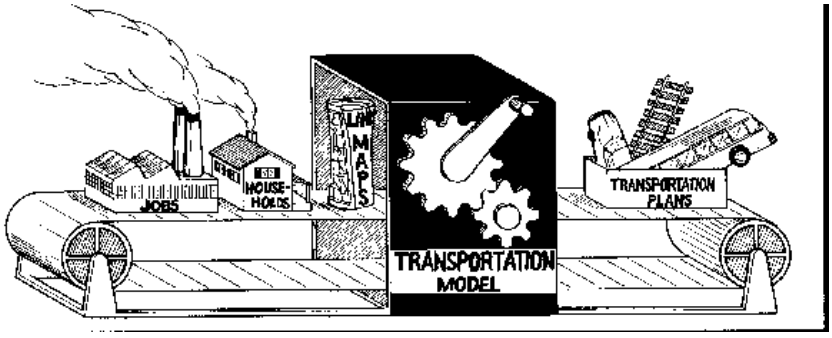
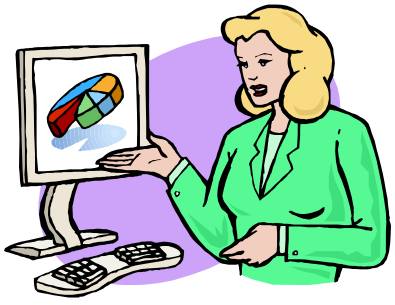
Modeling Effort Part 4:

Calibration & Validation



Visualizing Data Checks

- Use GIS to visualize data
- Visual inspection to check attributes
- Review minimum paths



Explain why changes in the alignment can impact the demand on a facility. Here I am going to focus on how demand diminishes the further away from the urban core (or developed area) you move the project.

This is definitely an issue that they are interested in and deals with the sensitivity of the models to distinguish between alternative alignments. If you think of an actual example to show them, it might be helpful. Scott might have a good one from Kinston and the Global Transpark (he's done 62 forecasts so far).

Trip Generation Validation

- Vehicle Trips/HH = 7-8
  Trips/Capita =3-4
- Internal Trips %
  - 80-90%
- NHB By Non-residents
  - usually behave like residents
  - 40-60%
- P/A ratio
  - 0.9 - 1.10

Travel models were first developed in the 1950s to do highway planning. In response to changes in policy and the need to address a broader range of questions, models have been modified to deal with these broader issues, such as:

•transit and mode choice modeling

•air quality analysis

•land use feedback

Trip Generation Validation

Vehicle Trip Production Rates

Housing Classification	1995 Triangle Household Survey	Triad Survey	National Data *[FHWA]*
Excellent	9.4*	9.3	11.2
Above Average	9.4*	9.1	11.2
Average	8.3	7.7	8.3
Below Average	6.2*	6.3	5.4
Poor	6.2*	5.7	5.4
All Dwelling Units	7.8	7.4 - 8.0	7.8

*Categories had to be combined to achieve a statistically significant sample

*Vehicle Trip Attraction Rates**

Employment Type	HBW	HBO	NHB	IX
Industry	1.2	0.63	1.1	0.34
Retail	1.2	3.4	1.0	0.49
Highway Retail	1.2	4.2	4.0	0.28
Office	1.2	1.2	1.1	0.28
Service	1.2	2.0	1.9	0.28
Dwelling Units	0	0.9	0.13	0.33

*Rates obtained from 1995 Triangle Household Survey

Trip Generation Validation

Purpose	Triangle Survey*	Triad Survey*	Charlotte Region*	National
HBW	22%	20%	19%	18 - 25%
HBO	46%	49%		47 - 58%
NHB	32%	31%		18 - 28%

*Incorporates urban and non-urban households

Trip Distribution Validation

- Estimated trip lengths rule of thumb (based on population)
  - $HBW_{tt}=.98*P^{0.19}$
  - $HBO_{tt}=2.18*P^{0.12}$
  - $NHB_{tt}=.63*P^{0.20}$
- Curves look reasonable?
- Intrazonals-
  - HBW (1-5%)
  - HBO (5-18%)
  - NHB (6-10%)

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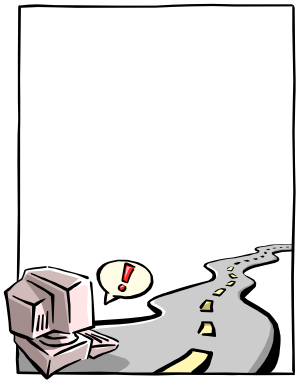
Highway Assignment Validation



- *VMT per household and per person-*
  - *large~ 40-60 miles/day/HH*
  - *small~ 30-40 miles/day/HH*
  - *large~17-24 miles/day/person*
  - *small~10-16 miles/day/person*
- *Traffic Volumes-*
  - *By facility type (Table 2)*
  - *By volume group (Table 3)*

I will be discussing the differences between scientific models (where results are more reliable) and mathematical/behavior models (where results are less reliable because they cannot account for the uniqueness of individuals)

Highway Assignment Validation

Validation Targets

Table 2. Percent Difference Targets for Daily Traffic Volumes by Facility Type

Facility Type	FHWA Targets (+/-)	NCDOT Targets
Freeway	7%	5%
Major Arterial	10%	8%
Minor Arterial	15%	10%
Collector	25%	15%

Source: FHWA, *Calibration and Adjustment of System Planning Models*, 1990

Table 3. Percent Difference Targets for Daily Volumes for Individual Links

Average Annual Daily Traffic	FHWA Desirable Percent Deviation	NCDOT Targets Desirable Percent Deviation
< 1,000	60	55
1,000 - 2,500	47	50
2,5000 - 5,000	36	30
5,000 - 10,000	29	25
10,000 - 25,000	25	20
25,000 - 50,000	22	15
> 50,000	21	10

Source: TMIP, *Model Validation and Reasonableness Checking Manual*, 1997 and NCDOT, *Model Specifications*

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Highway Assignment Validation