

Research Digest

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TxDOT Research Project Publications, Oct.-Dec. 2012

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Item 1

MASH Test 3-11 on the T131RC Bridge Rail

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

TTI 1002-12-1 • 2012

The Texas Department of Transportation (TxDOT) currently uses the TxDOT Type T101RC Bridge Rail, a steel post and beam bridge rail anchored to the top of concrete curbs. The T101RC Bridge Rail is 27 inches in height and can be anchored to the top of concrete curbs of varying heights. The heights of the posts and the number of bridge rail elements vary depending on the height of the concrete curb. The posts are anchored to the curb using four adhesive anchors. Based on crash testing of similar rail designs of the same height, the researchers believed that the TxDOT Type T101RC Bridge Rail would not meet the [AASHTO] Manual for Assessing Safety Hardware (MASH) Test Level 3 (TL-3) criteria. The purpose of this portion of the project was to design and crash test a modified design of the TxDOT T101RC Bridge Rail that would meet the strength and safety performance criteria for TL-3 of MASH. A new bridge rail was developed and tested for this project.

This report is available for free download (6.3 MB):

<http://tti.tamu.edu/documents/9-1002-12-1.pdf>

Item 2

MASH TL-3 Testing and Evaluation of a Steel Bridge Rail with Pickets

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

TTI 1002-12-2 • 2012

TxDOT has a need for a steel bridge rail that anchors to a concrete curb with an aesthetic appearance using steel pickets. Bridge railings that use pickets (concrete and steel) have exhibited undesirable safety performance characteristics. The purpose of this portion of the project was to design and evaluate a steel bridge rail with pickets that would meet the strength and safety performance criteria for Test Level 3 (TL-3) of MASH. The bridge rail tested for this project was similar to the Wyoming 2-tube bridge rail that was successfully crash tested under NCHRP Report 350 criteria (Texas Transportation Institute [TTI] Project No. 472610-4, dated May 1996). Details from the Wyoming 2-Tube design were incorporated and used in the design of the new TxDOT Picket Rail. The TxDOT Picket Rail evaluated and presented herein met all the safety performance criteria for MASH TL-3 and is suitable for implementation on new bridge construction.

This report is available for free download (15.3 MB):

<http://tti.tamu.edu/documents/9-1002-12-2.pdf>

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Item 3

Thin Overlay Mix Designs for West Texas Districts

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

TTI 1529-P1 • 2012

This disc contains a technical memorandum (.pdf) "Task Report #2.2, Developing Very Thin Overlays with Locally Available Aggregates for Each District" and Excel files (.xls) for 16 mix designs and a summary of all mixes from the project. This report does not constitute a standard, specification, or regulation. "The objective of this subtask was to generate crack resistant hot mix designs which could be placed very thin using locally available materials for each of the West Texas Districts wanting to participate in this study. Crack Attenuating Mixes (CAMs) had been placed in other parts of the state with good performance, though not in West Texas. Local aggregates meeting minimum quality and gradation requirements were solicited from 10 districts... In addition to the CAM mix designs, fine graded permeable friction course (PFC) and fine graded stone matrix asphalt (SMA) mixes were developed for two of the aggregate sources. A summary of all the mix designs is presented in the [tech memo] and a detailed discussion of all test results... Spreadsheets for each mix design have been submitted separately as product P1 from this research study. A total of 6 mixes were selected for placement at the Pecos Test Track; two CAMs, two PFCs and two fine SMAs. Based on the results presented in this report the locally available Hoban from Pecos and the Eastland aggregates from Abilene District were used in the construction of test sections. " --Exec. Summary

This report is available for free download (ZIP file):

<http://tti.tamu.edu/documents/9-1529-P1.zip>

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Item 4

South Texas Native Plant Restoration Project Final Report

TEXAS A&M UNIVERSITY KINGSVILLE (TAMUK). CAESAR KLEBERG WILDLIFE RESEARCH INSTITUTE
TAMUK 4570-1 • 2012

The South Texas Native Plant Restoration Project was a resounding success in that the primary goal of developing commercial sources of native seed has been substantially met. By the conclusion of the project on August 31, 2012, twenty native seed sources had been developed or aided in being commercialized because of this project. Ecotypic native seeds are today commercially available for use by the Texas Department of Transportation (TxDOT), and the methods to plant, establish, and manage these native species along roads in Texas have been tested, reported on, and are available for vegetation managers' reference and implementation.

CONTENTS

- Executive Summary
- Introduction
- Selection of Species
- Seed Collection
- Seed Processing
- Nursery and Greenhouse Planting
- Seed Harvest
- Seed Testing
- Seed Increase
- Establishment Methods
- Work Summary by Species
- Seed Releases and Commercialization Status
- Recommendations and Future Work
- References
- Appendix A-E

This report is available for free download (302 MB **** Large File Alert ****):

<http://tti.tamu.edu/documents/0-4570-1.pdf>

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Item 5

Implementation of New Pavement Performance Prediction Models in PMIS: Report

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

TTI 6386-01-1 • 2012

Pavement performance prediction models and maintenance and rehabilitation (M&R) optimization processes enable managers and engineers to plan and prioritize pavement M&R activities in a cost-effective manner. This report describes TxDOT's efforts to implement and improve these capabilities in the Pavement Management Information System (PMIS). Specifically, this report describes the processes and results of (a) introducing the new performance prediction models (developed in Project 0-6386) to TxDOT engineers and managers through a webinar workshop, (b) assessing the reasonableness of these models through an online survey and follow-up interviews with TxDOT engineers and managers, and (c) evaluating the PMIS optimization procedure. In most cases, the new pavement performance prediction models were found reasonable by TxDOT pavement practitioners. No major errors were found in the code of the PMIS optimization process. Minor discrepancies were found between the output of PMIS and the output of a replicate of the PMIS optimization process (developed by the researchers); suggesting that the needs analysis and the Ride Score models in PMIS may require further evaluation and improvement.

This report is available for free download (4.6 MB):

<http://tti.tamu.edu/documents/5-6386-01-1.pdf>

Item 6

Use of Flashing Yellow Operations to Improve Safety at Signals with Protected-Permissive Left Turn (PPLT) Operations

TEXAS SOUTHERN UNIVERSITY (TSU). DEPARTMENT OF TRANSPORTATION STUDIES

TSU 6568-1 • 2012

MUTCD 2009 Edition suggests the use of Flashing Yellow Arrow (FYA) indication in replacement of green ball indication for permissive left-turn signal in presence of separate signal heads. Currently, there is no clear guidance on how to implement flashing yellow operations with PPLT in Texas. The objective of this research project is to develop guidelines for FYA with PPLT operations. To fulfill this goal, the researchers (1) reviewed and synthesized national and peer state practices on FYA PPLT; (2) surveyed traffic engineers and drivers; (3) deployed FYA PPLT operation at five selected intersections in Texas cities; (4) identified software and hardware issues associated with the deployment of FYA PPLT; and (5) evaluated the safety performance of FYA PPLT based on the historical crash data analysis and field traffic conflict studies. According to the findings of this research, it is recommended that FYA signal indication can be used at most of signals with PPLT operations to improve intersection safety and to comply with the requirements of the MUTCD. However, FYA PPLT operation is not recommended at busy intersections that have high left-turn volumes and opposing volumes, and it should be implemented with great cautions at intersections where lead-lead left-turn phasing is used.

This report is available for free download (4.5 MB):

http://itri.tsu.edu/Reports/TxDOT_0-6568-R1.pdf

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Item 7

Alternative Methods of Flexible Base Compaction Acceptance

TEXAS A&M UNIVERSITY. TEXAS TRANSPORTATION INSTITUTE (TTI)
TTI 6587-2 • 2012

This report presents the results from the second year of research work investigating issues with flexible base acceptance testing within the Texas Department of Transportation. This second year of work focused on shadow testing non-density-based acceptance methods in parallel with the nuclear density gauge. The research team investigated methods of setting target values and then performed parallel testing of the new devices with the density gauge on three construction projects. In addition to using the nuclear density gauge as the default test device, the research team employed a portable falling weight deflectometer, dynamic cone penetrometer (DCP), and portable seismic pavement analyzer. The field testing showed the DCP to be the most preferred device to use in lieu of the nuclear density gauge. Based on the findings, this report presents a modified construction specification for flexible base and a draft test procedure for using the DCP for compaction acceptance.

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

<http://tti.tamu.edu/documents/0-6587-2.pdf>

Item 8

Binder Rheology and Performance in Warm Mix Asphalt

UNIVERSITY OF TEXAS AT AUSTIN. CENTER FOR TRANSPORTATION RESEARCH (CTR)
CTR 6591-1 • 2012

Since the introduction of warm mix asphalt (WMA) in the United States, a variety of different technologies and processes have been developed and used to achieve proper mixing and compaction at reduced temperatures compared to conventional hot mix asphalt (HMA). A better understanding of the effect of WMA additives and reduced aging on the rheology of asphalt binders is a crucial step towards the successful implementation of WMA. This report presents the findings from a study conducted to investigate the influence of chemical WMA additives and reduced short-term aging on the properties of asphalt binders, mortars, and mixtures. A detailed description of the findings relevant to asphalt binders modified using warm mix additives is presented in the Interim Report. This report presents the details of the test methods and findings relevant to mortars and mixtures prepared using warm mix additives. Findings from this study indicate that certain WMA additives tend to exacerbate the reduced stiffness and early age rutting resistance in warm mix binders. The long-term aged WMA binders had similar or slightly reduced resistance to low-temperature cracking compared to conventional binders. Also, WMA with reclaimed asphalt had similar low temperature cracking resistance as compared to a similar HMA with reclaimed asphalt. Tests on asphalt mortars indicated that the WMA additives significantly affected the fatigue cracking resistance of one of the two binders. Tests on full asphalt mixtures indicate that in most cases the rutting and moisture damage resistance of WMA mixtures was similar to or less than the corresponding control HMA. Findings based on the tests conducted using asphalt mortars and asphalt mixtures were qualitatively consistent with the findings based on the tests conducted using asphalt binders.

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

http://www.utexas.edu/research/ctr/pdf_reports/0_6591_1.pdf

Research Digest

Item 9

Recommendations and Guidelines for the Use of WMA Mixtures

UNIVERSITY OF TEXAS AT AUSTIN. CENTER FOR TRANSPORTATION RESEARCH (CTR)

CTR 6591-P1 • 2012

This document provides recommendations for warm-mix asphalt mixtures based on the results of tests conducted under TxDOT research project 0-6591.

CONTENTS

- Chapter 1. Introduction and Background
- Chapter 2. Fatigue Cracking and Moisture Damage Resistance of Asphalt Mortars
- Chapter 3. Stiffness and Resistance to Fracture, Rutting, and Moisture Damage in WMA Mixtures
- Chapter 4. Conclusions and Recommendations
- References

This report is available for free download (147 KB):

http://www.utexas.edu/research/ctr/pdf_reports/0_6591_p1.pdf

Item 10

Optimizing Resource Allocations for Routine Highway Maintenance: Workshop Summary

UNIVERSITY OF TEXAS AT AUSTIN. CENTER FOR TRANSPORTATION RESEARCH (CTR)

CTR 6623-P2 • 2012

This document contains information about a workshop held November 8, 2010, on the topic of TxCAP for TxDOT research project 0-6623. "The Texas Condition Assessment Program (TxCAP) combines information from PMIS, TxMAP, and TxTAP to get an overall picture of state roads. Currently, TxDOT uses TxCAP together with PMIS, TxMAP, and TxTAP to measure and compare overall road inventory condition among its 25 Districts, which provide a comprehensive assessment of the Interstate and Non-Interstate highway system." -- p.2

CONTENTS

- Meeting Agenda
- Background Information
- Worksheets
- Results and Feedback

This report is available for free download (292 KB):

http://www.utexas.edu/research/ctr/pdf_reports/0_6623_p2.pdf

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Item 11

Strategies to Encourage and Facilitate Utility Owner Participation in Transportation Projects: Guidebook and Training Materials

TEXAS A&M UNIVERSITY. TEXAS TRANSPORTATION INSTITUTE (TTI)
TTI 6624-P1 • 2012

"A 2002 survey of state departments of transportation (DOTs), highway contractors, design consultants, and others identified utility adjustments as the most frequent reason for delays in highway construction. Management of utility conflicts through effective communication, cooperation, and coordination among stakeholders is a critical mechanism to keep transportation projects on schedule. Delays and inefficiencies in utility-related activities have a tendency to proliferate into project letting and even construction, frequently resulting in higher bids, change orders and/or damage or delay claims, litigation by utility owners or agencies, safety concerns at the job site, frustration of the traveling public, and negative public perception about the project. Report 0-6624-1 documents the process to assemble a list of 64 potential strategies to improve utility owner participation in the project development process... The researchers also held meetings with TxDOT districts and divisions, project advisors, utility owners, and other relevant agencies in the state. These meetings enabled stakeholders to provide input into the strategies identified from the detailed literature review and recommend additional strategies. TxDOT officials interviewed included representatives from urban and rural districts. Utility stakeholders interviewed included operators of various sizes and in different industries such as oil and gas, communications, water, and electricity. The result of the meetings with various stakeholders, including project advisors, TxDOT districts and regions, and utility owners was a consolidation and ranking of potential strategies. The following strategies reflect the highest priorities identified through this process: Modernization of the utility process at TxDOT. Use of utility conflict matrices and associated procedures. Streamlining and standardization of utility cost data submissions and reimbursement process, including utility agreements and master utility agreements. Core skill training on utility topics.

The [guidebook chapters] describe each of these strategies in more detail. The discussion includes an implementation plan. A companion to this content is a set of materials in electronic format (see companion CD). The purpose of these materials is to facilitate access to or otherwise complement information provided in this guidebook. Intended users of these materials include stakeholders such as division and district officials, utility owners, consultants, and contractors. Although the materials are provided as a companion CD to this guidebook, TxDOT could also make them available to stakeholders through other means, e.g., a website, universal serial bus (USB) flash drives, or even email. The companion CD also includes training materials to assist on the process of disseminating the strategies described in this guidebook. The training materials include one Microsoft® PowerPoint® file per strategy, along with presenter and participant handout materials." --Guidebook, p.1-2

This report is available for free download (ZIP file):

<http://tti.tamu.edu/documents/0-6624-P1.zip>

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Item 12

Instructor's and Student's Training Materials and Guidebook

TEXAS A&M UNIVERSITY. TEXAS TRANSPORTATION INSTITUTE (TTI)
TTI 6631-P1 • 2012

"As part of TxDOT Research Project 0-6631, the Texas Transportation Institute (TTI) of the Texas A&M University System is conducting research to develop best practices for utility investigations in the TxDOT project development process. Workshops are being conducted at five locations around the state: Austin, Dallas, Houston, San Antonio, and Waco. The purpose of the workshop is (a) to describe research results related to best practices for utility investigations and (b) to obtain feedback from stakeholders including representatives from TxDOT divisions, regions, and districts in design and utilities; subsurface utility engineering (SUE) providers; and utility company representatives... At the end of the workshop, participant should be able to: describe SUE practices during the project development process, identify opportunities to implement utility investigation best practices with regard to timing during the project development process, conduct a project utility impact analysis." --Workshop Overview

This report is available for free download (ZIP file):

<http://tti.tamu.edu/documents/0-6631-P1.zip>

Item 13

Workshop Materials: PowerPoint and Guide

UNIVERSITY OF TEXAS AT AUSTIN. CENTER FOR TRANSPORTATION RESEARCH (CTR)
CTR 6640-P2 • 2012

This CD-ROM contains a PDF "Very Short Duration Operations: Safety Guidebook" and a 55-slide Microsoft PowerPoint (.pptx) presentation "TXDOT RESEARCH PROJECT 0-6640 STATE OF THE PRACTICE FOR WORKERS IN VERY SHORT DURATION WORK ZONE OPERATIONS Educational Module," a workshop presentation from July 2012. "This safety guidebook seeks to complement training modules that will educate maintenance workers on identifying work zone hazards. Identifying risk factors in VSDOs helps maintenance workers to better judge the condition of VSDOs and make more informed decisions on whether to conduct an operation as a VSDO or not. This safety guidebook provides details and findings of shadowing activities conducted to reveal the current practice of VSDOs at TxDOT. This guidebook also presents a risk management process that enables maintenance workers to identify work zone hazards for VSDOs and improve their judgment about work zone conditions. Multiple scenarios illustrating the risks are presented, and related safety recommendations are also discussed. An expert panel was convened in April 2011 and March 2012 to generate these recommendations." --Reader's Guide to Guidebook

This report is available for free download (9.8 MB):

<http://library.ctr.utexas.edu/digitized/products/0-6640-P2/6640-P2.zip>

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Item 14

Guidebook on DTA Data Needs and Interface Options for integration into the Planning Process

UNIVERSITY OF TEXAS AT AUSTIN. CENTER FOR TRANSPORTATION RESEARCH (CTR)

CTR 6657-P1 • 2012

"The goals of this guidebook are three-fold: 1) outline the data needed to run a dynamic traffic assignment (DTA) model, 2) propose methods for integrating DTA with macroscopic planning models and microscopic simulation models, and 3) propose methods for integrating DTA within the four-step planning process." --Introduction.

CONTENTS

- Introduction
- Data Needs
- Interfacing with Existing Planning Tools
- Integrating DTA with the Four-Step Travel Model
- Conclusion
- References

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

http://www.utexas.edu/research/ctr/pdf_reports/0_6657_p1.pdf

Item 15

Research on Best Practices for Winter Weather Operations

PRAIRIE VIEW A&M UNIVERSITY

PVAM 6669-1 • 2012

There is a growing need to identify actionable practices relative to winter weather operations. Because of the potential and inherent hazards during cold weather, it has become increasingly important to ensure that these practices can be effectively employed as well as protect the health and safety of employees working in extreme conditions. The research objective is to develop a winter weather operations manual for the Texas Department of Transportation (TxDOT) districts that are vulnerable to weather-related emergencies. A synthesis of the best practices related to winter weather operations and transferable best practices are documented in the operations manual to help maintenance crews better understand how to work in challenging weather-related events. In addition, a playbook for winter storms in Texas was developed to be used for general public awareness of winter storm operations.

This report is available for free download (5.5 MB):

<http://tti.tamu.edu/documents/0-6669-1.pdf>

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Item 16

Concrete Pavement Type Selection Workbook Based on Coarse Aggregate Availability and Costs

TEXAS STATE UNIVERSITY, SAN MARCOS

TSUSM 6681-P1 • [2012]

This Microsoft Excel workbook is a product of research project 0-6681 "Optimizing Concrete Pavement Type Selection Based on Aggregate Availability" sponsored by the Texas Department of Transportation and is designed to help evaluate total project costs and select appropriate project. The workbook is composed of six different sheets: User Guide (Purple Tab), General Information (Red Tab), Construction Quantities (Brown Tab), Construction Cost (Olive Green Tab), Maintenance Cost (Blue Tab), Rehabilitation Cost (Gray Tab). Yellow cells indicate input values.

"The objective of this project is to develop guidelines to select rigid pavements based on the type of aggregate that will produce the best performance... Proper selection of PCC pavement type based on coarse aggregate type will enhance overall PCC pavement performance, thus minimizing maintenance and repair costs." --Research and Technology Implementation Office Research Program FY 2012, p.39

This report is available for free download (5.5 MB):

<http://tti.tamu.edu/documents/0-6681-P1.xlsx>

Item 17

Comparison and Assessment of Mechanical and Herbicide-Chemical Side-Trimming Methods of Managing Roadside Vegetation by the Texas Department of Transportation (TxDOT)

TEXAS A&M UNIVERSITY KINGSVILLE (TAMUK)

TAMUK 6732-1 • 2012

This project compared and assessed the mechanical and herbicide-chemical side-trimming methods that TxDOT uses to manage roadside vegetation. This report discusses safety, effectiveness, and economic costs of these methods. It also shares industry best management practices by appending comments of several resource professionals concerned with side-trimming operations for vegetation management on rights-of-way. The researcher based his assessment on information and data that TxDOT's Vegetation Management staff provided, and information and perspectives on rights-of-way from resource management professionals associated with other state DOTs as well as other agencies involved in vegetation management. The report emphasized that TxDOT seeks to collaborate with stakeholders to determine the best and most appropriate side-trimming methods for various unique ecological and cultural situations across Texas.

This report is available for free download (475 KB):

<http://tti.tamu.edu/documents/0-6732-1.pdf>

Research Digest

Item 18

Oversize/Overweight Vehicle Permit Fee Study

UNIVERSITY OF TEXAS AT AUSTIN. CENTER FOR TRANSPORTATION RESEARCH (CTR)
CTR 6736-2 • 2012

In Rider 36, the Texas Legislature in the 2012-2013 General Appropriations Act directed the Texas Department of Transportation (TxDOT) to conduct a study on road damage caused by oversized and overweight (OS/OW) vehicles and to provide recommendations for permit fee and fee structure adjustments, which are to be submitted to the Legislative Budget Board and the Governor. TxDOT commissioned CTR and the University of Texas at San Antonio to evaluate the damage that OS/OW vehicles (including exempt vehicles) cause to the transportation infrastructure (including pavements and bridges) along with direct costs imposed by OS/OW vehicles on highway appurtenances (such as signs, traffic signals, and light poles) and other direct costs that other state agencies and local jurisdictions accrue from OS/OW enforcement or management.

The project developed methodologies to quantify pavement and bridge consumption rates per mile. The consumption rates were calculated for multiple axle loads and axle configuration and are independent of the commodity being transported. Per mile fees for bridges were also calculated for non-routed loads. In addition to the consumption rates for bridges and pavements due to the effect of axle loads, the researchers developed a new fee schedule that considers costs associated with oversize vehicles that exceed legal width, height, or length for 34 rate categories. These new fees were also calculated based on vehicle miles traveled. Based on the new permit fee structure the research team conducted a revenue analysis by comparing it to FY 2011 permit sales numbers and associated revenue...

This report is available for free download (20.4 MB):

http://www.utexas.edu/research/ctr/pdf_reports/0_6736_2.pdf

Item 19

Preparing Texas Land and Sea for the Panama Canal Expansion : Report from the Panama Canal Stakeholder Working Group

TEXAS A&M UNIVERSITY. TEXAS TRANSPORTATION INSTITUTE (TTI)
TTI 6800-1d • 2012

This project assists the Texas Department of Transportation (TxDOT) in assessing the potential impacts of the Panama Canal expansion on Texas ports and the landside transportation system. TxDOT formed a Panama Canal Stakeholder Working Group (PCSWG) to help examine these impacts and possible opportunities for expanding global trade. The PCSWG held a series of meetings to obtain input from shippers and carriers, ports, metropolitan planning organizations (MPOs), regional mobility authorities (RMAs), industry groups, and other organizations. In addition to the Panama Canal expansion, the PCSWG discussed opportunities to expand global trade related to the growth of the state's population and developments in the energy sector. This report summarizes the results of these meetings, along with an examination of current and planned roadway, port, and rail projects. Short-, mid-, and long-term TxDOT transportation improvements, other projects and policies that will better position the state of Texas to take advantage of the Panama Canal expansion, and other opportunities to enhance Texas' role in global trade are presented.

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

http://ftp.dot.state.tx.us/pub/txdot-info/panama/final_report.pdf

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Item 20

Synthesis of Port Related Freight Improvement Studies: Technical Report

TEXAS A&M UNIVERSITY. TEXAS TRANSPORTATION INSTITUTE (TTI)
TTI 6801-1 • 2012

This project was undertaken to assist in identifying landside transportation projects that will better position the state of Texas to benefit from the expansion of the Panama Canal through increases in exports and imports. Studies and plans over the past 10 years have examined different aspects of the freight system in the state, including ports, railroads, highways, and intermodal facilities. This project summarizes the key elements addressed in these previous studies, especially those related to landside access to ports. The results of this review were summarized and a searchable Excel spreadsheet was developed containing information on the identified landside access projects. The spreadsheet includes information on the project type, the issues addressed, estimated cost, funding sources, and other related characteristics.

This report is available for free download (754 KB):
<http://tti.tamu.edu/documents/0-6801-1.pdf>

Item 21

A Web-Based Pavement Performance and Maintenance Management and GIS Mapping System for Easy Access to Pavement Condition Information

UNIVERSITY OF TEXAS AT AUSTIN. CENTER FOR TRANSPORTATION RESEARCH (CTR)
CTR 9035-01-2 • 2012

State Departments of Transportation, including the Texas Department of Transportation (TxDOT), have long been moving towards the development and implementation of pavement management systems that would enable monitoring of the performance of their roadways, as well as assist transportation officials with maintenance budget allocation and planning decisions. Various past attempts focused on using the available performance databases as well as state-of-the-art concepts for the development of such systems. The unique characteristics of the state of Texas, the most predominant of which is the vast size of the managed pavement network—79,696 centerline miles of highways including 49,829 bridges—have made some of the decision support models and/or algorithms a challenge to implement. This report presents a new approach to the development of such a decision-support system with its focus on maintenance management for TxDOT. The new system is web-based and provides functional capabilities that allow transportation officials and engineers to make informed decisions regarding their budget planning and budget allocation for pavement maintenance management, fully utilizing available historical data. The developed system has successfully supported some of the TxDOT Districts in the development of their 4-year pavement management plans. In addition, pavement conditions in Texas were analyzed in terms of the effectiveness of the 4-year pavement management plans.

This report is available for free download (458 KB):
http://www.utexas.edu/research/ctr/pdf_reports/5_9035_01_2.pdf

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Item 22

A Procedural Document Describing the Process of Developing the 4-year Plan

UNIVERSITY OF TEXAS AT AUSTIN. CENTER FOR TRANSPORTATION RESEARCH (CTR)
CTR 9035-01-P8 • 2012

The Texas Department of Transportation (TxDOT) is responsible for a vast managed pavement network: 79,991 centerline miles of highways and 49,829 bridges. Rider 55 of the appropriations bill for TxDOT requires that prior to the beginning of each fiscal year, the department provide the Legislative Budget Board and the Governor with a detailed plan for the use of these funds. This plan should include, but is not limited to, a district-by-district analysis of pavement score targets and how proposed maintenance spending will impact pavement scores in each District. To fulfill this requirement, TxDOT and its Districts develop the 4-year pavement management plans and update the plans every year. The plans are used to predict the future conditions of pavements and analyze the impact of the appropriated funding on the conditions of the pavements. To support the TxDOT Districts in developing the 4-year pavement management plans, this report presents a procedural process to guide the Districts in plan development.

This report is available for free download (48.6 KB):

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