TRANSPORTATION RESEARCH BOARD

PUBLICATIONS ON PEDESTRIANS AND BICYCLISTS

2000-2003

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This report was compiled with the assistance of Joya Banerjee and Eric C. Shen, P.E.

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1. **00962118**

ACCESSIBLE PEDESTRIAN SIGNALS: SYNTHESIS AND GUIDE TO BEST PRACTICE

CORPORATE AUTHOR: Transportation Research Board
SERIES: NCHRP Research Results Digest 278
PAGES: 21p
DATE: July, 2003
FEATURES: Figs. Phots. 9 Ref.

ABSTRACT: This digest summarizes the publication "Accessible Pedestrian Signals: Synthesis and Guide to Best Practice," by J.M. Barlow, B.L. Bentzen and L. Tabor of Accessible Design for the Blind. Following an introduction and background information on accessible pedestrian signals (APS), the digest covers the following topics: U.S. rules and regulations related to APS; international practice; APS technologies and features; where to install APS; designing installations; new construction or reconstruction installation; retrofitting an intersection with an APS; and specifications for installation of APS components.
DESCRIPTOR: Audible pedestrian signals; Blind persons; Visually impaired persons; Guidelines; Best practices; Regulations; International; Technology; Location; Design; Installation; Retrofitting; Specifications; Accessible pedestrian signals; United States

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2. **00939832**

NEW TRB SPECIAL REPORT: THE RELATIVE RISKS OF SCHOOL TRAVEL: A NATIONAL PERSPECTIVE AND GUIDANCE FOR LOCAL COMMUNITY RISK ASSESSMENT

AUTHOR: Fischbeck, PS; Huey, BM.
CORPORATE AUTHOR: Transportation Research Board
SERIES: TR News 224
PAGES: pp 39-42

DATE: January, 2003
ISSN: 07386826
FEATURES: 1 Fig.

ABSTRACT: A Transportation Research Board (TRB) Study Committee, convened under Congressional mandate, has produced a practical framework for communities to evaluate and manage the relative risks of the various modes for school travel. This article summarizes the study committee's goals and approaches, data sources, and findings, which are presented in their entirety in TRB Special Report 269, "The Relative Risks of School Travel: A National Perspective and Guidance for Local Community Risk Assessment."

DESCRIPTOR: School children; Transportation safety; Transportation modes; Risk assessment; School buses; Automobile travel; Walking; Bicycle travel

3. 00962114
MORE EFFECTIVE WINTER MAINTENANCE METHOD FOR CYCLEWAYS

AUTHOR: Bergstrom, A.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record 1824
PAGES: pp 115-122
DATE: 2003
ISBN: 0309085578
ISSN: 03611981
FEATURES: 3 Fig. 2 Tab. 13 Ref.

ABSTRACT: Increased cycling as a means of personal travel could generate environmental benefits if associated with a corresponding decrease in car-based transport. For promoting cycling during winter, the maintenance service level of cycleways is of importance. Earlier studies indicated that the Swedish public is unsatisfied with the service levels provided on cycleways during winter. In Sweden, cycleways normally are cleared of snow through plowing and are gritted for skid control. Field studies tested an unconventional winter maintenance method that uses a power broom for snow clearance and salt for deicing. The field studies were evaluated through road-condition observations, measurements of friction, a questionnaire survey, interviews, and bicycle measurements. The method of using a power broom for snow clearance and salt for deicing provided a higher service level than traditional winter maintenance methods, but it was two to three times more expensive. The method has greater potential in regions, such as southern Sweden, with low snow accumulation but with major ice-formation problems than in regions with a colder climate. Cyclists noticed the improved maintenance service level provided with

the method used in the field study, but although cyclists stated that road condition is important to their decision to cycle, it could not be concluded that the enhanced service level generated a higher winter cycling frequency.

NOTES: This paper appears in Transportation Research Record No. 1824, Highway Maintenance Safety, Support, and Services.
DESCRIPTOR: Bikeways; Winter maintenance; Snow and ice control; Level of service; Field studies; Deicing; Sodium chloride; Costs; Power broom (Snow removal); Sweden
STATUS: AVAILABLE TRB BOOKSTORE

4. 00935484
EFFECTS OF PEDESTRIAN TREATMENTS ON RISKY PEDESTRIAN BEHAVIOR

AUTHOR: Siques, JT.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record 1793
PAGES: pp 62-70
DATE: 2002
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ISSN: 03611981
FEATURES: 3 Fig. 5 Tab. 5 Photos

ABSTRACT: The effects of pedestrian treatments on risky pedestrian behavior at light rail transit grade crossings were examined. Five pedestrian treatments were evaluated--(a) pedestrian automatic gates, (b) a prototype active pedestrian warning device, (c) a prototype active "Look Both Ways" sign, (d) barrier channelization at a skewed crossing, and (e) a "Stop Here" pavement marking. Pedestrian grade-crossing treatments were installed at three grade crossings along the Tri-County Metropolitan Transportation District of Oregon MAX light rail system in Portland, Oregon. The pedestrian treatments and the crossing geometry varied at the three locations, providing for three unique evaluations on the effectiveness of different pedestrian treatments at grade crossings. The grade crossings were videotaped for at least 1 week both before and after the installation of the pedestrian treatments. The data were evaluated using a before-and-after statistical approach to determine the effects of the treatments on risky pedestrian behavior. The statistical evaluation of the data shows that pedestrian treatments result in a statistically significant reduction in risky pedestrian behavior. The greatest reductions were found with pedestrian automatic gates. The results, however, also demonstrate that various pedestrian treatments can sometimes increase risky pedestrian behavior.

NOTES: This paper appears in Transportation Research Record No. 1793, Transit: Intermodal Facilities, Rail Transit, Commuter Rail, Light Rail Transit, Maintenance, and Ferry Transportation.

DESCRIPTOR: Light rail transit; Pedestrian safety; Risk taking; Railroad grade crossings; Countermeasures; Warning devices; Traffic signs; Road markings; Before and after studies; Videotapes; Statistical analysis; Automatic gates; Channelization; Portland (Oregon)

STATUS: AVAILABLE TRB'S BOOKSTORE

5. 00935482

HEURISTIC ANALYSIS OF IMPACTS OF COMMUTER RAIL STATION CONSOLIDATION ON PEDESTRIAN ACCESS

AUTHOR: Ayvalik, CK; Khisty, CJ.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record 1793

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FEATURES: 4 Fig. 7 Tab. 17 Ref.

ABSTRACT: A mode-of-station-access survey at the Milwaukee District North Line Grayland and Mayfair Stations in Chicago is described. The study was conducted to determine the impacts of consolidating these two stations into a single new station. Patterns of different station access modes were studied. The analysis focused on the most sensitive market segment--walkers. Two different methods were used to determine how current walkers would be affected by such a station change. The first estimate was based on changes in walking distances. A heuristic procedure was developed to estimate the number of walkers currently using the system who would possibly walk to the proposed new station. This estimate assumed that stations would attract walkers from a circular area referred to as the catchment area. The average walking distance to each station determined its catchment area size. Further assumptions were made to predict those walkers who were not currently in the catchment areas but who would decide to walk to the new station. This study provides intuitive results and methodology that show promise for use in similar situations.

NOTES: This paper appears in Transportation Research Record No. 1793, Transit: Intermodal Facilities, Rail Transit, Commuter Rail, Light Rail Transit, Maintenance, and Ferry Transportation.

DESCRIPTOR: Railroad commuter service; Railroad stations; Consolidations; Pedestrians; Access; Heuristic methods; Impacts; Walking distance; Chicago (Illinois)
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6. 00935339
MULTIMODAL CORRIDOR LEVEL-OF-SERVICE ANALYSIS

AUTHOR: Dowling, RG; McLeod, D; Guttenplan, M; Zegeer, JD.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record 1802
PAGES: pp 1-6
DATE: 2002
ISBN: 030907729X
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FEATURES: 2 Fig. 12 Ref.
ABSTRACT: The 2000 release of the Highway Capacity Manual (HCM) provides for the first time a corridor analysis method that guides users in the application of various chapters of the HCM to the analysis of automobiles and transit in a corridor. Together with the recent publication of the Transit Capacity and Quality of Service Manual (TCQSM), the HCM 2000 represents a significant advance in the direction of multimodal level-of-service (LOS) analysis. However, relatively little guidance is given in either the HCM or the TCQSM on the compilation of automobile and transit segment levels of service into a measure of corridor level of service. In addition, bicycles and pedestrians are ignored in the corridor methodology. A methodology was developed and tested in Florida for measuring and reporting the user-perceived quality of service for highway corridors from a multimodal perspective. Automobile and transit LOS analyses are based on the HCM 2000 and TCQSM, respectively. Bicycle and pedestrian levels of service are based on the bicycle and pedestrian LOS models, respectively. Four classes of corridors are recommended, and the methodology was tested on two classes of urban corridors, with and without a freeway. The methodology is applied in three steps: (a) corridor definition, (b) computation of modal level of service, and (c) reporting of results. The methodology was applied to six case studies throughout Florida at generalized and conceptual planning levels. Conclusions about the methodology were drawn from the case studies; the main conclusion is that the methodology provided a reliable overall indicator of corridor level of service by mode.

NOTES: This paper appears in Transportation Research Record No. 1802, Traffic Flow Theory and Highway Capacity 2002.

DESCRIPTOR: Highway corridors; Multimodal transportation; Level of service; Methodology; Automobiles; Public transit; Bicycles; Pedestrians; Case studies; Highway Capacity Manual; Transit Capacity and Quality of Service Manual; Florida
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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6276

7. 00936259
PEDESTRIAN LEVEL OF SERVICE FOR MIDBLOCK STREET CROSSINGS

AUTHOR: Baltes, MR; Chu, X.
CORPORATE AUTHOR : Transportation Research Board
SERIES: Transportation Research Record 1818
PAGES: pp 125-133
DATE: 2002
ISBN: 0309077435
ISSN: 03611981
FEATURES: 1 Fig. 6 Tab. 20 Ref.
ABSTRACT: A level-of-service methodology for pedestrians crossing streets at midblock locations was developed. The methodology can provide a measure of effectiveness that indicates pedestrians' perceived quality of service in crossing roads at midblock locations. An objective was to determine what variables are correlated with pedestrians' perceived quality of service for midblock crossings. A statistical calibration and validation process involved the collection of actual site characteristics and stated levels of quality of service by a sample of persons at a selection of midblock crossing locations. The variables included those that are most important to the Florida Department of Transportation and local governments for the purpose of improving pedestrian mobility, safety, and livability. Results showed that the levels of crossing difficulty tend to increase with the width of painted medians, signal spacing, and turning movements. They also showed that both the presence of pedestrian signals and cycle length are statistically significant, although they were hypothesized to be indeterminate. Finally, the results further indicated that people tend to find that the presence of pedestrian signals lowers their level of crossing difficulty.

NOTES: This paper appears in Transportation Research Record No. 1818, Highway Safety: Work Zones, Law Enforcement, Motorcycles, Trucks, Older Drivers, and Pedestrians.
DESCRIPTOR: Midblock crossings; Pedestrian safety; Level of service; Quality of service; Field studies; Medians; Width; Traffic signals; Spacing; Turning traffic; Traffic signal cycle; Time duration; Significance (Statistics); Pedestrian signals; Florida

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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6301&CATID=1&series=1

8. 00936258

ADVANCE YIELD MARKINGS AND FLUORESCENT YELLOW-GREEN RA 4 SIGNS AT CROSSWALKS WITH UNCONTROLLED APPROACHES

AUTHOR: Van Houten, R; McCusker, D; Huybers, S; Malenfant, JEL; Rice-Smith, D.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record 1818
PAGES: pp 119-124
DATE: 2002
ISBN: 0309077435
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FEATURES: 4 Fig. 1 Photos. 9 Ref.
ABSTRACT: Motorists yielding to pedestrians at the crosswalk line on multilane roads with uncontrolled approaches can screen the view of the pedestrians from vehicles approaching in the next lane the pedestrians must cross. Two strategies were designed to increase the safety of pedestrians at crosswalks with uncontrolled approaches: installation of a sign instructing motorists to yield in advance of the crosswalks, supported by yield markings, and replacement of crosswalk signs at the crosswalk with fluorescent yellow-green sheeting. Motorist and pedestrian behaviors were measured at 24 sites (12 urban and 12 rural) where motor vehicle-pedestrian conflicts had occurred. Measured were evasive action, the distance motorists stopped before the crosswalk when yielding to pedestrians, and the percentage of motorists yielding to pedestrians. Results showed that the advance yield sign and advance yield markings reduced the percentage of motor vehicle-pedestrian conflicts involving evasive action and increased the percentage of motorists yielding to pedestrians and yielding further back from the crosswalk line. Results also showed large safety benefits on multilane roads with two-way traffic, multilane roads with one-way traffic, and single-lane roads with one-way traffic. The fluorescent yellow-green crosswalk signs, although more conspicuous, produced no improvement in yielding behavior or motor vehicle- pedestrian conflicts. All results of this experiment, confirmed by statistical analysis, were found to endure during follow-up data collection 6 months after the treatments were introduced. Treatments were applied only to streets posted at 50 km/h (30 mph).

NOTES: This paper appears in Transportation Research Record No. 1818, Highway Safety: Work Zones, Law Enforcement, Motorcycles, Trucks, Older Drivers, and Pedestrians.
DESCRIPTOR: Pedestrian vehicle interface; Crosswalks; Multilane highways; Pedestrian safety; Yield signs; Road markings; Urban areas; Rural areas; Field studies; Behavior; Uncontrolled approaches (Crosswalks); Fluorescent yellow-green sheeting; Pedestrian vehicle conflicts
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9. 00936256
PEDESTRIAN COLLISION PREDICTION MODELS FOR URBAN INTERSECTIONS

AUTHOR: Lyon, C; Persaud, B.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record 1818
PAGES: pp 102-107
DATE: 2002
ISBN: 0309077435
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FEATURES: 2 Fig. 6 Tab. 14 Ref.

ABSTRACT: In more recent safety analysis methods, collision prediction models can be used for identifying intersections with promise of safety improvement and for evaluating the effects of treatment. Considerable effort has been directed at developing collision prediction models, but little has been directed at pedestrian collisions. Collisions involving motor vehicles and pedestrians pose a significant safety problem, principally in urban areas, where the levels of vehicle-pedestrian conflicts are high. Data from Toronto, Canada, are used in the development of pedestrian collision prediction models for three- and four-legged urban intersections, with and without signal control. These models, which relate safety to pedestrian and vehicle traffic volumes, can be used to identify locations that might be targeted for treatment and to help evaluate treatment effects. Models are developed by using pedestrian and vehicular volumes and vehicle volumes only. It is seen that the use of pedestrian volume information results in a much richer model, emphasizing the importance of collecting this information in routine traffic counting programs. An important issue for collision prediction models is transferability to other jurisdictions. This is especially important in the case of pedestrian collision models, because many jurisdictions may not have data sets containing sufficient collisions and pedestrian volume counts with which to calibrate reliable models. Data from the city of Hamilton, Ontario, were used to test the

transferability of the Toronto four-legged signalized intersection model. The test was successful: the recalibrated Toronto models predicted collision numbers that were very close to those predicted by the model calibrated directly for the Hamilton data.

NOTES: This paper appears in Transportation Research Record No. 1818, Highway Safety: Work Zones, Law Enforcement, Motorcycles, Trucks, Older Drivers, and Pedestrians.

DESCRIPTOR: Pedestrian accidents; Urban areas; Signalized intersections; Unsignalized intersections; Mathematical prediction; Mathematical models; Traffic volume; Pedestrian vehicle conflicts; Pedestrian volume; Pedestrian collision models; Transferability; Toronto (Canada); Hamilton (Canada)

STATUS: AVAILABLE TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6301&CATID=1&series=1

10. 00936255

PEDESTRIAN LOCATION IDENTIFICATION TOOLS: IDENTIFYING SUBURBAN AREAS WITH POTENTIALLY HIGH LATENT DEMAND FOR PEDESTRIAN TRAVEL

AUTHOR: Moudon, AV; Hess, PM; Matlick, JM; Pergakes, N.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record 1818

PAGES: pp 94-101

DATE: 2002

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ISSN: 03611981

FEATURES: 2 Fig. 2 Tab. 25 Ref.

ABSTRACT: Planning tools were developed for local and state agencies to identify locations with latent demand for pedestrian travel that are currently underserved with pedestrian infrastructure. Prior research in the Puget Sound showed that approximately 20% of the suburban population lives in dense, compact areas with latent demand for pedestrian travel. The tools are designed to enable agencies to target capital investments in nonmotorized infrastructure to areas with the highest potential for pedestrian trips. They are a first step toward delineating suburban pedestrian zones. After a review of existing methodologies to identify areas with pedestrian travel demand, two tools were developed that use geographic information system software. One tool benefits from high-resolution parcel-level data with specified land use attributes. The other tool, however, relies on commonly available census block data and aerial photography. It is more labor intensive than the first tool and requires familiarity with reading urban form and development patterns. The tools

identify locations with potential for pedestrian travel based on two attributes. First, the locations contain land uses that are functionally complementary, that is, commonly linked by travel. The land uses are dense residential development (travel generators) and retail areas and schools (travel attractors). Second, these land uses are also spatially complementary, that is, sufficiently close to each other to be linked by walking.

NOTES: This paper appears in Transportation Research Record No. 1818, Highway Safety: Work Zones, Law Enforcement, Motorcycles, Trucks, Older Drivers, and Pedestrians.

DESCRIPTOR: Transportation planning; Pedestrians; Suburbs; Capital investments; Nonmotorized transportation; Infrastructure; Travel demand; Geographic information systems; Location; Land use; Residential areas; Schools; Walking distance; Latent demand; Pedestrian travel; Retail areas; Puget Sound Region (Washington)

STATUS: AVAILABLE TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6301&CATID=1&series=1

11. 00936253

MODAL SHIFT MECHANISM IN THE TRANSITION PERIOD FROM BICYCLE USER TO AUTOMOBILE USER

AUTHOR: Koike, H; Morimoto, A; Takekoshi, Y; Sarker, MJ.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record 1818

PAGES: pp 83-88

DATE: 2002

ISBN: 0309077435

ISSN: 03611981

FEATURES: 14 Fig. 7 Ref.

ABSTRACT: As motorization spreads worldwide, concern is growing about the adverse effect of automobiles on energy resources and global environmental problems. A way to alleviate excessive dependency on automobiles is to promote bicycle transportation. However, it is difficult to increase bicycle usage except in some European countries, such as the Netherlands. In Japan the bicycle is commonly used from childhood through high school, but a rapid shift to the automobile takes place at college age. College students were surveyed by questionnaire on their bicycle use patterns and automobile ownership, along with bicycle use in their hometowns. The statistical analysis shows various relationships among population size of hometowns, regional characteristics, individual favoritism toward

bicycles, financial condition, and so on. A clear difference was found between two groups of hometown regions for present bicycle usage patterns: those from large metropolitan areas and those from smaller regions. The transportation systems in cities and different population sizes influence bicycle use and favoritism toward bicycles, which in turn affects the present bicycle use level. Finally, the study reveals four factors that affect the modal shift from bicycle user to automobile user during the college-age period: physical environment, financial aspects, past experience, and favoritism toward bicycle use. These factors should be incorporated in designing bicycle transportation policy in urban areas.

NOTES: This paper appears in Transportation Research Record No. 1818, Highway Safety: Work Zones, Law Enforcement, Motorcycles, Trucks, Older Drivers, and Pedestrians.

DESCRIPTOR: Modal shift; Bicycle travel; Automobile travel; College students; Surveys; Questionnaires; Automobile ownership; Statistical analysis; Metropolitan areas; Small towns; Environment; Economic factors; Transportation policy; Urban areas; Japan

STATUS: AVAILABLE TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6301&CATID=1&series=1

12. 00936241

TOWARD IMPROVED TRAFFIC SAFETY: ROAD USE PERCEPTION AND BEHAVIOR IN ESTONIA

AUTHOR: Antov, D; Soot, S.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record 1818

PAGES: pp 1-6

DATE: 2002

ISBN: 0309077435

ISSN: 03611981

FEATURES: 7 Tab. 13 Ref.

ABSTRACT: Rapid increases in motorization have raised concerns about accidents and fatalities internationally. Even nations that are experiencing declining numbers of fatalities, such as Estonia, have made reducing fatalities a major public policy goal. Traffic fatalities declined from 491 in 1991 to 204 in 2000 in Estonia. The federal government is intent on another 50% decrease by 2010. Two steps are necessary to achieve this decrease: understanding of the perceptions of road use behavior and field observations of driving and pedestrian practices. In May and June 2001, 655 subjects were surveyed to assess their perceptions of road use behavior. Drunken driving, lack of seat-belt use in the rear seat, and

speeding on rural roads were all perceived to be problems. Generational differences accounted for the greatest differences in perception. The young gave higher scores to most road use activities, suggesting that better driver education may be needed. The number of fatalities and field observation indicate that treatment of pedestrians is an area in need of attention, especially because of the perception that it is not a major problem. Pedestrians accounted for 39% of motor-vehicle-related fatalities in Estonia in 2000. In field observations, 70% of drivers were observed to be in violation of the law requiring them to yield to pedestrians. Pedestrians themselves are not without blame; in field observations, 26% of pedestrians were seen to be in violation at signalized crossings. Finally, speeding continues to be a perceived and observed problem.

NOTES: This paper appears in Transportation Research Record No. 1818, Highway Safety: Work Zones, Law Enforcement, Motorcycles, Trucks, Older Drivers, and Pedestrians.

DESCRIPTOR: Traffic safety; Fatalities; Drivers; Behavior; Drunk driving; Seat belts; Speeding; Surveys; Interviewing; Problem identification; Age groups; Driver education; Field studies; Pedestrian accidents; Traffic violations; Pedestrians; Road user perception; Estonia

STATUS: AVAILABLE TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Pr product_ID=6301&CATID=1&series=1

13. 00939819

STATEWIDE PLANNING TOOL TO SUPPORT MULTIMODAL DECISION-MAKING

AUTHOR: Mazur, GD; Dixon, KK; Sarasua, WA.

CORPORATE AUTHOR: Transportation Research Board

PAGES: pp 359-370

DATE: 2002

FEATURES: 6 Fig. 7 Ref.

CONFERENCE: Eighth TRB Conference on the Application of Transportation Planning Methods, Corpus Christi, Texas,April 22, 2001-April 26, 2001, Transportation Research Board; Texas Department of Transportation; Corpus Christi Metropolitan Planning Organization; Federal Highway Administration; and Federal Transit Administration.

ABSTRACT: The environment for statewide transportation planning continues to grow more complex. At the same time, continued innovation in personal computing capabilities is allowing transportation planners to link previously disparate databases and thus develop robust analysis routines

that address a variety of issues within and between modes. The Georgia Department of Transportation's (GDOT's) Multimodal Transportation Planning Tool (MTPT) is one such tool for statewide planning that facilitates multimodal assessment of transportation needs and opportunities in rural and small urban areas. The MTPT is a comprehensive system and project- level planning tool that can be used to identify needs and project priorities for non-urbanized areas in Georgia. The MTPT integrates a series of analytical routines into a Geographic Information System platform, allowing an assessment of passenger travel on essentially all surface transportation modes. At the system level, the MTPT can assess various metrics of current and future operational and physical performance, and identify those modal elements that fail to meet threshold values or that have been previously identified as modal needs. At the project-level, the MTPT can perform a more detailed safety, operational, and physical analysis of roadway corridors, including those targeted for statewide bicycle routes. The analysis framework in the tool links multiple agency databases to provide planners, decision makers and the public with a consolidated picture of transportation deficiencies and needs for the state. The MTPT can produce results at various aggregation levels including individual corridors, cities, counties, and GDOT administrative districts. In a typical session, an MTPT user identifies the geographic area to analyze, identifies modes to analyze, enters any user-specified parameters, conducts baseline and sensitivity analyses, and displays the results. This paper provides an overview of MTPT development with special emphasis on agency databases and analysis routines that made the tool feasible. Customization and calibration efforts are also presented. Attention is paid to current use of the MTPT for preparing Georgia's Statewide Transportation Plan in order to highlight usefulness of the tool in a practical application.

NOTES: The CD-ROM contains the proceedings of the sixth, seventh and eighth conferences. The eighth conference proceedings were published in October 2001.

DESCRIPTOR: Transportation planning; Multimodal transportation; Decision making; Rural areas; Small towns; Strategic planning; Geographic information systems; Passenger transportation; Bicycle travel; Rural highways; Rural transit; Georgia

STATUS: COPIES OF PAPERS AVAILABLE FROM TRB BOOKSTORE

AVAILABILITY: http://gulliver.trb.org/publications/tris/out_of_print.html

14. 00939773

AN URBAN TRANSPORTATION PLANNING MODEL FOR SHANGHAI - A CITY WITH RAPID ECONOMIC GROWTH AND URBAN DEVELOPMENT

AUTHOR: Ho, EP; Lu, X; Li, J; Xue, M; Pratt, RH.
CORPORATE AUTHOR: Transportation Research Board
PAGES: pp 282-299
DATE: 2002
FEATURES: 1 Fig. 7 Tab. 8 Ref.
CONFERENCE: Seventh TRB Conference on the Application of Transportation Planning Methods,Boston, Massachusetts,March 7, 1999-March 11, 1999, Transportation Research Board; Commonwealth of Massachusetts, Executive Office of Transportation and Construction; and Boston Metropolitan Planning Organization.
ABSTRACT: Shanghai, a major commercial and industrial city in China, has experienced tremendous economic growth in the last decade. This has led to rapid and extensive development in the urban and transportation systems. Under such fast changing conditions, it is difficult to effectively model people's travel demand characteristics over an extended period of time. This paper presents an urban transportation planning model recently developed in Shanghai. The model consists of a number of model elements with relatively simple structures. Such a model framework allows the authors to calibrate and update the model easily so that it can accommodate any major changes in transportation services and travel demand characteristics. The model considers various kinds of variables that can effectively reflect the regional economic growth as well as the urban and transportation development in Shanghai. The model is a sequential process consisting of trip generation, trip distribution, modal split and traffic assignment. A special feature of the model is a two-stage modal split process. The walk trips and personal motorized trips are determined before the trip distribution model. The rest of trips are split between bicycle and transit after the trip distribution model. The two-stage modal split process allows the model to separate different travel market segments with significantly different travel characteristics at the early stage of the modeling process. The model then handles the trips of various market segments with different model elements with appropriate model structures and variables. The model was developed based on the data collected in the travel and traffic surveys in 1995. This paper first describes the model framework, then the structures of individual model elements. It also discusses the calibration results of the model.

NOTES: The CD-ROM contains the proceedings of the sixth, seventh and eighth conferences. The seventh conference proceedings were published in September 1999.
DESCRIPTOR: Urban transportation; Transportation planning; Economic growth; Urban development; Mathematical models; Trip generation; Trip distribution;

Modal split; Traffic assignment; Market segmented groups; Calibration; Shanghai (China)

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AVAILABILITY: http://gulliver.trb.org/publications/tris/out_of_print.html

15. 00939765

THE MASSACHUSETTS STATEWIDE BICYCLE TRANSPORTATION PLAN

AUTHOR: Viola, K; Lehman, J; Silveria, J; Smith, P.

CORPORATE AUTHOR: Transportation Research Board

PAGES: pp 155-162

DATE: 2002

FEATURES: Figs. Phots.

CONFERENCE: Seventh TRB Conference on the Application of Transportation Planning Methods,Boston, Massachusetts,March 7, 1999-March 11, 1999, Transportation Research Board; Commonwealth of Massachusetts, Executive Office of Transportation and Construction; and Boston Metropolitan Planning Organization.

ABSTRACT: The Executive Office of Transportation and Construction (EOTC) and the Massachusetts Highway Department (MassHighway), with the support of Governor Paul Cellucci and under the direction of Secretary of Transportation Patrick J. Moynihan, launched the comprehensive "Statewide Bicycle Transportation Plan" in 1996 to develop policies and practices to improve conditions for bicycling in the Commonwealth. Secretary Moynihan released the plan at the April 1998 Metro Boston Trail Conference, where it received public and agency approval and media recognition. The success of the Massachusetts "Statewide Bicycle Transportation Plan" can be largely attributed to its extensive and innovative public involvement process. As this is the first such Massachusetts statewide bicycle plan, EOTC and MassHighway invited a number of state agencies, bicycle community representatives, and the public to help identify bicycle transportation opportunities and needs in several broad areas, including highway planning, design, construction and maintenance practices, and transit connections. Particularly instrumental to the public involvement process was the formation of a User/Focus Group representing bicycle advocacy groups, business representatives, state legislators, and others familiar with bicycling issues and initiatives. The User/Focus Group provided valuable perspective throughout the entire planning process. After the 30- day public review period of the Final Draft Plan, the User/Focus Group also met with Highway Commissioner Kevin J. Sullivan to discuss the plan's outcome and implementation. Citizens were also extensively involved through two series of seven public information meetings held throughout the state, and

review and comment on draft plan sections. For the first time, EOTC and MassHighway made project materials, including draft recommendations, available on the Internet and received public comments electronically (E-mail). The "Executive Summary and Action Plan" are the nucleus of the larger plan; that portion reviews the public involvement process, the policy framework, and jurisdictional roles and responsibilities. The Action Plan is being carried out, in large part because of the strong support generated through the plan's public involvement process. Significant advances include: establishing the Bicycle Program Office under the direction of EOTC; issuing MassHighway's " Engineering Directive E-98-003" addressing bicycle accommodation; establishing a task force to revise MassHighway's 1994 publication, " Building Better Bicycling," develop a more comprehensive bicycle manual, and present workshops on bicycle facility design; and hiring a Bicycle Pedestrian Accommodation Engineer.

NOTES: The CD-ROM contains the proceedings of the sixth, seventh and eighth conferences. The seventh conference proceedings were published in September 1999.

DESCRIPTOR: Transportation planning; Bicycles; Public participation; Highway planning; Public transit; Focus groups; Internet; Electronic mail; Massachusetts

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AVAILABILITY: http://gulliver.trb.org/publications/tris/out_of_print.html

16. 00939762
LINKING LAND USE AND TRANSPORTATION IN THE OREGON HIGHWAY PLAN

AUTHOR: Gassaway, C.

CORPORATE AUTHOR: Transportation Research Board

PAGES: pp 133-140

DATE: 2002

FEATURES: 1 Fig. 1 Tab.

CONFERENCE: Seventh TRB Conference on the Application of Transportation Planning Methods,Boston, Massachusetts,March 7, 1999-March 11, 1999, Transportation Research Board; Commonwealth of Massachusetts, Executive Office of Transportation and Construction; and Boston Metropolitan Planning Organization.

ABSTRACT: Balancing main street's need for accessibility with the state highway system's need for mobility is one of several key land use/transportation issues in Oregon's 1998 Highway Plan. The plan, an update of the 1991 Highway Plan, recognizes the links between land use and transportation,

mobility and accessibility, and state and local interests. The plan recognizes the importance of main streets as compact, pedestrian-friendly community centers as well as the need to protect mobility for through traffic outside these centers. The Highway Plan includes policies on land use and transportation, access management, level of service standards, off- system improvements, and interjurisdictional partnerships that address these issues. The policy on land use and transportation recognizes the roles and responsibilities of state and local government in maintaining accessibility and mobility on the state highway. It encourages the designation of a "special transportation area" (STA) where a community center straddles the state highway. The primary objective of a highway facility in an STA is to provide access to community activities, businesses and residences. Outside STAs, traffic speeds are higher and driveway access and spacing depend on highway classification. The designation of an STA is a joint state and local process involving a management plan that addresses street design, travel times, traffic impacts, and local auto and bicycle/pedestrian circulation. The policy directs the state to work with local governments to support compact development and maintain level of service standards outside of STAs. The policies on access management and level of service standards are linked to this land use policy and to land use types. Since Oregon's resources for adding capacity are very limited, the plan emphasizes increased access management to provide safety and maintain travel speeds, with standards varying according to highway classification and urban development. The level of service standards are used to maintain consistency between desired highway performance and intensity of land use development. The policy on state-local partnerships supports joint planning and project development to enhance the seamless qualities of the transportation system. The policy on off-system improvements supports state assistance on a local transportation system where the off-system improvement is a cost- effective way to improve the operation of the state highway system. Underlying the policies are state participation in local transportation planning and local participation in state highway corridor planning. These include land use elements.

NOTES: The CD-ROM contains the proceedings of the sixth, seventh and eighth conferences. The seventh conference proceedings were published in September 1999.

DESCRIPTOR: Highway planning; Land use; Accessibility; Mobility; State highways; Through traffic; Access control (Transportation); Level of service; Transportation policy; Traffic speed; Driveways; Urban development; Highway safety; Joint development; Partnerships; State government; Local government; Highway corridors; Land use planning; Highway classification; Special transportation areas; Oregon

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AVAILABILITY: http://gulliver.trb.org/publications/tris/out_of_print.html

17. 00939746

TRANSPORTATION, HUMAN HEALTH, AND PHYSICAL ACTIVITY: RESOURCE PAPER

AUTHOR: Saelens, B; Sallis, J; Frank, L.
CORPORATE AUTHOR: Transportation Research Board
SERIES: CONFERENCE PROCEEDINGS 28
PAGES: pp 185-194
DATE: 2002
ISBN: 030907715X
ISSN: 10731652
FEATURES: 1 Fig. 2 Tab. 51 Ref.
CONFERENCE: Environmental Research Needs in Transportation,Washington, D.C.,March 21, 2002-March 23, 2002,Federal Highway Administration; U.S. Environmental Protection Agency; Center for Transportation and Environment, North Carolina State University; and Transportation Research Board.

ABSTRACT: The design of communities and transportation systems is strongly related to nonmotorized transportation (NMT) behavior; however, the effect of environmental policy variables on total physical activity is not clear. Because large proportions of people in the United States live in the sprawling and exclusively residential environments associated with low levels of walking for transport, land use and transportation policies may already be having a substantial, although generally undocumented, impact on public health. Professionals from numerous fields are concerned that we have built our communities so that it is difficult, and in many cases dangerous, to walk or bike, and have thus "engineered" physical activity out of our daily lives. There is a public health imperative to evaluate environmental and policy variables and their associations with NMT, recreational physical activity, and total physical activity. The results of such studies can inform efforts to alter the environments in which people live their daily lives so as to promote population shifts in physical activity and improve transportation systems. Conducting and applying research on environmental correlates of NMT and physical activity will require collaboration among researchers from a wide range of professions.

DESCRIPTOR: Conferences; Environmental protection; Research; Strategic planning; Public health; Physical fitness; Walking; Bicycling; Nonmotorized transportation; Environmental policy; Land use; Transportation policy; Physical activity; United States
STATUS: AVAILABLE TRB BOOKSTORE
AVAILABILITY: http://gulliver.trb.org/publications/conf/reports/cp_28.pdf

18. 00815890
RESEARCH PAYS OFF: RUMBLE STRIPS: FINDING A DESIGN FOR BICYCLES AND MOTOR VEHICLES

AUTHOR:	Bachman, D.
CORPORATE AUTHOR:	Transportation Research Board
SERIES:	TR News 215
PAGES:	pp 28-29
DATE:	July, 2001
ISSN:	07386826
FEATURES:	1 Tab. 1 Phot. 1 Ref.

ABSTRACT: The Pennsylvania Department of Transportation (PennDOT) researched milled rumble strip patterns that are safe and effective for bicyclists as well as motorists on nonfreeway roads. This was a difficult task because the needs of each group differ. Bicyclists want to cross the rumble strip safely and comfortably with minimal vibration, while motorists want sufficient vibration and sound to warn that the vehicle is drifting from the travel lane. Six rumble strip configurations were tested and rated. Two patterns were chosen and will be installed on nonfreeway routes across Pennsylvania this year. The goal is to reduce run-off-the-road crashes and fatalities on nonfreeway facilities, while at the same time improving bicyclist safety.

DESCRIPTOR:	Rumble strips; Design; Highway safety; Bicycles; Ran off road accidents
STATUS:	AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY:	http://gulliver.trb.org/publications/trnews/rpo/rpo.trn215.pdf

19. 00814168
LIGHT RAIL SERVICE: PEDESTRIAN AND VEHICULAR SAFETY

AUTHOR:	Korve, HW; Ogden, BD; Siques, JT; Mansel, DM; Richards, HA; Gilbert, S; Boni, E; Butchko, M; Stutts, JC; Hughes, RG.
CORPORATE AUTHOR:	Transportation Research Board: Korve Engineering, Incorporated
SERIES:	TCRP Report 69
PAGES:	149p
DATE:	2001
ISBN:	0309067049
ISSN:	10734872
PROJECT NUMBERS:	Project A-13 FY '97

FEATURES: Figs. Tabs. Phots.

ABSTRACT: This report provides documentation and presents the results of a study to improve the safety of light rail transit (LRT) in semiexclusive rights-of-way where light rail vehicles operate at speeds greater than 35 mph through crossings with streets and pedestrians pathways. This report also presents the results of field tests conducted to improve the safety of higher speed LRT systems through grade crossing design. The results of a "before and after" evaluation of the effectiveness of presignals at highway- rail grade crossings on motorist behavior at two locations are discussed. These results demonstrate the effectiveness of presignals and were used to develop recommended guidelines for presignal installation. The guidelines may be considered in planning and designing of new LRT systems or in retrofitting and extending existing LRT systems. The report should be useful to LRT system designers, LRT operations and maintenance personnel, transit operations planners, traffic engineers, light rail safety officials, transit managers, and transit law enforcement officials.

DESCRIPTOR: Light rail transit; Transit safety; Right of way (Traffic); Pedestrian safety; Traffic safety; Before and after studies; Traffic signals; Railroad grade crossings; Guidelines; Planning and design; Retrofitting; Light rail transit grade crossings; Presignals

STATUS: AVAILABLE FROM TRB'S BOOKSTORE

AVAILABILITY: http://trb.org/trb/publications/tcrp/tcrp_rpt_69.pdf

20. 00820031

PEDESTRIAN WARNING AND CONTROL DEVICES, GUIDELINES, AND CASE STUDIES

AUTHOR: Siques, JT.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1762

PAGES: pp 18-24

DATE: 2001

ISBN: 0309072239

ISSN: 03611981

PROJECT NUMBERS: 1762-003

FEATURES: 3 Fig. 1 Tab. 9 Phot. 5 Ref.

ABSTRACT: A high percentage of collisions between light rail vehicles (LRVs) and pedestrians result in injuries or fatalities. As such, properly identifying potentially hazardous crossings and providing pedestrian treatments to

those crossings are integral to the design of new light rail transit systems or extensions and for the evaluation of existing systems. An approach is discussed to select pedestrian treatments at grade crossings, and examples of innovative treatments for existing systems are given. The focus is four key factors that enable pedestrians to walk through a grade crossing safely: (a) pedestrian awareness of the crossing, which can be enhanced by passive signs and tactile warnings; (b) the pedestrian path across the trackway, which is subject to pedestrian channelization and positive control devices; (c) pedestrian awareness of and ability to see an approaching LRV, which depends on pedestrian sight distance at the crossing and can be improved through active warning devices; and (d) pedestrian understanding of the potential hazards at grade crossings, which requires public outreach and education. These four factors are discussed, and treatments for each are provided.

NOTES: This paper appears in Transportation Research Record No. 1762, Transit Rail, Commuter Rail, Major Activity Center Circulation Systems, Light Rail, and Ferry Service.

DESCRIPTOR: Light rail transit; Railroad grade crossings; Pedestrian safety; Awareness; Pedestrian vehicle interface; Signs; Warning devices; Crosswalks; Sight distance; Pedestrian education; Guidelines; Case studies

STATUS: AVAILABLE FROM TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6052&CATID=1&series=1

21. 00819921

PEDESTRIAN TIMING ALTERNATIVES AND IMPACTS ON COORDINATED SIGNAL SYSTEMS UNDER SPLIT-PHASING OPERATIONS

AUTHOR: Tian, ZZ; Urbanik, T; Engelbrecht, R; Balke, K.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1748

PAGES: pp 46-54

DATE: 2001

ISBN: 0309072077

ISSN: 03611981

PROJECT NUMBERS: 1748-006

FEATURES: 10 Fig. 1 Tab. 4 Ref.

ABSTRACT: Split phasing can sometimes be more efficient in serving vehicular traffic under certain geometric and traffic flow conditions, such as the case in

which a high volume of left-turning traffic is served from a shared-lane configuration. However, pedestrian crossing-time requirements can have a significant impact on intersection operations, especially in coordinated signal systems. Various alternatives for providing pedestrian timings under split-phasing operations are presented. The advantages and disadvantages, implementation strategies, and potential impact on intersection operations, especially on coordinated signal systems, are addressed with regard to each timing alternative. Further, the concept of the two-stage crossing design and the use of an exclusive pedestrian phase under split-phasing operations are investigated. The proposed model can be used to determine when exclusive pedestrian phasing can actually improve operational efficiency.

NOTES: This paper appears in Transportation Research Record No. 1748, Advanced Traffic Management Systems and Vehicle-Highway Automation 2001.

DESCRIPTOR: Traffic signal control systems; Pedestrian phase; Traffic signal timing; Highway operations; Split phasing; Two-stage crossing; Exclusive pedestrian phasing; Operational efficiency

STATUS: AVAILABLE FROM TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6062&CATID=1&series=1

22. 00822753

PEDFLOW: DEVELOPMENT OF AN AUTONOMOUS AGENT MODEL OF PEDESTRIAN FLOW

AUTHOR: Kukla, R; Kerridge, J; Willis, A; Hine, J.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1774

PAGES: pp 11-17

DATE: 2001

ISBN: 0309072352

ISSN: 03611981

PROJECT NUMBERS: 1774-002

FEATURES: 3 Fig. 15 Ref.

ABSTRACT: The need for an autonomous agent approach for the modeling of pedestrians in urban environments is discussed, and PEDFLOW is placed in the context of existing models. PEDFLOW is a microscopic model of pedestrians' movement; each pedestrian is represented as an agent capable of making its own decisions on the basis of a part of the observable scene local to that pedestrian. The model, implemented in Java, provides a

framework in which agents are visualized as squares in a grid and movement is modeled as a change of grid position with a delay that characterizes the speed of the agent. A single rule set that is made specific to each agent by the incorporation of parameters characterizing types of pedestrians is used. The rules originate from computer-aided analysis of video footage and are transformed into a form that can be efficiently processed by the agent. By adding tools to extract measures of pedestrian flow, the PEDFLOW model will be made useful to urban planners to evaluate infrastructural changes intended to promote walking in the urban environment.

NOTES: This paper appears in Transportation Research Record No. 1774, Artificial Intelligence and Intelligent Transportation Systems.

DESCRIPTOR: Pedestrian flow; Simulation; Urban areas; Transportation planning; Infrastructure; Walking; Microscopic models

STATUS: AVAILABLE FROM TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6063&CATID=1&series=1

23. 00822751

PEDESTRIAN VISIBILITY UNDER AUTOMOBILE LOW-BEAM HEADLIGHT ILLUMINATION: WITH AND WITHOUT HEADLIGHT COVERS

AUTHOR: Schnell, T; Aktan, F; McGehee, DV; Dvorak, M; Hunt, J; Reyes, A; Sorak, D.

CORPORATE AUTHOR: Transportation Research Board the Transportation Research Board 1773

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PROJECT NUMBERS: 1773-013

FEATURES: 7 Fig. 6 Tab. Phots. 22 Ref.

ABSTRACT: Pedestrians and bicyclists are the most vulnerable of all participants in traffic. Their safety at night should be a priority for headlamp designers, rule-making agencies, and consumers alike. A disturbing trend-- the use of very dark aftermarket headlamp covers on vehicle headlamps--is emerging. This trend is observed primarily in sports cars owned by young drivers. These dark headlamp covers, often referred to as blackouts, serve no real purpose other than that of supposedly enhancing vehicle appearance. For a driver using such headlamp covers at night, it may appear as though the overall visibility is not much affected. However, this perception is misleading and wrong, as will be clearly demonstrated. The objective was to quantify the detrimental effects dark headlamp covers

have on pedestrian visibility. To do so, detection distances were obtained in the field using 15 observers who were approaching stationary pedestrian mockups. The independent variables were pedestrian size (child, adult), diffuse clothing reflectance (dark, light), and illumination (with and without headlamp covers). Clothing reflectance turned out to have the strongest effect on the detection distance, closely followed by the factor of illumination. The conclusions that can be drawn from the work presented are simple. Nighttime pedestrians should not wear dark clothing, instead they should wear white or reflective clothing, and motorists should not drive with dark headlamp covers at night.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.
DESCRIPTOR: Pedestrian safety; Night visibility; Sports cars; Headlamps; Clothing; Reflectivity; Luminance; Low beamed headlamps; Headlamp covers
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

24. 00822750
RELATING SEVERITY OF PEDESTRIAN INJURY TO IMPACT SPEED IN VEHICLE- PEDESTRIAN CRASHES: SIMPLE THRESHOLD MODEL

AUTHOR: Davis, GA.
CORPORATE AUTHOR: Transportation Research Board
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PROJECT NUMBERS: 1773-012
FEATURES: 3 Fig. 2 Tab. 32 Ref.
ABSTRACT: An ordered, discrete outcome model that relates the severity of injury suffered by a struck pedestrian to the speed of the striking vehicle is derived and then fit to previously published data. Particular care is taken to account for covariate measurement error and for the fact that the data were collected using an outcome-based, or retrospective, sampling plan. The results show similar patterns for children (ages 0-14) and adults (ages 15-59), but for elderly pedestrians (ages 60+) the injuries produced in crashes that involved lower impact speeds tended to be more severe than for the other two groups. Use of the model is illustrated by applying it to two reconstructed vehicle-pedestrian crashes to determine the likely

severity of the injury had the driver adhered to a speed limit. Some implications for speed limits on residential streets are also pointed out.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.
DESCRIPTOR: Mathematical models; Injury severity; Pedestrian accidents; Speed; Children; Adults; Aged; Residential streets; Speed limits
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

25. 00822749

METHOD OF IMPROVING PEDESTRIAN SAFETY PROACTIVELY WITH GEOGRAPHIC INFORMATION SYSTEMS: EXAMPLE FROM A COLLEGE CAMPUS

AUTHOR: Schneider, RJ; Khattak, AJ; Zegeer, CV.
CORPORATE AUTHOR: Transportation Research Board
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FEATURES: 2 Fig. 2 Tab. 6 Phot. 26 Ref.
ABSTRACT: A method of combining two information bases with the aid of geographic information systems to identify locations where pedestrian crash problems exist or may exist in the near future is described. The first information base is a set of police crash reports. Locations and attributes obtained from these reports are used to identify clusters of pedestrian crashes in an area so that sites can be evaluated for safety improvements. Geographic analysis of crash types, severity, pedestrian age, and other factors may also be conducted with these data. The second information base is a set of pedestrian and driver perception surveys. Data from this set of surveys are used to identify locations that may have a high potential for crashes even though none or few have been reported recently. Integrating the two information bases may allow transportation planners and engineers to focus on sites with the greatest potential for pedestrian improvements and ultimately prevent more crashes, injuries, and fatalities. The proactive data integration technique developed in this study was applied to pedestrian safety problems on a college campus, aiding the process of planning and implementing various countermeasures related to

education, enforcement, and engineering. Note that more than 17 million people (more than 6% of the population) in the United States are associated with college campuses. The method can also be applied to bicycle or other special types of crashes in other geographic areas such as cities, commercial zones, and neighborhoods.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.
DESCRIPTOR: Pedestrian safety; Databases; Accident reports; Surveys; Geographic information systems; Accident locations; Pedestrian accidents; Accident prone locations; Campuses; Countermeasures; Data integration
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

26. 00822748
ESTIMATING PEDESTRIAN EXPOSURE PREDICTION MODEL IN RURAL AREAS

AUTHOR: Qin, X; Ivan, JN.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1773
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PROJECT NUMBERS: 1773-010
FEATURES: 2 Fig. 7 Tab. 21 Ref.
ABSTRACT: "Pedestrian exposure" is defined as the exposure risk of pedestrians to collisions with motor vehicles. It is one of the important factors influencing pedestrian crashes. Because pedestrian exposure or even pedestrian volume counts are not readily available, population density is usually used as a substitute in pedestrian crash prediction models. Unfortunately, population density is not a good replacement for pedestrian exposure because it does not account for the amount of walking people do. This study investigates the relationship between the weekly pedestrian exposure in rural areas of Connecticut and factors such as population density, presence of sidewalks, number of lanes, area type, traffic control type, and median household income. General linear modeling and Tukey and Duncan multiple comparison of means methods are used to identify the significant factors. Only the number of lanes, area type, and sidewalk system significantly explain the variation in the resulting pedestrian exposure prediction model. This study suggests extra

improvement in pedestrian facilities for the areas with high pedestrian exposure. Ongoing research will take advantage of the model to estimate pedestrian crash models in rural areas of New England.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.
DESCRIPTOR: Estimating; Pedestrian accidents; Accident risk forecasting; Rural areas; Population density; Sidewalks; Traffic lanes; Traffic control; Income; Land use; Pedestrian exposure; Pedestrian facilities; Connecticut
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

27. 00822747
MODELING THE ROADSIDE WALKING ENVIRONMENT: PEDESTRIAN LEVEL OF SERVICE

AUTHOR: Landis, BW; Vattikuti, VR; Ottenberg, RM; McLeod, DS; Guttenplan, M.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1773
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PROJECT NUMBERS: 1773-009
FEATURES: 5 Fig. 2 Tab. 10 Ref.
ABSTRACT: A method is needed to objectively quantify pedestrians' perceptions of safety and comfort in the roadside environment. This quantification, or mathematical relationship, would provide a measure of how well roadways accommodate pedestrian travel. Essentially, it would provide a measure of pedestrian level of service (LOS) within a roadway environment. Such a measure of walking conditions would greatly aid in roadway cross-sectional design and would help evaluate and prioritize the needs of existing roadways for sidewalk retrofit construction. Furthermore, the measure can be used to evaluate traffic-calming strategies and streetscape designs for their effectiveness in improving the pedestrian environment. Such a measure would make it possible to merge pedestrian facility programming into the mainstream of transportation planning, design, and construction. To meet the need for such a method, as well as to fulfill a state mandate to establish levels of service standards for all transportation modes, the Florida Department of Transportation sponsored the development of the Pedestrian LOS Model. The model was

developed through a stepwise multivariable regression analysis of 1,250 observations from an event that placed 75 people on a roadway walking course in the Pensacola, Florida, metropolitan area. The Pedestrian LOS Model incorporates the statistically significant roadway and traffic variables that describe pedestrians' perception of safety or comfort in the roadway environment between intersections. It is similar in approach to methods used to assess automobile operators' level of service established in the Highway Capacity Manual.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.

DESCRIPTOR: Pedestrian safety; Comfort; Roadside; Pedestrian traffic; Level of service; Mathematical models; Design; Sidewalks; Traffic calming; Programming (Planning); Multiple regression analysis; Pedestrian facilities; Streetscape design; Pensacola (Florida)

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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

28. 00822746

SCANNING "EYES" SYMBOL AS PART OF THE WALK SIGNAL: EXAMINATION ACROSS SEVERAL INTERSECTION GEOMETRIES AND TIMING PARAMETERS

AUTHOR: Van Houten, R; Malenfant, JEL; Steiner, R.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1773

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PROJECT NUMBERS: 1773-008

FEATURES: 2 Fig. 1 Tab. 1 Phot. 4 Ref.

ABSTRACT: The use of animated scanning "eyes" in conjunction with Walk interval was examined by a series of studies. In the first experiment, conflicts that involved either the pedestrian or the motorist taking evasive action were examined before and after the scanning eyes were introduced at the following locations: two intersections with one-way traffic on both streets, four intersections with two-way traffic on both streets, and two intersections with one-way traffic on one street and two-way traffic on the other. Conflicts were reduced at crosswalks on all eight streets; reductions on seven of the eight streets were significant. The second experiment examined whether it was better to have the eyes look in both directions

(eyes scanning back and forth with equal dwell times in each direction) or only in the direction of the threat (unequal dwell times with the eyes looking longer in the direction of the threat at crosswalks on one-way streets). Results showed that looking one way was no more effective than looking both ways. The effectiveness of steady versus intermittently applied scanning eyes was examined in the second experiment and in the third. The results of this study show that a steady scanning eyes display applied in conjunction with the Walk interval was no more effective than an intermittently applied scanning eyes display, with the eyes alternately on for 3.5 s and off for 3.5 s, but was more effective than an intermittent scanning eyes display that was alternately on for 3.5 s and off for 7 s.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.
DESCRIPTOR: Pedestrian vehicle interface; Intersections; Field studies; Pedestrian walk signals; Motor vehicle-pedestrian conflicts; Scanning eyes symbol
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

29. 00822745
ADVANCE YIELD MARKINGS: REDUCING MOTOR VEHICLE-PEDESTRIAN CONFLICTS AT MULTILANE CROSSWALKS WITH UNCONTROLLED APPROACH

AUTHOR: Van Houten, R; Malenfant, JEL; McCusker, D.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1773
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PROJECT NUMBERS: 1773-007
FEATURES: 5 Fig. 3 Phot. 4 Ref.

ABSTRACT: Motorists yielding to a pedestrian at the crosswalk line can screen the view of the pedestrian crossing in front of them. This places the pedestrian at risk from vehicles approaching in adjacent travel lanes. An experiment was conducted in which advance yield markings and a symbol sign prompting motorists to yield to pedestrians at the markings were placed at several intersections. Their effects on pedestrian safety at multilane crosswalks with pedestrian-activated yellow flashing beacons

were evaluated. Motorist and pedestrian behaviors measured throughout the experiment included the following: occurrence of motor vehicle-pedestrian conflicts that involved evasive action, distance before the crosswalk that motorists stopped when yielding to pedestrians, and percentage of motorists yielding to pedestrians. The introduction of the markings and the sign 10 m before the crosswalk increased the distance in front of the crosswalk that motorists yielded to pedestrians and it markedly reduced the percentage of motor vehicle-pedestrian conflicts. Placing markings 15 m and 25 m in advance of the crosswalk produced similar benefits, demonstrating that treatment effects can be produced over a wide range of values.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.

DESCRIPTOR: Pedestrian vehicle interface; Multilane highways; Crosswalks; Road markings; Pedestrian signs; Intersections; Pedestrian safety; Pedestrian actuated controllers; Flashing beacons; Motor vehicle-pedestrian conflicts; Advance yield markings

STATUS: AVAILABLE FROM TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

30. 00822744

SAFETY EFFECTS OF MARKED VERSUS UNMARKED CROSSWALKS AT UNCONTROLLED LOCATIONS: ANALYSIS OF PEDESTRIAN CRASHES IN 30 CITIES (WITH DISCUSSION AND CLOSURE)

AUTHOR: Zegeer, CV; Stewart, JR; Huang, H; Lagerwey, P.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1773

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PROJECT NUMBERS: 1773-006

FEATURES: 3 Fig. 34 Ref.

ABSTRACT: Pedestrians are legitimate users of the transportation system and they should, therefore, be able to use the system safely. Pedestrian needs in crossing streets should be identified, and appropriate solutions should be selected to improve pedestrian safety and access. Deciding where to mark crosswalks is only one consideration in meeting that objective. This study involved an analysis of 5 years of pedestrian crashes at 1,000 marked

crosswalks and 1,000 matched unmarked comparison sites. None of the sites in this study had a traffic signal or stop sign on the approaches. Detailed data were collected on traffic volume, pedestrian exposure, number of lanes, type of median, speed limit, and other site variables. Poisson and negative binomial regressive models were used. Study results revealed that on two-lane roads the presence of a marked crosswalk alone at an uncontrolled location was associated with no difference in pedestrian crash rate, compared with an unmarked crosswalk. Further, on multilane roads with traffic volumes above about 12,000 vehicles per day, having a marked crosswalk was associated with a higher pedestrian crash rate (after controlling for other site factors) compared with an unmarked crosswalk. Raised medians provided significantly lower pedestrian crash rates on multilane roads, compared with roads without a raised median. Older pedestrians had crashes that were high relative to their crossing exposure. More substantial improvements were recommended to provide for safer pedestrian crossings, including adding traffic signals (with pedestrian signals) when warranted, providing raised medians, and implementing speed-reducing measures.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.

DESCRIPTOR: Pedestrian safety; Crosswalks; Road markings; Pedestrian accidents; Traffic volume; Traffic lanes; Medians; Speed limits; Regression analysis; Two lane highways; Multilane highways; Aged; Recommendations; Traffic signals; Speed control; Pedestrian exposure; Raised medians

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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

31. 00822742

CYCLING TO WORK IN PHOENIX: ROUTE CHOICE, TRAVEL BEHAVIOR, AND COMMUTER CHARACTERISTICS

AUTHOR: Howard, C; Burns, EK.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1773

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PROJECT

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FEATURES: 2 Fig. 5 Tab. 21 Ref.

ABSTRACT: Through a survey of expert cyclists, the relationship between the actual routes cyclists traveled and existing street conditions was documented, and bicycle commuters of the Phoenix metropolitan area were profiled. Data were collected on individual commuting routes between home and work. Additional data collected include age and gender characteristics. Frequency analysis in a geographic information system compared the number of common street segments among actual and alternative routes to determine cyclists' use of existing street facilities. Findings are reported for actual routes compared with shortest distance, shortest time, and safest route alternatives on street facilities between the same origin and destination. Spatial analysis identified local gaps in arterial street bicycle facilities at municipal boundaries. These findings include evidence that cyclists adjust their routes to use current street bicycle facilities, and suggest that policy makers should concentrate on linking bicycle facilities across jurisdictions.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.

DESCRIPTOR: Bicycle commuting; Route choice; Travel behavior; Cyclists; Travel surveys; Age; Gender; Geographic information systems; Bicycle facilities; Arterial highways; Spatial analysis; Phoenix (Arizona)

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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

32. 00822741

ACCURACY OF NUMERICAL RECTIFICATION OF VIDEO IMAGES TO ANALYZE BICYCLE TRAFFIC SCENES

AUTHOR: Khan, SI; Raksuntorn, W.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1773

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PROJECT NUMBERS: 1773-003

FEATURES: 10 Fig. 2 Tab. 23 Ref.

ABSTRACT: A method is presented to process full motion video of traffic scenes to estimate bicycle location, speed, and acceleration at a given rate of image processing. The technique presented to estimate bicycle location data from video frames is based on transforming screen coordinates of video frames to ground or roadway coordinates and is known as rectification. The numerical technique and the error analysis are presented. This technique will allow researchers to video record traffic scenes and analyze them to estimate various microscopic and macroscopic traffic flow measures. These measures may be used to develop and validate traffic flow models. Very few studies have been conducted to study bicycle flow characteristics. The data collection technique presented here should allow researchers to collect bicycle flow data at very low cost.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.

DESCRIPTOR: Bicycle facilities; Video cameras; Image processing; Location; Speed; Acceleration (Mechanics); Bicycles; Microscopic traffic flow; Macroscopic traffic flow; Traffic models; Data collection; Accuracy; Bicycle flow; Rectification

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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

33. 00822740

DEVELOPMENT OF RUMBLE STRIP CONFIGURATIONS THAT ARE MORE BICYCLE FRIENDLY

AUTHOR: Torbic, D; Elefteriadou, L; El-Gindy, M.

CORPORATE AUTHOR: Transportation Research Board

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PROJECT NUMBERS: 1773-002

FEATURES: 2 Fig. 9 Tab. 11 Ref.

ABSTRACT: This research was initiated to develop new rumble strip configurations for the Pennsylvania Department of Transportation that would alert inattentive or drowsy motorists and could be safely and comfortably traversed by bicyclists. Three primary steps were involved in the development of the new configurations. First, simulation was used to

evaluate different configurations for their potential to be bicycle friendly. Second, several configurations that had the greatest potential to be bicycle friendly were installed and field experiments were conducted to further evaluate their effectiveness. Finally, the field data were analyzed and the configurations that were installed were ranked based on their ability to provide a comfortable and controllable ride for bicyclists and to alert inattentive or drowsy motorists. On the basis of results of bicycle and motor vehicle tests, two new rumble strip configurations were recommended for implementation along nonfreeway facilities. One configuration was recommended for use along nonfreeway facilities with higher operating speeds, and a second was recommended for nonfreeway facilities with lower operating speeds.

NOTES: This paper appears in Transportation Research Record No. 1773, Part 2: Bicycle and Pedestrian Research.
DESCRIPTOR: Rumble strips; Design; Drivers; Attention; Drowsiness; Bicycles; Simulation; Field tests; Operating speed; Pennsylvania
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6157&CATID=1&series=1

34. 00824585
BUILT ENVIRONMENT AS DETERMINANT OF WALKING BEHAVIOR: ANALYZING NONWORK PEDESTRIAN TRAVEL IN PORTLAND, OREGON

AUTHOR: Greenwald, MJ; Boarnet, MG.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1780
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ISSN: 03611981
PROJECT NUMBERS: 1780-005
FEATURES: 9 Tab. 14 Ref.

ABSTRACT: Much has been written about the connection between land use/urban form and transportation from the perspective of affecting automobile trip generation. This addresses only half the issue. The theoretical advances in land use-transportation relationships embodied in paradigms such as the jobs-housing balance, neotraditional design standards, and transit-oriented development rely very heavily on the generation of pedestrian traffic to realize their proposed benefits. The present analysis uses models

and data sets similar to those used in previous work for the Portland, Oregon, area but applies them toward analysis of nonwork walking travel. The results suggest that regardless of the effects that land use has on individual nonwork walking trip generation, the impacts take place at the neighborhood level.

NOTES: This paper appears in Transportation Research Record No. 1780, Land Development and Public Involvement in Transportation.
DESCRIPTOR: Land use; Walking; Trip generation; Neighborhoods; Nonwork trips; Portland (Oregon)
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6096&CATID=1&series=1

35. 00824582
TITLE: IMPLICATIONS OF URBAN DEVELOPMENT FOR TRAVEL DEMAND IN THE NETHERLANDS

AUTHOR: Maat, K; Harts, JJ.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1780
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PROJECT NUMBERS: 1780-002
FEATURES: 2 Fig. 2 Tab. 24 Ref.

ABSTRACT: The assumption that travel demand is influenced by land use has long been applied in Dutch spatial planning policy. The aim of the present analysis is to explore how far this policy has succeeded in bringing about a compact and mixed spatial structure. Hence, a detailed analysis of the variation and development in the dispersal of urban activities, mix of uses, density, and diversity in urban areas between 1990 and 1996 is provided. It appears that although urban areas are leveling out on the one hand, they are undergoing a process of separation on the other. Although most of the building in the Randstad (the densely populated western part of the Netherlands) is taking place inside the designated urban regions, it is not producing compact monocentric towns; the urban areas are converging more and more, the metropolitan centers are losing their importance, and subcenters and concentrations of services are springing up on the edges of the urban regions. These phenomena confirm the

emergence of complex, polycentric urban areas. Suburban sprawl is increasing rapidly in the intermediate zone outside the Randstad, where low-density residential areas, monoenvironments, and business estates are expanding. This region appears to have become the suburban search space for the Randstad. These dual trends will increase the distance between locations and make destinations less easily accessible by bicycle and public transport. Hence, neither the polycentric development inside the Randstad nor the suburban developments outside the Randstad will contribute to the reduction of car use.

NOTES: This paper appears in Transportation Research Record No. 1780, Land Development and Public Involvement in Transportation.
DESCRIPTOR: Urban development; Travel demand; Urban sprawl; Suburbs; Residential areas; Business districts; Automobile travel; Polycentric urban areas; Netherlands; Randstad (Netherlands)
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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6096&CATID=1&series=1

36. 00824515
INTERVAL DISTRIBUTION FOR EXCLUSIVE, MIXED-USE BICYCLE PATHS

AUTHOR: Khan, SI; Singh, B.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1776
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PROJECT NUMBERS: 1776-030
FEATURES: 5 Fig. 4 Tab. 15 Ref.

ABSTRACT: The interval distribution for exclusive, mixed-use bicycle paths that include pedestrians, skaters, and joggers is examined. Interval distributions are used to generate arrivals, an essential input to a traffic simulation model. Different time headway distributions have been fitted for vehicular traffic flow based on the type of facility, traffic composition, and flow rate. However, only one study reports on the arrival patterns of bicycles approaching an intersection, and no studies examine the interval distribution for bicycles on exclusive bicycle paths. Bicycle traffic data collected for two bicycle paths in Denver, Colorado, were analyzed. Two populations were considered to describe arrival patterns on bicycle paths.

The first consisted of the combined population of bicyclists, pedestrians, skaters, and joggers. The second population consisted of only bicycles, which are considered separately. With bicycles classified as unconstrained and constrained in either a combined population of bicyclists, pedestrians, skaters, and joggers or a separate population of bicyclists only, a Schuhl's composite distribution of negative exponential distribution was found to model interval distributions. The composite distribution's fit was significantly better than a negative exponential distribution, as demonstrated by Kolmogorov- Smirnov tests. The distributions may be used to generate not only the interval between consecutive arrivals but also the type of user.

NOTES: This paper appears in Transportation Research Record No. 1776, Traffic Flow Theory and Highway Capacity 2001.
DESCRIPTOR: Bikeways; Pedestrians; Cyclists; Traffic simulation; Mixed use bicycle paths; Skaters; Joggers; Interval distributions; Arrival patterns; Denver (Colorado)
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6108&CATID=1&series=1

37. 00824514
CHARACTERISTICS OF PASSING AND MEETING MANEUVERS ON EXCLUSIVE BICYCLE PATHS

AUTHOR: Khan, SI; Raksuntorn, W.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1776
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PROJECT NUMBERS: 1776-029
FEATURES: 13 Fig. 7 Tab. 5 Ref.

ABSTRACT: The findings are presented of a comprehensive analysis of the characteristics of passing and meeting maneuvers of bicycles traveling on an exclusive bicycle path 3 m (10 ft) wide. The study is based on bicycle location data collected every 0.5 s from video images of bicycle traffic scenes recorded in Denver, Colorado. For passing maneuvers, the average speeds of passing and passed bicycles, the relationship between passing and passed bicycle speeds every 0.5 s, comfortable speed difference

threshold, lateral spacing during passing, average passing lengths, and the shape of passing are reported. For meeting maneuvers, statistics about the average speed and lateral spacing are included; for paired riding, headway and lateral spacing statistics are included. The results also show that the average bicycle speeds estimated are significantly higher than the speeds reported from a study conducted in the Netherlands. These findings can be used to develop more accurate procedures for the analysis of the quality of service of bicycle paths. According to the 2000 "Highway Capacity Manual" (HCM), a weighted sum of the number of passing and meeting events is used as the criterion to determine the level of service for bicycle paths. The procedures in the 2000 HCM are based on research mainly conducted in the Netherlands for two-lane or 2.4-m-wide bicycle paths and have been extended to 3-m-wide paths. The findings presented here are for 3-m-wide bicycle paths in the United States and therefore may be used to develop new procedures for HCM as well as provide the data needed to develop a bicycle simulation model.

NOTES: This paper appears in Transportation Research Record No. 1776, Traffic Flow Theory and Highway Capacity 2001.

DESCRIPTOR: Bikeways; Passing; Maneuvering; Average travel speed; Headways; Quality of service; Level of service; Video imaging; Lateral spacing; Highway Capacity Manual; Denver (Colorado); Netherlands

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38. 00824513

STOCHASTIC MODELING AND DESIGN OF VEHICULAR AND PEDESTRIAN NETWORKS

AUTHOR: Smith, JM.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1776

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FEATURES: 7 Fig. 8 Tab. 23 Ref.

ABSTRACT: One of the most important problems in today's engineering, planning, and design community is the performance modeling and design of vehicular

and pedestrian traffic networks. Although there are many deterministic models for these problems, few stochastic models other than simulation have been developed. State-dependent queues and finite queuing network models are crucial tools for the topological network design of traffic networks, routing of occupants, and the capacitated allocation and design of resources to accommodate occupant traffic. The latter network design and analysis problems are the focus of the present effort.

NOTES: This paper appears in Transportation Research Record No. 1776, Traffic Flow Theory and Highway Capacity 2001.
DESCRIPTOR: Stochastic programming; Networks; Highway traffic; Pedestrian traffic; Traffic queuing; Mathematical models; Design; Routing
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39. 00824512
NONLOCAL CONTINUOUS-SPACE MICROSCOPIC SIMULATION OF PEDESTRIAN FLOWS WITH LOCAL CHOICE BEHAVIOR

AUTHOR: Hoogendoorn, SP; Bovy, PHL.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1776
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FEATURES: 4 Fig. 10 Ref.

ABSTRACT: Compared with vehicular traffic, pedestrian flow operations are very complex. This is why vehicular flow simulation modeling approaches are generally not applicable to the description of pedestrian flows. Gaining insights into pedestrian flow operations is important in, for instance, the planning and geometric design of pedestrian infrastructural facilities. Additionally, management of pedestrian flows requires knowledge of pedestrian flow behavior. Motivated by the need for accurate pedestrian flow models, a microscopic pedestrian flow model is presented. The model is characterized by pedestrian interaction behavior, based on stimulus-response mechanisms. Moreover, local route-choice behavior is included, which describes how pedestrians choose their direction on the basis of, among other things, their destination and local pedestrian flow

conditions. The choice behavior is based on the concept of subjective utility maximization. Moreover, the model features parallel updating, comparable with recently developed cellular automata models for pedestrian flows. However, contrary to these models, pedestrian locations are not bounded to discrete cells. The model can therefore easily describe multidirectional pedestrian flows (e.g., unidirectional, bidirectional, and crossing). Application of the model to a simple hallway is discussed. Besides speed-density relations, self-organizing phenomena are studied in pedestrian flows (dynamic lane formation and clustering) from the microscopic pedestrian flow model.

NOTES: This paper appears in Transportation Research Record No. 1776, Traffic Flow Theory and Highway Capacity 2001.

DESCRIPTOR: Pedestrian flow; Behavior; Simulation; Mathematical models; Route choice; Utility theory; Maximization; Microscopic simulation; Parallel updating; Multidirectional flow; Hallways; Speed-density relations; Self-organizing phenomena

STATUS: AVAILABLE FROM TRB'S BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=6108&CATID=1&series=1

40. 00810822
WINTER MAINTENANCE STANDARDS ON CYCLEWAYS

AUTHOR: Bergstrom, A.

CORPORATE AUTHOR: Transportation Research Board

SERIES: 23

PAGES: pp 65-74

DATE: 2001

ISBN: 0309067472

ISSN: 10731652

FEATURES: 4 Fig. 2 Tab. 3 Phot. 19 Ref.

CONFERENCE: Ninth Maintenance Management Conference,Juneau, Alaska,July 17, 2000- July 20, 2000,Transportation Research Board; American Association of State Highway and Transportation Officials; Federal Highway Administration; Alaska Department of Transportation and Public Facilities; and Iowa Department of Transportation.

ABSTRACT: A high incidence of bicycle usage for personal travel is desirable, provided it is associated with a corresponding decrease in car-based transport. Cycling provides considerable health benefits as well as environmental benefits. During winter, weather conditions figure significantly in a person's decision whether to cycle; whereas road

conditions are also important, it is not certain that improved road standards would increase cycling usage. The relationship between improved winter maintenance standards and the benefit to society is complex and merits additional study. During February and March 1999, a pilot study of unconventional methods for snow clearance and skid control was performed in Linkoping, Sweden. One method with good results involved a front- mounted sweeper for snow clearance combined with a brine spreader for deicing. This method was further tested in a large-scale field study during the winter of 1999-2000. Both of these studies are presented, with the main focus on how to evaluate road standards (for example, through observation of road conditions and friction measurement). Literature reviews concerning winter maintenance methods for cycleways used in Sweden are also included. Winter maintenance methods on cycleways used today often are adapted to the prevailing conditions on motor traffic roads but are not necessarily the best methods for bicycle traffic. The methods most suitable for cycleways with regard to accessibility and total cost for cyclists are needed. A combination of different methods adjusted to weather and road conditions is likely to be the best solution.

DESCRIPTOR: Winter maintenance; Standards; Bikeways; Bicycle lanes; Snow and ice control; Snowplows; Deicers (Equipment); Field studies; Literature reviews; Sweden

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5972&CATID=1&series=2

41. 00812425
NEOTRADITIONAL DESIGN: MOBILITY FOR ALL AGES

AUTHOR: DeRobertis, M.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Circular E-C019,
PAGES: 6p
DATE: December, 2000
ISSN: 00978515
PROJECT NUMBERS: Paper J-2
FEATURES: 1 Fig. 8 Phot.
CONFERENCE: Urban Street Symposium,Dallas, Texas,June 28, 1999-June 30, 1999, Transportation Research Board; American Association of State Highway and Transportation Officials; American Society of Civil Engineers; Federal Highway Administration; Institute of Transportation Engineers; and National Association of County Engineers.

ABSTRACT: This paper examines the needs of school-age children and senior citizens from the perspective of traditional and neotraditional developments. A brief historical review of street development illustrates societal expectations regarding pedestrian mobility from the 1920s, 1950s and 1990s. Examples are given to illustrate the needs of pedestrians, particularly the elderly and school children. It concludes that traditional developments and neotraditional developments enable both the young and the old to experience transportation independence.

DESCRIPTOR: Highway design; School children; Aged; History; Streets; Pedestrians; Mobility; Pedestrian facilities
STATUS: AVAILABLE TRB'S WEB SITE
AVAILABILITY: http://gulliver.trb.org/publications/circulars/ec019/ec019.pdf

42. 00812423
WEST PALM BEACH TRAFFIC CALMING: THE SECOND GENERATION

AUTHOR: Stillings, T; Lockwood, I.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Circular E-C019,
PAGES: 22p
DATE: December, 2000
ISSN: 00978515
PROJECT NUMBERS: Paper I-5
FEATURES: 2 Fig. 10 Phot. 5 Ref.
CONFERENCE: Urban Street Symposium,Dallas, Texas,June 28, 1999-June 30, 1999, Transportation Research Board; American Association of State Highway and Transportation Officials; American Society of Civil Engineers; Federal Highway Administration; Institute of Transportation Engineers; and National Association of County Engineers.
ABSTRACT: The Transportation Division of West Palm Beach city, Florida, is implementing innovative practices based on traffic calming, New Urbanism, and associated principles. In North America, the city's program can be considered "second generation traffic calming," prioritizing economic development, revitalization, aesthetics, pedestrian comfort and safety, and driver behavior modification, resulting in intense redevelopment activity. Other programs of the city, ranging from home ownership to facade enhancements, complement the program. This comprehensive, coordinated approach to city building has helped stabilize and revive the downtown and several "challenged" neighborhoods, while stimulating significant private investment. Traffic calming has become a normal component of these efforts.

DESCRIPTOR: Traffic calming; Economic development; Urban renewal; Aesthetics; Pedestrian safety; Drivers; Behavior modification; Redevelopment; Central business districts; Neighborhoods; Private enterprise; Investments; West Palm Beach (Florida)
STATUS: AVAILABLE TRB'S WEB SITE
AVAILABILITY: http://gulliver.trb.org/publications/circulars/ec019/ec019.pdf

43. 00812421
CALMING NEW YORK CITY INTERSECTIONS

AUTHOR: King, MR.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Circular E-C019,
PAGES: 15p
DATE: December, 2000
ISSN: 00978515
PROJECT NUMBERS: Paper I-3
FEATURES: 5 Fig. 8 Tab. 6 Ref.
CONFERENCE: Urban Street Symposium,Dallas, Texas,June 28, 1999-June 30, 1999, Transportation Research Board; American Association of State Highway and Transportation Officials; American Society of Civil Engineers; Federal Highway Administration; Institute of Transportation Engineers; and National Association of County Engineers.

ABSTRACT: In 1993, the New York City Department of Transportation (DOT) received a federal grant (under the Intermodal Surface Transportation Efficiency Act of 1991, Congestion Mitigation and Air Quality) to research, design and test innovative traffic calming devices. This was part of a larger program to enhance the pedestrian environment in the city. Under this program, crash statistics analysis and policy codification were used to " sell" traffic calming within the DOT. This paper presents a crash analysis of Leading Pedestrian Intervals (LPI), a crash analysis of neckdowns, and the new neckdown policy. Neckdowns, also known as corner extensions, bulb-outs, and sidewalk expansions, narrow intersections by extending the curb at the corner.

DESCRIPTOR: Traffic calming; Intersections; Pedestrian safety; Accident analysis; Policy; Traffic signal timing; Sidewalks; Design; Leading pedestrian intervals; Neckdowns; New York (New York)
STATUS: AVAILABLE TRB'S WEB SITE
AVAILABILITY: http://gulliver.trb.org/publications/circulars/ec019/ec019.pdf

44. 00812416
PEDESTRIAN LEVEL OF SERVICE BASED ON TRIP QUALITY

AUTHOR: Jaskiewicz, F.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Circular E-C019,
PAGES: 14p
DATE: December, 2000
ISSN: 00978515
PROJECT NUMBERS: Paper G-1
FEATURES: 10 Fig. Refs.
CONFERENCE: Urban Street Symposium ,Dallas, Texas,June 28, 1999-June 30, 1999, Transportation Research Board; American Association of State Highway and Transportation Officials; American Society of Civil Engineers; Federal Highway Administration; Institute of Transportation Engineers; and National Association of County Engineers.

ABSTRACT: The pedestrian experience is dependent upon numerous qualitative factors that are not addressed in customary level-of-service analyses. This paper outlines a process by which such factors can be used to analyze pedestrian systems. Nine specific evaluation measures are described, followed by an account of their application in Winter Park, Florida.

DESCRIPTOR: Level of service; Pedestrians; Evaluation and assessment; Pedestrian facilities; Winter Park (Florida)
STATUS: AVAILABLE TRB'S WEB SITE
AVAILABILITY: http://gulliver.trb.org/publications/circulars/ec019/ec019.pdf

45. 00812413
DOWNTOWN STREETS: ARE WE STRANGLING OURSELVES IN ONE-WAY NETWORKS?

AUTHOR: Walker, GW; Kulash, WM; McHugh, BT.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Circular E-C019,
PAGES: 18p
DATE: December, 2000
ISSN: 00978515
PROJECT NUMBERS: Paper F-2
FEATURES: 9 Fig. 1 Tab. 2 Ref.

CONFERENCE: Urban Street Symposium,Dallas, Texas,June 28, 1999-June 30, 1999, Transportation Research Board; American Association of State Highway and Transportation Officials; American Society of Civil Engineers; Federal Highway Administration; Institute of Transportation Engineers; and National Association of County Engineers.

ABSTRACT: As many communities are in the process of revitalizing their downtowns, a common issue is the prevalence of intricate and often confusing one-way street networks. This paper provides a comparison of one-way versus two- way street systems for downtowns and presents an evaluation methodology for considering two-way conversion. The analysis gives equal weight to all modes of travel and includes the non-regular visitor to downtown. Motorist analysis factors include mobility, vehicle miles of travel, number of turning movements, travel time, vehicle capacity, and parking supply. Pedestrian factors analyzed are number and severity of pedestrian/ vehicle crossing conflicts. Direction and symmetry of routes comprise the transit analysis factors, and retail factors measure the visibility of street front locations.

DESCRIPTOR: Central business districts; Urban renewal; One way streets; Mobility; Vehicle miles of travel; Turning traffic; Travel time; Vehicle capacity; Parking facilities; Pedestrian vehicle interface; Public transit; Retail trade
STATUS: AVAILABLE TRB'S WEB SITE
AVAILABILITY: http://gulliver.trb.org/publications/circulars/ec019/ec019.pdf

46. 00812398
MOBILITY-FRIENDLY STREET STANDARDS FOR DELAWARE

AUTHOR: Ewing, R.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Circular E-C019,
PAGES: 8p
DATE: December, 2000
ISSN: 00978515
PROJECT NUMBERS: Paper B-5
FEATURES: 3 Tab. 2 Ref.
CONFERENCE: Urban Street Symposium,Dallas, Texas,June 28, 1999-June 30, 1999, Transportation Research Board; American Association of State Highway and Transportation Officials; American Society of Civil Engineers; Federal Highway Administration; Institute of Transportation Engineers; and National Association of County Engineers.

ABSTRACT: New subdivision street standards are under consideration for statewide adoption by the Delaware Department of Transportation. If they are accepted, this will be the first time such "skinny" street standards have been adopted at such a high level of government. The goal is to scale down, traffic calm, and pedestrianize subdivision streets, recognizing that subdivision streets are extensions of residents' living environments.

DESCRIPTOR: Highway design; Design standards; Urban highways; Streets; Subdivisions; Traffic calming; Pedestrians; Delaware

STATUS: AVAILABLE TRB'S WEB SITE

AVAILABILITY: http://gulliver.trb.org/publications/circulars/ec019/ec019.pdf

47. 00812391

URBAN STREET SYMPOSIUM: CONFERENCE PROCEEDINGS, DALLAS, TEXAS, JUNE 28- 30, 1999

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Circular

PAGES: v.p.

DATE: December, 2000

ISSN: 00978515

PROJECT NUMBERS: E-C019

FEATURES: Figs. Tabs. Phots. Refs.

CONFERENCE: Urban Street Symposium,Dallas, Texas,June 28, 1999-June 30, 1999, Transportation Research Board; American Association of State Highway and Transportation Officials; American Society of Civil Engineers; Federal Highway Administration; Institute of Transportation Engineers; and National Association of County Engineers.

ABSTRACT: The Urban Street Symposium was attended by about 200 planners, engineers, and other urban street design professionals. The symposium has the following objectives: (1) Provide a forum for comparison and debate of alternative urban street design practices; (2) Highlight problems caused by certain design practices, and better alternatives; (3) Promote applications of research; (4) Reconsider long-held urban street design practices in light of the "new urbanism" movement; (5) Document better urban street design practices; (6) Show "how to do it"; (7) Share innovations with others; and (8) Transfer urban street research findings to state agencies and to local governments. This circular contains 36 symposium papers that were submitted for publication. They have been grouped into the following subject areas: (A) Public Involvement: Examples and Models; (B) Layout and Functional Classification:

Different Paradigms; © Access Management: The Best Idea Since the Interstate System; (D) Street Speed: Management and Accommodation; (E) Intersections: Where It All Comes Together; (F) Cross Sections: Allocating the Width; (G) ADA and Peds; (H) Safety and Design: Quality Control; (I) Traffic Calming: Experiences and Examples; and (J) Flexible and Neotraditional Designs: Pro and Con.

DESCRIPTOR: Conferences; Urban highways; Highway design; Innovation; Public participation; Layout; Access control (Transportation); Speed control; Intersections; Cross sections; Pedestrians; Highway safety; Traffic calming; Design standards; Highway classification
STATUS: AVAILABLE FROM TRB'S BOOKSTORE
AVAILABILITY: http://nationalacademies.org/trb/bookstore

48. 00795401
PROBABILISTIC MODELS FOR PEDESTRIAN CAPACITY AND DELAY AT ROUNDABOUTS

AUTHOR: Oh, H; Sisiopiku, VP.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Circular E-C018
PAGES: pp 459-470
DATE: June, 2000
ISSN: 00978515
FEATURES: 5 Fig. 1 Tab. Refs.
CONFERENCE: Fourth International Symposium on Highway Capacity,Maui, Hawaii,June 27, 2000-July 1, 2000,Transportation Research Board

ABSTRACT: The increase of the popularity of modern roundabouts in urban settings creates the need to assess their impact on pedestrian delays and capacities. This paper presents an analytical approach for calculation of pedestrian crossing capacity and pedestrian delay at roundabouts. Comparisons between pedestrian capacity and delays at roundabouts and signalized intersections are also provided. The pedestrian crossing capacity is conceptualized with the help of the maximum pedestrian crossing rate (MPCR). The MPCR is based on a probabilistic gap acceptance model. The model is made possible with the following practical assumptions: (a) priority cannot be given to the pedestrian at the crosswalk of roundabouts and (b) arrival rate of approaching vehicles follows the probabilistic distribution. The MPCR at signalized intersections is calculated based on the existing pedestrian capacity model of the "Highway Capacity Manual" considering signal phases and timing. As MPCRs for both intersection alternatives are proposed, the resulting delays can be calculated and compared. Queuing theory principles under

M/M/1 (random arrivals/random departures/one server) and service on vehicles in the order of arrival (first in first out, FIFO) conditions are employed for this purpose. Capacity and delay are compared for a set of experimental conditions. The results indicate that roundabouts provide more capacity than signalized intersections for approaching traffic of up to 1000 veh/h/direction. The comparison of pedestrian delays confirms the intuitive concept that roundabouts can provide lower pedestrian delay under light vehicle and pedestrian traffic. In this paper, the MPCR model for calculation of pedestrian capacity and delay at roundabouts has been suggested and experimental results from model application are presented and discussed. These models, concepts, and results themselves may be useful to evaluate performance of roundabouts with respect to pedestrians. Employment of alternative arrival distributions is expected to enhance applicability, accuracy, and diversity of this model and is recommended for future studies.

DESCRIPTOR: Roundabouts; Pedestrian traffic; Signalized intersections; Probability; Gap acceptance; Mathematical models; Queuing theory; Highway capacity; Traffic delay; Performance; Pedestrian capacity; Pedestrian delay
STATUS: AVAILABLE FROM TRB'S WEB SITE
AVAILABILITY: http://gulliver.trb.org/publications/circulars/ec018/ec018toc.pdf

49. 00784584
BICYCLING: PATHWAY TO THE FUTURE

AUTHOR: Clarke, A.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation in the New Millennium
PAGES: 7p
DATE: 2000
ABSTRACT: As the decade draws to a close, average federal spending on bicycle and pedestrian facilities exceeds $260 million annually. The U.S. Department of Transportation (USDOT) has staff working on bicycle and pedestrian issues in most of its agencies. In addition, the USDOT has set ambitious national goals for bicycling and walking, is nearing completion of a multiyear bicycle and pedestrian research program, has elevated bicycle and pedestrian safety to priority status, and has published a wide range of related technical and promotional literature. Every state is required by law to have a bicycle and pedestrian coordinator, and dozens of cities and counties have full-time bicycle and pedestrian staff. Public opinion and

attitudes toward bicycling have also become more favorable. Thus, as the new millennium dawns, the future for bicycling as a component of the transportation system looks bright. This paper discusses the improved prospects for bicycling, as well as the significant obstacles to be overcome before it can break through as a mainstream transportation mode.

NOTES: This paper is available on the CD-ROM, Transportation in the New Millennium: State of the Art and Future Directions, Perspectives from Transportation Research Board Standing Committees. It is also available on the TRB website.

DESCRIPTOR: BICYCLING; FEDERAL AID; RESEARCH; PROMOTION; PUBLIC OPINION; ATTITUDES; FUTURE

AVAILABILITY: http://gulliver.trb.org/publications/millennium/00011.pdf

50. 00784221
PEDESTRIAN TRANSPORTATION: A LOOK FORWARD

AUTHOR: Blomberg, R; Jordan, G; Killingsworth, R; Konheim, C.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation in the New Millennium

PAGES: 6p

DATE: 2000

ABSTRACT: This paper discusses issues related to pedestrians and pedestrian travel as the new millennium begins as determined by the Transportation Research Board Committee on Pedestrians. The health and other beneficial aspects of pedestrian travel, conflicts with vehicular transportation, and efforts to improve and increase pedestrian travel are described. The lack of access to or funds for sidewalks or walkways, indifference to the potential of walking, and the belief that too few people are interested in walking as perceived by facility planners are barriers to increasing pedestrian travel. Developments in design guidance, safety, land use, and fitness are some of the areas of focus identified by the Committee that are described in this paper.

NOTES: This paper is available on the CD-ROM, Transportation in the New Millennium: State of the Art and Future Directions, Perspectives from Transportation Research Board Standing Committees. It is also available on the TRB website.

DESCRIPTOR: PEDESTRIAN AREAS; PEDESTRIAN SAFETY; PEDESTRIAN TRAFFIC; PEDESTRIAN VEHICLE INTERFACE; PEDESTRIANS; WALKING; WALKWAYS; TRANSPORTATION PLANNING; PLANNING BY FACILITY OR LAND USE; SIDEWALKS; PHYSICAL FITNESS; TRANSPORTATION RESEARCH BOARD

AVAILABILITY: http://gulliver.trb.org/publications/millennium/00088.pdf

51. 00798925
EVALUATION OF BLUE BIKE-LANE TREATMENT IN PORTLAND, OREGON

AUTHOR: Hunter, WW; Harkey, DL; Stewart, JR; Birk, ML.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
PAGES: pp 107-115
DATE: 2000
ISBN: 0309066859
ISSN: 03611981
PROJECT NUMBERS: 1705-017
FEATURES: 8 Fig. 3 Tab. 3 Phot. 5 Ref.

ABSTRACT: Many European cities use colored markings at bicycle-motor vehicle crossings to reduce conflicts. To determine whether such colored markings help improve safety at American bicycle-motor vehicle crossings, the city of Portland, Oregon, studied the use of blue pavement markings and a novel signage system to delineate selected conflict areas. The University of North Carolina Highway Safety Research Center (HSRC), under contract to the Federal Highway Administration, analyzed the project data. From 1997 to 1999, Portland marked 10 conflict areas with paint, blue thermoplastic, and an accompanying "Yield to Cyclist" sign. All of the sites had a high level of cyclist and motorist interaction, as well as a history of complaints. The crossings were all at locations where the cyclist travels straight and the motorist crosses the bicycle lane in order to exit a roadway (such as an off-ramp situation), enter a right-turn lane, or merge onto a street from a ramp. The study used videotape analysis and found most behavior changes to be positive. Significantly higher numbers of motorists yielded to cyclists and slowed or stopped before entering the blue pavement areas, and more cyclists followed the colored bike-lane path. However, the blue pavement also resulted in fewer cyclists turning their heads to scan for traffic or using hand signals, perhaps signifying an increased comfort level. The overwhelming majority of cyclists and close to a majority of motorists surveyed felt the blue areas enhanced safety. Colored pavement and signage should continue to be used and evaluated in bicycle-motor vehicle conflict areas.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Bicycle lanes; Traffic conflicts; Road markings; Color; Traffic signs; Off ramps; Right turn lanes; Merging area; Behavior; Cyclists; Drivers; Traffic safety; Videotapes; Portland (Oregon)
STATUS: AVAILABLE FROM TRB BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

52. 00798924
EVALUATION OF INNOVATIVE BIKE-BOX APPLICATION IN EUGENE, OREGON

AUTHOR: Hunter, WW.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
PAGES: pp 99-106
DATE: 2000
ISBN: 0309066859
ISSN: 03611981
PROJECT NUMBERS: 1705-016
FEATURES: 3 Fig. 5 Tab. 3 Phot. 5 Ref.

ABSTRACT: An innovative "bike box"—a right-angle extension to a bike lane (BL) at the head of the intersection—was installed with accompanying traffic signs but no extra traffic signals at a busy downtown intersection featuring two one-way streets in Eugene, Oregon, in summer 1998. The box allows bicyclists traveling to the intersection in a left side BL to get to the head of the traffic queue on a red traffic signal indication and then proceed ahead of motor vehicle traffic toward a right side BL when the traffic signal changes to green. Cyclists traveling through the intersection were videotaped before and after placement of the box. The videotapes were coded to evaluate operational behaviors and conflicts with motorists, other bicyclists, and pedestrians. Twenty-two percent of the bicyclists who approached in the left side BL and then crossed to the BL on the right side of the street (the bicyclists for whom the box was most intended) used the box. Many more bicyclists in this target group could have used the box (i.e., they had a red signal indication and enough time to move into the box). A problem with motor vehicle encroachments into the box likely diminished the frequency of use. The rate of conflicts between bicycles and motor vehicles changed little in the before and after periods. No conflicts took place while the bike box was being used as intended.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Bicycle lanes; Signalized intersections; Videotapes; Before and after studies; Traffic conflicts; Cyclists; Drivers; Pedestrians; Behavior; Innovation; Highway traffic control; Eugene (Oregon)
STATUS: AVAILABLE FROM TRB BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

53. 00798923
ANALYSIS OF GAP PATTERNS IN LONGITUDINAL RUMBLE STRIPS TO ACCOMMODATE BICYCLE TRAVEL

AUTHOR: Moeur, RC.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
PAGES: pp 93-98
DATE: 2000
ISBN: 0309066859
ISSN: 03611981
PROJECT NUMBERS: 1705-015
FEATURES: 3 Fig. 1 Tab. 5 Ref.

ABSTRACT: Rumble strips can offer significant reductions in run-off-road crashes on rural highways. Newer ground-in rumble strip designs can be installed on a wider variety of shoulders, but these new designs have a much greater negative effect on bicycle traffic than did previous designs. The feasibility of placing gaps in a rumble strip pattern to permit bicycle traffic to cross the rumble strip area without striking the rumble strip pattern itself was investigated. A recommended minimum length for these gaps to accommodate bicyclists of varying abilities at speeds representative of downhill conditions was also determined. On the basis of experimental information collected, the researchers recommend that rumble strips on noncontrolled-access highways include periodic gaps of 3. 7 m (12 ft) in length, and that these gaps be placed at periodic intervals at a recommended spacing of 12.2 m (40 ft) or 18.3 m (60 ft).

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Rumble strips; Design; Bicycle travels
STATUS: AVAILABLE FROM TRB BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

54. 00798922
COORDINATING TRAFFIC SIGNALS FOR BICYCLE PROGRESSION

AUTHOR: Taylor, DB; Mahmassani, HS.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
PAGES: pp 85-92
DATE: 2000
ISBN: 0309066859
ISSN: 03611981
PROJECT NUMBERS: 1705-014
FEATURES: 5 Fig. 15 Ref.

ABSTRACT: Traffic signal coordination that provides either (a) progression for bicycles or (b) simultaneous progression for bicycles and automobiles traveling on the same facility is analyzed. A conceptual foundation, consisting of three primary contributions, is developed for analyzing bicycle-automobile mixed-traffic progression along signalized streets. First, the principal considerations for bicycle progression are articulated. Second, several concepts and techniques that provide improved (or alternative) multiobjective solutions are presented and analyzed. Third, a multiobjective formulation framework for solving the mixed-traffic design problem is proposed. This framework formally incorporates the elements that were introduced as part of the first two contributions and provides a method to handle the inherent competing objectives of the situation. Additionally, important practical aspects of designing and implementing bicycle progression systems, such as handling bicycle speed variability and selecting appropriate facilities for initial (or test) projects, are identified and discussed.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Traffic signal control systems; Bicycles; Vehicle mix; Speed
STATUS: AVAILABLE FROM TRB BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

55. 00798921

CYCLING AND URBAN TRAFFIC MANAGEMENT AND CONTROL SYSTEMS

AUTHOR: Clark, SD; Page, MW.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
PAGES: pp 77-84
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ISSN: 03611981
PROJECT NUMBERS: 1705-013
FEATURES: 2 Fig. 1 Tab. 35 Ref.

ABSTRACT: Since the 1950s, cycling has been a declining mode of travel in the United Kingdom. During this same period, sophisticated techniques for managing traffic in the urban environment have been developed. Given these circumstances, the presence of cyclists is often ignored by urban traffic control (UTC) systems, which are dominated by consideration of the flows and journey times of private motorized vehicles. Authorities are enthusiastic about the promotion of cycling as a mode of travel and are looking to see if this can be assisted by use of traffic management systems. The fact that cyclists and potential cyclists vary considerably in their abilities and performance, as well as in their attitudes to timesaving and safety, is highlighted. The context of the problem is set, the specific issue of detection of cycles is examined, the potential for implementation of priority measures in different types of UTC systems is discussed, and the issue is illustrated with some actual installations. Limited European evidence would suggest that only minimum effort is needed to take explicit account of cycling when a UTC system is being implemented. This supports the idea that cyclists can be given a higher degree of consideration within a UTC system without incurring significant additional costs. Only when cycling achieves a near-dominant proportion of the trips within a city and is growing in volume, as is the case in China, is explicit consideration to cyclists given.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Highway traffic control; Urban areas; Bicycle travel; Human factors; Detection and identification; United Kingdom; China
STATUS: AVAILABLE FROM TRB BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

56. 00798920

MODELING OF BICYCLE ROUTE AND DESTINATION CHOICE BEHAVIOR FOR BICYCLE ROAD NETWORK PLAN

AUTHOR: Hyodo, T; Suzuki, N; Takahashi, K.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
PAGES: pp 70-76
DATE: 2000
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ISSN: 03611981
PROJECT NUMBERS: 1705-012
FEATURES: 10 Fig. 5 Tab. 6 Ref.

ABSTRACT: A new modeling method that describes bicycle route or destination choice behavior is presented. Although there are numerous bicycle users in Japan, the urban transportation planning process often treats bicycles and pedestrians as a single mode. Therefore, a methodology by which to evaluate and analyze bicycle demand needs to be developed. A bicycle route choice model that describes the relationship between route choice behavior and facility characteristics (e.g., road width or sidewalk) has been proposed. This model can be applied to the planning of bicycle road networks. The data from a bicycle trip survey conducted in Japan are used to study the characteristics of the model. The model is applied to study access railway station choice (destination choice). The model can produce a better fit than can a conventional model.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Bicycle travel; Route choice; Origin and destination; Behavior; Cyclists; Mathematical models; Travel demand; Roads; Sidewalks; Planning and design; Japan
STATUS: AVAILABLE FROM TRB BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

57. 00798919

NEW MODELING APPROACH TO MIXED-TRAFFIC STREAMS WITH NONMOTORIZED VEHICLES

AUTHOR: Oketch, TG.
CORPORATE

AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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PROJECT NUMBERS: 1705-011
FEATURES: 4 Fig. 3 Tab. 14 Ref.

ABSTRACT: Mixed-traffic streams that contain motorized and nonmotorized vehicles are becoming more common in urban areas. These streams contain standard vehicle types such as private cars, buses, and trucks, as well as nonstandard vehicles such as bicycles, motorcycles, and other vehicular forms. Models suitable for analysis of such streams hardly exist, and most available models are limited in scope and effectiveness. Analysis of mixed streams that uses traditional approaches has achieved limited success and has involved much recalibration effort and significant model modifications. Effective analysis of these streams therefore inevitably requires new models to be developed that use different approaches. Aspects of a model developed specifically for mixed streams are presented. This model covers different vehicle types, including nonmotorized ones, and allows for some special behaviors, such as seepage to fronts of queues by two-wheeled vehicles and simultaneous use of two lanes. In addition to normal car-following rules, the model incorporates lateral movement with a gradual lane change maneuver (as opposed to an instantaneous one), the decisions of which are governed by fuzzy logic rules. The model was calibrated and tested with data from Nairobi, Kenya, and its predictions were found to be in close agreement with the field data. In addition to its being a normal traffic management tool, the model makes a significant contribution to the study of the influence of nonstandard vehicle types or behavior on traffic performance.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Vehicle mix; Motor vehicles; Nonmotorized transportation; Urban areas; Traffic models; Fuzzy logic; Calibration; Nairobi (Kenya)
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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

58. 00798918

SIDEWALK CROSS-SLOPE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT

AUTHOR: Kockelman, K; Zhao, Y; Heard, L; Taylor, D; Taylor, B.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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FEATURES: 3 Tab. 27 Ref.

ABSTRACT: It is the long-term intent of the Americans with Disabilities Act (ADA) that publicly available services along a public street be accessible to people with disabilities via a continuous, unobstructed pedestrian circulation network. When altered, almost all streets, with the exception of rural roads and highways, will be required to provide an accessible sidewalk wherever feasible. Existing research and science related to sidewalk cross-slope requirements are described in detail. The history and spirit of the ADA are summarized, relevant court decisions are discussed, and key ADA cross-slope-related requirements are identified (along with applicable caveats). Current practices rely on a combination of strict, but limited, physical solutions and some programmatic solutions, about which there is much uncertainty as to how and when they should be applied. Very little existing work considers the effort and other access differences that result from changes in cross slope. Thus, additional research is needed to ensure sound policy regarding user access to transportation facilities.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Sidewalks; History; Court decisions; Regulations; Access; Cross slope; Americans with Disabilities Act

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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

59. 00798917
EFFECTS OF INNOVATIVE PEDESTRIAN SIGNS AT UNSIGNALIZED LOCATIONS: THREE TREATMENTS

AUTHOR: Huang, H; Zegeer, C; Nassi, R.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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PROJECT NUMBERS: 1705-008
FEATURES: 2 Fig. 5 Tab. 6 Phot. 11 Ref.

ABSTRACT: Three types of devices that have been used in conjunction with marked crosswalks in an attempt to improve pedestrian safety were evaluated: an overhead crosswalk sign in Seattle, Washington; pedestrian safety cones (which read, "State Law: Yield to Pedestrians in Crosswalk in Your Half of Road") in New York State and in Portland, Oregon; and pedestrian-activated overhead signs (which read, "Stop for Pedestrians in Crosswalk") in Tucson, Arizona. The signs were used under varying traffic and roadway conditions. The effects of these three treatments on pedestrian and motorist behavior were evaluated. The variables of interest were whether pedestrians had the benefit of motorists yielding to them; whether pedestrians had to run, hesitate, or abort their crossing; and whether pedestrians crossed in the crosswalk. The New York cones and Seattle signs were effective in increasing the numbers of pedestrians who had the benefit of motorists yielding to them. At one location in Tucson, the overhead sign increased motorist yielding to pedestrians. The signs in Seattle and Tucson were effective in reducing the number of persons who had to run, hesitate, or abort their crossing. None of the treatments had a clear effect on whether people crossed in the crosswalk. By themselves, these devices cannot ensure that motorists will slow down and yield to pedestrians. It is essential to use these and other devices along with education and enforcement, but creation of friendlier pedestrian environments (e.g., by means of implementing geometric improvements) for the purpose of reducing vehicle speeds may be more important.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Pedestrian signs; Unsignalized intersections; Crosswalks; Pedestrian safety; Overhead traffic signs; Traffic cones; Messages (Communications); Pedestrian actuated controllers; Pedestrians; Drivers; Behavior; Traffic safety education; Traffic law enforcement; Traffic calming; Seattle (Washington); New York (State); Portland (Oregon); Tucson (Arizona)

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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

60. 00798916
LOCATOR TONES FOR PEDESTRIAN SIGNALS

AUTHOR: Bentzen, BL; Barlow, JM; Gubbe, D.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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PROJECT NUMBERS: 1705-007
FEATURES: 1 Tab. 5 Ref.

ABSTRACT: The two primary problems experienced by visually impaired persons at pedestrian-actuated intersections are determining whether there is a push-button and locating the push button. Many countries use accessible pedestrian signals much more widely than has been done in the United States, and a number of these—including Australia, Hong Kong, Sweden, Denmark, Germany, Belgium, and Austria—routinely require the use of a locator tone. Typically emanating from the push-button housing, a push-button locator tone indicates to pedestrians that they are expected to push a button to request a pedestrian phase. It enables visually impaired pedestrians to locate the push button quickly and efficiently. Research was undertaken to determine the effect of locator tone repetition rate on efficiency of pedestrians' location of the push-button pole. Repetition rates of 1.0 and 1.5 Hz resulted in equal pole location speed, faster than that for the 0.5 Hz repetition rate, and were preferred over the 0.5 Hz repetition rate. Locator tones 2 dB above ambient sound resulted in faster pole location than did tones 5 dB and 10 dB above ambient sound. Push-button locator tones should have a standardized repetition rate between 1.0 Hz and 1.2 Hz so that it may be ensured that visually impaired pedestrians can efficiently locate push buttons. Locator tones need be no more than 5 dB louder than ambient traffic sound.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Pedestrian actuated controllers; Visually impaired persons; Location; Pedestrian signals

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61. 00798915
AUTOMATED DETECTION OF PEDESTRIANS IN CONJUNCTION WITH STANDARD PEDESTRIAN PUSH BUTTONS AT SIGNALIZED INTERSECTIONS

AUTHOR: Hughes, R; Huang, H; Zegeer, C; Cynecki, M.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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PROJECT NUMBERS: 1705-006
FEATURES: 4 Fig. 1 Tab. 4 Phot. 12 Ref.

ABSTRACT: Automated pedestrian detection systems provide the means to detect the presence of pedestrians as they approach the curb prior to crossing the street, and then these systems call the Walk signal without any action required on the part of the pedestrians. These detectors can also extend the clearance interval in order to allow slower persons to finish crossing. Whether automated pedestrian detectors, when used in conjunction with standard pedestrian push buttons, would result in fewer overall pedestrian-vehicle conflicts and fewer inappropriate crossings (i.e., pedestrians' beginning to cross during a Don't Walk signal) was evaluated. Before and after video data were collected at intersection locations in Los Angeles, California (infrared and microwave), Phoenix, Arizona (microwave), and Rochester, New York (microwave). The results indicated a significant reduction in vehicle-pedestrian conflicts, as well as a reduction in the number of pedestrians beginning to cross during the Don't Walk signal. The differences between microwave and infrared detectors were not significant. Detailed field testing of the microwave equipment in Phoenix revealed that fine-tuning of the detection zone is still needed in order to reduce the number of false calls and missed calls.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Signalized intersections; Crosswalks; Clearance interval (Traffic signal cycle); Pedestrian vehicle interface; Traffic conflicts; Before and after

studies; Video cameras; Microwave detectors; Infrared detectors; Equipment tests; Automatic pedestrian detection; Pedestrian signals; Los Angeles (California); Phoenix (Arizona); Rochester (New York)

STATUS: AVAILABLE FROM TRB BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

62. 00798914

EFFECTS OF TRAFFIC CALMING MEASURES ON PEDESTRIAN AND MOTORIST BEHAVIOR

AUTHOR: Huang, HF; Cynecki, MJ.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705

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PROJECT NUMBERS: 1705-005

FEATURES: 5 Tab. 4 Phot. 11 Ref.

ABSTRACT: By slowing down vehicle traffic, shortening crossing distances, and enhancing motorist and pedestrian visibility, traffic calming treatments may benefit pedestrians who are crossing the street. The effects of selected traffic calming treatments on pedestrian and motorist behavior were evaluated at both intersection and midblock locations. Before and after data were collected in Cambridge, Massachusetts (bulbouts and raised intersection), Corvallis, Oregon (pedestrian refuge island), Seattle, Washington (bulbouts), and Sacramento, California (refuge islands). The key findings include that none of the treatments had a significant effect on the percentage of pedestrians for whom motorists yielded, the treatments usually did not have a significant effect on average pedestrian waiting time, and refuge islands often served to channelize pedestrians into marked crosswalks. The raised intersection in Cambridge also increased the percentage of pedestrians who crossed in the crosswalk. While traffic calming devices have the potential for improving the pedestrian environment, these devices by themselves do not guarantee that motorists will slow down or yield to pedestrians.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.

DESCRIPTOR: Traffic calming; Pedestrians; Drivers; Behavior; Pedestrian safety; Crosswalks; Midblock crossings; Before and after studies; Waiting time; Traffic safety; Cambridge (Massachusetts); Corvallis (Oregon); Seattle (Washington); Sacramento (California)
STATUS: AVAILABLE FROM TRB BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

63. 00798913
ANALYSIS OF PEDESTRIAN GAIT AND PERCEPTION-REACTION AT SIGNAL-CONTROLLED CROSSWALK INTERSECTIONS

AUTHOR: Fugger, TF, Jr; Randles, BC; Stein, AC; Whiting, WC; Gallagher, B.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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ISSN: 03611981
PROJECT NUMBERS: 1705-004
FEATURES: 4 Fig. 4 Tab. 10 Ref.

ABSTRACT: Pedestrian accident analysis and reconstruction remain the most difficult areas for the accident analyst. Although data relating to average pedestrian walking speeds, perception-reaction, and pedestrian accident reconstruction can be found in the literature, proper pedestrian study data pertaining to real-life situations are lacking. Pedestrians were observed at signal-controlled crosswalk intersections, and their perception-reaction to the crosswalk signal, acceleration rate to reach constant walking velocity, and average walking speed once steady state velocity is achieved were determined. Experimental test data collected regarding pedestrian gait analysis, initiation, and steady state walking speeds are presented. "Real world" pedestrian observations were gathered at a variety of intersections, ranging from busy downtown intersections to suburban intersections throughout the greater Los Angeles area. Kinematic data on pedestrian movements were obtained using high-speed digital video. A high-speed video motion analysis system was used to reduce the data and to obtain the mean acceleration and time to steady state walking velocity. Perception-reaction data collected on 288 subjects show a significant percentage of the pedestrians initiating movement within 1 s of Walk light illumination. Some differences were observed when the state of anticipation was being considered, and these results are presented. The

mean acceleration (0.14 +/- 0.09 g) and steady state velocity (1. 36 +/- 0.24 m/s) values did not demonstrate a significant difference between males and females. The width of the street or initial state of anticipation did not have an effect on either mean acceleration values or steady state velocities.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Pedestrian accidents; Accident reconstruction; Walking; Velocity; Average travel speed; Field studies; Crosswalks; Signalized intersections; Central business districts; Suburbs; Pedestrian movement; Video cameras; Steady state; Los Angeles (California)
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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

64. 00798912
POWER OF THE LINE: SHARED-USE PATH CONFLICT REDUCTION

AUTHOR: Jordan, G; Leso, L.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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PROJECT NUMBERS: 1705-003
FEATURES: 1 Fig. 2 Tab.

ABSTRACT: Painting a yellow center line at blind curves on a busy multiuser path (bicyclists, pedestrians, in-line skaters, runners) decreased the percentage of people who "went the wrong way" on the path, in a before-and- after study whose sample size was 2,147. A busy 3.6-m (12-ft) paved recreational and commuting path in Philadelphia circles the Schuylkill River for 13.5 km (8.4 mi). There are numerous blind curves caused by hedges, rock outcrops, and bridge piers. Many people were traveling on the wrong side around sharp blind curves. Counts were taken and videotapes made in order to determine the percentage of bicyclists, pedestrians, in-line skaters, and runners on the proper side, on the wrong side, and passing on the wrong side. Then a solid-yellow center line and directional arrows were neatly spray painted at the blind curves, and after counts were taken. The percentage of wrong-side travel fell from 35% to

15%, a 57% reduction. White lines and arrows were placed at driveways and road crossings. The white lines reduced wrong-way travel from 30% to 10%, a reduction of 66%. Painted center lines kept people on the proper side and reduced the likelihood of conflicts and crashes. Paint is easy, fast, and inexpensive, and creates no physical obstacle; it is hard to damage and it works without education of the public.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Walkways; Bikeways; Skating; Traffic conflicts; Center lines; Before and after studies; Crosswalks; Driveways; Philadelphia (Pennsylvania)
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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

65. 00798911
CALIBRATING PEDESTRIAN LEVEL-OF-SERVICE METRICS WITH 3-D VISUALIZATION

AUTHOR: Miller, JS; Bigelow, JA; Garber, NJ.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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PROJECT NUMBERS: 1705-002
FEATURES: 5 Fig. 2 Tab. 15 Ref.

ABSTRACT: Unlike the case with airport terminals or the central business district, the quality of suburban pedestrian facilities is most likely affected less by congestion and more by safety, the walking environment, and aesthetics. Because the "Highway Capacity Manual" does not explicitly capture such factors when measuring pedestrian level of service (LOS), researchers have proposed innovative rating scales that do. These scales use either measurable characteristics, such as walkway width, median openings, and signalization parameters, or user perceptions, such as continuity and convenience, to rate a pedestrian facility. Unfortunately, the results of these scales are not always easy to interpret. For example, in a scaling system for pedestrian facilities in which a raised curb median counts 6 points and a blinking pedestrian-crossing signal counts 3 points, the developers of the scale believed that the median would be twice as

valuable to pedestrians as the crossing signal. But would pedestrians agree? A scaling system was developed for pedestrian LOS and calibrated using visualization (computer-aided modeling techniques consisting of still shots and animations). Subjects' perceived ratings of a pedestrian facility after they viewed still pictures and animations of the facility were compared with the computed rating of the facility from an LOS scale. The chief value of this method is that it helps ensure that pedestrian crossing needs are systematically considered and that engineers, planners, and the public agree on the calibration of a pedestrian LOS scale. The methodology is also applicable in urban areas where pedestrian needs beyond physical capacity are to be explicitly considered. The approach is original in that visualization as a simulation and data analysis tool was used to calibrate a pedestrian LOS scale.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.
DESCRIPTOR: Suburbs; Pedestrian areas; Level of service; Pedestrian safety; Environment; Aesthetics; Calibration; Pedestrian facilities; Three dimensional visualization
STATUS: AVAILABLE FROM TRB BOOKSTORE
AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

66. 00798910
PEDESTRIAN TRAVEL POTENTIAL IN NORTHERN NEW JERSEY: A METROPOLITAN PLANNING ORGANIZATION'S APPROACH TO IDENTIFYING INVESTMENT PRIORITIES

AUTHOR: Matley, TM; Goldman, LM; Fineman, BJ.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1705
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PROJECT NUMBERS: 1705-001
FEATURES: 3 Fig. 2 Tab. 8 Ref.

ABSTRACT: At metropolitan planning organizations such as the North Jersey Transportation Planning Authority (NJTPA), planning investments to support pedestrian trips for a large and diverse metropolitan area would be an intractable challenge without an open, coordinated, and cooperative

approach and a strong information foundation. To address this challenge, NJTPA has adopted an innovative approach using regional analysis and priority setting to guide planning activity for a very local scale. The design and initial applications of this approach are described. Areas with proximity and connectivity features supporting pedestrian activity were identified using data available at the regional level. The data were analyzed within a pedestrian potential index (PPI) comprising four key indicators: population densities, employment densities, land use mix, and street network density, all analyzed at the census tract level. Thresholds were set to begin to find priority areas in which investment in pedestrian strategies would be more likely to generate a high return in terms of walking trips generated. The analysis also allows local planners to understand how their communities compare in relative levels of density, land use mix, and network connectivity. This information can help planners identify areas for planning activities that would address these factors and encourage walking trips. With the first results from application of the PPI, NJTPA has solicited feedback from state and local planning partners. With subsequent refinement, this analysis will be finalized for the region and incorporated in the next update of the NJTPA Regional Transportation Plan.

NOTES: This paper appears in Transportation Research Record No. 1705, Pedestrian and Bicycle Transportation Research 2000.

DESCRIPTOR: Pedestrians; Travel; Strategic planning; Investments; Regional analysis; Population density; Employment; Land use; Streets; Walking; Trip generation; Transportation planning; North Jersey Transportation Planning Authority; New Jersey

STATUS: AVAILABLE FROM TRB BOOKSTORE

AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5835&CATID=1&series=1

67. 00802580
GAS-KINETIC MODELING AND SIMULATION OF PEDESTRIAN FLOWS

AUTHOR: Hoogendoorn, S; Bovy, PHL.

CORPORATE AUTHOR: Transportation Research Board

SERIES: Transportation Research Record - Journal of the Transportation Research Board 1710

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PROJECT NUMBERS: 1710-005

FEATURES: 4 Fig. 7 Ref.

ABSTRACT: Insight into pedestrian flow operations is important in both planning geometric design of infrastructure facilities such as railway stations as well as in the management of pedestrian flows in such facilities. Lack of empirical knowledge regarding the characteristics of pedestrian flows under varying circumstances and designs motivates using a model-based approach. In this study, a new pedestrian flow model based on the gas-kinetic modeling paradigm is established. The mesoscopic equations describe the dynamics of so-called pedestrian phase-space density, which can be considered as a two-dimensional generalization of the phase-space density used in gas-kinetic vehicular traffic flow. Convection, acceleration, and noncontinuum transition terms govern the dynamics. The latter terms reflect the dynamic influence of pedestrians decelerating and the changing angle of movement due to pedestrians interacting. Numerical solutions of the resulting gas-kinetic equations are established by using a novel particle discretization approach. Essentially, this approach upgrades the mesoscopic equations to a microscopic pedestrian flow simulation model. Using the particle discretization approach, the model's behavior is tested for different test-case scenarios. The model is shown to produce plausible speed-density functions from which walking speeds and travel times can be derived for a variety of conditions.

NOTES: This paper appears in Transportation Research Record No. 1710, Traffic Flow Theory and Highway Capacity 2000.
DESCRIPTOR: Pedestrian flow; Rail transit stations; Mathematical models; Equations; Simulation; Speed; Density; Functions (Mathematics); Walking; Travel time
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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5924&CATID=1&series=1

68. 00802579
MODELING FOUR-DIRECTIONAL PEDESTRIAN FLOWS

AUTHOR: Blue, VJ; Adler, JL.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1710
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NUMBERS: 1710-004
FEATURES: 6 Fig. 1 Tab. 21 Ref.

ABSTRACT: The objective of this study is to explore the modeling of multidirectional pedestrian flows. The complex interactions between flow entities within m- directio nal space present challenges that cannot be readily handled by existing bidirectional flow models. A cellular automata microsimulation model for four-directional flow is prescribed. This model, built on previous bidirectional models developed by the authors, additionally seeks to manage cross-directional conflicts. Performance of this function in the simulation of unidirectional, bidirectional, cross-directional, and four- directional flows is presented. The applications extend to m-directional terminal facility design and to four-directional street corners, a vital component in any network model of pedestrians.

NOTES: This paper appears in Transportation Research Record No. 1710, Traffic Flow Theory and Highway Capacity 2000.
DESCRIPTOR: Pedestrian flow; Mathematical models; Passenger terminals
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69. 00803884
FIELD EVALUATION OF A LEADING PEDESTRIAN INTERVAL SIGNAL PHASE AT THREE URBAN INTERSECTIONS

AUTHOR: Van Houten, R; Retting, RA; Farmer, CM; Van Houten, J.
CORPORATE AUTHOR: Transportation Research Board
SERIES: Transportation Research Record - Journal of the Transportation Research Board 1734
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PROJECT NUMBERS: 1734-014
FEATURES: 3 Fig. 3 Tab. 17 Ref.

ABSTRACT: About 37% of pedestrian injury crashes and 20% of fatal pedestrian crashes occur at intersections. Many conventional countermeasures include traffic control devices that either increase pedestrian attention to potential vehicle-pedestrian conflicts or encourage drivers to yield to pedestrians. A noteworthy limitation of these warning and prompting messages is their reliance on a voluntary behavioral response. Public

education and enforcement campaigns have also generally not produced tangible and long-lasting safety benefits. This research, conducted at three urban intersections, examined the influence of a 3-s leading pedestrian interval (LPI)--a brief and exclusive signal phase dedicated to pedestrian traffic—on pedestrian behavior and conflicts with turning vehicles. The introduction of a 3-s LPI reduced conflicts between pedestrians and turning vehicles and reduced the incidence of pedestrians yielding the right-of-way to turning vehicles.

NOTES: This paper appears in Transportation Research Record No. 1734, Highway and Traffic Safety: Engineering, Evaluation, and Enforcement; Trucking and Motorcycles.

DESCRIPTOR: Urban areas; Signalized intersections; Pedestrian accidents; Countermeasures; Pedestrian phase; Pedestrian vehicle interface; Turning traffic; Field studies

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AVAILABILITY: http://64.118.69.9/acb1/showdetl.cfm?&DID=92&Product_ID=5920&CATID=1&series=1

70. 00803612

PEDESTRIAN CROSSINGS OF LIGHT RAIL TRANSIT TRACKWAYS IN HIGHWAY MEDIANS

AUTHOR: Boorse, JW.

CORPORATE AUTHOR: Transportation Research Board: American Public Transportation Association

PAGES: 10p

DATE: 2000

FEATURES: 7 Fig.

CONFERENCE: Light Rail: Investment for the Future. 8th Joint Conference on Light Rail Transit,Dallas, Texas,November 11, 2000-November 15, 2000, Transportation Research Board, and American Public Transportation Association

ABSTRACT: As the popularity of light rail transit (LRT) continues to grow, planners are pressed to identify conduits for new lines. To minimize construction costs, existing highways with wide rights-of-way are frequently chosen for this purpose. In many cases a median is constructed in the center of the highway, or an existing median is reconstructed to serve as a host for an LRT trackway. In addition to providing a physical separation for vehicles traveling in opposite directions, medians frequently offer a midway refuge for pedestrians crossing the highway at an intersection or a midblock crosswalk. At many signalized intersections, particularly where the street is wide, the timing of the traffic signals may take into account the pedestrian's ability to cross the highway in two stages, pausing in the median. The inclusion of LRT trackage in a highway

median can significantly affect its function as a pedestrian refuge, since the portion that is occupied by the trackway cannot serve in that capacity. Addressing this impact is a challenge to those responsible for designing the interface of pedestrian and LRT train movements. The following is a discussion of how pedestrians crossing a median trackway can be effectively protected by the application of a combination of engineering and operating practices. The discussion explores the feasible options as they apply to particular situations and constraints that are part and parcel of contemporary metropolitan areas in North America.

NOTES: This paper is available on the CD-ROM, Light Rail: Investment for the Future, 8th Joint Conference on Light Rail Transit.

DESCRIPTOR: Pedestrians; Crosswalks; Light rail transit; Medians; Highways; Railroad tracks; Right of way (Land); Intersections; Midblock crossings; Signalized intersections; Traffic signal timing; Pedestrian safety; Engineering; Metropolitan areas

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71. 00803598

LIGHT RAIL SERVICE: PEDESTRIAN AND VEHICULAR SAFETY

AUTHOR: Korve, HW; Siques, JT.

CORPORATE AUTHOR: Transportation Research Board: American Public Transportation Association

PAGES: 14p

DATE: 2000

FEATURES: 2 Fig. 2 Tab.

CONFERENCE: Light Rail: Investment for the Future. 8th Joint Conference on Light Rail Transit,Dallas, Texas,November 11, 2000-November 15, 2000, Transportation Research Board, and American Public Transportation Association

ABSTRACT: Results of the Transit Cooperative Research Program (TCRP) Project A-13 are discussed, and innovative safety initiatives that show promise for the near future are described. Eleven light-rail transit (LRT) systems were studied in the United States and Canada. Safety treatments for both motorists and pedestrians are discussed, and possible solutions to problems observed at the 11 LRT systems are presented. In addition, pre-signals are discussed in detail, along with the results of the "before and after" field-testing of the effectiveness of pre-signals conducted in Illinois through TCRP Project A-13. First hand results are provided of traffic-

control devices that previously have not been studied in depth but are being installed with increasing frequency throughout the United States.

NOTES: This paper is available on the CD-ROM, Light Rail: Investment for the Future, 8th Joint Conference on Light Rail Transit.

DESCRIPTOR: Light rail transit; Safety; Vehicle occupants; Pedestrian safety; Before and after studies; Traffic control devices; Pre-signals

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