

# Traffic Monitoring Research



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# Research Areas



- **Motorcycle Data – Danny Jenkins**
- **Ramp Data – Danny Jenkins**
- **Long Distance Travel/Origin Destination Research-  
Danny Jenkins/Brad Gudzinias/Patrick Zhang**
- **Bicycle / Pedestrian data – Steven Jessberger**
- **VMT/VHT Research- Patrick Zhang**

# Research Project Update



Danny Jenkins

- **Motorcycle data**
- **Ramp data**
- **Long Distance Passenger Origin-Destination Study**

# Motorcycle Data



- **NCHRP Project 08-81 "Improving the Quality of Motorcycle Travel Data Collection"**
- **Contractor: Texas Transportation Institute**
- **Current Status:**
  - Literature Review- complete
  - Field Testing of Promising Technologies- spring 2012
  - Project completion- fall 2012

# Ramp Data



- **OHPI Project Development of Methods For Obtaining Traffic Data Associated With Interchange Ramps**
- **Contractor: AECOM with support from Delcan**
- **Major Tasks:**
  - Task 2 - Identify Current Ramp Traffic Data Sources (underway- 50% complete)
  - Task 3 - Ramp Configurations and Develop Algorithms To Estimate Ramp Volumes (underway- 10% complete)
  - Task 4- Validate Estimated Ramp Volume Algorithms (start spring 2012)

# Long Distance Passenger Origin-Destination Study



- **OHPI Project Long Distance Passenger Origin-Destination Study**
- **Contractor: RD Mingo and Associates with significant support from Wilbur Smith Associates and Resource Systems Group**
- **Major Tasks:**
  - Task 3 – Create 2008 highway (auto and bus), air, and rail passenger trip tables (draft tables complete)
  - Task 4 - Create 2040 highway (auto and bus), air, and rail passenger trip tables
  - Task 5- Create 2008 and 2040 highway long distance vehicle trip tables

# Questions?



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# Research Project Update



Brad Gudzin

- Long-distance travel model exploratory research
- Long-distance mode choice model
- Elasticity analysis

# Long-distance travel model exploratory research



## Objectives:

- Explore methods to modeling long-distance passenger modeling in the U.S.
- Build on advanced modeling methods being used in regional and statewide modeling for national planning and policy

# Long-distance travel model exploratory research



- Foundation for modeling national long-distance passenger travel
- Identify model structure and trip purposes
- Unique considerations for long-distance trips
- Useful for external trip inputs to statewide models
- Also valuable for national transportation infrastructure planning
- Analogous to FAF, but with people instead of freight

# Long-distance mode choice model



## Objectives:

- Develop quantitative tools to analyze long-distance travelers make their modal choices
- Inform policy analyses by better understanding how travelers make these choices

# Long-distance mode choice model



- Auto is dominant for trips <500 miles but the auto/air transition (trips 500-1000 miles) is not well understood
- Parallel research projects being conducted by Oak Ridge National Laboratory (ORNL) and by Battelle
- Develop a model of from variables in NHTS that explain travel behavior

# Elasticity analysis



## Objectives:

- Study the effects of cost changes on auto travel
- Establish quantitative relationships between auto trips and cost

# Elasticity analysis



- Auto trips shift modes in response to costs
- Related to model choice model development, since certain factors (e.g. gas prices) may lead to mode shifts

# Questions?



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# Research Project Update



Steven Jessberger

- **Bicycle and Pedestrian Data**

# Bicycle and Pedestrian Data Collection



- **Contractor – AMEC**
- **May 2011 – November 2011**
- **Task 1 – Literature Review of over 30 documents**
- **Task 2 – Fact Finding webinar series and eight Professional Interviews**
- **Final Report will be posted to the FHWA Highway Community Exchange**

# Bicycle and Pedestrian Research Findings



- **Task 1 – excellent format and document for quickly searching research papers for topics of interest**
  - No Established Formats
  - Need Factoring Processes
  - Most Counts less than 24 hours and not from Permanent Installations
  - Counting Technology is improving rapidly
  - Need for Counting both Individual Data and Mixed use Facilities

# Bicycle and Pedestrian Research Findings



- **Task 2 Webinars and Professional Interviews of 25 States, 8 Planning Agencies and 21 Other Entities**
  - The top two reasons for collecting pedestrian counts are
    - ✦ Safety analyses
    - ✦ Project specific needs (typically before and after studies)
  - The top two reasons for collecting bicycle counts are:
    - ✦ Safety analyses
    - ✦ Project evaluation (before and after studies)
  - Sampling Process is not well established
  - Bicycle Data Collection Equipment works well under varied weather conditions

# Bicycle and Pedestrian Research Findings



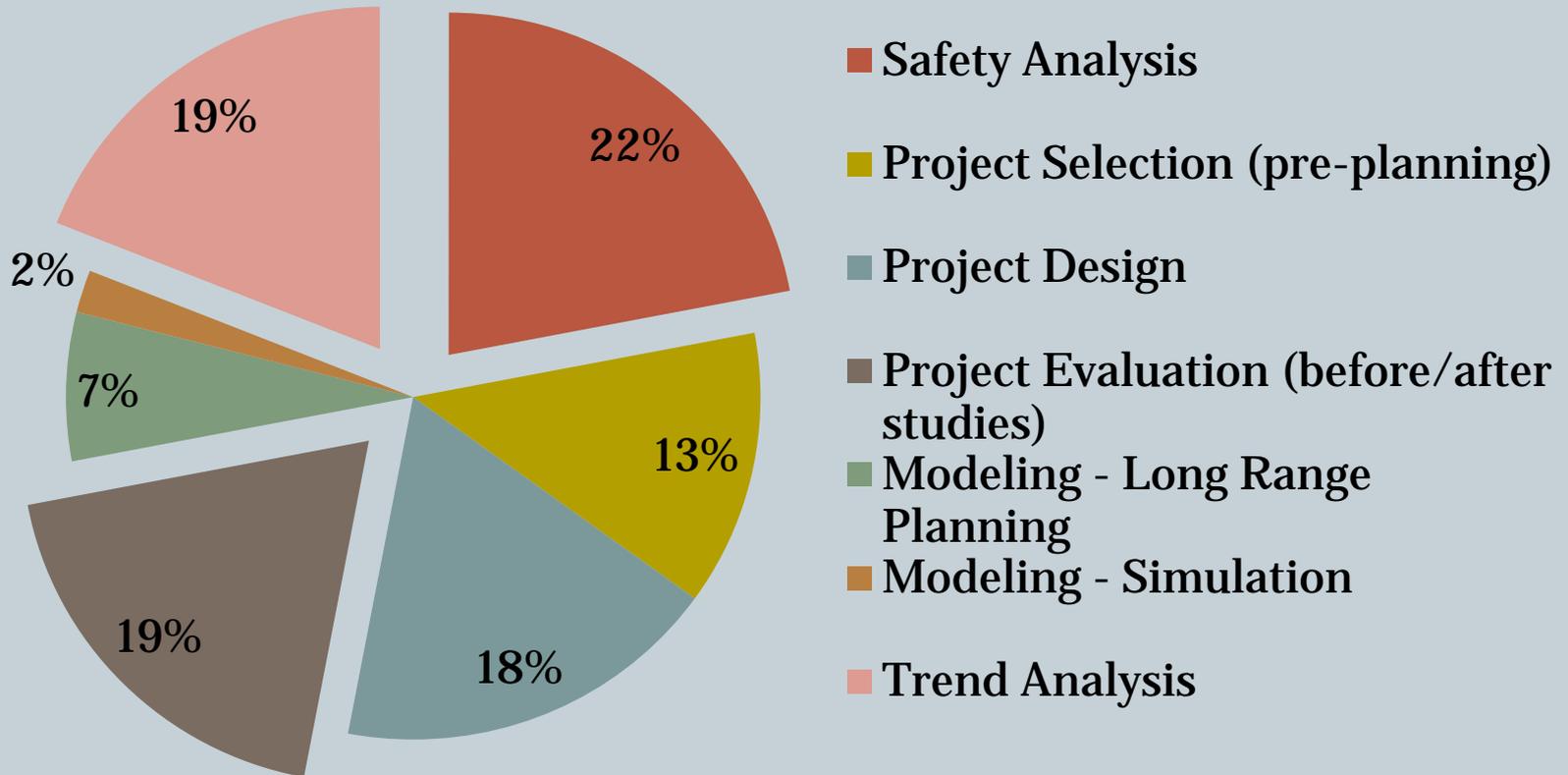
## ● Task 2 Webinar Results

- Out of 99 people responding 72% had collected bicycle and pedestrian data for 3 years or less
- Only 13% of respondents collect 24/7 permanent data
- 61% of respondents do their pedestrian counts manually
- 49% of respondents do their bicycle counts manually
- Only 25% of respondents have independently verified their equipments effectiveness
- Only 13% of respondents have experience extrapolating bicycle and pedestrian counts temporally
- Including weather is very important item to include in a National bicycle or pedestrian format

# Webinar Poll Results



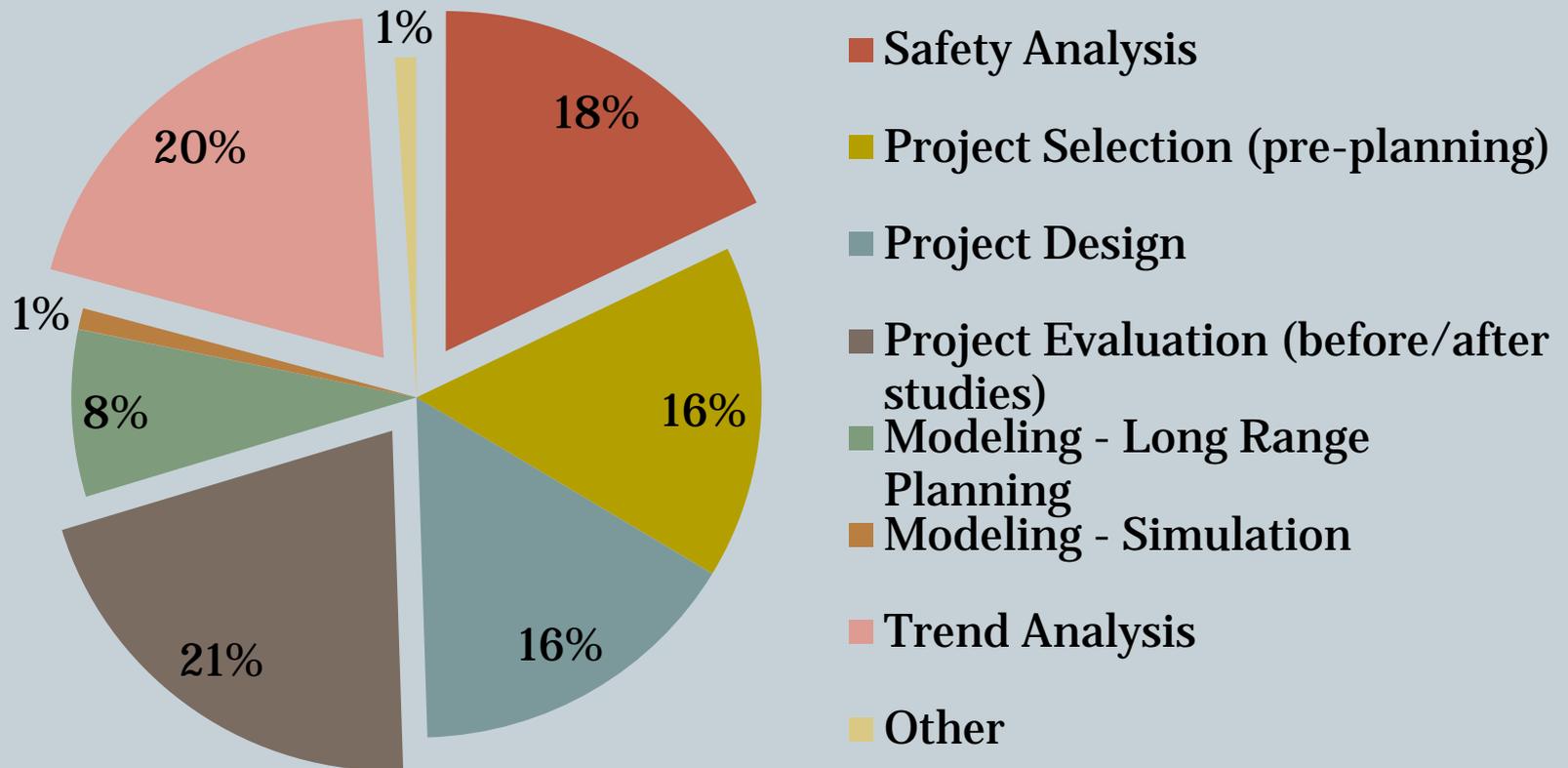
## Pedestrian Counts Are Collected For



# Webinar Poll Results



## Bicycle Counts Are Collected For



# Questions?



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# Research Project Update



Patrick Zhang

- **Vehicle and VMT Disaggregate by State and Fuel**
- **Vehicle Hours Traveled**
- **Vehicle Miles Forecast**
- **Design of a New Approach for a National Household Long Distance Travel Survey Instrument**
- **OD Study**

# Vehicle and VMT Disaggregate by State and Fuel



- **Gasoline - Conventional**
- **Diesel - Conventional**
- **Propane**
- **Compressed Natural Gas**
- **Bio-Diesel**
  - B20 (Most Diesel Vehicles)
  - B100 (Vehicles after 1994 without factory warranty)
- **Ethanol**
  - E10 (All Gasoline Vehicles)
  - E85 (Flexfuel Vehicles)
- **Electricity**
  - All-Electric Vehicles
  - Hybrid Electric Vehicles
  - Plug-in Hybrid Electric Vehicles
    - ✦ Parallel plug-in hybrids
    - ✦ Series plug-in hybrids

# Vehicle Hours Traveled



- **Historical analysis of trends in VHT**
  - Focus on understanding determinants of VHT at urban area level
  - Address objections to TTI focus on delay (vs. total travel time)
- **Develop Forecasting Model**
  - Attempt to forecast VHT using TTI historical data
  - Analogous to VMT model and would dovetail nicely
  - Need to determine correspondence between VHT and VMT measures for individual urban areas
- **Develop facility-level model of speed and VHT**
  - Focus on single urban area (probably California)

# Vehicle Miles Forecast



- The national model forecasts VMT by vehicle types (4, no motorcycle) and road classes (5, verify) at national level.
- The state model forecasts VMT by vehicle types (4) at state level.
- Models are updated every 6 months while other agencies release their forecast data such GI and Census of Bureau.
- Models are used to provide policy support and scenario analysis.

# Design of a New Approach for a National Household Long Distance Travel Survey Instrument



- **Sampling Frame/Design**
- **Data Collection Methods**
- **Statistical Estimation and Weighting**
- **Resource and Schedule Estimation**
- **Exploratory Research on Sampling Frame/Design Topics**
- **Exploratory Research on Data Collection Methods**
- **Exploratory Research on Estimation and Weighting**
- **Survey Design for Long Distance Travel**
- **Assist in the Preparation of the OMB Package**
- **Pilot Test Demonstration**

# OD Study



## **Task 1: Evaluate the Impacts of Infrastructure Network, Travel Service Availability, Congestion, Social and Economical Factors, and Other Factors on Long Distance Passenger Travel Demand and Modal Choice**

- develop a framework for analyzing long distance passenger travel decisions.
- propose a set of research hypotheses regarding the important factors that affect long distance travel decisions.
- identify data sources useful for evaluating these hypotheses.
- analyze those data and information that lends credence to or detracts from our working hypotheses.

# OD Study -continued



## **Task 2: Develop a Traffic Data Framework**

- Literature Review and Data Identification
- Network Representation in Database
- Traffic Assignment Modeling
- System Implementation and Performance Evaluation

# Questions?



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