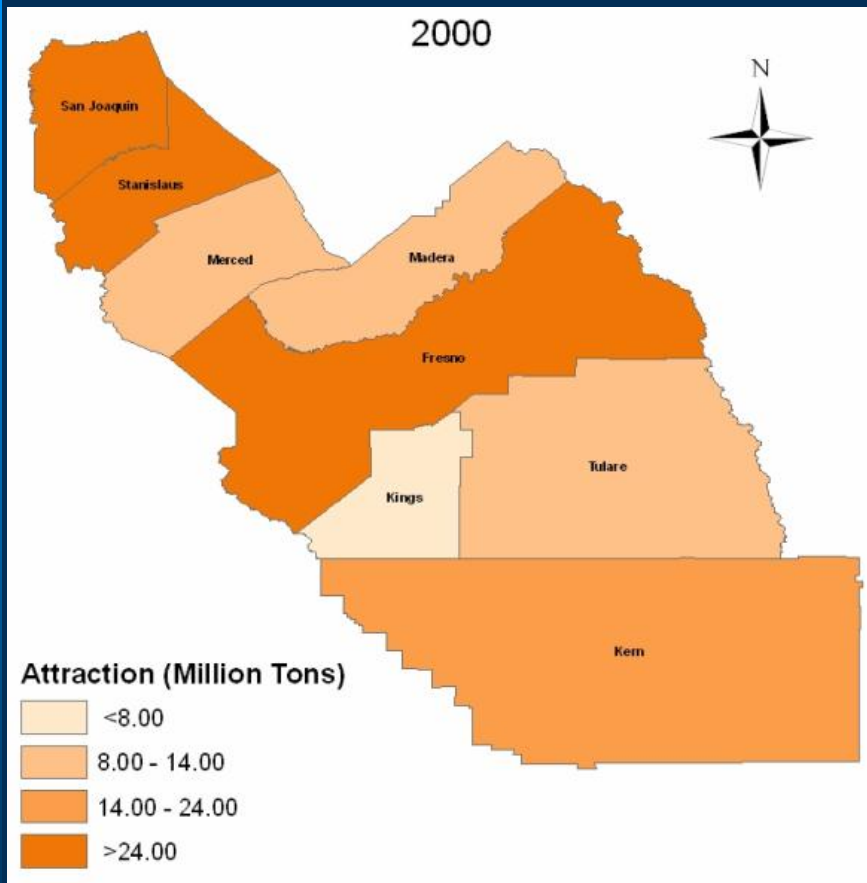


# Task 3 and Task 5 Results

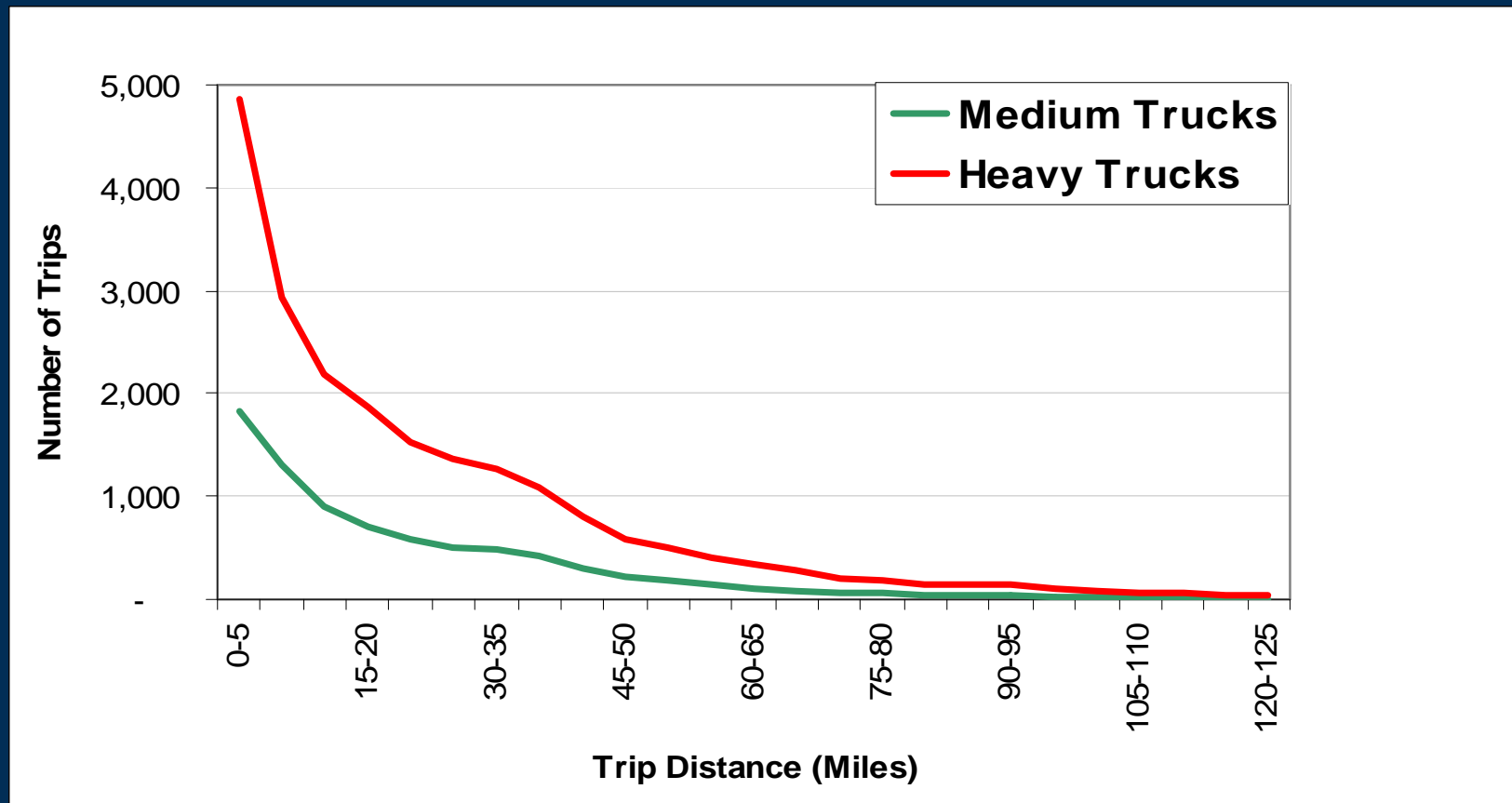
## ITMS County Attractions – Manufacturing Products



# Task 3 and Task 5 Results ITMS County Attractions – Total

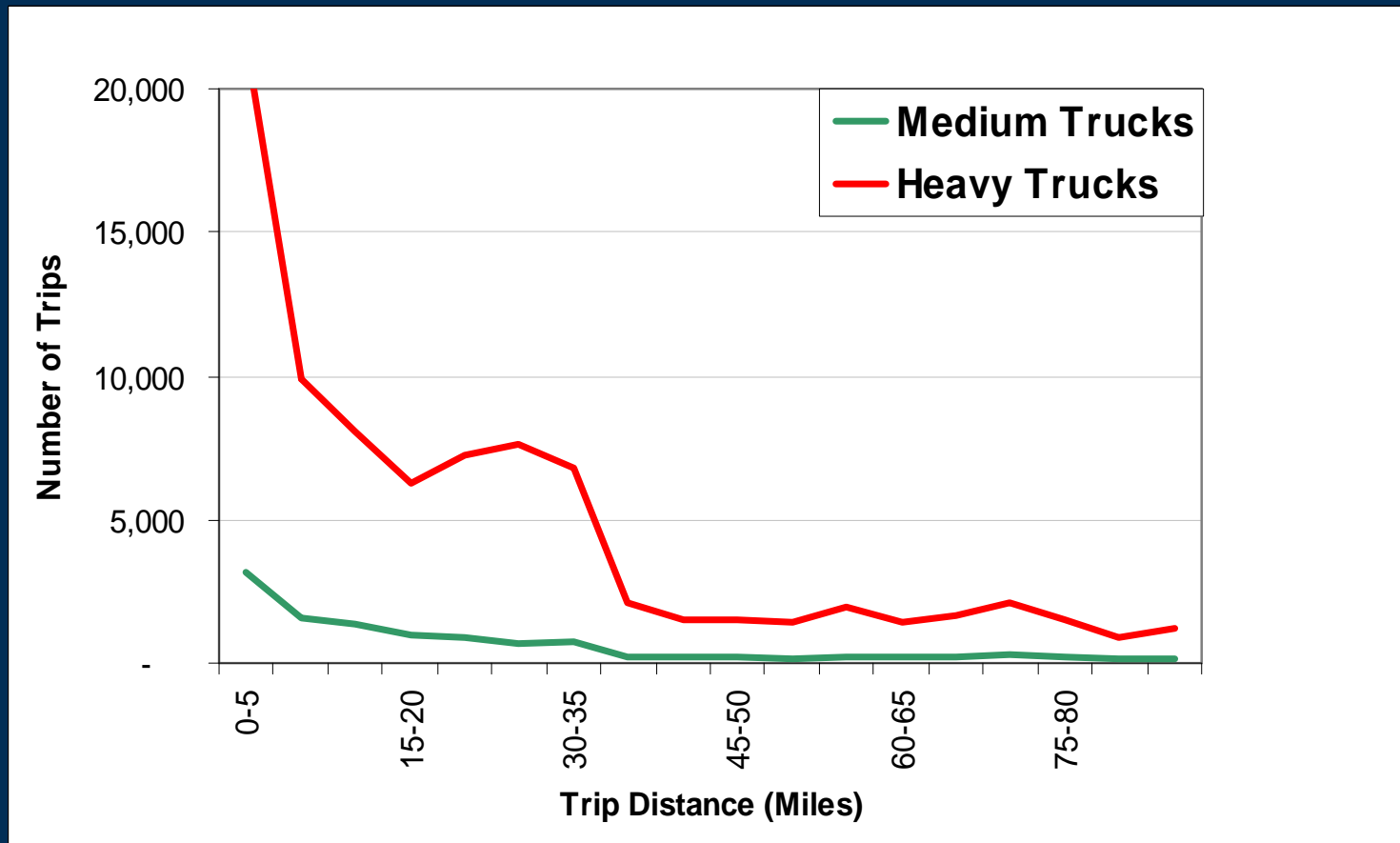


# Trip Length Distribution for Short-Haul Trucks



Average Trip Length : **Medium Trucks: 20 miles** **Heavy Trucks: 25 Miles**

# Trip Length Distribution for Long Haul Trucks



Average Trip Length : **Medium Trucks: 40 miles** **Heavy Trucks: 46 Miles**

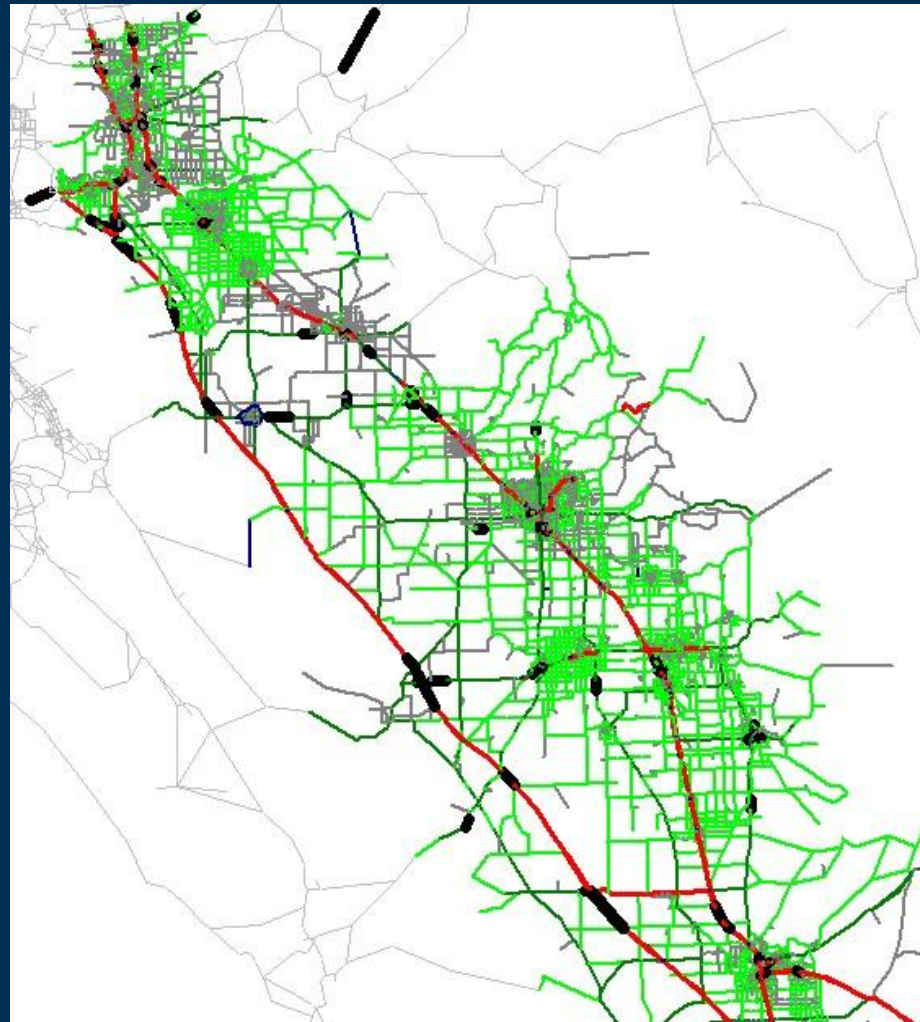
# Task 4

## Improve Model Validation

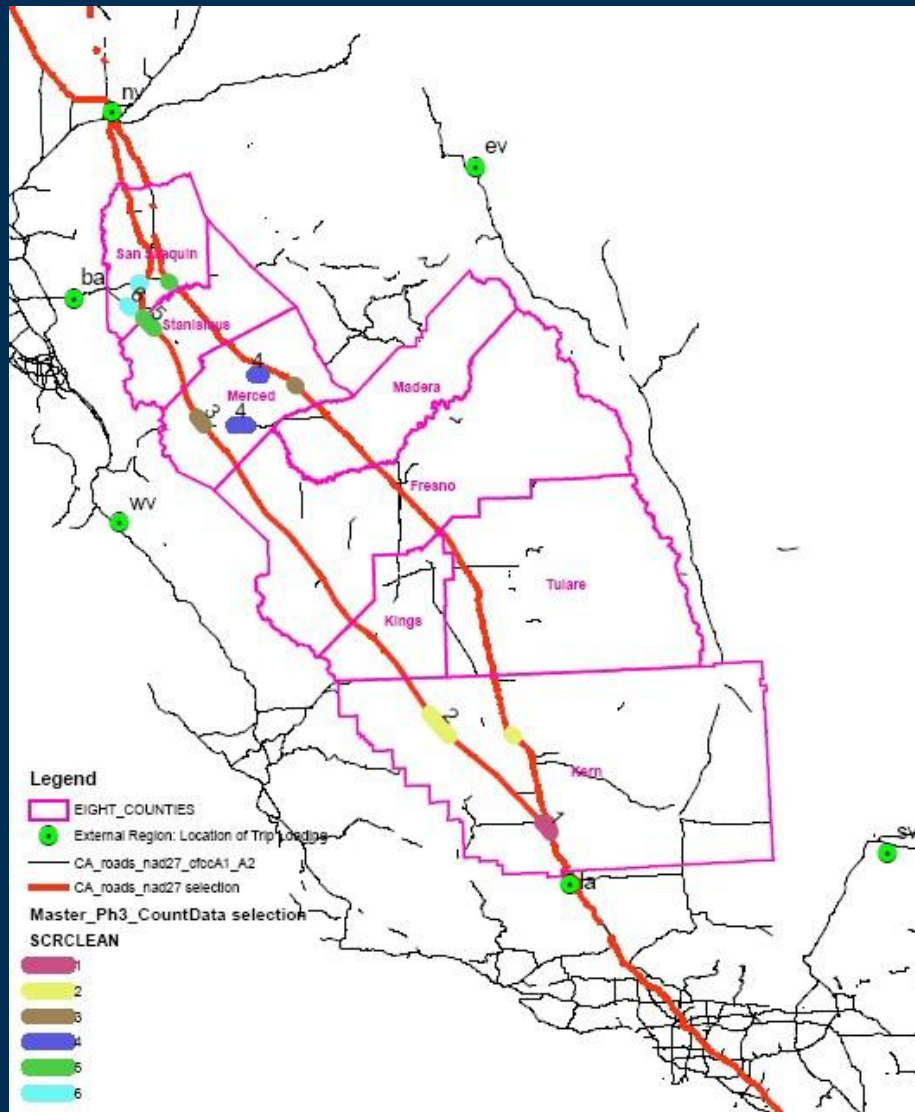
### EXISTING COUNTS

County	Counts
Fresno	121
Kern	220
Kings	18
Madera	12
Merced	20
San Joaquin	58
Stanislaus	10
Tulare	2
Total	481

Facility Type	Counts
Freeways	112
Expressway	90
Collectors	224
Local Roads	69



# Screenlines and External Gateways



# Validation at the External Gateways

Gateway	No of Counts	Counts		Model Volumes		% Difference	
		Medium	Heavy	Medium	Heavy	Medium	Heavy
BA	2	1,856	12,572	1,861	12,576	0.2%	0.0%
EV	6	184	1,125	184	1,125	-0.2%	0.0%
LA	4	1,780	14,504	1,759	14,588	-1.2%	0.6%
NV	4	2,192	18,652	2,192	18,653	0.0%	0.0%
SV	2	340	4,358	340	4,358	0.0%	0.0%
WV	4	777	3,338	777	3,338	0.0%	0.0%
<b>Total</b>	<b>22</b>	<b>7,129</b>	<b>54,549</b>	<b>7,112</b>	<b>54,638</b>	<b>-0.2%</b>	<b>0.2%</b>

# Validation at County Crossings

County Border	Counts		Model Volumes		Difference	
	Medium	Heavy	Medium	Heavy	Medium	Heavy
San Joaquin-Stanislaus	2,732	20,172	3,109	21,698	377	1,526
Stanislaus-Merced	1,844	16,642	2,704	16,755	860	113
Merced-Fresno	716	8,236	1,429	7,795	713	-441
Fresno-Kings	1,418	10,632	1,887	11,554	469	922
Kings-Kern	1,026	8,320	1,137	6,720	111	-1,600
Merced-Madera	1,096	9,204	1,727	12,357	631	3,153
Madera-Fresno	2,484	12,948	2,094	15,000	-390	2,052
Fresno-Tulare	1,464	11,154	1,738	11,255	274	101
Tulare-Kern	1,630	10,186	1,591	10,632	-39	446

# Validation by County

County	No. of Counts	Counts		Model Volumes		% Difference	
		Medium	Heavy	Medium	Heavy	Medium	Heavy
San Joaquin	58	24,124	192,862	21,301	150,984	-11.7%	-21.7%
Stanislaus	10	5,394	42,814	6,128	42,523	13.6%	-0.7%
Merced	20	5,191	46,782	8,077	51,164	55.6%	9.4%
Fresno	121	20,977	99,385	15,094	98,137	-28.0%	-1.3%
Madera	12	4,596	32,834	5,610	39,941	22.1%	21.6%
Kings	18	3,406	14,484	2,370	14,158	-30.4%	-2.3%
Tulare	22	7,796	43,658	7,170	44,569	-8.0%	2.1%
Kern	220	44,185	143,746	15,519	105,776	-64.9%	-26.4%

# Validation by Screenline

Screen-line	No. of Counts	Counts		Model Volumes		Percent Difference	
		Medium	Heavy	Medium	Heavy	Medium	Heavy
1	4	1,426	14,000	1,736	14,550	21.7%	3.9%
2	4	2,104	18,642	2,812	17,815	33.6%	-4.4%
3	4	1,484	16,142	2,415	16,499	62.7%	2.2%
4	4	370	2,366	251	1,528	-32.0%	-35.4%
5	4	2,274	14,580	2,967	20,057	30.5%	37.6%
6	4	2,004	11,980	2,195	14,298	9.5%	19.4%
<b>Total</b>	<b>24</b>	<b>9,662</b>	<b>77,710</b>	<b>12,376</b>	<b>84,747</b>	<b>28.1%</b>	<b>9.1%</b>

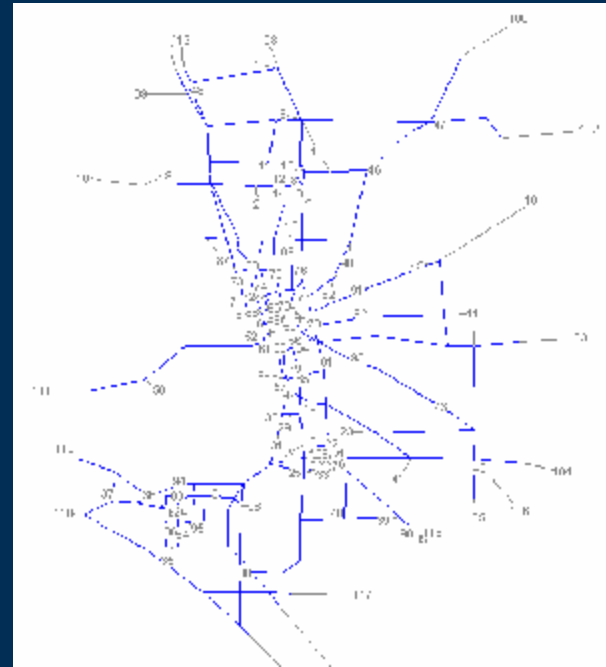
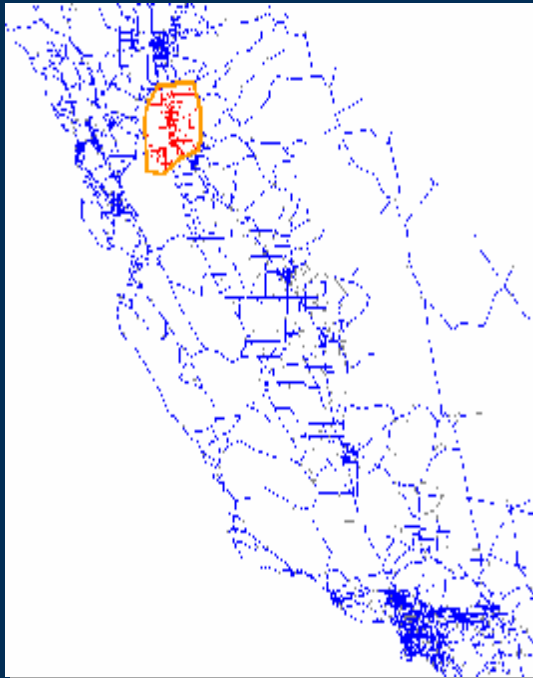
# Validation by Functional Class

Facility Type	No. of Counts	Counts		Model Volumes		Percent Difference	
		Medium	Heavy	Medium	Heavy	Medium	Heavy
Freeways	112	63,288	513,624	72,995	506,704	15.3%	-1.3%
Expressways	90	12,804	52,282	6,139	39,576	-52.1%	-24.3%
Arterials & Collectors	224	34,745	68,560	6,238	35,659	-82.0%	-48.0%
Local Roads	69	9,404	18,806	473	2,024	-95.0%	-89.2%
<b>Total</b>	<b>719</b>	<b>154,968</b>	<b>721,832</b>	<b>92,083</b>	<b>619,623</b>	<b>- 41%</b>	<b>-14%</b>

# Task 8

## Integrate with Local Traffic Models

- Integrate with eight-county models (Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare)
- Use Subarea Trip Extraction feature in Cube/TP+



## **Task 8**

### **Integrate with Local Traffic Models**

- **Use subarea matrix as the truck trip table**
- **Review trip generation models; adjust trips if trucks are included in the models**
- **Develop procedures to perform multiclass assignment**
- **Compare model truck percentages to observed numbers for at least 10 roadway segments**
- **Provide procedures to test for local land use changes**

# Task 10

## Truck Studies

- **Create truck studies for each of the eight counties**
  - **Truck-Only Lanes/Truck Bypass Lanes**
  - **Goods Movement Strategies**
  - **Truck/Rail Diversion Strategies**
- **Cambridge Systematics to work with County Staff to define studies**
  - **Local Staff to submit study definitions by 11/01/07**
  - **CS to review study definitions and propose changes by 11/15/07**

## Overall Project Status / Schedule

<b>Task</b>	<b>Status</b>	<b>Projected Finish Date</b>
<b>2000 Model Update and Validation</b>	<b>Almost Done</b>	<b>10/15/2007</b>
<b>2030 Model</b>	<b>All inputs ready</b>	<b>11/1/2007</b>
<b>Model Integration</b>	<b>Preliminary work done</b>	<b>11/15/2007</b>
<b>Training / Truck Studies</b>	<b>Pending</b>	<b>Dec 07 – Feb 08</b>
<b>Documentation</b>	<b>Pending</b>	<b>Jan 08 – Feb 08</b>

# Task 9

## Training

- **Provide 2 training sessions for the truck model and the commodity flow tool**
  - A hands-on practice of running the base and future year models
  - A hands-on exercise of using model outputs as inputs to the local traffic models
  - Hands-on exercises to create and complete truck studies
- **2 Additional Local Training sessions, one each in the north and south valley locations**