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IMPLEMENTATION REPORT

Project Prepares State For Estimating Bicycle And Pedestrian Demand

The primary objective of this research project was to encourage bicycle and pedestrian travel demand forecasting procedures as developed in Texas Department of Transportation (TxDOT) Project 0-1723. The researchers worked with three TxDOT districts in applying and field-testing the demand forecasting procedures on state roadways at various stages in TxDOT's planning, design, or construction phases.

By working with planning personnel in three districts, the researchers hoped to:

- familiarize TxDOT district planning personnel with bicycle/pedestrian travel demand forecasting procedures;

- test the demand forecasting procedures using land use and facility data gathered for planned roadway construction/ reconstruction projects;

- evaluate the procedures for ease of use and data availability and, where possible, validate demand estimates against comparable bicycle/pedestrian usage rates;

- revise the demand forecasting procedures as appropriate; and

- develop implementation recommendations.

What We Did . . .

The researchers worked with the districts on the roadway corridors shown in Table 1. We held a preliminary meeting with each of the respective district contacts to summarize the demand forecasting procedures and discuss candidate case study corridors. Once the case study corridors were chosen, we gathered the necessary data and developed bicycle and demand estimates (see following paragraph for detail). We conducted a second meeting with each district contact to discuss the findings and develop recommendations for implementing results. TTI researchers then documented each of the case studies in this implementation report.

In developing the bicycle/pedestrian travel demand

Table 1. District Contacts and Case Study Corridors

TxDOT District, Contact Person	Case Study Corridor and Limits	Description of Corridor
Bryan District, Robert Appleton, P.E.	Texas Avenue (Business SH 6): Dominik Drive to FM 2818 (approx. 3 miles)	Four-lane, high-volume primary arterial; heavy commercial activity with frequent driveway access; several parallel side streets.
Houston District, Teri Kaplan	West White Oak Bayou Trail: Pinemont Street to 18th Street (approx. 5 miles)	Shared-use trail that parallels bayou in right-of-way separate from roadway; bisects several parks/green spaces, mix of single and multi-family housing, and some commercial activity; parallel street with moderate traffic volume (T.C. Jester).
San Antonio District, Ken Zigrang	Blanco Road (FM 2696): West Avenue to Loop 1604 (approx. 4.5 miles)	Ranges from four-lane (southern end) to two-lane (northern end) arterial; heavy commercial activity and multi-family housing at southern end, single-family housing and green space at northern end.

estimates, the researchers gathered the following data for each of the three case study corridors:

• **street network and layout** - this information defined analysis subsections and influence areas along the study corridors; and

• **land use information** - numbers of dwelling units/households (residential land use) and commercial building footprints (commercial land use) were gathered from geographic information system (GIS) databases in each of the three areas.

What We Found . . .

In the initial meetings with the district contacts, the TTI researchers found slightly different perspectives about how TxDOT or other planning agencies could use and apply bicycle and pedestrian demand forecasting procedures. Ideas on the use of bicycle/pedestrian demand forecasting procedures are summarized here because of their usefulness in implementation. In summary, the suggested uses for bicycle and pedestrian demand estimates were:

1. determining appropriate facility design treatments and sizes;

2. identifying and prioritizing high-demand corridors; and

3. developing regional or district-wide bicycle and pedestrian plans.

The first district contact indicated that bicycle and pedestrian demand estimates could be used to help determine the appropriate facility size and design. For example, transportation planners might use pedestrian demand estimates to determine appropriate sidewalk widths. The contact person also indicated that demand estimates could be used outside of urban areas (e.g., suburban or rural developing areas) to decide whether or not to provide a bicycle or pedestrian facility. Most urban areas, however, use a standard pedestrian or bicycle facility design (i.e., wide curb lanes or shoulders) on roadway reconstruction.

The second district contact indicated that travel demand

estimates could help quantify the benefits and impacts of bicycle and pedestrian facilities. In this district, the metropolitan planning organization (MPO) is developing the "Bicycle-Pedestrian Corridor Profile Method" to reveal how bicycle and pedestrian facilities affect the travel patterns. This method under development will estimate bicycle and pedestrian demand, which can then be used to evaluate and prioritize congestion mitigation and air quality (CMAQ) projects for funding.

The third contact indicated that the district would use bicycle and pedestrian demand estimates for developing a better regional bicycle/ pedestrian plan. In this district, the bicycle and facility designs are either standardized by TxDOT (i.e., sidewalk width) or largely determined by a technical committee within the MPO (i.e., striped bicycle lanes). The contact person indicated that district personnel typically do not make the decision of whether or not to provide bicycle/pedestrian facilities, and that the existing regional plan determines where bicycle/pedestrian facilities are provided.

The results of the bicycle and pedestrian demand forecasting analysis are shown in Table 2. The results indicate that bicycle and pedestrian trips can be estimated using readily available data, and that the estimates are within range of bicycle and pedestrian volume counts performed previously in this research study.

The Researchers Recommend . . .

The research team recommends that TxDOT staff implement these procedures where TxDOT deems demand estimates necessary for bicycle and pedestrian facilities. In TxDOT districts where bicycle and pedestrian accommodation is a standard practice on all state roadways, the demand forecasting procedures may not be necessary except where bicycle and/or pedestrian demand could affect design dimensions.

Table 2. Results of Bicycle and Pedestrian Demand Forecasting Analysis

Corridor and Section	Land Use Classification	Estimated Daily Bicycle Trips	Estimated Daily Pedestrian Trips
Texas Avenue (SH 6 Business) Dominik Drive to Brentwood Drive Brentwood Drive to FM 2818	mixed-use urban mixed-use urban	350[a] 140[a]	260 100
West White Oak Bayou Trail Pinemont Street to 34th Street 34th Street to 18th Street	mixed-use urban mixed-use urban	140 160	90 105
Blanco Road West Avenue to Bitters Road Bitters Road to Loop 1604	mixed-use urban suburban	150 25	95 30

Notes: [a] Actual number of bicycle trips could be significantly less because of diversion to parallel collector streets (Anderson and George Bush E) about 1/4-mile on either side of Texas Avenue

For More Details . . .

For more information on the bicycle/pedestrian travel demand forecasting procedures, contact:

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Interested readers can find the actual demand forecasting procedures in TTI Report 1723-S. TTI Reports 1723-1 and 1723-2 contain the literature review and documentation of the development of the forecasting procedures, respectively.

To obtain copies of the reports, contact Dolores Hott, Texas Transportation Institute, Information & Technology Exchange Center, (979) 845-4853, or e-mail d-hott@tamu.edu. See our on-line catalog at http://tti.tamu.edu.

Related Research

The following list highlights research or other activities in Texas related to bicycle/pedestrian travel demand forecasting:

• **Houston, Texas:** The Houston-Galveston Area Council (HGAC) is developing a multinomial logit model for predicting bicycle demand. The model will be based upon before-and-after studies along seven bicycle corridors in Houston.

• **Dallas-Ft. Worth, Texas:** The North Texas Council of Governments has developed simple tools for estimating relative bicycle/pedestrian demand. The tools are based upon readily available census data such as average income levels and households.

• **Federal Highway Administration (FHWA):** The FHWA has published two reports on bicycle/pedestrian demand forecasting. They are Guidebook on Methods to Estimate Non-Motorized Travel: Overview of Methods (Report FHWA-RD-98-165) and Guidebook on Methods to Estimate Non-Motorized Travel: Supporting Documentation (Report FHWA-RD-98-166).

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