



Research Digest

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Research Digest

Item 1

Core Competencies for Highway Safety Professionals

TRANSPORTATION RESEARCH BOARD

NCHRP RRD 302 • 2006

This digest presents the results of a study conducted by Paul Jovanis and Frank Gross, Pennsylvania State University. The TRB Joint Subcommittee for Highway Safety Workforce Development initiated and guided the work. The study identified core competencies for safety professionals that can be used for safety education and professional development.

Full-text PDF of this report is available for free download at
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_302.pdf

Item 2

Safety Impacts And Other Implications of Raised Speed Limits on High-Speed Roads

TRANSPORTATION RESEARCH BOARD

NCHRP RRD 303 • 2006

This digest summarizes the results of NCHRP Project 17-23, "Safety Impacts and Other Implications of Raised Speed Limits on High-Speed Roads." The digest is based on a report by Kara Kockelman of the University of Texas at Austin under subcontract to Jon Bottom of CRA International. The project objective was to determine the effects of raised speed limits from 55 mph or greater on freeways and non-freeways, in both rural and urban settings. The effects considered included safety, operations, socioeconomics, and environmental. The final report is available on the TRB website as NCHRP Web-Only Document 90.

Full-text of this report is available for free download at
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_303.pdf



Research Digest

Item 3

Aggregate Tests for Hot-Mix Asphalt Mixtures Used in Pavements

TRANSPORTATION RESEARCH BOARD

NCHRP Report 548 • 2006

NCHRP Project 4-19, “Aggregate Tests Related to Asphalt Concrete Performance in Pavements,” recommended a set of performance-related aggregate tests for evaluating aggregates for use in hotmix asphalt (HMA) pavements. Performance indicators considered in the research included permanent deformation resulting from laboratory traffic loading (both with and without stripping), fatigue cracking, and surface defects (e.g., raveling, popouts, and potholes). The performance relationships were developed based on tests performed using the Superpave Shear Tester (SST) and the Georgia Loaded Wheel Tester (GLWT); however, the relationships were not validated. As part of their results, the NCHRP 4-19 researchers recommended a follow-on experiment for additional research to achieve validation. The proposed research involved tests of both coarse and fine aggregate uncompacted voids as well as the flat or elongated particle test, 2:1 ratio (FOE21). These three tests were to be validated for their ability to predict HMA rutting and fatigue performances. Additionally, particle size analysis and methylene blue values (MBV) of the HMA mixture aggregate fraction smaller than the 0.075-mm sieve ($p_{0.075}$) were to be tested to validate their ability to predict rutting in HMA mixtures. The researchers further suggested that the MBV of the fine aggregate be validated for ability to predict moisture susceptibility of HMA. Finally, the results of Micro-Deval (MDEV) and Magnesium Sulfate Soundness (MGSO₄) tests on aggregates were to be evaluated for predicting HMA toughness and durability. The object of this research was to use accelerated pavement testing techniques to conduct the rutting, fatigue, and moisture susceptibility validation experiments identified in NCHRP Project 4-19. For each aggregate test, a descriptive ranking indicating how well it relates to HMA performance is given. Also, an attempt has been made to suggest appropriate tests for given combinations of climatic conditions, materials, and traffic loads. A literature review was completed first and was used to guide the research team in selecting five coarse and six fine aggregates for use in the study. The selected aggregates were tested and used in various combinations to produce five coarse-graded and six fine-graded mixtures that were then tested for rutting characteristics in the accelerated loading facility. The five coarse aggregates covered a wide array of aggregate types and properties; each was combined with a common natural sand to produce the five coarse-graded mixtures. The six fine aggregates also represented various aggregate types and properties; each of these was combined with a common coarse aggregate to produce the six finegraded mixtures.

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http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_557.pdf



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Item 4

Commuting In America III

TRANSPORTATION RESEARCH BOARD

NCHRP Report 550 • 2006

During the coming decades, many baby boomers -- who will start turning 65 in 2010 -- will leave the workplace and stop commuting. At the same time, the latest projections from the Census Bureau show that the number of younger people entering the work force will increase; but these new workers will not outnumber those who will retire. Almost 20 million people ages 18 to 65 are expected to enter the work force during the years 2000 to 2010, followed by only about 12 million over the two following decades. But such projections may underestimate the actual number of Americans who will start working, because it is difficult to project how many immigrants will arrive and enter the work force and how many baby boomers will keep working after age 65, the report says. Immigration in the past decade has increased far more than expected, the report says. The latest census revealed that there are about 8 million more immigrants in the country than the 1990 census projected. Because of this influx, the nation's 30-year decline in population growth reversed sharply in the 1990s, returning to the growth rates of the 1970s. This "immigration bubble" is changing the nature of the work force and overall commuting patterns, the report says. Although immigrants make up less than 14 percent of all workers, they represent about 40 percent of those in large carpools. The percentage is particularly high among Hispanic immigrants, who are largely responsible for the recent growth in carpooling after 30 years of decline. Recent immigrants also are more likely to walk or bike to work, or to use public transportation. Another trend that could significantly affect commuting in the future is the increasing number of people who work from home, the report says. The latest census data shows that 4 million Americans now work from home -- more than those who walk to work -- and that a growing number of those over age 55 are doing so. The general direction of commutes also has shifted, the report points out. From 1990 to 2000, about 64 percent of the growth in commuting in metropolitan areas was from suburb to suburb, while the traditional commute from suburbs to a central city grew by only 14 percent. As more employers move out of cities to be closer to skilled suburban workers, the suburbs now account for the majority of job destinations. The latest census data also show that, compared with previous decades, more Americans are leaving for work between 5 a.m. and 6:30 a.m., are commuting for longer time periods -- between 60 and 90 minutes -- and are leaving their home county to work in a nearby county. Other findings in the report include: The number of new solo drivers grew by almost 13 million in the 1990s. The number of workers with commutes lasting more than 60 minutes grew by almost 50 percent between 1990 and 2000. Men make up the majority of early-morning commuters, from midnight to 7:30 a.m. Women tend to commute later and make up the majority of commuters after around 7:30 a.m. The number of Americans who commute from the city to the suburbs exceeds the number of those commuting from suburbs to the city and accounts for 9 percent of commuting activity. From 1990 to 2000, the number of Americans commuting from the city to the suburbs increased by 20 percent. The percentage of African-American households without vehicles dropped from 31 percent of households to 24 percent from 1990 to 2000. While the population over age 65 grew by only 12 percent from 1990 to 2000, workers over 65 increased by 21 percent. 30 million vehicles were added to households from 1990 to 2000, and 13 million of those were added to households that already had two or more vehicles. Only about 4 percent of workers live in households with no vehicle.

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Item 5

Best-Value Procurement Methods for Highway Construction Projects

TRANSPORTATION RESEARCH BOARD

NCHRP Report 561 • 2006

NCHRP Project 10-61, Best-Value Procurement Methods for Highway Construction Projects, is designed to investigate best-value concepts currently in use in the construction industry, evaluate their relative effectiveness, and recommend a best-value system or systems that may be used in conjunction with a traditional design-bid-build delivery system for highway construction. This report documents the results of the research effort. It presents the objectives and scope of the research, suggested definitions for best-value procurement, and expected results from implementing the method. Products of the research, as presented in this report, include the following: A common definition and a conceptual framework for using best-value procurement methods for highway construction projects. A best-value procurement system that allows for flexibility in the choice of parameters and award methods. An implementation plan that includes a project screening system for selecting candidate projects, and a step-by-step process for selecting appropriate parameters, criteria, and award algorithms once the project is selected. Strategies to overcome legal and procurement-related barriers to implementation of best-value methods. Recommendations regarding model legislation and a sample best-value guide specification. A compendium of case studies for best-value procurement in the highway construction industry. A training tool to assist agencies with implementation. Full-text PDF of this report is available for free download from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_561.pdf

Item 6

Statewide Travel Forecasting Methods

TRANSPORTATION RESEARCH BOARD

NCHRP Synthesis 358 • 2006

This synthesis describes statewide travel forecasting models designed to address planning needs and provide forecasts for statewide transportation, including passenger vehicle and freight movement. It discusses the types and purposes of models being used, integration of state and urban models, data requirements, computer needs, resources (including time, funding, training, and staff), limitations, and overall benefits. Five case studies are included, two that focus on passenger components, two on freight components, and one on both passenger and freight. In addition, definitions of common technical terms and an annotated bibliography of statewide and national forecasting techniques are provided. An excerpt from the Guidebook on Statewide Travel Forecasting Models concerning passenger and intercity travel forecasting is included as an appendix. This synthesis effort was based on the results of surveys received from each state that has a statewide travel forecasting model. A literature review was also undertaken, with major information sources (studies, databases, surveys, and programs) cited and discussed. Full-text PDF of this report is available for free download from http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_358.pdf



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Item 7

Bridge Rating Practices and Policies for Overweight Vehicles

TRANSPORTATION RESEARCH BOARD

NCHRP Synthesis 359 • 2006

This synthesis focuses on overweight vehicle bridge permit processes. Information on state and provincial bridge rating systems, bridge evaluation practices and permit policies as they relate to overweight and oversize vehicles is highlighted and discussed. This report is intended to assist in the understanding of the reasons for nonuniform permitting practices. The report reviews specifications, software types, treatment of nonstandard configurations, and allowance for in-place dead loads; processes of permit review; and personnel assigned to permit review. A survey was distributed to transportation agencies at the state level in the United States and to Canadian provinces. A literature search was undertaken to identify relevant research reports, papers, and other publications for review and summation. Additional information was acquired from telephone interviews with targeted individuals and organizations to supplement the survey and literature search.

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http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_359.pdf

Item 8

Rock-Socketed Shafts for Highway Structure Foundations : A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD

NCHRP Synthesis 360 • 2006

Drilled shafts are one of the few structural foundation types that can be built directly into rock. Foundations in rock are attractive because high load carrying capacities are possible and foundation displacements can be limited to acceptable levels more readily than through foundations in soil. Over the past 25 years, much knowledge and experience has been gained by the engineering and construction industries with the use of rock-socketed drilled shafts for support of transportation structures. The goal of this synthesis is to collect, review, and organize the most salient aspects of that knowledge and experience and to present it in a form that is useful to foundation designers, researchers, contractors, and transportation officials.

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http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_360.pdf

Item 9

Improving Pedestrian Safety at Unsignalized Crossings

TRANSPORTATION RESEARCH BOARD

TCRP Report 112 / NCHRP Report 562 • 2006

TCRP Report 112/NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings will be of interest to state, county, and city traffic engineers; transit agencies; roadway designers; and urban planners, as well as consultants for these groups and agencies. This material provides considerable information and useful guidance for improving pedestrian safety at unsignalized crossings. The report presents the edited final report and Appendix A. TCRP Web-Only Document 30/NCHRP Web-Only Document 91, available on the CRP website, contains appendixes B through O of the contractor's final report.

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http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf



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Item 10

Using Archived AVL-APC Data to Improve Transit Performance and Management

TRANSPORTATION RESEARCH BOARD

TCRP Report 113 • 2006

Automatic vehicle location (AVL) and automatic passenger counter (APC) systems are capable of gathering an enormous quantity and variety of operational, spatial, and temporal data that, if captured, archived, and analyzed properly, holds substantial promise for improving transit performance by supporting improved management practices in areas such as service planning, scheduling, and service quality monitoring. Historically, however, such data has not been used to its full potential. Many AVL systems, designed primarily for real-time applications, fail to capture and/or archive data items that would be valuable for off-line analysis. And where good quality data is captured, new analysis tools are needed that take advantage of this resource. Recent technological advances have created new opportunities for improving the quantity, variety, and quality of data captured and for analyzing it in meaningful ways. The objective of this research was to develop guidance for the effective collection, archiving, and use of AVL-APC data to improve the performance and management of transit systems. This project yielded three types of products: a survey of practice, guidance on AVL-APC systems and data analysis, and prototype tools for analysis of archived AVL-APC data. The state of the practice in AVL-APC data capture and analysis was ascertained by means of literature review, widespread telephone interviews, intensive case studies of nine transit agencies in three countries, and a workshop for suppliers. The case studies (published as TCRP Web Document 23) are from five transit agencies in the United States (Seattle [WA], Portland [OR], Chicago [IL], New Jersey, and Minneapolis [MN]); two agencies in Canada (Ottawa, Montréal); and two agencies in the Netherlands (The Hague and Eindhoven).

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Research Digest

Item 11

Transit Agency Participation in Medicaid Transportation Programs

TRANSPORTATION RESEARCH BOARD

TCRP Synthesis 65 • 2006

Non-Emergency Medical Transportation (NEMT) has existed since the mid-1970s. From the beginning of the program, coordination was employed to maximize scarce resources in rural areas. During this period, many rural agencies and some urban agencies successfully coordinated NEMT service with public transit and/or other human service programs. However, opportunities still exist for public transit agencies in both urban and rural areas to participate in the NEMT program as providers of service or as brokers. Although rural transit agencies have historically taken advantage of coordination opportunities, there are a growing number of urban transit agencies that are seeing opportunities for coordination with benefits for customers, transit agencies, and state Medicaid agencies. Medicaid is a large funding resource for transportation across the country. In rural areas, NEMT funding is often greater than public transit funds and virtually dwarfs other human service transportation programs in terms of funding and priorities. Any coordination effort that does not include Medicaid risks omitting the largest participant. TCRP requested this synthesis to examine the tasks necessary for a successful public transit– NEMT partnership. This review is conducted to assist transit agencies in exploring opportunities to coordinate services with NEMT programs. The report identifies and examines barriers and actions (at all levels) that can foster or inhibit coordination at the local level. The overall focus of this effort is on how transit agencies coordinate services with NEMT. A literature review was undertaken to examine coordination efforts between medical transportation and public transportation; NEMT service models (which have a significant effect on the potential for coordination); administrative/management/monitoring issues; and other pertinent concerns, such as cost allocation. Most of the coordination literature focused on state level efforts, although a handful of documents addressed local level coordination with transit agencies. The literature included articles on fixed-route bus service; cost transferring onto Americans with Disabilities Act paratransit; working relationships between NEMT and public transit and among state and local Medicaid officials, state departments of transportation (DOTs), and transit system officials; and uniform service standards.

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