

# ANCHORAGE AREA TRAVEL MODEL

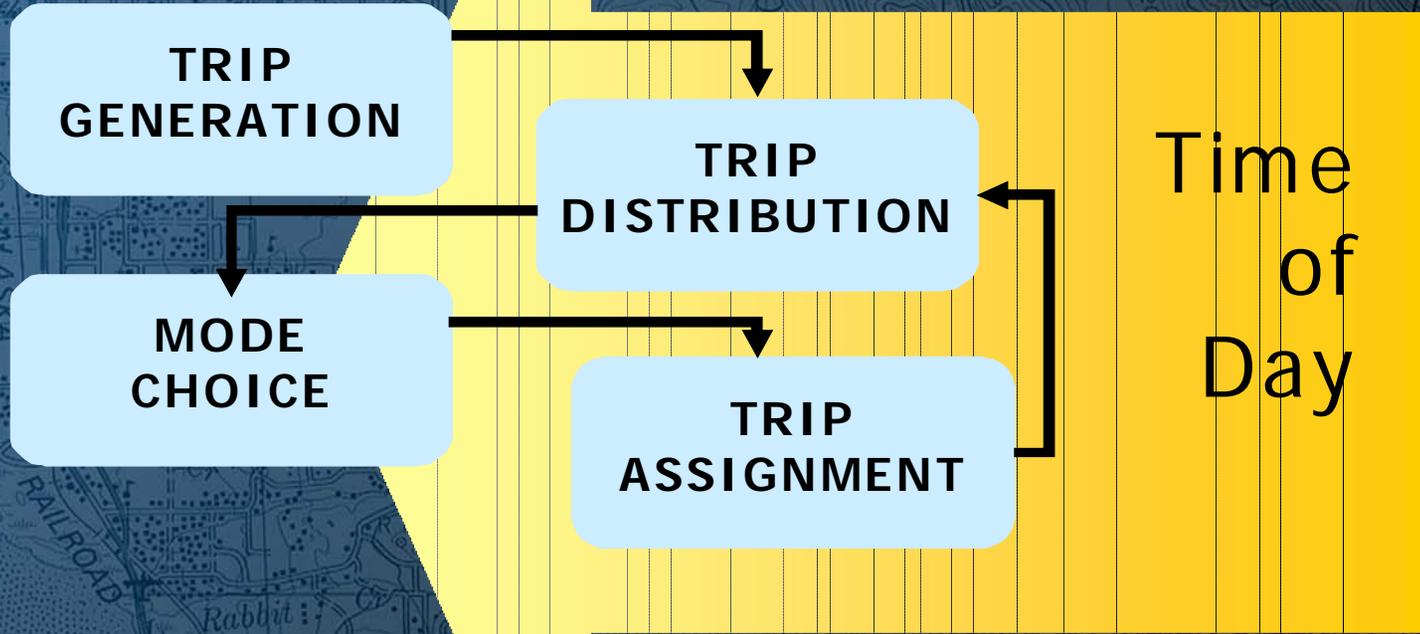
## Review of Model Update Process & Results

TMIP/FHWA Peer Review  
Monday/Tuesday, May 24-25, 2004

# Pieces of the Model Puzzle Include:

- Trip Generation (Do I make a trip?)
- Trip Distribution (Where do I go?)
- Time of day (When do I go?)
- Modal Choice (What are my means of travel?)
- Assignment (What route do I choose?)

# 4-Step Process



# Do I make a trip?

## Trip Generation

### USER CHARACTERISTICS

- Household Size
- Household Income
- Workers per Household
- Autos per Household

# Where do I go?

## Trip Distribution

### TRIP PURPOSES

- Home ↔ Work
- Home ↔ Other
- Non-Home ↔ Work
- Home ↔ Shop
- Home ↔ School
- Non-Home ↔ Non-Work

# What are my means of travel ?

## Mode Choice

### OPTIONS

- Drive Alone
- Pedestrian
- Drive with Passenger
- Transit
- Bicycle
- Auto Passenger

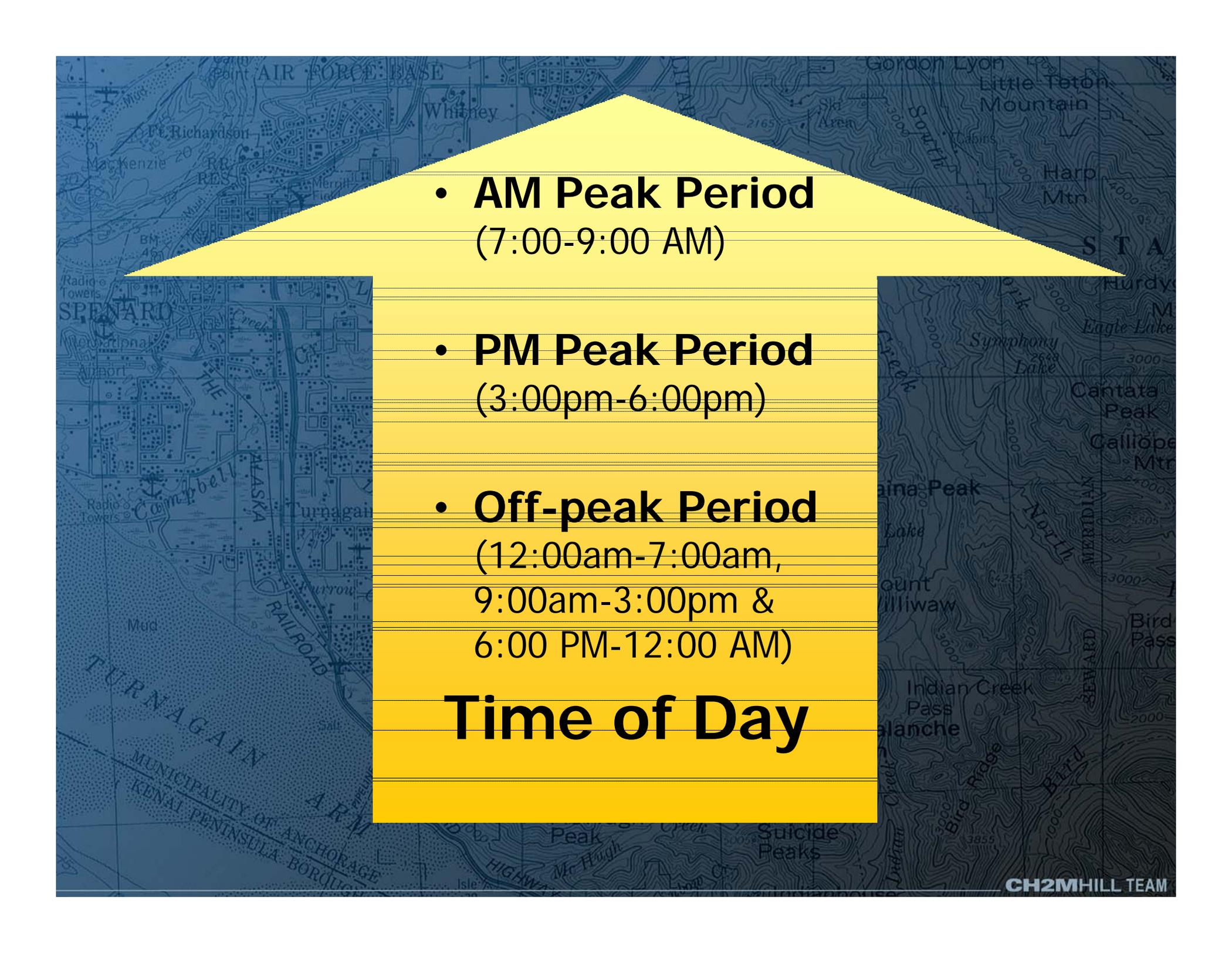
# What route do I choose ?

## Trip Assignment

### THE SHORTEST PATH TO A DESTINATION

- Speeds
- Capacity

(Estimates Delay then  
recalculates speed)

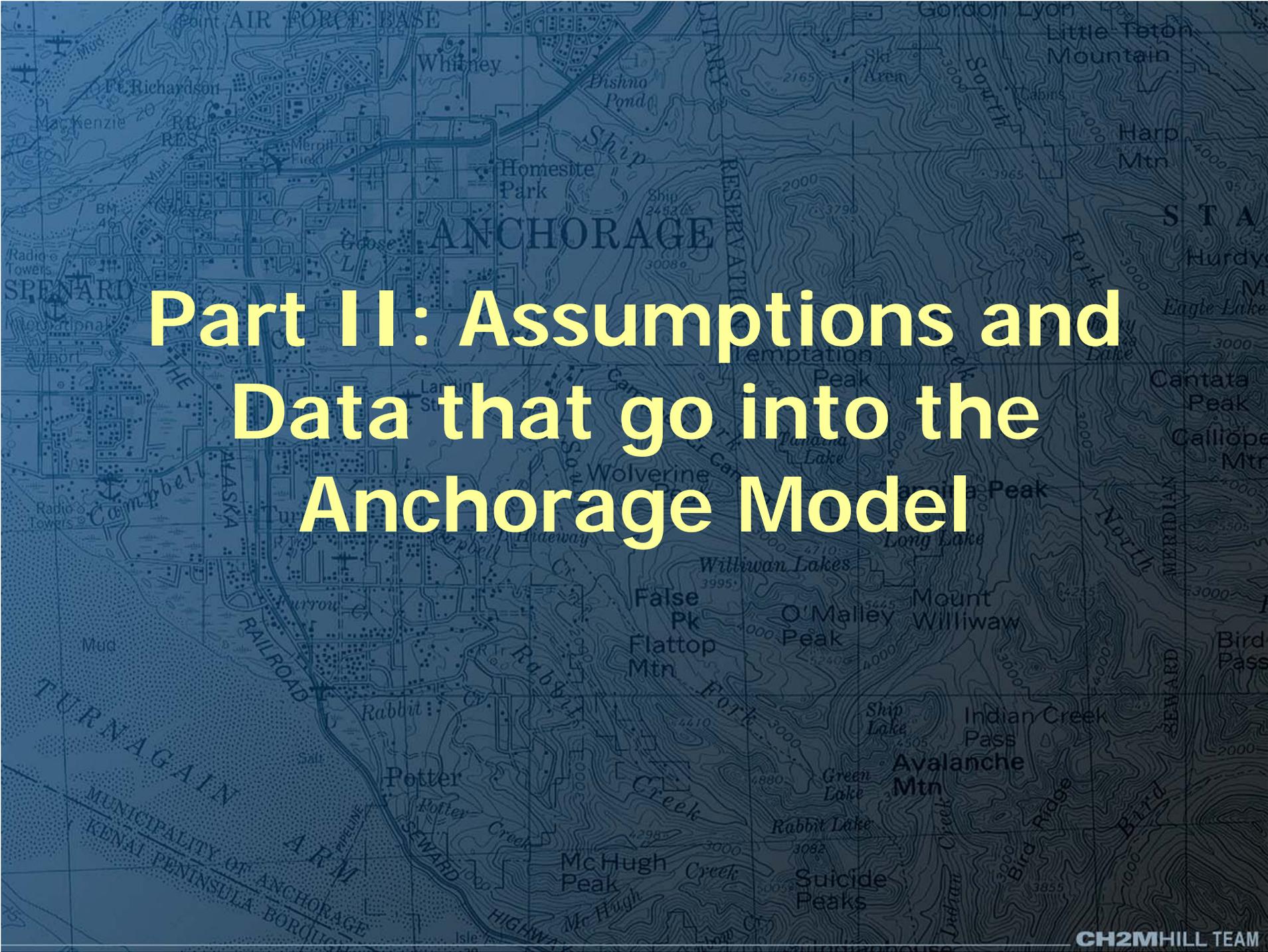


• **AM Peak Period**  
(7:00-9:00 AM)

• **PM Peak Period**  
(3:00pm-6:00pm)

• **Off-peak Period**  
(12:00am-7:00am,  
9:00am-3:00pm &  
6:00 PM-12:00 AM)

**Time of Day**

A topographic map of Anchorage, Alaska, rendered in shades of blue. The map shows contour lines, roads, and various geographical features. The word "ANCHORAGE" is prominently displayed in the center. Overlaid on the map is the text "Part II: Assumptions and Data that go into the Anchorage Model" in a large, bold, white font. The map includes labels for "Point AIR FORCE BASE", "Whitney", "Ship", "Homesite Park", "Goose Lake", "Seward Highway", "Turnagain Arm", "Municipality of Anchorage", and "Kenai Peninsula Borough".

# Part II: Assumptions and Data that go into the Anchorage Model

# Key Objectives of the ANC Model Update Process

- Improve model's sensitivity and ability to forecast multimodal travel and related policy impacts
- Better represent travel impacts of land use and development policies advocated in Anchorage 2020 (the Comp Plan)
- Incorporate updated travel behavior and population characteristics data embodied in the 2002 Household Travel Survey and 2000 U.S. Census into model formulations and assumptions

# Key Objectives of the ANC Model Update Process

- Update and improve model procedures
- Develop and incorporate post-processors to estimate impacts of policies and other transportation improvements not effectively represented in standard travel demand models
- Demonstrate consistency of projected model results with independent system activity measures such as traffic and transit rider count data

# Data Sources

## ANC USER

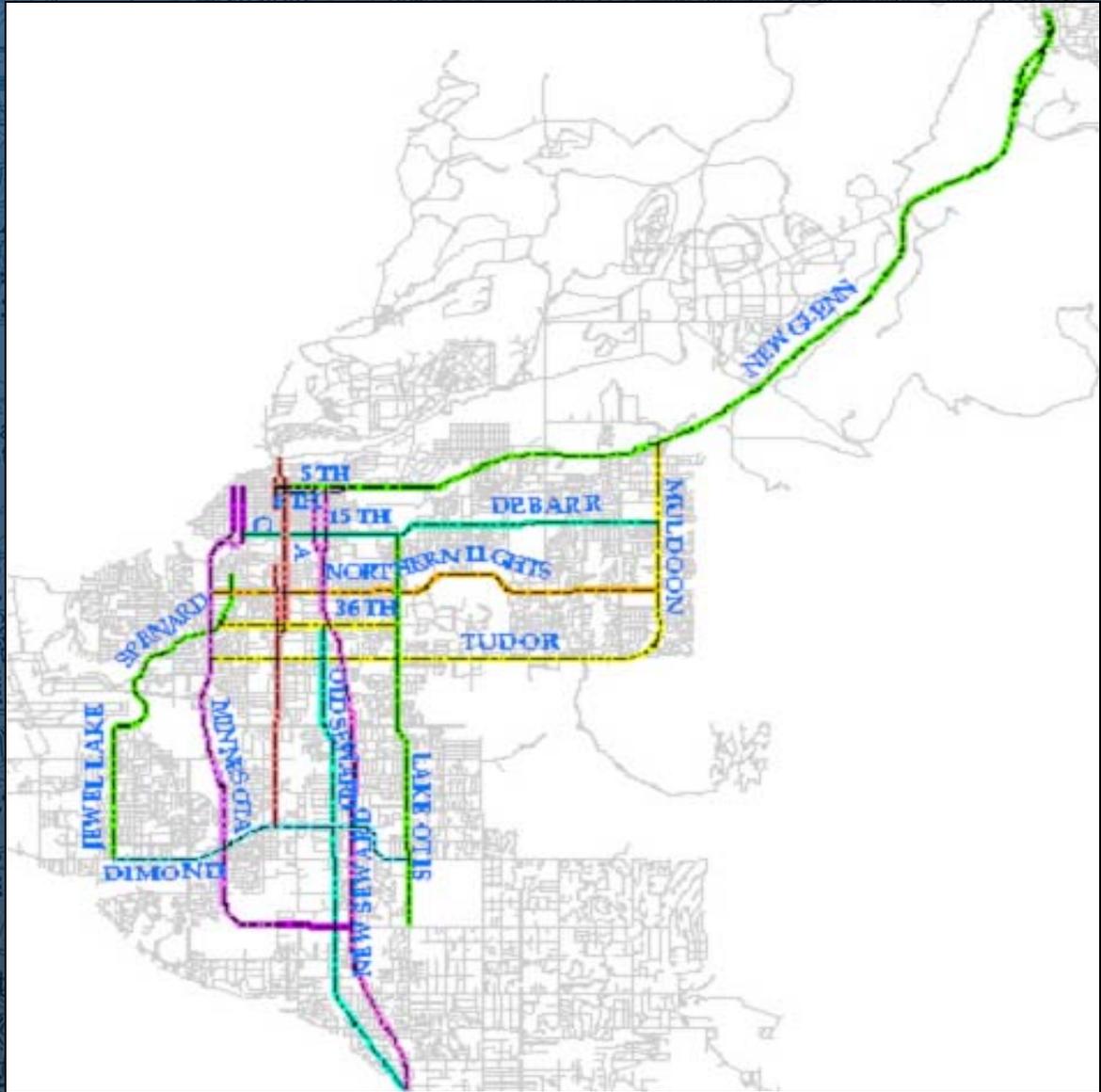
### Household Size/Income/Workers/Children/Autos

- 2002 U.S Census
- 2002 Household Travel Survey
- 12 Corridor Travel Time Survey
- Employment Data Inventory
- 2002 Traffic/Transit Rider Counts



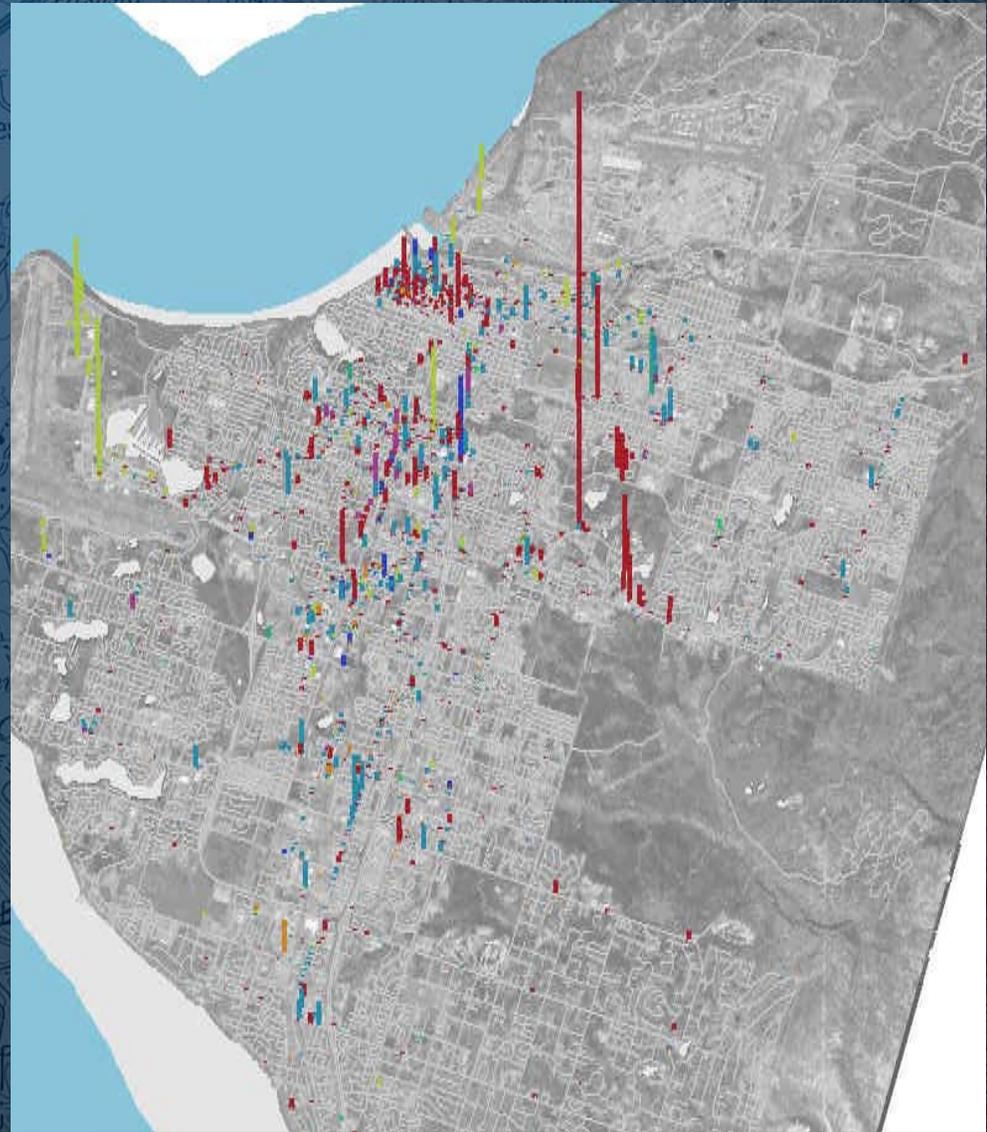


# Corridor Travel Time Survey

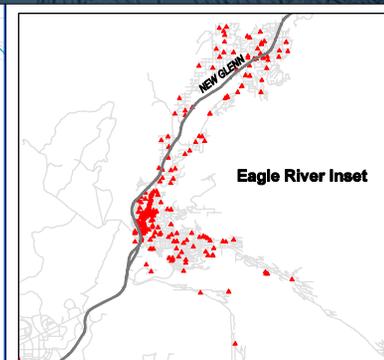
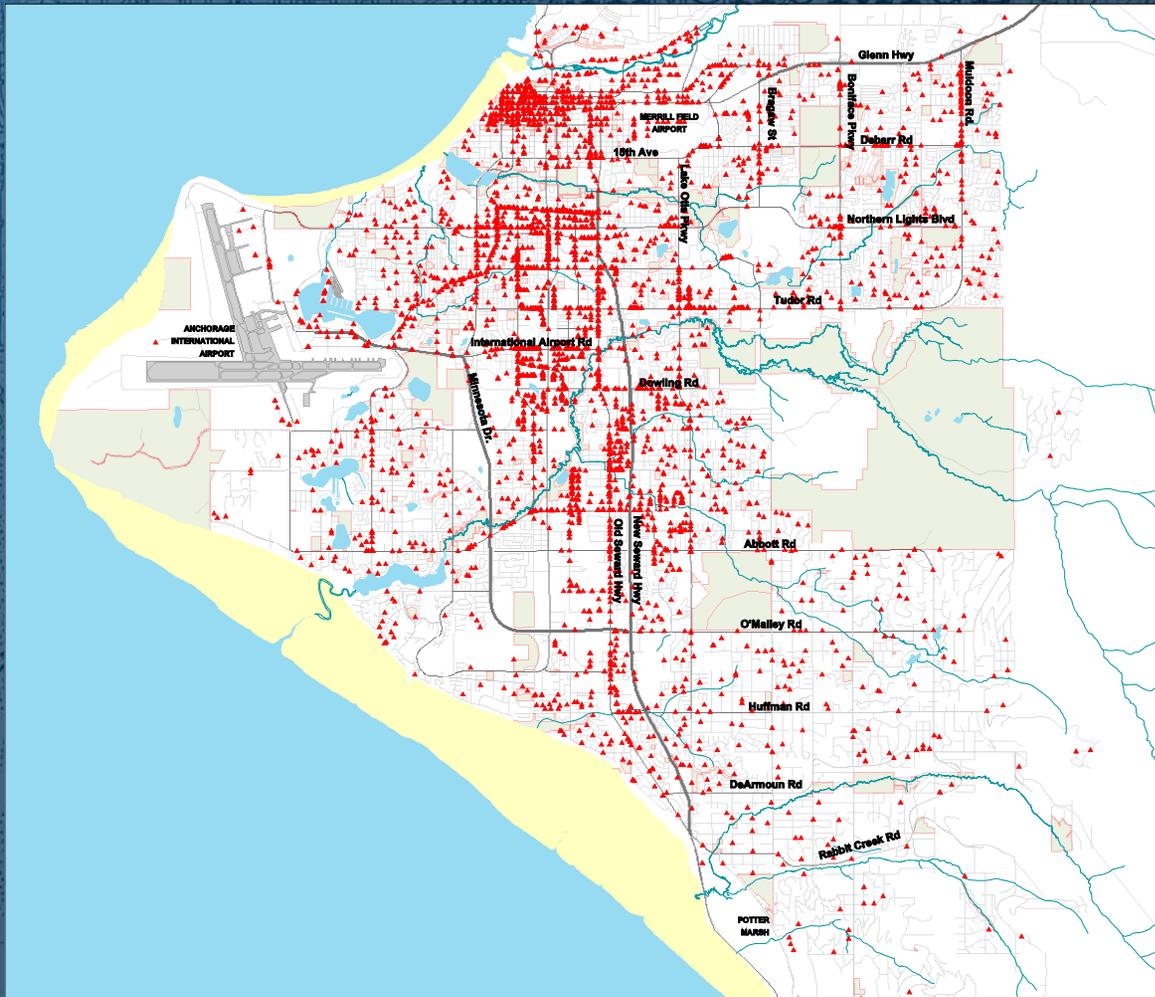


# Employment Data Inventory

- 2002
- By Employer Location and SIC
- Sources – Dept of Labor, School District, Gov't



# Total Employment



**Employment Locations  
City of Anchorage**

**Legend**

- ▲ Employment Locations

**Hydro**

- Mud Flats
- Water
- Lake
- Streams

**Parks**

- Parks

**Major Roads**

**OSHP**

- 1
- 2
- 3
- 4
- 5

— Street Network

N

1 inch equals 1 miles

CH2MHILL

# 2002 Traffic/Transit Rider Counts

- Daily and Hourly Counts for over 800 count stations
- Counts classified by vehicle type where available
- Route level patronage data for PeopleMover

# Data Development & Resources

- ✓ 2002 Anchorage Household Travel Survey (AHS)
- ✓ 2002 Employment Update (DOL, ASD, GOV)
- ✓ 2002 Household Update (US Census + Permit Data)
- ✓ TAZ & Multimodal Network Refinements
- ✓ Integrated Traffic Count Database
- ✓ Parking Cost Survey
- ✓ Regional Travel Time/Speed Survey
- ✓ Review/Revision of Special Generators
- ✓ Land Parcel Inventory
- ✓ ASD School Enrollments and Locations

# Trip Generation

# Do I make a trip?

- New models for income and auto ownership
- Updated and more accurate data on area's employment
- Updated and more accurate data on the area's population and tripmaking

# Trip Distribution

# Where do I go in ANC?

- Improved recognition of major trip types
- Better and more accurate definition of types of destinations
- Improved representation of differences between peak and off-peak trip patterns
- New school trip model will recognize school service areas

## Mode Choice

# What are my means of travel?

- New transit networks describe operation by type of service (i.e. Local vs. Express Bus)
- Peak and off-peak service modeled separately for transit
- Parking cost explicitly considered in mode choice
- Area density and diversity represented equitably for all areas
- Improved definition of walk accessibility to transit

# Trip Assignment

# How do I get there?

- AM, PM and off-peak periods assigned separately – not as daily traffic
- Output of period specific traffic will provide better estimates of network congestion and improve quality of input to air emissions modeling

## Post Processing

# What else should I consider?

- Supplemental software/database will provide estimates of travel demand management index
- Special software will show effects of Intelligent Transportation Systems (ITS) deployment
- Project/scenario cost-benefit procedures will help prioritize projects
- Level of Service (LOS) analysis tools will provide better information on traffic operations impacts

# Elements of Travel Model Update

- Review of Current Model
- Model Updating Strategy
- Implementation of Model Updates

# Key Findings of Model Review

- ✓ No income forecasting during land use allocation
- ✓ Auto ownership and income group distribution fixed by TAZ using survey relationships
- ✓ Fixed transit and transit access speeds – access based on highway zone centroid link lengths
- ✓ Home based other purpose used to represent variety of dissimilar trip types
- ✓ Application of TOD procedures found ineffective
- ✓ Significant problems with network coding and updating procedures

# Key Findings of Model Review

- ✓ Survey data applied in unlinked form
- ✓ Density/mix variables in mode choice models zone and zone size dependent
- ✓ Application of residence end zone variables in mode choice not applied to disaggregated market segments
- ✓ Transit walk access tripsheds and maximum expected walk times not defined
- ✓ Forecasting procedure application monolithic and inflexible – limited sensitivity testing possible
- ✓ Special policy analysis (e.g. TDM) not supported

# Travel Model Update Strategy

- ✓ Update and improve household disaggregation
- ✓ Expand trip purpose set
- ✓ Recalibrate trip generation/update cross-classification
- ✓ Improve highway/transit model networks/linkages
- ✓ Recalibrate trip distribution/review formulations
- ✓ Develop new TOD factoring/application procedures
- ✓ Recalibrate mode choice models and reassess formulation of key inputs
- ✓ Develop post processing capabilities to address unmet policy analysis needs

# Travel Model Update Strategy

- ✓ Validate 2002 model traffic volume estimates against full set of daily, peak period, classified and other available count information
- ✓ Validate 2002 transit assignments against route ridership counts
- ✓ Validate 2002 model congested highway speeds against data from speed/travel time survey
- ✓ Review update land use/network assumptions based on validation results and field checks

# Model Update Implementation (General & Preprocessing)

- ✓ Survey data preprocessed to better resolve home based trip purposes
- ✓ New logit auto ownership disaggregation model developed and all disaggregation models recalibrated
- ✓ Trip purposes expanded to HBW, HBO, HBS, HBSch, NHBW & NHBNW to increase homogeneity of calibrated models
- ✓ Highway/transit network attribute schema redesigned and simplified

# Model Update Implementation (Distribution/Mode Choice)

- ✓ Trip distribution models recalibrated
- ✓ Growth factor (FRATAR) distribution model developed for HBSch (in process)
- ✓ Quantitative measure of pedestrian factors (PEF) adopted to replace qualitative measurement
- ✓ Zone independent (GIS based) measurement of density/density mix
- ✓ Parking cost model developed and incorporated into mode choice formulation (in process)
- ✓ Mode choice calibrated/applied for market segments (in process)

# Model Update Implementation (TOD & Operations)

- ✓ Development of post-distribution TOD factoring model for both mode choice and assignment procedures
- ✓ Flexible procedures designed and developed to link traffic count information to the highway network description
- ✓ Updating and expansion of model procedures library to current TransCAD version and incorporation into new menu/editing system
- ✓ Improved and better integrated model and operational documentation

# Where We Are Now

- Refine and finalize Mode Choice Models
- Validating new model performance
- Complete 2013 and 2025 population-employment forecast allocations
- Run travel model, test transportation network performance
- Continue refinement of 7 LRTP transportation system elements (with Focus Groups)
- Propose and finalize evaluation framework and criteria with RT
- Meet and review results with Roundtable, TOC, and public