

***Building Technical Capabilities***  
*in CRCOG Planning Programs*

*MPO Certification Review*  
*July 2009*

# Technical Capabilities

- 1. Travel forecasting**
- 2. Traffic analysis & engineering**
- 3. GIS applications**
4. CMS: capitalizing on ITS (3:15 pm session)
5. Communications & community involvement (2:15 session)

# Travel Model

## 1. Very sophisticated 4-step model

- Effective for regional & small area forecasts
- Effective for highway & transit forecasts

## 2. Frequently used tool

- Region transportation plan
- Corridor studies & small traffic studies
- Busway planning *& design*

# Travel Model

## Growing number of applications

- Corridor studies: Rt195, Rt305, Rt 3, ...
- Small traffic studies: Unionville

## Increasingly demanding applications

- Testing more alternatives & variations
- Extensive & detailed intersection turn move forecasts
- User benefit analysis for busway

## Increasing importance of some applications

- New Starts funding dependent on forecasts
- Busway design decisions based on forecasts

Recognized importance & “value added” to projects:

**Strong commitment & investment in model**

- New software: TransCAD
- Full-time modeler
- Improving ability to link to GIS system
  - improved graphics
  - network accuracy
  - ease of maintenance
- Dedicate GIS staff to maintain land use data for model
- Model upgrade project (*Cambridge Systematics, \$180,000*)
- Hardware investments: 2 fast computers, separate data storage, better plotter

**Still problematic:** staff size, succession, model development

# **Travel Model** – *transit applications*

## **New Britain Busway** – working with CDOT

### Forecasts & analyses for New Starts application

- Ridership projections
- User benefit analysis
- Alternative specific effects calculations
- Service planning (*Now*)

# Travel Model – transit applications

## New Britain Busway – ridership forecasts

### boardings by station

Station Name	# Trips			
Hfd Loop	4,256	4,256		
Union Station	1,317		BRT Stations	
Aetna/Sigourney	2,399			
Park St	1,194			
New Park	294			
Flatbush	614	9,382		
Elmwood	776			
Newington Junc.	327			
Cedar Street	457			
East Street	404			
East Main Street	425			
New Britain CBD	1,176			
west of NBT	1,482	1,482		
<b>TOTAL</b>	<b>15,120</b>			

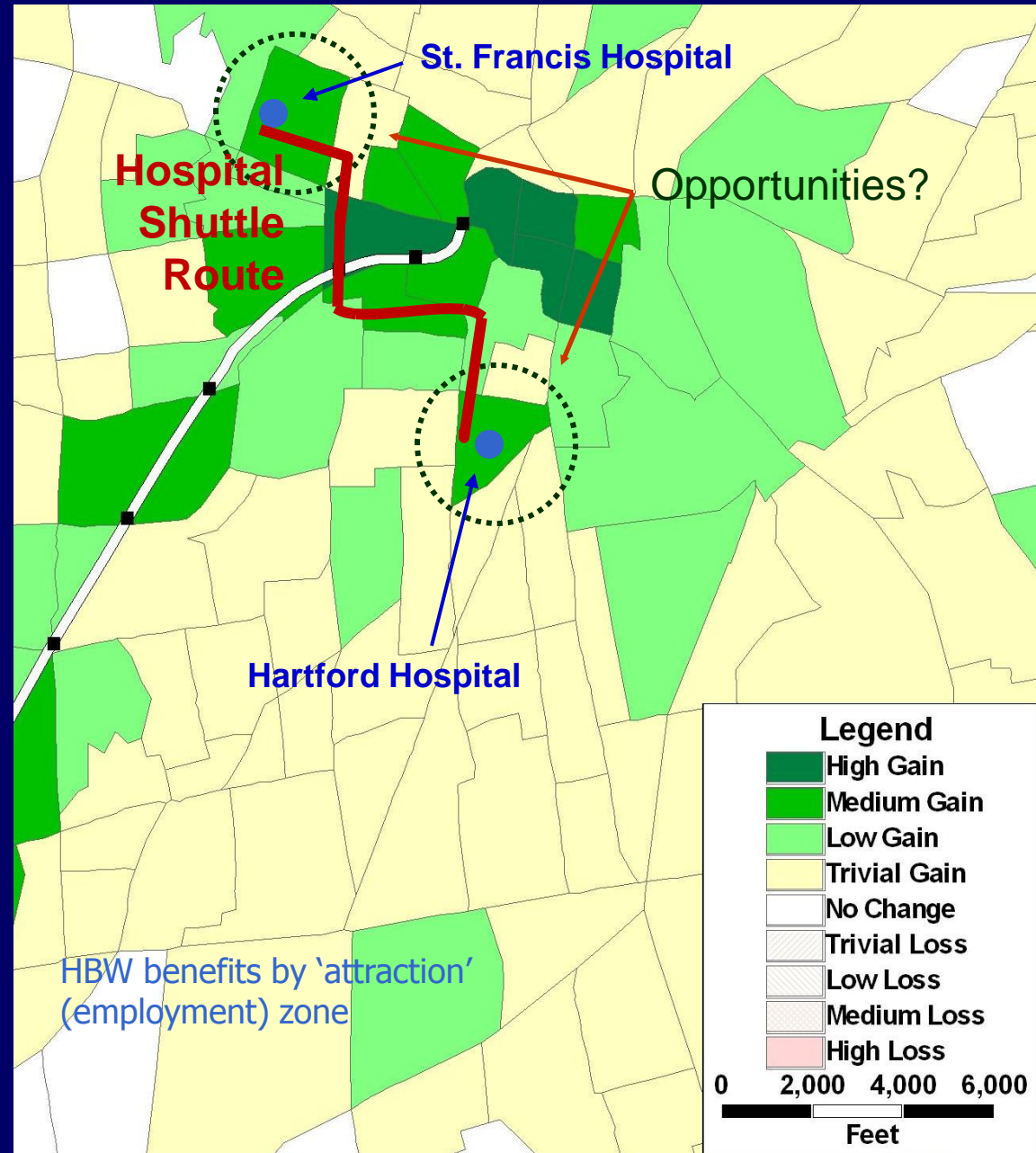
### boardings by access mode

Station Name	Access Type	Balanced Boards	Access Share
Union Station	WALK	1,762	71.4%
Union Station	DRIVE	0	0.0%
Union Station	XFER	705	28.6%
		<b>2,467</b>	
Aetna/Sigourney	WALK	2,051	85.5%
Aetna/Sigourney	DRIVE	0	0.0%
Aetna/Sigourney	XFER	348	14.5%
		<b>2,399</b>	
Park Rd	WALK	837	70.1%
Park Rd	DRIVE	0	0.0%
Park Rd	XFER	357	29.9%
		<b>1,194</b>	
New Park	WALK	219	74.7%
New Park	DRIVE	68	23.0%
New Park	XFER	7	2.3%
		<b>294</b>	

# **Travel Model** – *User Benefit Analysis*

1. User Benefit Analysis – new FTA software
  - One of first regions to successfully adapt our model to use new FTA evaluation tool
  - Invited to present results at FTA Roundtable
2. Advantages realized
  - Optimize project benefits & cost-effectiveness ratio
  - Better service planning
  - Better equity assessment tool – environmental justice

# New Britain BRT: More Opportunities?



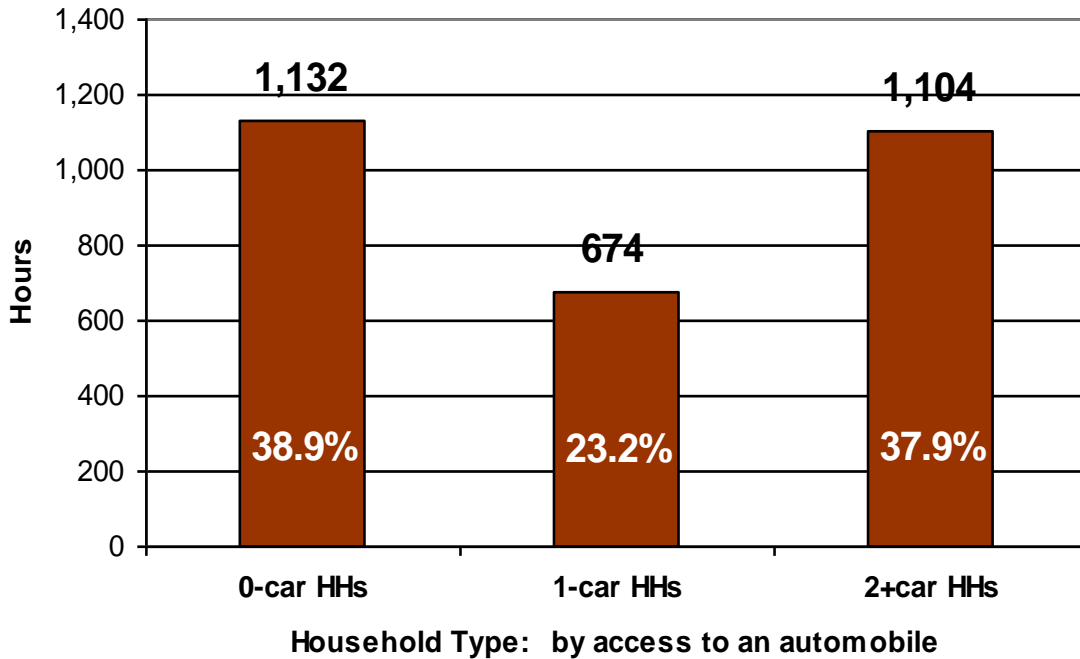
Benefit maps can offer clues to 'opportunities'

Maps showed that hospitals offered opportunity that we had overlooked

RESULT: designed new shuttle route to connect hospitals to busway.

# User Benefit Analysis: **Good Tool for Equity Assessment**

**User Benefits - from New Britain Busway (work trips)**



- No question that 0-Car HHs get equitable share of benefits
- Muted early criticism that the project 'just for wealthy suburban commuters'

38.9% of benefits accrue to 0-car HHs  
(11.% of region's HHs)

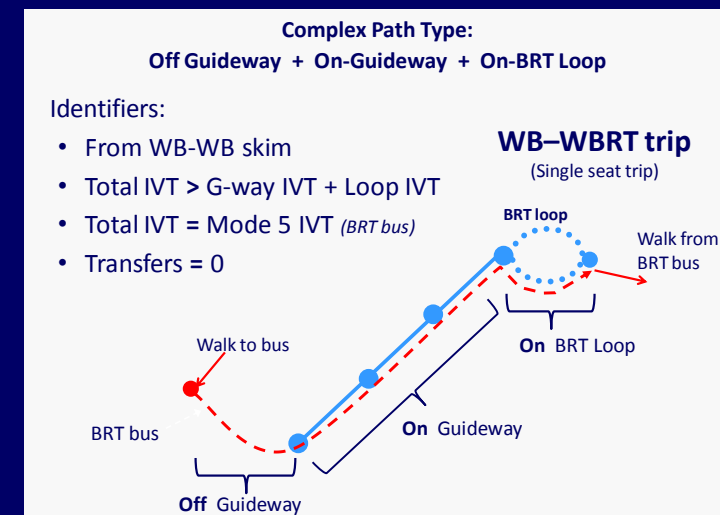
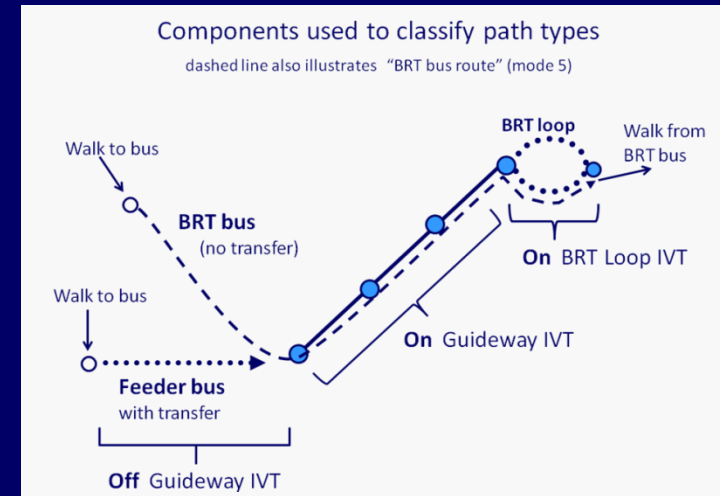
# Travel Model – Alternative Specific Effects

FTA allows user benefit estimate to be adjusted if:

- Transit mode is 'new' to region  
*(cannot calibrate model to a mode if it does not exist)*
- Region demonstrates it has a reasonable way estimate 'extra' benefits a 'new' mode might yield

We developed ASE methodology

- Based on ability to isolate & assess pieces of transit paths



# Travel Model – Alternative Specific Effects

FTA approved our method:

- Invited us to present it at 2007 modeling conference

Approval was critical to busway

- **Increased user benefits by 10% or 450 hours**
- Difference between medium and medium-low cost-effectiveness rating

	Walk Access	
	<i>1-seat ride</i>	<i>1-seat ride</i>
	<b>WG-WG</b>	<b>WG-WBRT</b>
Reliability	2.0	2.0
Branding	2.0	2.0
Schedule	2.0	2.0
Span of service	2.0	2.0
Station amenities	1.0	1.0
Dynamic info	1.0	1.0
<b>Total weight</b>	<b>10.0</b>	<b>10.0</b>
<b># Trips</b>	<b>97</b>	<b>235</b>
<b>User Benefits</b>	<b>16.2</b>	<b>39.2</b>

# **Travel Model** – *service planning*

## **DOT developing new & more refined service plan**

- Committee: DOT, consultant, operators, CRCOG
- Model has key role in evaluating route structure

## **6-8 months of developing & testing options**

- Initial focus: test 2 different system options
  1. Thru-route emphasis (more single seat rides)
  2. Base shuttle with all feeders

# Travel Model – *service planning*

Tested nearly 100 route & schedule combinations

## Result:

- Revised structure with more base busway shuttle service
- More service to Bristol CBD, UConn Health Center, and Westfarms Mall
- **Expect a gain of 200-300 hours of user benefits**

Test No.	Test Description	Busway Trips	User Benefit
	2008 Submittal	15,120	3,840
	Alternative 1 - Final Composite (Test 14)	15,039	4,265
	Alternative 2 - Final composite (Test 13)	14,597	4,226
1	<b>Alternative 3 - Draft Composite</b> <ul style="list-style-type: none"> <li>• Based on the final composite of Alternative 2</li> <li>• Added changes (as summarized by Martin's e-mail)</li> <li>• Used a new baseline for User Benefit calculation</li> </ul>	15,817	4,359
⋮ ↓	⋮ ↓	⋮ ↓	⋮ ↓
41	<ul style="list-style-type: none"> <li>• <b>Based on Test 40</b></li> <li>• Removed the Middletown Connection added in Alt. 1 (Note: UB calculated via Baseline in 2008 submittal)</li> </ul>	15,039	3,919
42	<ul style="list-style-type: none"> <li>• <b>Based on Test 41</b></li> <li>• Re-route Meriden Express to I-91 as in the baseline</li> <li>• Extend ARCH route to Meriden (Note: UB calculated via Baseline in 2008 submittal with ARCH route extended to Meriden)</li> </ul>	15,296	3,997

# **Travel Model** – *Highway applications*

## **1. CRCOG corridor studies**

- Good tool for forecasting growth & testing alternatives

## **2. Uses in last 3 years**

- Route 195 Corridor Study
- Route 305 Corridor Study

## **3. Next**

- I-84 Viaduct, Route 3, Route 10

# Highway applications: Unionville example

## Prepare future volume forecasts

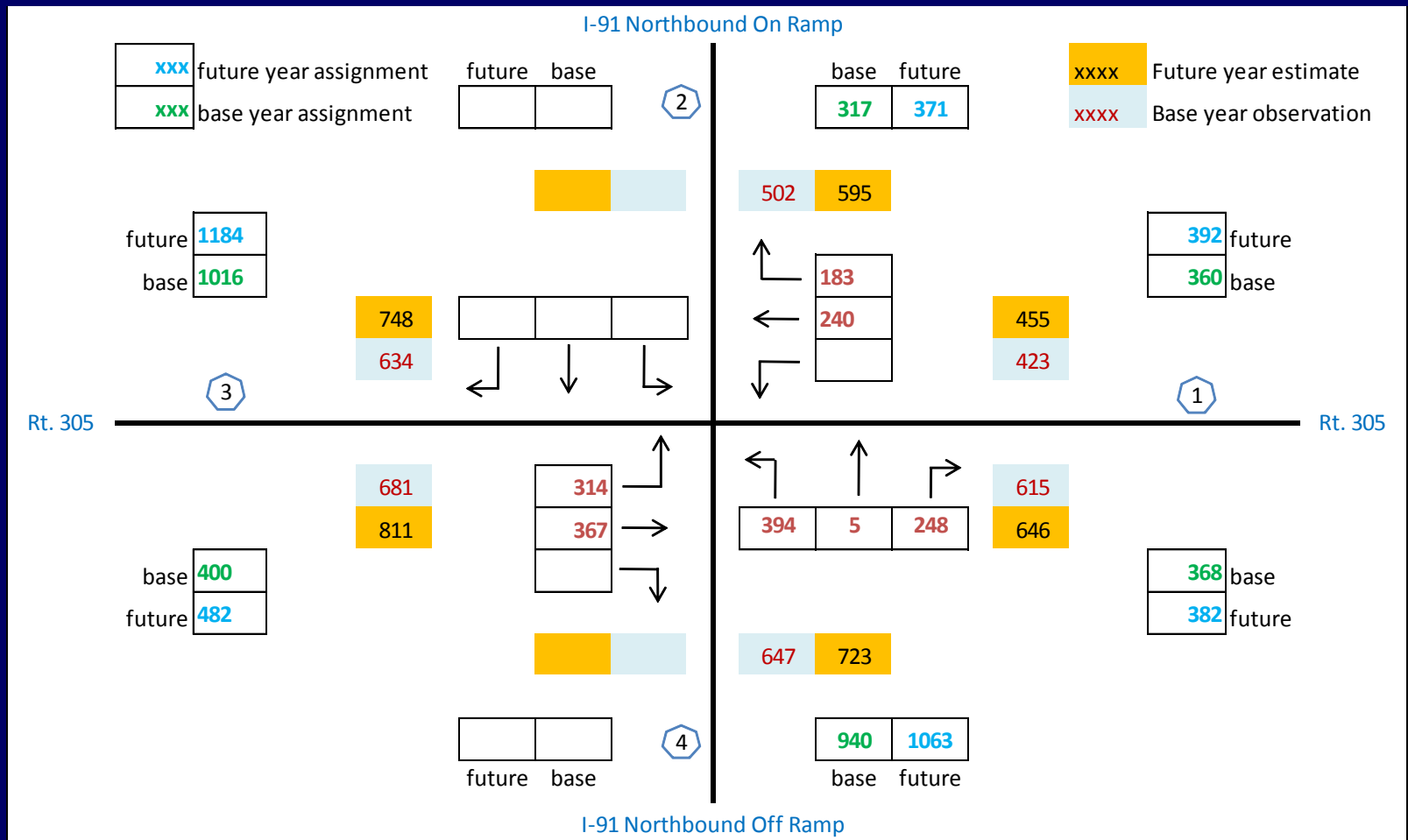
## Test impact of alternatives on volumes

Scenario	ID	range of estimate	Unionville			
			traffic on Rte 177 Bridge	traffic on New Crossing	change in traffic Rte 177	% change in traffic Rte 177
			<i>No Improvements</i>	-----	-----	<b>20,500</b>
Improve Rt 177	A1	low estimate	21,800	-----	1,300	6%
	A2	high estimate	23,300	-----	2,800	14%
Add river crossing	B1	low estimate	16,800	8,100	-3,700	-18%
	B2	high estimate	16,300	9,400	-4,200	-20%

# Highway applications: RT 305 example

## Prepare detailed turn move forecasts

(Current model upgrade will enhance this ability)



# Traffic analysis & engineering tools

Tools used to support CRCOG's corridor study work:

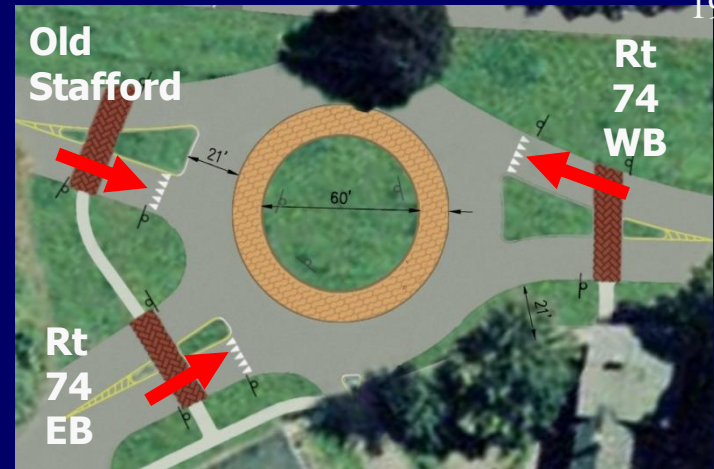
## **1. AutoCAD Lite:**

- read & revise concept plans
- prepare graphics for meetings

## **2. HCM:** intersection capacity analysis

## **3. Synchro:** traffic simulation & analysis

- *Simulations valuable at meetings*



	A	B	D
<b>RT 74 at Old Stafford Rd AM/PM</b>	<b>2007</b> Existing intersection stop sign on Old Staf.	<b>2030</b> Existing intersection stop sign on Old Staf.	<b>2030</b> Roundabout yield signs
RT 74 EB (SB)	A/A	A/A	A/A
RT 74 WB (NB)	A/A	A/A	A/C
Old Stafford SB	F/F	F*/F*	A/A

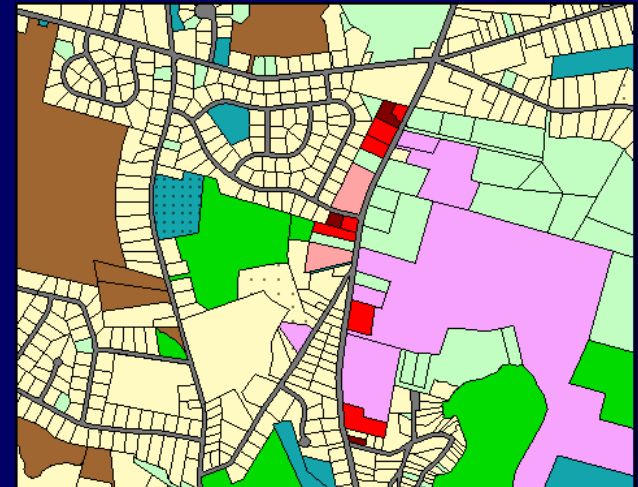
# Combining traffic forecasting & traffic engineering tools

Conclusion: ample capacity for 20+ yrs

# GIS: increasingly important for travel model

## Integral part of travel model. Use GIS to:

- Develop & maintain road & transit networks
- Develop & maintain socioeconomic data set
  - Population & employment
- Linking land use data to socioeconomic data
  - Goal is to use land use database to develop forecast of future population & employment for travel model



# **GIS:** *other applications*

- **Graphics** – *an overlooked public involvement tool*
  - Better graphics: committees, public meetings, reports
- **Environmental Justice**
  - Atlas
  - TIP equity assessment
- **LEP:** atlas and geographic analysis
- **CMS:** primary tool for organizing and analyzing new data

# Conclusion

Built strong technical capabilities & strong technical team.

- Improved our analytic capabilities
- Also our communication & community involvement capabilities (meeting graphics, web, email, surveys, ...)

Will continue to develop & expand capabilities