



Research Digest

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State DOT Research Reports

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Research Digest

Item 1

511 Travel Information Service Development & Documentation: Final Report

NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSDOT)

SPR C-07-18 • 2011

This report outlines the development and scope of the 511NY Travel Information Service. This information can be used to understand the foundations of 511NY as well as best practices used for establishing a statewide system offering real time traffic, transit and trip planner information.

This report is available for free download (63 KB):

https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-07-18%20Final%20Report_October%202011.pdf

Item 2

Assessing Operational, Pricing, and Intelligent Transportation System Strategies for the I-40 Corridor Using DYNASMART-P

NORTH CAROLINA STATE UNIVERSITY. DEPARTMENT OF CIVIL, CONSTRUCTION, AND ENVIRONMENTAL ENGINEERING

NC 2009-05 • 2011

This project delivered a calibrated DynusT model of the North Carolina Triangle region that provides performance assessment capability. The DynusT tool is the federally-sponsored continuation of the DYNASMART-P mesoscale dynamic traffic assignment software development effort. The model's performance assessment capability was demonstrated through application of the Triangle DynusT model to a series of carefully selected evaluation scenarios. Although the project was self-contained and motivated through its focus on the I-40 corridor, the findings are envisioned as the first step toward bringing regional-scale mesoscopic dynamic traffic assignment modeling capability statewide for modeling North Carolina's strategic highway corridors and detailed transportation program support for each of the state's metropolitan and rural planning regions.

This report is available for free download (48.3 MB):

<http://www.ncdot.org/doh/preconstruct/tpb/research/download/2009-05finalreport.pdf>



Item 3

Buffalo CarShare: Two Years in Review: A Look at the Organization's Growth, Membership, and Impacts

BUFFALO CARSHARE

SPR C-08-24 • 2011

Buffalo CarShare (BCS) began operations in June 2009 with 4 vehicles and 30 pioneering members. In the two years since then, the organization has grown to over 400 members and 11 vehicles. Members have made 8,600 trips totaling 32,000 hours and 241,000 miles through August 2011. Based on results of two member surveys conducted in the spring of 2010 and summer of 2011, we have estimated that 109 private cars have been taken off the road, and that our members have avoided using 24,359 gallons of gas since becoming members, have travelled nearly 500,000 less vehicle miles.

Unique to the industry, BCS has achieved these environmental accomplishments while serving a diverse membership base in terms of age, race, and income. Nearly two thirds of our members represent households earning \$35,000 or less, and half report incomes of less than \$25,000. Over the coming years, we hope to continue to broaden our membership base and publicize the results of these efforts so that our success may someday be replicated in Upstate NY cities and other struggling regions.

This report is available for free download (2.2 MB):

<https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/Bufalo%20CarShare%202yr%20report%20-%20print.pdf>

Item 4

Encouraging Innovation by CDOT Workers

COLORADO DEPARTMENT OF TRANSPORTATION (CDOT)

CDOT-2011-14 • 2012

In the course of their work, Colorado DOT employees have been known to create devices that improve the safety, efficiency, and quality of their work. The purpose of this study was to identify recent devices that were created by CDOT employees and to document them. In response to a request for innovations, CDOT employees submitted 34 candidate innovations. An Inventing and Patenting workshop was developed and delivered to these and other CDOT employees. A series of documents were developed for 23 of the 34 devices, namely: (1) Device Costs and Benefits, (2) User Manual, (3) Mechanical Drawing Package, and (4) Preliminary Patentability Assessment. The intent of this effort was to help disseminate, if appropriate, innovative devices throughout CDOT and other DOTs, and to provide input on patentability to the device developers.

This report is available for free download (11 MB):

<http://ntl.bts.gov/lib/44000/44400/44431/2011-14.pdf>

Item 5

Evaluating the Performance and Making Best Use of Passing Relief Lanes: Final Report

OPUS INTERNATIONAL CONSULTANTS INC.

RC-1565 • 2011

This report documents the evaluation of the performance and safety effectiveness of passing relief lanes within the State of Michigan. The study began with the identification of passing relief lanes within Michigan. This was followed by collecting historical volume data, implementation dates and crash history for each of the 10 study sites as well as for the 100 reference sites and 231 passing lanes in the State. The analysis of the passing relief lanes within Michigan included a literature review, a best practices review and summary, an evaluation of the crash data via a naïve Empirical Bayes (EB) analysis and site visits to a select group of 10 passing relief lane study sites as determined by the study team. The site visits included speed data collection at a total of 50 locations; 5 locations for each passing relief lane study site. The analysis also found that the equivalent uniform annual benefit (EUAB) was less than 1.0; a cost analysis could not be conducted as no construction costs were available for the passing relief lanes. Based upon the results of the EB analysis, Crash Modification Factors (CMFs) were established to reflect the passing lanes in Michigan.

This report is available for free download (4.2 MB):

http://www.michigan.gov/documents/mdot/MDOT_Research_Report_RC1565_379285_7.pdf

Item 6

Evaluating the Performance and Safety Effectiveness of Roundabouts: Final Report

OPUS INTERNATIONAL CONSULTANTS INC.

RC-1566 • 2011

This report documents the evaluation of the performance and safety effectiveness of roundabouts within the State of Michigan. The study began with the identification of roundabouts within Michigan. This was followed by collecting data on the geometric features of the roundabouts and crash history for each roundabout site from January 1, 2001 to December 31, 2010. The analysis of the roundabouts within Michigan included a literature review, a best practices review of other municipalities, an evaluation of the crash data (both a simple before and after and an Empirical Bayes (EB) analysis, and a site visit to a select group of roundabouts that was determined by the study team. The site visits included a speed study at several of the locations, a conflict analysis at several of the locations, and an assessment of overall operations of the roundabout, including noting any potential issues that may be observed from the operations of the roundabouts. Another finding of the analysis was an average cost savings that the various types of roundabouts are expected to have based on savings the reduction in delay and crash reduction. Additional findings from the site visits resulted in a rating of issues based on Collision Risk Assessment Method. Based upon the results of the EB analysis, Safety Performance Functions (SPFs) and Crash Modification Factors (CMFs) were established to reflect the roundabouts in Michigan. These are the first SPFs and CMFs that were developed to reflect the behaviors of Michigan roundabouts.

This report is available for free download (Website with links):

http://www.michigan.gov/mdot/0,4616,7-151-9622_11045_24249-273327--,00.html



Item 7

Evaluation of Innovative Traffic Safety Devices at Short-Term Work Zones: Final Report

UNIVERSITY OF KANSAS. CIVIL, ENVIRONMENTAL & ARCHITECTURAL ENGINEERING DEPARTMENT

K-TRAN: KU-09-5 • 2011

The objective of this study was to investigate and evaluate the usage and effectiveness of innovative traffic control devices that can be used in short-term work zones. Any device to be used in short-term work zones should command the respect of drivers, be durable, have an easily understood meaning, be low cost, be quick and easy to install and remove, and be reusable.

This study was conducted in three sections: a literature review of previously published research, a nationwide usage survey, and a field test for a selected device, portable plastic rumble strip (PPRS). PPRSs, which have been tested on a closed course, were found to be a device potentially suitable for use at short-term work zones. This field study was to investigate the effects of the PPRSs and drivers' response to them at three short-term maintenance work zones in Kansas. The results showed that the effect of PPRSs in speed reductions was more significant on cars than on trucks. The PPRSs reduced car speeds by 4.6 to 11.4 miles per hour. They also created 5.0 to 11.7 miles per hour mean speed reduction for trucks, but the reductions were only at two test sites. It was observed that 30 to 80 percent of truck drivers activated their brakes (indicated by brake light illumination) when they approached the PPRSs. In addition, about five percent of car and truck drivers swerved around the PPRSs. This indicates that additional signage or other supplemental traffic devices would be needed when the PPRSs are implemented.

This report is available for free download (2.4 MB):

http://ntl.bts.gov/lib/43000/43300/43383/KU095_Final.pdf

Item 8

Evaluation of Performance of Solar Powered Flashing Beacons at Severe Temperature Conditions

ILLINOIS CENTER FOR TRANSPORTATION

ICT-11-084 • 2011

This report contains the results of 34 tests for JSF and 26 tests for Carmanah solar-powered flashing beacons operating in mild cold temperature (-6.6 °C), severe cold temperature (-20 °C), and hot temperature (+70 °C) conditions. In addition, it contains two tests for JSF modules and two for Carmanah operating under "real world" conditions. In mild temperature condition, red and yellow modules of JSF flashed in MUTCD pattern for at least 11 and 8.5 days, respectively. The red and yellow modules of Carmanah flashed in MUTCD pattern for at least 11 and 8 days, respectively. Reducing the temperature to -20 °C resulted in a significant decrease in the duration of flashing in MUTCD pattern for JSF modules; however, that duration did not decrease for Carmanah.

Red and yellow modules of JSF flashed in MUTCD pattern for at least 18 and 24 hours in severe cold temperature condition. For Carmanah, red and yellow modules lasted in MUTCD flashing pattern for at least 14 and 11.5 days, respectively. In hot temperature condition, red and yellow modules of JSF flashed in MUTCD pattern for at least 6.5 and 5.5 days, respectively. Red and yellow modules of Carmanah lasted in MUTCD flashing pattern for at least 8.5 and 7 days, respectively. The "real world" condition test indicated that in certain conditions (e.g. solar panels covered with snow), the solar panels may not be able to generate enough power for the LEDs to keep them flashing in MUTCD pattern. In this condition, the flashing pattern changes to a power saver mode. The red modules of JSF and Carmanah were visible when the distance was at least 1500 ft in a sunny and very bright day. The yellow modules of JSF and Carmanah were visible up to a distance of about 1000 ft in the same day. If solar panels are accidentally disconnected when the modules are outdoors and batteries are fully charged, the JSF and Carmanah modules were visible at a distance of 700 ft, in a cloudy but bright day.

This report is available for free download (3 MB):

<http://ict.illinois.edu/publications/report%20files/FHWA-ICT-11-084.pdf>

Item 9

Evaluation of Steady-Burn Warning Lights on Channelizing Drums in Work Zones

WAYNE STATE UNIVERSITY. TRANSPORTATION RESEARCH GROUP

RC-1543 • 2011

This report documents the results of a study to evaluate the safety and mobility impacts associated with the elimination of steady burn warning lights on drums in construction work zones. National crash data are compared among states with different policies regarding the use of steady burn warning lights and an in-depth investigation of Michigan work zone crashes is also conducted. The results of the crash data investigation are supplemented by a series of field studies that examine driver behavior in work zones, both with and without steady burn warning lights. Additional field studies are conducted to assess the luminance characteristics of drums with and without lights, as well as the condition of drums in each type of work zone. The luminance studies are supplemented by additional studies that are conducted in a controlled environment. While the presence of steady burn warning lights is found to marginally increase luminance, all luminance measurements were significantly above recommended visibility minimums regardless of whether steady burn lights were in use. Field study results were mixed as steering reversals occurred more frequently, lateral placement was relatively unaffected, and speeds tended to be slightly higher in work zones where steady burn warning lights were present. Purchasing and maintaining steady burn warning lights are found to add significant tangible and intangible costs, which may not deliver sufficient safety benefits to justify such costs.

This report is available for free download (7.1 MB):

http://www.michigan.gov/documents/mdot/MDOT_Research_Report_RC1543_341756_7.pdf

Item 10

Freeway Ramp Management in Pennsylvania: Final Report

UNIVERSITY OF PITTSBURGH

FHWA-PA-2011-005-PIT007 • 2011

This research identified the opportunities to implement ramp management strategies on freeways in Pennsylvania. The research explored the need to integrate local arterial traffic signal systems with ramp management strategies to reduce the impacts of ramp management on local roadways. The report recommends a definition of freeway congestion and screening criteria for candidate ramp management freeways in Pennsylvania. In addition, a case study was performed for the I-376 tunnel bottleneck in the City of Pittsburgh to identify potential ramp management strategies, their impact on local roadways, mitigation strategies for local traffic signal systems and the relative benefits and costs of implementing such a project on I-376. Transportation planning and simulation models were used to evaluate travel pattern changes and measures of performance of the I-376 freeway with ramp management strategies in place.

This report is available for free download (41.2 MB):

ftp://ftp.dot.state.pa.us/public/pdf/BPR_PDF_FILES/Documents/Research/Complete%20Projects/Extending%20Pavement%20Life/Freeway%20Ramp%20Management.pdf

Item 11

"Green-Friendly" Best Management Practices (BMPs) for Interstate Rest Areas

ILLINOIS CENTER FOR TRANSPORTATION

ICT-11-082 • 2011

This report presents the findings of a research project to study and develop a list of “green friendly” Best Management Practices (BMPs) for Illinois interstate rest areas. The objectives of this project are to (1) develop energy and cost baseline data for the 53 rest area buildings in Illinois by gathering utility use statements and other pertinent data for a one-year period for each building and utilize the data to compute the carbon footprint of each building; (2) perform on-site assessment of existing conditions in three selected rest areas; (3) conduct a comprehensive literature review on green design and sustainable construction, available energy saving alternatives, LEED certification requirements, and decision-making and optimization techniques that can be used for optimizing upgrade decision of rest area buildings; (4) investigate potential energy saving alternatives for the selected rest areas and study their cost savings and environmental impact; (5) conduct Life Cycle Cost Analysis (LCCA) for the suggested green friendly measures and generate a report detailing their overall costs and payback periods; (6) investigate the requirements and possibilities for the rest areas to achieve LEED certification under the LEED rating system for existing buildings; (7) develop a Decision Support Tool (DST) to identify optimal upgrade decisions for rest area buildings; and (8) develop recommendations for upgrading the three selected rest areas. To achieve these objectives, the research team carried out six major tasks: (1) developed energy cost baseline data and carbon footprint for each Illinois rest area; (2) performed on-site assessment for three selected rest areas; (3) conducted comprehensive literature review; (4) identified potential green-friendly best management practices; (5) developed a Decision Support Tool (DST) for optimizing LEED upgrade decisions of rest area buildings; and (6) developed recommendations for upgrading the three selected rest areas.

This report is available for free download (10.6 MB):

<http://ict.illinois.edu/publications/report%20files/FHWA-ICT-11-082.pdf>



Item 12

Improving Driver's Ability to Safely and Effectively Use Roundabouts: Educating the Public to Negotiate Roundabouts

WAYNE STATE UNIVERSITY. TRANSPORTATION RESEARCH GROUP
RC-1542 • 2011

This report documents the results of a study aimed at developing materials to educate the public on the appropriate use of roundabouts. The study began with the identification of roundabouts throughout the State of Michigan. This was followed by an investigation of those factors affecting operations and safety at roundabouts in the State of Michigan, as well as a determination of public perceptions as they relate to roundabouts. This investigation included a comprehensive state-of-the-art literature review, national and statewide state-of-the-practice surveys, an evaluation of statewide roundabout crash data, a series of field behavioral studies at several roundabout locations, and the implementation of a statewide road user survey. Based upon the results of this investigation, a suite of materials were created, which included trifold brochures, posters, PowerPoint slides, animations, and videos. These materials provide a diverse toolbox for use by MDOT and other Michigan road agencies to educate the public as to safe and correct use of roundabouts, as well as the benefits associated with roundabouts in comparison to traditional intersections. Ultimately, it is expected that the public awareness materials that were developed as a part of this project will serve to enhance the ability of MDOT and other state agencies to improve road user's understanding and abilities to successfully use roundabouts throughout the State of Michigan.

This report is available for free download (2 PDFs):

http://michigan.gov/documents/mdot/MDOT_Research_Report_RC1542_Part1_354968_7.pdf
http://michigan.gov/documents/mdot/MDOT_Research_Report_RC1542_Part2_354971_7.pdf

Item 13

Improving Driver Safety with Behavioral Countermeasures

CENTRAL MICHIGAN UNIVERSITY. CENTER FOR DRIVING EVALUATION, EDUCATION & RESEARCH
RC-1561 • 2011

The purpose of this project was to provide MDOT with insight regarding the effectiveness of potential implementations of behavioral countermeasures for increasing driver safety in Michigan. The Center for Driver Evaluation, Education, and Research at Central Michigan University performed a series of task including (1) a literature review of driver safety behavioral countermeasures that have been used in the State of Michigan, (2) a literature review of driver safety behavioral countermeasures that have been used nationally, and (3) a pilot study of a countermeasure that was deemed promising for implementation in construction zones. In this report, the findings of the literature reviews are provided as well as estimations of their potential effectiveness, costs, and implementation issues. The driver safety problem areas covered in this report are alcohol-impaired driving, young drivers, distracted driving, drowsy driving, and older drivers. A review of new and innovative solutions that help improve driver safety behaviors is also included. The results of the pilot study are also discussed as well as their implications for future construction zone design.

This report is available for free download (1.2 MB):

http://www.michigan.gov/documents/mdot/MDOT_Research_Report_RC1561_372531_7.pdf



Research Digest

Item 14

ITS Evaluation: Phase 3 (2010)

WASHINGTON STATE TRANSPORTATION CENTER (TRAC)

WA-RD 672.3 • 2011

This report documents the results of applying a previously developed, standardized approach for evaluating intelligent transportation systems (ITS) projects to 17 ITS earmark projects. The evaluation approach was based on a questionnaire to investigate technical, management, and organizational lessons learned. The report includes an evaluation report for each of the 17 ITS projects. Each report includes a discussion of the following: Background; Project description; System usage and benefits; Cost, operations and maintenance; Architecture and standards; Lessons learned.

Most of the lessons learned in this evaluation phase were similar to those documented in previous evaluations.

This report is available for free download (1.8 MB):

<http://www.wsdot.wa.gov/research/reports/fullreports/672.3.pdf>

Item 15

A Michigan Toolbox for Mitigating Traffic Congestion

TEXAS A&M UNIVERSITY. TEXAS TRANSPORTATION INSTITUTE (TTI)

RC 1554 • 2011

Researchers created A Michigan Toolbox for Mitigating Traffic Congestion to be a useful desk reference for practitioners and an educational tool for elected officials acting through public policy boards to better understand the development, planning, and implementation of congestion mitigation strategies. The Toolbox provides an overview of traffic congestion, the need for local and state solutions, and project survey responses. Forty-seven specific strategies are presented in the Toolbox. Strategies are organized by transportation system management and travel demand management categories. For each strategy, a detailed review of its characteristics, costs, benefits, and Michigan experiences is given. To help create the Toolbox, researchers conducted an online survey of MPOs focusing on their experiences with mitigation strategies. MPO staff from Michigan transportation management areas was interviewed regarding the congestion management process in Michigan. Researchers identified available benefit-cost ratios for individual strategies in order to gauge their effectiveness. Local and regional transportation agencies can apply these strategies as appropriate to improve mobility and travel reliability throughout the State of Michigan.

This report is available for free download (2.3 MB):

http://www.michigan.gov/documents/mdot/MDOT_Research_Report_RC1554_Part1_368867_7.pdf



Research Digest

Item 16

Primary and Secondary Incident Management: Predicting Durations in Real Time

OLD DOMINION UNIVERSITY. TRANSPORTATION RESEARCH INSTITUTE

VCTIR 11-R11 • 2011

Traffic incidents are a major source of congestion in Virginia. Secondary incidents comprise a relatively small but important portion of all incidents, and relatively little is known about their occurrence, characteristics, and associated delays. The main objectives of this study were to define secondary incidents, understand and analyze the occurrence and nature of such incidents, and develop tools that can comprehensively and continuously analyze primary and secondary incidents at the planning and operational levels, ultimately contributing to congestion management. The scope of the study is limited to freeway incidents in the Hampton Roads (HR) area.

This report is available for free download (2.2 MB):

http://www.virginiadot.org/vtrc/main/online_reports/pdf/11-r11.pdf



Item 17

Review of Nonpublic Funding Options Available to the Virginia Department of Transportation for the Operation and Maintenance of Its Safety Rest Areas and Welcome Centers

VIRGINIA CENTER FOR TRANSPORTATION INNOVATION AND RESEARCH (VCTIR)

VCTIR 11-R22 • 2011

In 2009, 19 Virginia interstate SRAs were closed with the intent of saving approximately \$9 million per year in costs to the Virginia Department of Transportation (VDOT), but these closures were met with opposition by interstate travelers because of concerns regarding traveler safety, losses of state tourism dollars, and the injury to the Commonwealth's reputation as a business-friendly state.

Federal law prohibits federal-aid highways from offering any type of commerce for "serving motor vehicle users" at SRAs located on the interstate highway system right-of-way unless the establishment was in existence prior to 1960 and is owned by a state (23 U.S.C. § 111). Accordingly, commercial enterprises in Virginia have located off-line at interstate interchanges and are now consistently opposed to efforts to amend directly or interpret innovatively federal code limiting commercial activity at SRAs. Yet the commercialization of SRAs is not the only possible access through federal or state code to nonpublic funding of these facilities.

In the last 20 years, incremental changes--essentially "workarounds"--have been introduced to federal law through federal transportation authorizations either allowing charges for specific, limited services meeting national needs through interstate SRAs or providing innovative pilot programs aimed at generating "whole-facility" interstate funding, such as tolling. Although it is true that some nonpublic SRA funding options have appeared and disappeared with successive federal surface transportation programs, there are other avenues to nonpublic funding of SRAs allowable under current federal code, currently extended federal transportation authorization, and current state law.

A review of state and federal law governing interstate highway right-of-way, surveys of Virginia interstate rest area users, interviews with industry groups, assessment of current state DOT initiatives for interstate SRA funding, and questionnaires distributed to state DOTs provided the nonpublic funding options presented in this report. These options include the expansion of vending options, indoor advertising, and facility sponsorship, as well as relocated facilities under regional management at scenic/historic locations and commercial facilities on private land adjacent to existing SRAs in the interstate right-of-way. In the long term, modification of the provisions of 23 U.S.C. § 111 or the repeal of 23 U.S.C. § 301 would allow states significantly more flexibility in nonpublic funding options for interstate safety rest areas.

This report is available for free download (909 KB):

www.virginiadot.org/vtrc/main/online_reports/pdf/11-r22.pdf

Item 18

Safety and Operational Analysis of 4-Lane to 3-Lane Conversions (Road Diets) in Michigan: Final Report

MICHIGAN STATE UNIVERSITY. DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
RC 1555 • 2012

Road diets, specifically 4-to-3 lane conversions, implemented in various locations in Michigan were studied to determine the safety- and delay-related impacts, develop crash modification factors (CMFs), and develop guidelines that would be useful in deciding when it might be desirable to implement such road diets. The results of the operational analysis support a guideline that suggests that 4-to-3 lane conversions result in significant delay when average daily traffic (ADT) exceeds 10,000 and, more importantly, when peak hour volumes exceed 1,000. A CMF of 0.91 (after adjustment for background citywide trends) for all crash types is recommended although the factor is not statistically different from 1.0. There was considerable site-to-site variation among the 24 sites studied, and this should always be considered when a road diet is contemplated. A study-by-study literature review and suggestions for implementation strategies are also included.

CONTENTS

Includes: Appendix A: detailed literature review (by project/study); Appendix B: detailed on-site reviews of selected sites in Michigan; Appendix C: operational analysis—additional results; Appendix D: safety analysis—detailed site-by-site information; Appendix E: additional implementation information; Appendix F: site aerial views; Appendix G: survey instrument for initial solicitation of site information; Appendix H: crash reclassification scheme

This report is available for free download (website with links):

http://www.michigan.gov/mdot/0,4616,7-151-9622_11045_24249-270908--,00.html

Item 19

Safety Impacts of Highway Shoulder Attributes in Illinois

ILLINOIS CENTER FOR TRANSPORTATION
ICT-10-078 • 2011

The single greatest category of highway vehicle crashes is run-off-the-road incidents. Significant material differences and elevation changes in shoulder edges pose a potential safety hazard when a vehicle leaves the travel way. Shoulder paving is recognized as a positive countermeasure to reduce a shoulder drop-off hazard. This report documents an in-depth analysis of safety impacts of shoulder attributes using data on Illinois state-maintained highways for period 2000-2006. Preliminary data analysis is first conducted to establish the correlation between shoulder-related crashes by type and severity category and shoulder attributes such as shoulder material type and outside paved shoulder width. Then, an analytical procedure is developed and applied to the Illinois data for assessing safety impacts of shoulder paving and prioritizing highway segments for shoulder paving using the Empirical Bayesian (EB) analysis and cross-sectional analysis approaches and an optimization model. While this procedure does not eliminate the need for human judgment, it could help experts make better decisions using optimization techniques. The findings are expected to help Illinois Department of Transportation (DOT) update current design manuals.

This report is available for free download (1.5 MB):

<http://ict.illinois.edu/publications/report%20files/FHWA-ICT-11-078.pdf>

Item 20

Safety Performance Functions for Ramp Terminals at Diamond Interchanges

PERSAUD AND LYON INC.

CDOT-2011-9 • 2011

This report documents two efforts to support CDOT in the area of Safety Performance Function (SPF) development. The first involved the data collection and development of SPFs for five categories of ramp terminals at diamond interchanges. For each category, data for the period 2000 to 2006 were collected at sites selected to ensure statewide geographical representation and coverage of the range of traffic volume and other variables in each category. The second effort involved estimating the over dispersion parameters for a number of existing SPFs already in use by CDOT for various roadway segment categories. These parameters are required for implementing the state-of-the-art empirical Bayes procedure for various safety management processes. The development of SPFs for the five categories of ramp terminals was successful. Separate SPFs were developed for total and for injury (fatal+injury) accidents. The calibration of over dispersion parameters for the existing roadway segment SPFs was also successful.

This report is available for free download (2.1 MB):

<http://www.coloradodot.info/programs/research/pdfs/2011/spf2.pdf>

Item 21

So Many Choices, So Many Ways to Choose: How Five State Departments of Transportation Select Safe Routes to School for Funding

WASHINGTON STATE TRANSPORTATION CENTER (TRAC)

WA-RD 743.2 • 2011

This report compares how five state DOTs – Florida, Mississippi, Texas, Washington, and Wisconsin – select the most promising SRTS proposals for funding. It reviews how the five states approach the selection process by considering grant types, SRTS plans, eligibility requirements, program distribution policies, proposal review processes, and established selection criteria. The selection processes and criteria used are reviewed to highlight examples of best practices that consider (1) the four common barriers to walking and biking to school (distance, income, parent values and parent concerns), (2) the “five E’s” commonly used to classify SRTS program elements (engineering, education, encouragement, enforcement, and evaluation), and (3) the five conceptualized stages of an SRTS program (existing conditions, planning, proposal, implementation, and assessment of outcomes).

The results of this review are insights into how the five state DOTs define an effective SRTS program and how they prioritize awards for the many good SRTS program proposals they receive. Examples of effective selection practices are identified as a basis for making specific recommendations on what constitutes a promising proposal selection process that awards programs with the highest potential to increase the safety and number of children walking or biking to school.

An appendix contains documentation on the original SRTS proposal selection protocols used by the five contributing state DOTs.

This report is available for free download (2.8 MB):

<http://www.wsdot.wa.gov/research/reports/fullreports/743.2.pdf>



Research Digest

Item 22

Tire/Pavement and Environmental Traffic Noise Research Study: Interim Report - 2009 Testing

TRANSTEC GROUP, INC.

CDOT-2011-1 • 2011

This research study is being conducted in response to CDOT's interest in traffic noise in general, and the tire/pavement interaction in particular. Following a rigid set of testing protocols, data is being collected on highway traffic noise characteristics along with safety and durability aspects of the associated pavements. The overall goal of this research project is to develop and execute a comprehensive, long-term study to determine if a particular pavement surface type and/or texture can be successfully used in Colorado to help satisfy FHWA noise mitigation requirements. The study is needed to accomplish the following: Determine the noise generation/reduction characteristics of pavements as functions of pavement type, pavement texture, age, time, traffic loading, and distance away from the pavement; Determine a correlation between source measurements using on-board sound intensity (OBSI), and statistical pass-by (SPB) and time-averaged wayside measurements; and Accumulate information that can be used for validation and verification of the accuracy of the FHWA Traffic Noise Model (TNM) to use on future Colorado highway projects.

This report is available for free download (4.2 MB):

<http://www.coloradodot.info/programs/research/pdfs/2011/qpr3.pdf>