

California Department of Transportation

GIS / Level of Service (LOS) Application

AASHTO GIS-T Symposium

2003

Diane Pierzinski

Carlos P. Yamzon

OVERVIEW

- **BACKGROUND**
- **PURPOSE**
- **STUDY DESIGN**
- **PROJECT DESCRIPTION**
- **USER REQUIREMENTS**
- **ISSUES / PROBLEMS**
- **CONCLUSIONS**

BACKGROUND

- **Project funded by a Federal Grant**
- **Administered by Caltrans to the Merced County Association of Governments (MCAG)**
- **Concept developed by Caltrans**
- **Application developed by MCAG**

PURPOSE

- **Streamline the process between Regional Travel Demand Forecasting and Project-Level Capacity / Level of Service (LOS) Analysis**

- **Create a GIS platform for Planning staff to analyze local development impacts on the State Highway System**

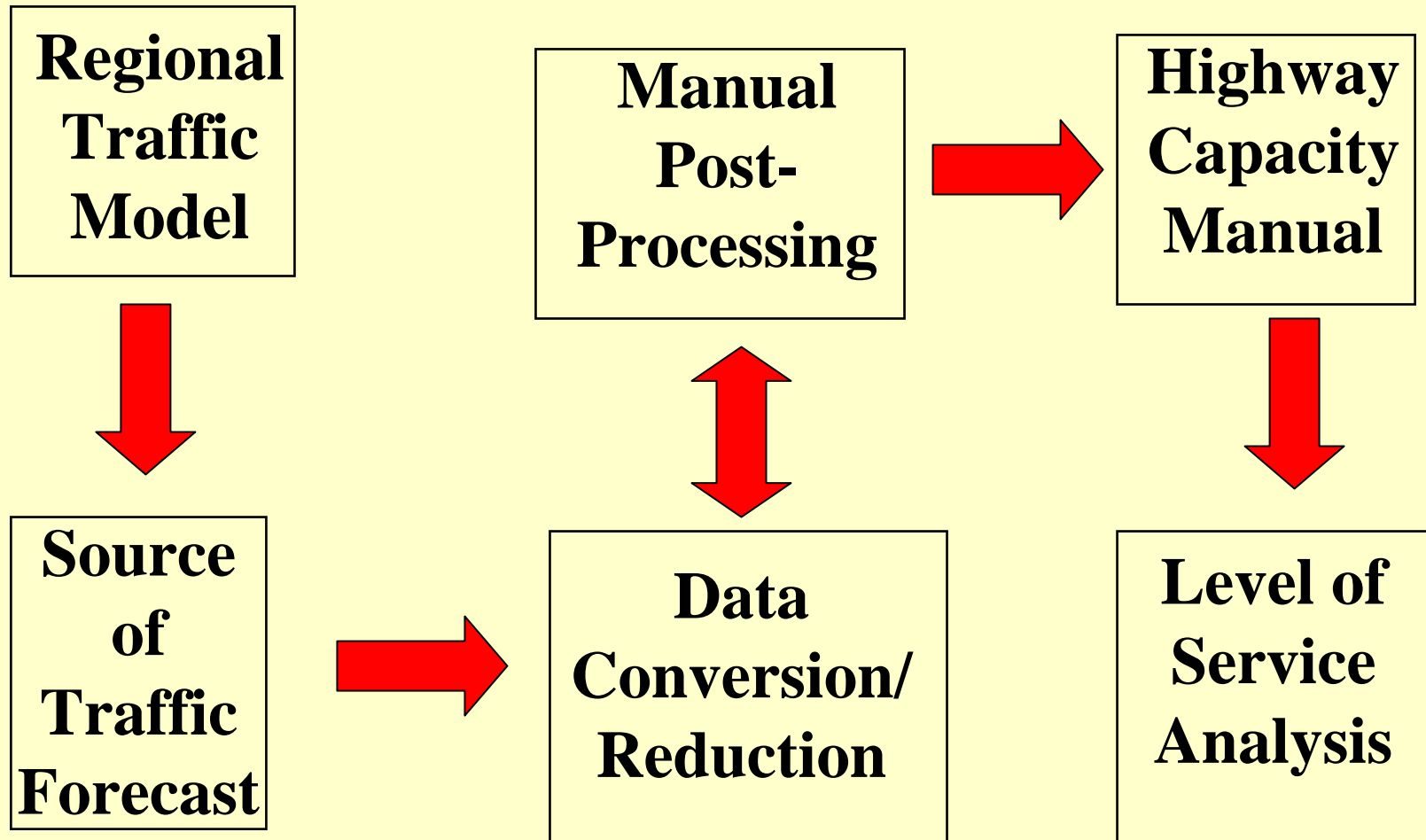
PROJECT DESIGN

- **Develop an Avenue script that performs LOS analysis in the ArcView Platform over an entire Traffic Model network, or selected segments through a User interface.**
- **Utilize existing TP+/ Viper GIS Tools to convert the MCAG Traffic Model network, with pre-defined roadway classes, to a workable shapefile.**
- **Import the shapefile in ArcView to perform Highway Capacity Manual LOS Analysis on all Freeways, Multi-Lane Highways, and Two-Lane Rural Roads that are part of the State Highway System.**

PROJECT DESCRIPTION

Traffic Studies / Analysis for Caltrans Capital Project

Process



3/17/03

Caltrans GIS LOS Application



GIS / Level of Service Analysis Interface

LEVEL OF SERVICE APPLICATION



Zoom to County

Make Map

Define Title

Access ArcView

End / Exit

CALCULATIONS FOR LEVEL OF SERVICE (LOS)

Free-Flow Speed Model User-defined

AADT Model User-defined

% Trucks in Peak Hour: %

Terrain Factor Level Rolling Mountainous

Directional Split: % Peak Hour Factor: %

Conditional Maximum Service Flow & # of Lanes:

Model User-defined

of Lanes in Peak Direction: Msef:

Width of Shoulders (Feet) 0 2 4 >= 6

% No Passing: %

Selection of Segments for L.O.S. Recalculations

None All Segment



Calculate

Reset

Show Selected/D

LOS Analysis User Dialog

Label Segment

Level of Service

LOS User

A

B

C

D

E

F

LOS

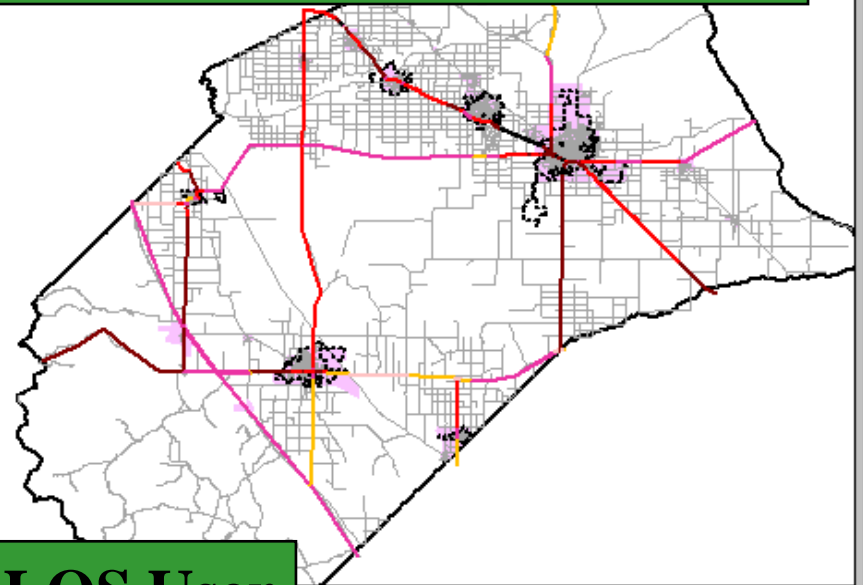
A

Roads

SUD P

Merced County

GIS Network with State Routes Color-coded by LOS



Attributes of LOS User

Attributes of LOS User

Shape	A	B	Speed	Lanes	Name	Vol	Rev	Aadt	Ft	Terrain	Et	Ds	W_lane	W_shoulder	Np	Fact	Msef	Fhv	Phdv	Sfi	Msf
PolyLine	1015	1026	28.0	2	140	1687.72729	2	3982.58032	0.05	L	0.00	0.65	12	2	0.70	0.10	0	0.00000	0.00	0.00	0.000
PolyLine	1015	7058	28.0	2	140	2294.85303	2	3982.58032	0.05	L	0.00	0.65	12	2	0.70	0.10	0	0.00000	0.00	0.00	0.000
PolyLine	1018	1039	33.0	2	140	5731.04980	2	10708.74609	0.05	L	0.00	0.65	12	2	0.70	0.10	0	0.00000	0.00	0.00	0.000
PolyLine	1018	7052	34.0	2	140	5500.98682	2	11755.32031	0.05	L	0.00	0.65	12	2	0.70	0.10	0	0.00000	0.00	0.00	0.000
PolyLine	1026	1015	28.0	2	140	2294.85303	2	3982.58032	0.05	L	0.00	0.65	12	2	0.70	0.10	0	0.00000	0.00	0.00	0.000
PolyLine	1026	7064	28.0	2	140	1372.39563	2	3352.16016	0.05	L	0.00	0.65	12	2	0.70	0.10	0	0.00000	0.00	0.00	0.000



LOS Analysis User Dialog

CALCULATIONS FOR LEVEL OF SERVICE (LOS) [X]

Median Divided Undivided Rural Suburban

Free-Flow Speed Model User-defined

AADT Model User-defined

% Trucks in Peak Hour: % % No Passing: %

Terrain Factor Level Rolling Mountainous

Directional Split: % Peak Hour Factor: %

Conditional Maximum Service Flow & # of Lanes:
 Model User-defined

of Lanes in Peak Direction: Msec:





Width of Lanes 9 10 11 12 feet

Width of Shoulders 0 2 4 6+ feet

Access Points 0 10 20 30 40+

Selection of Segments for L.O.S. Recalculations

None All Segment

Calculate Reset Show Selected/Date

USER REQUIREMENTS

Traffic Model Interface

Intermediate to Advanced Technical
Working Knowledge of Traffic
Modeling Concepts and Application

ArcView User Interface

Beginner to Intermediate Working
Knowledge of ArcView Program

Highway Capacity Manual (HCM)

Beginner to Intermediate Working
Knowledge of HCM Concepts and
Applications

ISSUES / PROBLEMS

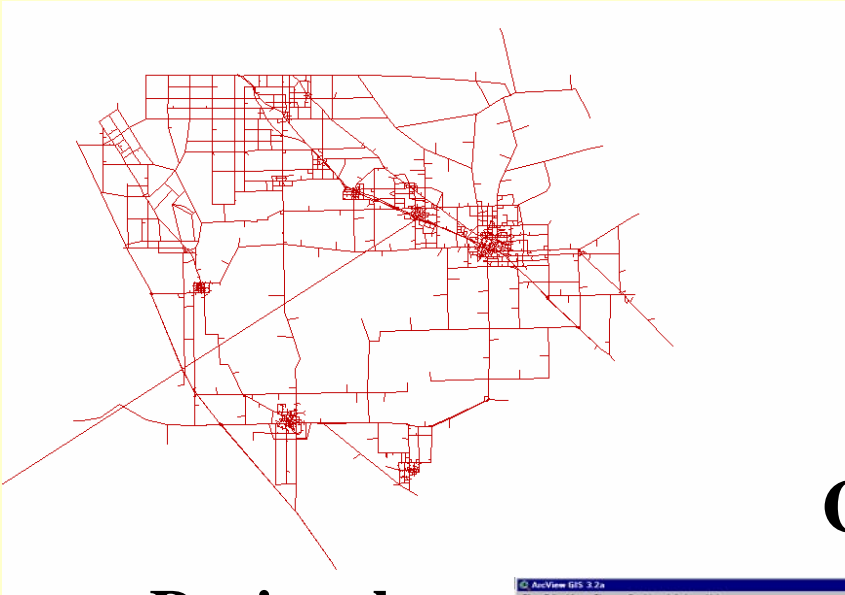
1. Highway Capacity Manual - Year 2000 Update

- Minor changes in methodologies for Freeways and Multi-lane Highways**
- Two completely new methodologies for Two-lane Rural Highways and new measures-of-effectiveness (MOEs)**

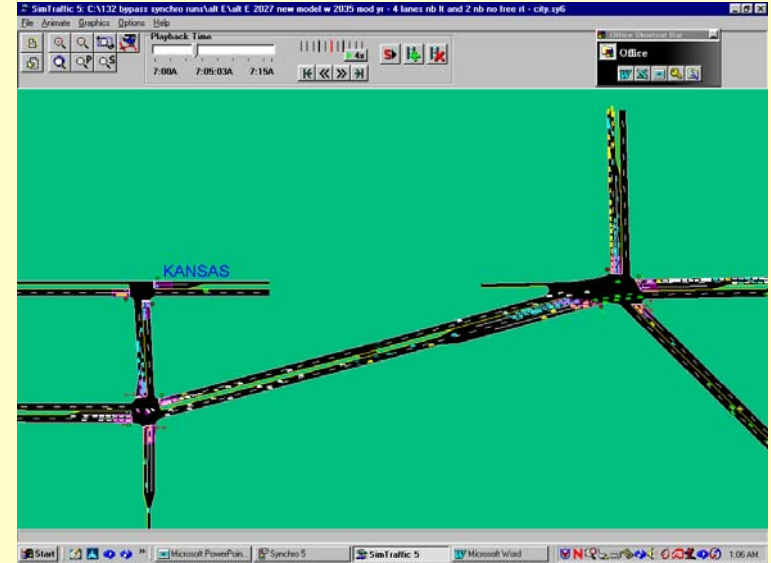
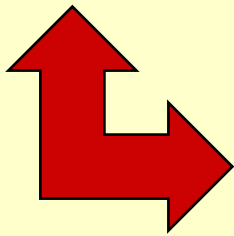
2. ArcGIS

CONCLUSIONS

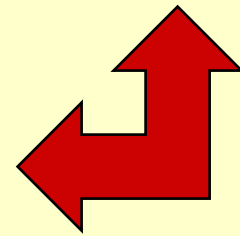
What's Next?



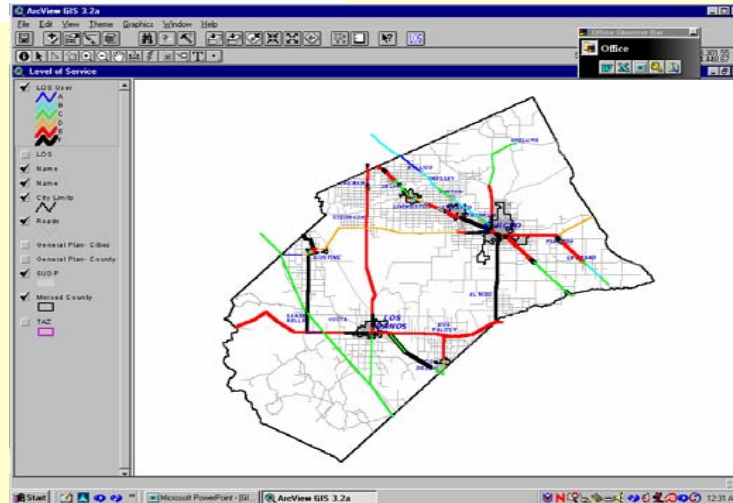
**Regional
Traffic Models**



**Micro-Simulation
Models**



GIS



Caltrans GIS LOS Application

QUESTIONS?

California Department of Transportation
GIS / Level of Service Application

CONTACT INFORMATION

Carlos P. Yamzon

Senior Transportation Planner

Tel. 209-948-3975

FAX -209-948-7174

carlos_yamzon@dot.ca.gov

