A Combined Quantitative and Qualitative Approach to Planning for Improved Intermodal Connectivity at California Airports (TO5406-6406)

(Quarterly Meeting)
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Outline

• Objectives
• Project Status
• Performance Evaluation
• IAPT Demonstration
• Presentation to MTC, SFO and BART Staff
• Next Steps
• Discussion
Objective

- Develop techniques for analyzing the effectiveness of alternative strategies for improving intermodal connectivity at airports using a combined quantitative and qualitative approach
  - Quantitative: Analytical models of airport traveler and transportation provider’s behavior, traffic networks
  - Qualitative: Descriptive case studies and analysis of agency decision making processes

- Research products:
  - Case studies of intermodal access projects at California airports
  - Develop prototype Intermodal Airport Ground Access Planning Tool (IAPT)
  - Using IAPT to evaluate selected case study projects at California airports
  - Policy recommendations and planning guidelines
Project Status – Progress on Current Tasks

- Develop prototype user interface module for the Intermodal Airport Ground Access Planning Tool.
  - Refining the IAPT graphical user interface

- Develop mode choice analysis module for the prototype Intermodal Airport Ground Access Planning Tool and calibrate on data for selected region
  - Further development of the OAK mode choice model
    - Extension to nested logit structure
    - Refine representation of regional transportation service data
  - Development of mode choice models for SFO and SJC

- Implement transportation provider modeling in IAPT
  - Development of Nash Game approach
Performance Evaluation

• System performance
  – Vehicle trips
  – Number of passengers
  – Transportation provider revenue
  – Vehicle-miles of travel (VMT) and vehicle-hours of travel (VHT)
  – Vehicle emissions
  – Passengers/vehicle-mile and passengers/vehicle-hour.

• Connectivity performance
  – Passenger waiting times
  – Number of passenger transfers
  – Connectivity-production cost
    • Combined measure of the value of traveler access times and transportation provider costs

• Need for an overall measure of intermodal connectivity
IAPT Demonstration

• Current status of software development
  – GUI
  – Project definition
  – Data entry and support
  – Computation
  – Display of analysis results
    • System performance measures
Presentation to MTC, SFO and BART Staff (Nov 14)

• Reaction to IAPT capabilities generally positive with some constructive suggestions for tool implementation and development

• IAPT capabilities
  – Issues in predicting future air passenger mode choice behavior
  – Forecasting air party characteristics in future years
    • Trends in air party characteristics over time
  – Data requirements to apply the tool to other airports
  – Extension to model interaction between airports
    • Air passenger airport choice

• Output display
  – Provide “drill-down” capability to present IAPT results for subsets of the market
  – Provide ability to export the analysis results in a standard format usable by other applications
Next Steps: Bay Area Case Studies

- **Objectives of case studies**
  - Demonstrate use of IAPT
  - Provide basis for policy recommendations
  - Analyze a range of different strategies

- **SFO**
    - Retrospective analysis of effect on ground access mode use
    - Validation of IAPT
  - Ferry service (San Francisco-SFO-South Bay)

- **OAK**
  - Oakland Airport Connector
    - APM link to Coliseum BART and Amtrak stations
  - South Peninsula off-airport terminal

- **SJC**
  - APM link to VTA light rail line
  - South County off-airport terminal
Next Steps: Policy Recommendations

• Key policy issues in airport ground access
  – Funding intermodal connections
  – Promoting use of high-occupancy modes
  – Measuring and monitoring system performance
  – Role of airport ground access in regional transportation planning
  – Interregional (cities or counties) jurisdictional issues

• Project selection and implementation
  – Measuring cost-effectiveness of alternative projects and strategies
  – Contribution of proposed projects to regional transportation goals
  – Institutional roles and responsibilities
    • Caltrans, MPOs, transit agencies, airport authorities, FTA, FAA, FHWA

• Development of project planning guidelines
  – Use of quantitative analysis in project evaluation
  – Measuring system performance
  – Strategies for improving intermodal connectivity
  – Importance of interagency coordination
Next Steps: IAPT Implementation

• Demonstration of the IAPT to additional potential users
• Documentation of IAPT development
Discussion

• IAPT functionality
  – GUI
  – Definition of case study projects
  – Data entry and data support needs
  – System performance measures
    • How to weigh the different performance measures in project selection
    • Use of system performance measures in policy assessment

• Measuring intermodal connectivity
  – Need for a policy-responsive measure
    • Reflects airport user perceptions of relative attractiveness of each mode
    • Measures effectiveness of alternative policies and potential projects
  – Possible approach
    • Ratio of weighted travel time/cost by high-occupancy mode to private car
    • Can be applied at the system, service or zonal level
    • Weights based on coefficients of mode choice model
Discussion

• Research needs beyond the current project
  – Airport choice in a region
  – Airport employees trips
  – Air cargo access/egress trips