



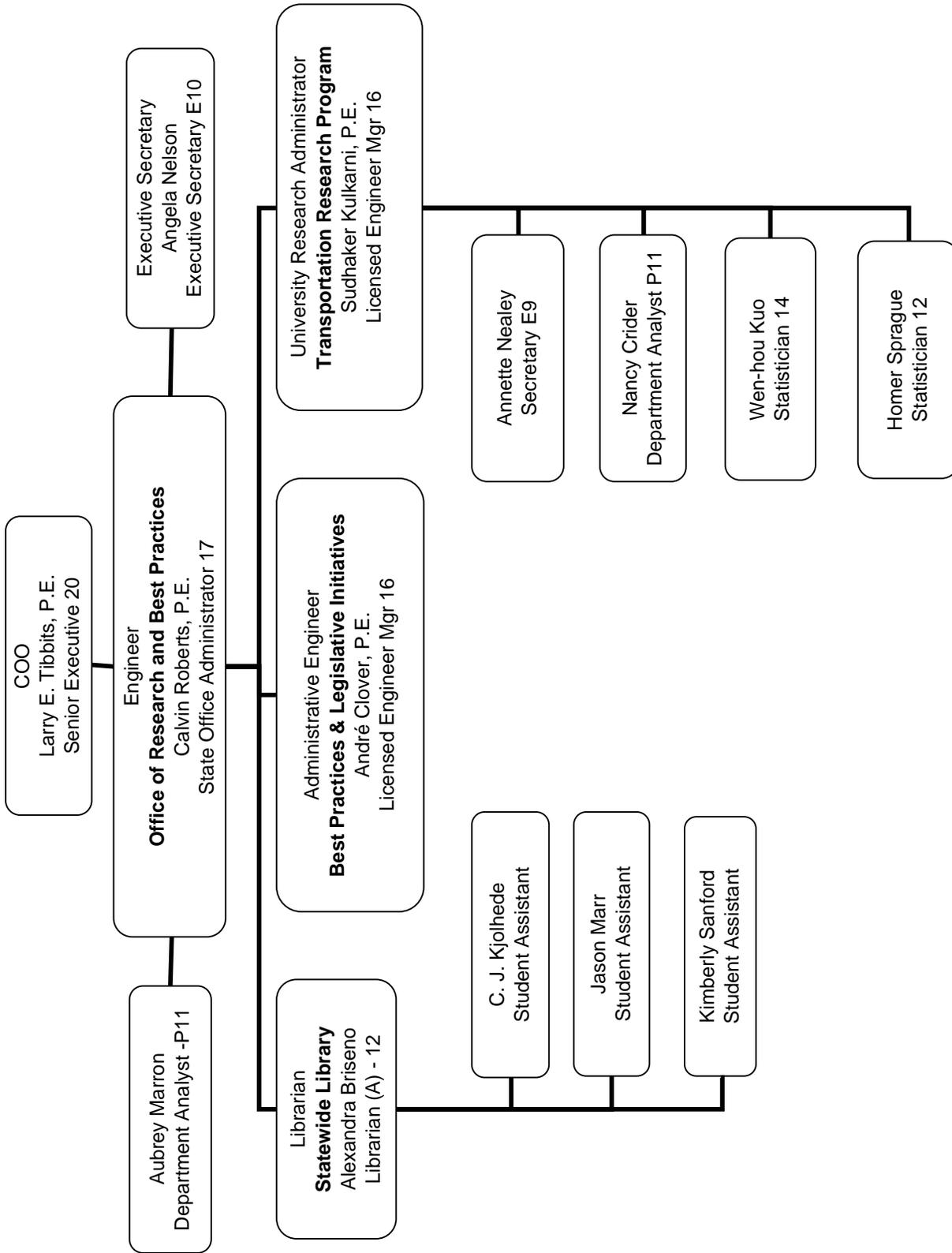
OFFICE OF RESEARCH &
BEST PRACTICES

APPENDIX A

MDOT Organization and Strategic Framework

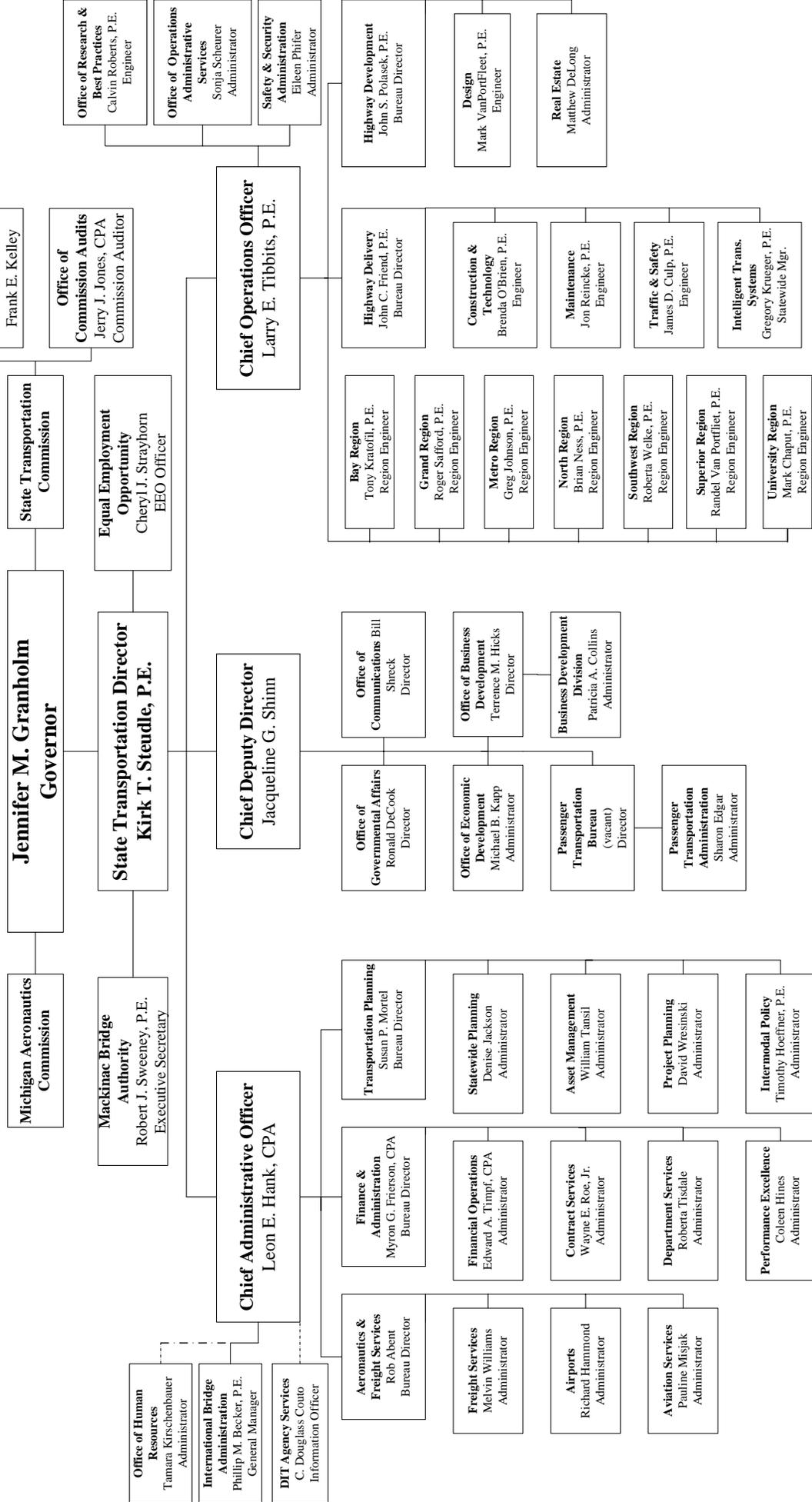
Michigan Department of Transportation





Michigan Department of Transportation

(July 2008)



**MICHIGAN DEPARTMENT OF TRANSPORTATION
OFFICE OF RESEARCH AND BEST PRACTICES**

NAME	TITLE	PHONE	CELL	E-MAIL	FAX	MAIL
Roberts, Calvin	Engineer of ORBP	517-241-2780	517-204-9842	robertsc	517-335-2785	B450
Nelson, Angela	Executive Secretary	517-241-2780		nelsonan	517-335-2785	B450
Marron, Aubrey	Department Analyst	517-373-3969		marrona	517-241-3194	B155

MDOT STATEWIDE LIBRARY

Briseno, Alexandra	Librarian	517-373-8548		brisenoa	517-241-3194	B155
Kjolhede, C.J.	Library Student Assistant	517-241-1809		kjolhedec	517-241-3194	B155
Marr, Jason	Library Student Assistant	517-241-1809		marrja	517-241-3194	B155
Sanford, Kimberly	Library Student Assistant	517-241-1809		sanfordk1	517-241-3194	B155

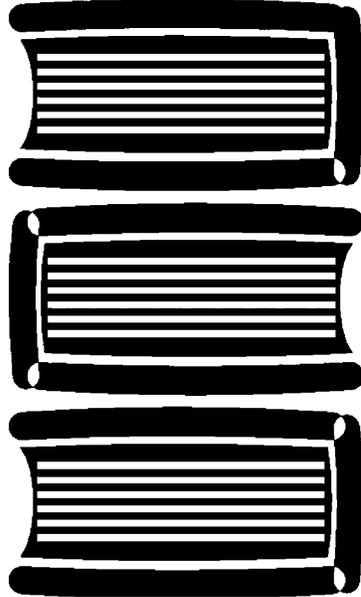
BEST PRACTICES & LEGISLATIVE INITIATIVES

Clover, Andre	Administrative Engineer	517-322-5683	517-749-9001	clovera	517-322-5664	E020
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TRANSPORTATION RESEARCH PROGRAM

Kulkarni, Sudhaker	University Research Administrator	517-322-5670		kulkarnis	517-322-5664	E020
Nealey, Annette	Research Administrative Assistant	517-322-1632		nealeya	517-322-1262	E020
Crider, Nancy	Research Analyst	517-322-1211		cridern	517-322-1262	E020
Kuo, Wen-hou	Statistician	517-322-1238		kuow	517-322-5664	E020
Sprague, Homer	Statistician	517-322-1580		spragueh	517-322-5664	E020

MDOT LIBRARY



**Michigan Department of Transportation Library
Murray Van Wagoner Building**

Hours of Service:
Monday thru Friday
7:30 – 11:45 AM
12:45 – 4:30 PM

Librarian: Alexandra Briseno
brisenoal@michigan.gov
517-373-8548
Front Desk: 517-241-1809
Fax: 517-241-3194

Providing materials and data to support MDOT's research needs.

Preserving MDOT's corporate memory.

Information Services include:

- Electronic Subject Searching**
- Interlibrary Loan of Special Materials**
- Computerized Catalog of Books and Electronic Media**
- Web Access to Databases Related to Transportation**
- Listings of Transportation-related Web Links**



OFFICE OF RESEARCH &
BEST PRACTICES

APPENDIX B

Program Development and Administration

Michigan Department of Transportation



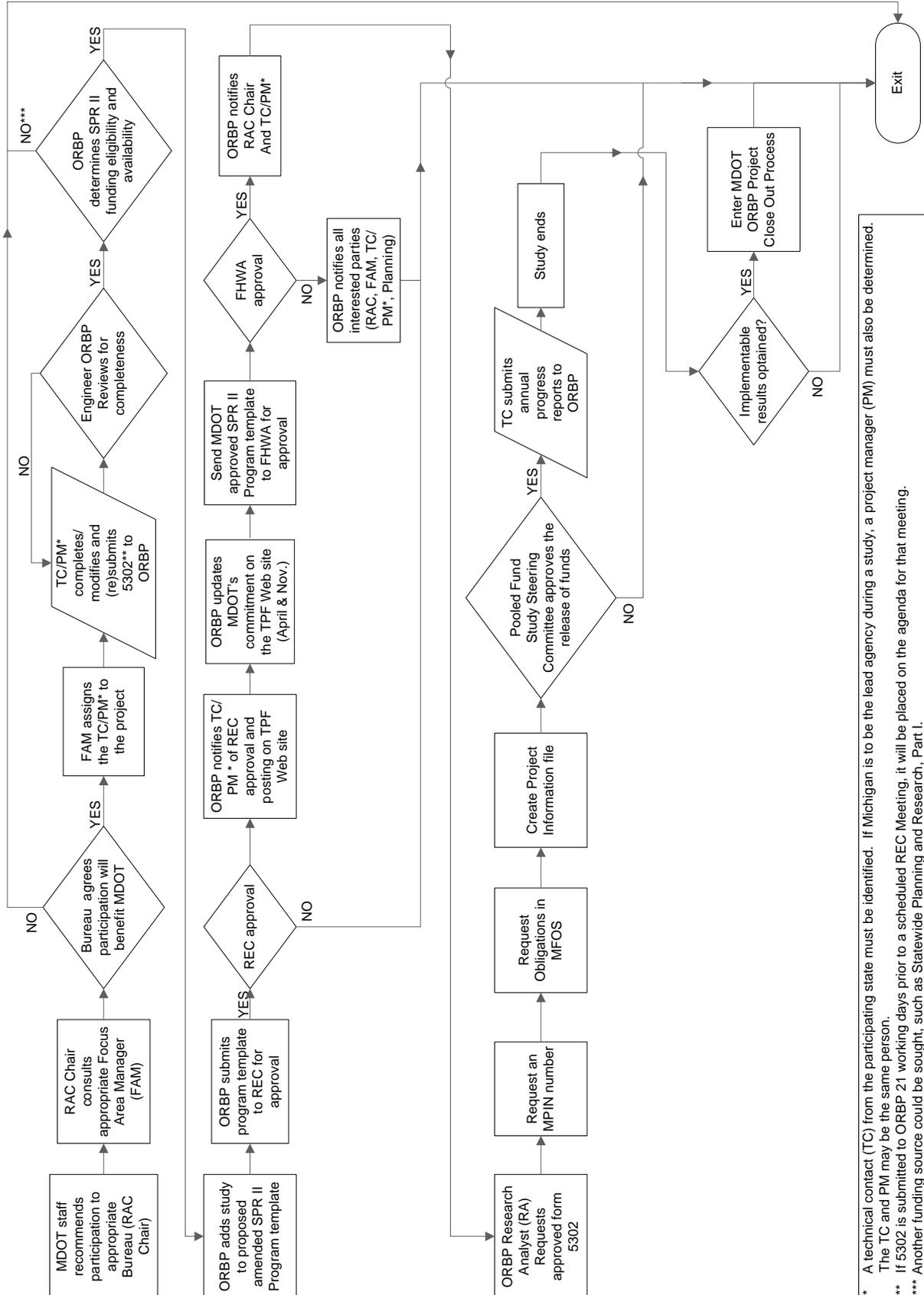
Michigan Department
Of Transportation
5302 (06/08)

Office of Research and Best Practices Procedure to Request Statewide Planning and Research, Part II, Money for Pooled Fund Projects Revised June 2008

The following procedure is required to request State Planning and Research (SPR), Part II, Program money for Michigan Department of Transportation (MDOT) participation in pooled fund studies.

- 1) Submit a written document, followed by an electronic version in Word format, to the Engineer of Research and Best Practices with the following information:
 - a) What is the name and focus area(s) of this pooled fund study?
 - b) Location of activity?
 - c) Who are the other participants?
 - d) Explain what MDOT's requirements will be to participate in this pooled fund study.
 - i) SPR, Part II, dollars.
 - ii) Dollars from other funds.
 - iii) MDOT staff participation.
 - iv) Duration of participation in what capacities.
 - v) Will out-of-state travel be required? If yes, please explain.
 - vi) Other considerations as applicable.
 - e) What is the expected result or end product?
 - f) Explain how this project outcome matches the strategic plan and goals of MDOT.
 - g) Explain how participation in this pooled fund will help meet MDOT's goals.
 - h) Explain how MDOT will be able to implement or incorporate the results from this pooled fund study.
 - i) What specific recommendation(s) do we anticipate at the project completion?
 - j) What implementation of data in terms of end results are we specifically looking for?
 - k) Do we anticipate the recommendation(s) from the research will have an impact on any existing MDOT specification(s), manual, etc.? If so; explain how. What are we trying to improve in regards to the specification(s), manual, etc.?
- 2) The Office of Research and Best Practices (ORBP) will review and explore the viability of the benefits to MDOT and SPR, Part II, fund availability for the project.
- 3) ORBP will prepare a comprehensive proposal incorporating the above submittal and specifying the financial impact to any and all currently approved projects, regardless of start date, as well as the overall SPR, Part II, Program budget if MDOT participation in this proposed pooled fund study is approved.
- 4) The Engineer of Research will present this comprehensive proposal for executive review and decision.

MDOT Office of Research and Best Practices
Pooled Fund Study Process
Developed by ORBP Team, June 24, 2008



* A technical contact (TC) from the participating state must be identified. If Michigan is to be the lead agency during a study, a project manager (PM) must also be determined. The TC and PM may be the same person.
 ** If 5302 is submitted to ORBP 21 working days prior to a scheduled REC Meeting, it will be placed on the agenda for that meeting.
 *** Another funding source could be sought, such as Statewide Planning and Research, Part I.

APPENDIX B: Program Development and Administration



Michigan Department
Of Transportation
5307 (05/08)

OFFICE OF RESEARCH & BEST PRACTICES TRANSPORTATION POOLED FUND STUDY ANNUAL REPORT FISCAL YEAR 2008

STUDY TITLE:

FUNDING SOURCE: SPR, Part II (____%) FHWA (____%) MFUNDS(____%) NCHRP (____%) OTHER (____%)

TECHNICAL CONTACT:

TPF #		MDOT START DATE	
JOB NUMBER		MDOT COMPLETION DATE (Original)	
ORBP NUMBER		COMPLETION DATE (Revised)	
LEAD AGENCY			
PROJECT MANAGER			
CONTRACTOR			

BUDGET STATUS

Total Budget		FY 2009 Estimated Budget	
TOTAL COST	(Original)*	TOTAL	
	(Revised)**		
EXPENDED FUNDS TO DATE***		SALARIES	
FY 2008 Budget		EQUIPMENT	(Expendable)
FY FUNDS	(Original)****	EQUIPMENT	(Non-expendable)
	(Revised)*****	TRAVEL	
FY EXPENDITURE		OTHER	
PERCENT COMPLETE (By Budget)		PERCENT COMPLETE (By Work)	

PARTICIPATING STATES

ABBREVIATE THE PARTICIPATING STATES. IF MDOT IS THE LEAD AGENCY, ALSO LIST THE CONTRIBUTION PERCENTAGE PER STATE.

(____%), (____%), (____%), (____%), (____%), (____%), (____%), (____%),

PURPOSE AND SCOPE

FISCAL YEAR 2007 ACCOMPLISHMENTS

FISCAL YEAR 2008 ACCOMPLISHMENTS TO DATE

FISCAL YEAR 2009 PROPOSED ACTIVITIES

JUSTIFICATION(S) FOR REVISION(S) (List the approval date for the revision(s))

SUMMARY OF THE IMPLEMENTATION RECOMMENDATION (Required the last year of participation)

- *The original authorized total budget amount of the study
- **The authorized total budget amount as revised, if applicable
- *** The project life to date expenditure
- ****The current fiscal year's original budget amount
- *****The revised fiscal year budget amount, if applicable



OFFICE OF RESEARCH &
BEST PRACTICES

APPENDIX C

Research Project Management

Michigan Department of Transportation



OFFICE OF RESEARCH AND BEST PRACTICES
 Research Advisory Panel (RAP) Members Selected

PROJECT TITLE:			
PROJECT #:		ORBP #:	
PROJECT MANAGER			
PRINCIPAL INVESTIGATOR			
RESEARCH CONSULTANT AGENCY			
RAP MEMBERS			
Name	Division/Region/TSC	Telephone	E-Mail
Focus Area Manager's Signature:			
Date:			
ORBP Initial of Receipt:		Date of ORBP Initial:	

cc: Project File

OFFICE OF RESEARCH AND BEST PRACTICES
Research Proposal Budget-By-Task Worksheet

Subtotal - Subcontractors/Consultants		Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
III. Supplies (Provide details if cost exceeds \$2,000. Individual line items in excess of \$1,000 require a detailed explanation.)									
Item	Unit cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
Subtotal - Supplies									
IV. Capital Equipment Required for this Research (List items with a value in excess of \$500. Equipment in excess of \$5,000 requires prior approval.)									
Item	Unit cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
Subtotal - Capital Equipment									
V. In-State Travel (Must be in accordance with IDS contract requirements.)									
Item	Unit cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
Subtotal - In-State Travel									
VI. Out-of-State Travel (Must be in accordance with IDS contract requirements.)									
Item	Unit cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
Subtotal - Out-of-State Travel									

Michigan Department of Transportation
 Proposal for Project Management Services,
 "Name"
 Revised Timeline for Work Areas and Tasks
 July 2007 through December 2010

Start Date July 2007	2007				2008				2009				2010			
	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10		
Work Area A: Peer Exchange COMPLETED																
1. Develop theme(s), identify team																
2. Lead planning meetings																
3. Develop pre-exchange communications plan																
4. Arrange facilities, accommodations																
5. Serve as facilitators																
6. Develop post-exchange communications plan																
Work Area B: Communications																
1. Design tools to raise awareness of ORNBP																
2. Design tools to bring MDOT new knowledge																
3. Write content																
4. Facilitate publication and distribution																
5. Deliver presentations at MDOT																
Work Area C: Research Admin. Manual COMPLETED																
1. Review draft manual																
2. Recommend uses of manual																
Work Area D: ORBP Strategic Planning																
1. Coordinate with MDOT plan																
2. Identify national best practices																
3. Lead strategic planning process																
4. Draft, revise and finalize strategic plan																
5. Develop outreach activities																
6. Assist with SOAT development																

Proposal for Project Management Services
Amendment for Additional \$100,000
Prepared for Michigan Department of Transportation
Prepared by "Name"
Effort by Tasks (Hours and Costs)
"Date"

Principal Staff Members	Role in Project	Time (%) Over Contract Period	Work Area						Total Hours	Hourly Rate Including Overhead*	Amendment Cost	Original Cost
			Work Area B	Work Area D	Work Area E	Work Area F	Work Area C	Work Area G				
	Principal Consultant	21%	75	60	50	75		260		\$0		
	Consulting, Writing, Project Management	8%	0	25	25	50		100		\$0		
	Writing & research	48%	300	100	100	100		600		\$0		
	Editing	10%	80	5	40	0		125		\$0		
	Publication and Web Design, Graphics	10%	50	20	50	0		120		\$0		
	Administrative support	3%	25	10	10	0		45		\$0		
	Labor Subtotals		530	220	275	225		1250		\$0	\$0.00	
	Travel**											
	Printing, copies, ofc. Supplies**									\$0	\$0	

*See Labor and Overhead Rates

**Travel, printing, supplies billed at cost.

"name"
MDOT Proposal for Technical Communication Services
Labor and Overhead Rates
April 6, 2007

	Pay Rate	Overhead Rate*	Subtotal	Fixed Fee	Total	Fixed Hourly Billing Rate
Classification (rate/fee)						
Principal		\$0.00	\$0.00	\$0.00	\$0.00	
Senior Associate		\$0.00	\$0.00	\$0.00	\$0.00	
Researchers/Writers		\$0.00	\$0.00	\$0.00	\$0.00	
Editor		\$0.00	\$0.00	\$0.00	\$0.00	
Graphic Designer**			\$0.00	\$0.00	\$0.00	
Administrative Associate		\$0.00	\$0.00	\$0.00	\$0.00	

*Includes employee taxes and fringe benefits

**Subcontractor overhead rate = 5%

EXAMPLE

Subcontract Checklist and Examples

The following statements must be included in subcontract agreements:

- MDOT/Prime contract number and authorization number (if applicable).
- Prime consultant's name.
- Sub-consultant's name.
- Description of work to be performed by sub-consultants, as stated in the scope of services.
- Job number(s), control section(s), and structure number(s), if applicable.
- A derivation of cost must be included in the subcontract.
- One of the following statements (using recommended or similar contract language) specifying the basis of payment, maximum contract amount, and fixed fee amount (if applicable) must be written into the subcontract:

(1)Actual Cost & Total Dollar Amount: compensation for the services must be on the basis of actual cost and must not exceed \$_____, as set forth in Exhibit _____.

(2)Actual Cost Plus Fixed Fee: compensation for the services must be on the basis of actual cost plus a fixed fee and must not exceed \$_____, which amount includes a fixed fee of \$_____, as set forth in Exhibit _____.

(3)Lump Sum: Compensation for the services must be on a lump sum basis in the amount of \$_____, as set forth in Exhibit _____.

(4)Milestone: Compensation for the services must be on a milestone basis in the amount of \$_____, payable upon completion of defined milestones, as set forth in Exhibit _____.

(5)Fixed Hourly Rate – Compensation for the services must be on the basis of a fixed hourly rate plus actual direct expenses and must not exceed \$_____, as set forth in Exhibit _____.

(6)Unit Price: Compensation for the services must be on the basis of a set unit price and must not exceed \$ _____, as set forth in Exhibit _____.

- A statement must be included in the subcontract that the subcontract will be governed by the laws of the State as set forth in the prime agreement.
- A statement must be included that all terms and conditions included in the prime agreement are incorporated in the subcontract.
- A statement must be included stating that in the event of a conflict between the terms and conditions of the subcontract and those of the prime agreement, the terms and conditions of the prime agreement will prevail.
- (Optional) Subcontract effective and expiration dates. If these dates are not provided in the subcontract, the prime agreement's effective and expiration dates will be used.

The subcontract must be submitted to the department for approval prior to execution by the prime consultant and subcontractor. Once department approval is obtained, the subcontract will be mailed to the prime consultant for execution. **An original signed copy of the subcontract must be returned to MDOT for the contract file.**

NOTE: Subcontracts for less than \$25,000 do not require MDOT approval. Sub-contracts must be approved by MDOT prior to sub work commencing on a project or invoicing for sub work.

All sub-contract revisions, including deletions and additions to contract language or budget information, must be reviewed and approved by MDOT.

APPENDIX C: Research Project Management



Michigan Department
of Transportation
5301 (01/08)

Office of Research and Best Practices PROJECT MANAGERS CHECKLIST FOR RESEARCH SERVICES

THIS REQUEST IS FOR (Check all that apply)

- NEW CONTRACT/
AUTHORIZATION
 ADDITIONAL WORK/CHANGE
IN SCOPE
 ADDITIONAL MONEY
 TIME EXTENSION

CONTRACT #			AUTHORIZATION #	RESEARCH #
JOB #	PHASE #	PCA CODE	INDEX CODE	OBJECT CODE

PROJECT TITLE

VENDOR/UNIVERSITY

PRINCIPAL INVESTIGATOR'S NAME	PHONE #	FAX #
-------------------------------	---------	-------

MDOT PROJECT MANAGER'S NAME	REGION/TSC	MAILCODE	PHONE #	FAX #
-----------------------------	------------	----------	---------	-------

IF THIS REQUEST IS FOR A TIME EXTENSION:

ORIGINAL START DATE	ORIGINAL ENDING DATE	ORIGINAL WORK DURATION IN MONTHS	NEW WORK DURATION IN MONTHS
---------------------	----------------------	----------------------------------	-----------------------------

JUSTIFICATION FOR THE TIME EXTENSION: (Please send and Email the following documents to the Office of Research & Best Practices: This form, completed, signed and dated, State Administration Board Agenda Questions Form 5304 (if project cost is over \$25,000), and SPR Part II History Report Form 5305.

IF THIS REQUEST IS FOR ADDITIONAL MONEY:

ORIGINAL TOTAL PROJECT COST	NEW TOTAL PROJECT COST
-----------------------------	------------------------

WHAT ARE THE ESTIMATED COSTS BY FISCAL YEAR. START WITH THE CURRENT FISCAL YEAR (Please send and Email the following documents to the Office of Research & Best Practices: This form, completed, signed and dated, State Administration Board Agenda Questions Form 5304 (if project cost is over \$25,000), revised proposal (work plan and budget), and SPR Part II History Report Form 5305.

AMOUNT TO BE SPENT BETWEEN 10/1/___ & 9/30/___	AMOUNT TO BE SPENT BETWEEN 10/1/___ & 9/30/___
AMOUNT TO BE SPENT BETWEEN 10/1/___ & 9/30/___	AMOUNT TO BE SPENT BETWEEN 10/1/___ & 9/30/___

IF THIS IS A NEW CONTRACT/AUTHORIZATION (Please send and Email the following documents to the Office of Research & Best Practices: This form, completed, signed and dated, proposal (work plan and budget), and SPR Part II History Report Form 5305.

Proposal Received – Verify the Following

- Personnel – all labor reported as % of effort (none included in direct expenses)
- Sub consultants have submitted a derivation of cost (Sub contract will be required if greater than \$25,000)
- Special Equipment:
 - Verified equipment is necessary for the project
 - Verified equipment is dedicated to the use of this project
 - Verified equipment is prorated for the life of this project
- Provide breakdown of direct expenses over \$2,000 This includes but is not limited to: Lab supplies, Travel expenses, Phone, Fax, Copying, etc.
- Proposed budget is broken down by MDOT fiscal year.

MDOT should be able to determine how expenses were developed from the breakdown provided (ex: Mail –250 letters @ \$9/letter)

Other Elements

- Job number authorization amount has been verified in MFOS
- State Administration Board Questions Form 5305 has been emailed to Research Analyst

State Ad Board Approval required for University Contracts or Authorizations in excess of \$25,000. This should not be considered a complete listing of SAB requirements. Check with the contract analyst for the most up to date rules.

PROJECT MANAGER'S SIGNATURE	DATE
ENGINEER OF OFFICE OF RESEARCH & BEST PRACTICES	DATE

**OFFICE OF RESEARCH AND BEST PRACTICES
 RESEARCH PROJECT DESCRIPTION FORM
 FY YEAR**

COMPLETED BY SUBMITTING AGENCY

PROJECT TITLE					
CRITICAL ISSUE CODE			MDOT PROJECT CATEGORY (See below)		
PROJECT MANAGER					
PROJECT DESCRIPTION					
OBJECTIVE/PURPOSE					
SCOPE					
PRODUCTS/DELIVERABLES					
IMPLEMENTATION PLAN					
SUBMITTING AGENCY					
AGENCY NAME			CONTACT NAME		
TELEPHONE #			FAX #		
EMAIL ADDRESS					
BUDGET INFORMATION					
TOTAL BUDGET (Breakdown by FY)	FY1	FY2	FY3	FY4	INDIRECT COST RATE

CRITICAL ISSUE CODES

- 0 - ADMINISTRATION
- 1 - CONGESTION: Increasingly congested facilities across all modes
- 2 - EMERGENCIES: Vulnerability to terrorist strikes and natural disasters
- 3 - ENERGY & ENVIRONMENT: Extraordinary challenges
- 4 - EQUITY: Burdens on the disadvantaged
- 5 - FINANCE: Inadequate revenue
- 6 - HUMAN & INTELLECTUAL CAPITAL: Inadequate investment in innovation
- 7 - INFRASTRUCTURE: Enormous, aging capital stock to maintain
- 8 - INSTITUTIONS: 20th century institution mismatched to 21st century missions
- 9 - SAFETY: Lost leadership in road safety

MDOT PROJECT CATEGORIES

- 1 - Bridges & Structures
- 2 - Asphalt Pavements
- 3 - Concrete Pavements
- 4 - Traffic & Safety

MDOT 5303 (01/08)
5 - ITS & VII Congestion Management
6 - Environment
7 - Miscellaneous

**OFFICE OF RESEARCH AND BEST PRACTICES
RESEARCH PROJECT DESCRIPTION FORM
FY YEAR 2008**

COMPLETED BY SUBMITTING AGENCY

PROJECT TITLE

Improved Performance of JPCP Overlays

CRITICAL ISSUE CODE

7

MDOT PROJECT CATEGORY (See below)

3

PROJECT MANAGER

David Smiley C&T

PROJECT DESCRIPTION

The study will evaluate the performance characteristics of JPCP, used as concrete overlays for distressed rigid and flexible pavements. In particular, the relationship between temperature and moisture gradients in concrete overlay slabs and their effects on stress development that leads to premature cracking will be investigated. The finding analysis is intended to lead to alternate designs and/or preventive measures that can nullify these effects.

OBJECTIVE/PURPOSE

The study objectives are: (1) Conduct a comprehensive evaluation of past concrete (JPCP) overlay projects, especially MDOT's 2003 I-75 Demonstration Project, to determine the effectiveness of design features and their contribution to distress (cracking) development, (2) Develop new designs or modifications of current designs for concrete overlays that are not prone to causes that initiate premature distress, (3) Determine appropriate preventive actions to extend the service life of future overlays and their respective cost savings and any time gains to construct.

SCOPE

Past research has shown that early cracking of a concrete pavement is related to the severity of temperature curling and moisture warping tendencies. The study will focus on these relationships - study tasks are: (1) Literature review to find the benefits of similar study efforts, (2) Extensive analysis with a dedicated finite element program that predicts stress development in a concrete slab from temperature/moisture effects as part of a multi-layer system, (3) A comprehensive field site investigation to compare empirical results of past projects, (4) Evaluation of alternate designs and/or preventive measures to nullify the adverse tendencies of temperature/moisture changes in concrete slabs.

PRODUCTS/DELIVERABLES

The primary deliverables are study reports and technology transfer to improve MDOT's underlying knowledge base of concrete pavement performance.

IMPLEMENTATION PLAN

The study will hopefully produce the basis for improved concrete overlay designs and construction practices that nullify current causes related to premature slab cracking. These improvements will hopefully reduce design costs and lessen construction time. Implementation will likely include training and purchase of the forementioned finite analysis program by MDOT for future investigative needs.

SUBMITTING AGENCY

AGENCY NAME

University of Michigan

CONTACT NAME

Dr. Will Hansen

TELEPHONE #

734-763-9660

FAX #

734-764-4292

EMAIL ADDRESS

whansen@umich.edu

BUDGET INFORMATION

TOTAL BUDGET (Breakdown by FY) \$269,541	FY1 \$127,983	FY2 \$105,686	FY3 \$35,872	FY4	INDIRECT COST RATE 52%

CRITICAL ISSUE CODES

- 0 - ADMINISTRATION
- 1 - CONGESTION: Increasingly congested facilities across all modes
- 2 - EMERGENCIES: Vulnerability to terrorist strikes and natural disasters
- 3 - ENERGY & ENVIRONMENT: Extraordinary challenges
- 4 - EQUITY: Burdens on the disadvantaged
- 5 - FINANCE: Inadequate revenue
- 6 - HUMAN & INTELLECTUAL CAPITAL: Inadequate investment in innovation

OFFICE OF RESEARCH AND BEST PRACTICES STATE ADMINISTRATIVE BOARD AGENDA QUESTIONS

Answers to these ten questions must be provided in the agenda description for those contracts/authorizations that require State Administrative Board (SAB) approval. Question numbers 5, 7, and 8 do not require a response from the Project Manager (PM). The remaining questions require a written answer from the PM, and should be submitted as part of the document packet to the Contract Services Division.

Spell out all acronyms and use full names of all municipalities. Please do not use abbreviations or jargon. This must make sense to non-MDOT people. Your Contract Administrator (CA) writes the full description in addition to your answers below, and decides how best to use your responses, so please provide more information rather than less whenever possible. The answers you provide below will also be included in the SAB description, but they may be adjusted.

Effective with the May 15, 2007, SAB agenda and all subsequent agendas, the question regarding the Criticality of a project will need to be addressed. Effective with the June 5, 2007, SAB the Criticality must include why the project cannot be deferred to a later Ad Board agenda.

E-mail your responses to these questions as an attachment to the Office of Research and Best Practices.

1. CRITICALITY: (What is the reason this item is deemed critical?) (Example: Independent evaluations of MDOT work zones are critical. Earlier this year a five vehicle crash occurred in one of the regions work zones, resulting in two fatalities. MDOT needs the expertise of this consultant to advise them regarding the quality of MDOT's work zones. As a result, this contract cannot be deferred until a later State Administrative Board agenda.)

2. PURPOSE/BUSINESS CASE: (Paragraph on what the project is, why MDOT wants to do it and what is new - if this is an amendment or revision. This is a brief summary of the scope, and will need the longest answer of all the questions. Use complete sentences.)

3. BENEFIT: (What are all possible benefits of doing this project this way and doing it at this time? Use one or two sentences.)

4. FUNDING SOURCE: XX% Federal Highway Administration Funds and XX% State Restricted Trunkline Funds.

5. COMMITMENT LEVEL: The hourly costs are fixed, however, the number of hours to perform this work has been estimated.

6. RISK ASSESSMENT: (What are all possible costs and problems associated with not doing this project this way and at this time? Use one or two sentences.)

7. COST REDUCTION: Costs in professional services contracts are based on an actual cost plus fixed fee basis not to exceed the contract maximum amount. Hours are negotiated based on needed service.

8. SELECT: (Qualifications - based selection, low bid selection, etc.)

9. NEW PROJECT IDENTIFICATION: (Generally, this answer should be "This is a new project" or "This is not a new project." The PM will ask "Will new physical assets result from this project?" For projects with partially new assets, such as an additional lane, indicate them here.)

10. ZIP CODE: (For the major portion of the project work. If several, use primary one only. For statewide projects, use 48909).

**OFFICE OF RESEARCH AND NATIONAL BEST PRACTICES
STATE ADMINISTRATIVE BOARD AGENDA QUESTIONS**

Answers to these ten questions must be provided in the agenda description for those contracts/authorizations that require State Administrative Board (SAB) approval. Question numbers 5, 7, and 8 do not require a response from the Project Manager (PM). The remaining questions require a written answer from the PM, and should be submitted as part of the document packet to the Contract Services Division.

Spell out all acronyms and use full names of all municipalities. Please do not use abbreviations or jargon. This must make sense to non-MDOT people. Your Contract Administrator (CA) writes the full description in addition to your answers below, and decides how best to use your responses, so please provide more information rather than less whenever possible. The answers you provide below will also be included in the SAB description, but they may be adjusted.

Effective with the May 15, 2007, SAB agenda and all subsequent agendas, the question regarding the Criticality of a project will need to be addressed. Effective with the June 5, 2007, SAB the Criticality must include why the project cannot be deferred to a later Ad Board agenda.

E-mail your responses to these questions as an attachment to the Office of Research and National Best Practices.

1. **CRITICALITY:** (What is the reason this item is deemed critical?) (Example: Independent evaluations of MDOT work zones are critical. Earlier this year a five vehicle crash occurred in one of the regions work zones, resulting in two fatalities. MDOT needs the expertise of this consultant to advise them regarding the quality of MDOT's work zones. As a result, this contract cannot be deferred until a later State Administrative Board agenda.)

Independent evaluations of MDOT restricted Right-Turn-In/Right-Turn-Out Access Management are critical. MDOT needs the expertise of this consultant to advise them of the safety impact of restricting driveway access.

2. **PURPOSE/BUSINESS CASE:** (Paragraph on what the project is, why MDOT wants to do it and what is new - if this is an amendment or revision. This is a brief summary of the scope, and will need the longest answer of all the questions. Use complete sentences.)

To access the magnitudes of the positive and negative impacts of restricting access; evaluate the outcomes of the restrictions in several specific situations where the technique has been (or could have been) applied; and develop general guidelines for when the technique should be considered.

3. **BENEFIT:** (What are all possible benefits of doing this project this way and doing it at this time? Use one or two sentences.)

The department will be provided a written report containing detailed analysis, results, and corresponding data. It will also include guidelines for using turning restrictions along with an indication of likely positive and negative impacts of such restriction in different situations.

4. **FUNDING SOURCE:** XX% Federal Highway Administration Funds and XX% State Restricted Trunkline Funds.

80% Federal Highway Administration Funds and 20% State Restructed Trunkline Funds

5. **COMMITMENT LEVEL:** The hourly costs are fixed, however, the number of hours to perform this work has been estimated.

6. **RISK ASSESSMENT:** (What are all possible costs and problems associated with not doing this project this way and at this time? Use one or two sentences.)

We currently don't have data regarding the safety impact of access management. The department needs to have crash histories of selected sites and several similar sites where the restrictions have been applied compared to sites where the restrictions have been established to compare the safety impact of the access management restriction.

7. **COST REDUCTION:** Costs in professional services contracts are based on an actual cost plus fixed fee basis not to exceed the contract maximum amount. Hours are negotiated based on needed service.

8. **SELECT:** (Qualifications - based selection, low bid selection, etc.)

9. **NEW PROJECT IDENTIFICATION:** (Generally, this answer should be "This is a new project" or "This is not a new project." The PM will ask "Will new physical assets result from this project?" For projects with partially new assets, such as an additional lane, indicate them here.)

This is not a new project.

10. **ZIP CODE:** (For the major portion of the project work. If several, use primary one only. For statewide projects, use 48909).

48909

APPENDIX C: Research Project Management



Michigan Department
Of Transportation
5305 (05/08)

OFFICE OF RESEARCH & BEST PRACTICES MDOT RESEARCH PROJECT REPORT FORM FISCAL YEARS 2008-2009

PROJECT TITLE _____

FUNDING SOURCE: SPR, Part II (____ %) FHWA (____ %) MFUNDS (____ %) NCHRP (____ %) OTHER (____ %)

PROJECT MANAGER _____

CONTRACT/AUTHORIZATION #		PROJECT START DATE	
SPR NUMBER		COMPLETION DATE (Original)	
ORBP NUMBER		COMPLETION DATE (Revised)	
RESEARCH AGENCY			
PRINCIPAL INVESTIGATOR			

FY 2008 QUARTER

1st (Oct 1 – Dec 31) 2nd (Jan 1 – Mar 31) 3rd (Apr 1 – Jun 30) 4th (July 1 – Sept 30)

BUDGET STATUS

Total Budget			FY 2009 Estimated Budget		
TOTAL COST	(Original)*		TOTAL		
	(Revised)**				
EXPENDED FUNDS TO DATE***			SALARIES		
FY 2008 Budget			EQUIPMENT	(Expendable)	
FY FUNDS	(Original)****		EQUIPMENT	(Non-expendable)	
	(Revised)*****		TRAVEL		
FY EXPENDITURE			OTHER		
% PERCENT COMPLETE (By Budget)			PERCENT COMPLETE (By Work)		

PURPOSE AND SCOPE

FISCAL YEAR 2007 ACCOMPLISHMENTS

FISCAL YEAR 2008 ACCOMPLISHMENTS TO DATE

FISCAL YEAR 2009 PROPOSED ACTIVITIES

JUSTIFICATION(S) FOR REVISION(S) (List the approval date for the revision(s))

SUMMARY OF THE IMPLEMENTATION RECOMMENDATION (Required the last year of the project)

*The original authorized total budget amount of the project
 **The authorized total budget amount as revised, if applicable
 *** The project life to date expenditure
 ****The current fiscal year's original budget amount
 *****The revised fiscal year budget amount, if applicable

Michigan Department
Of Transportation
5305 (04/08)

**OFFICE OF RESEARCH & BEST PRACTICES
STATEWIDE PLANNING AND RESEARCH (SPR), PART II
FISCAL YEARS 2008-2009**

PROJECT TITLE Ultra-High Performance Concrete for Michigan Bridges - Material Performance - Phase I

FUNDING SOURCE SPR, Part II

PROJECT MANAGER Roger Till			
CONTRACT/AUTHORIZATION #	2003-0063/A21	PROJECT START DATE	6/9/06
SPR NUMBER	101685	COMPLETION DATE (Original)	6/9/07
ORBP NUMBER		COMPLETION DATE (Revised)	9/9/07
RESEARCH AGENCY	MTU		
PRINCIPLE INVESTIGATOR	Dr. Tess Ahlborn		

FY 2008 QUARTER

1st (Oct 1 – Dec 31) 2nd (Jan 1 – Mar 31) 3rd (Apr 1 – Jun 30) 4th (July 1 – Sept 30)

BUDGET STATUS

Total Budget			FY 2009 Estimated Budget		
TOTAL COST	(Original)*	\$58,916.74	TOTAL		
	(Revised)**				
EXPENDED FUNDS TO DATE***		\$52,946.89	SALARIES		
FY 2008 Budget			EQUIPMENT (Expendable)		
FY FUNDS	(Original)****	\$5,969.85	EQUIPMENT (Non-expandable)		
	(Revised)*****		TRAVEL		
FY EXPENDITURE		0	OTHER		
PERCENT COMPLETE (By Budget)		95%	PERCENT COMPLETE (By Work)		
			95%		

PURPOSE AND SCOPE

This research provides a better understanding of ultra-high performance concrete behavior and its applicability to Michigan bridges. The new material could provide additional strength and long-term durability over current materials used today for highway structures. The project includes experimental testing and analysis with recommendations for implementation.

FISCAL YEAR 2007 ACCOMPLISHMENTS

Experimental studies for material behavior and durability were completed. Analysis was conducted and data compared with previous research. Results are being summarized. In addition, a simplified life cycle cost analysis has been completed. Recommendations are listed for the potential use of UHPC in Michigan highway structures.

FISCAL YEAR 2008 ACCOMPLISHMENTS TO DATE

The final report is in progress (10/1-12/31/07) and will be submitted to the panel for review, then revised prior to final delivery.

FISCAL YEAR 2009 PROPOSED ACTIVITIES

JUSTIFICATION(S) FOR REVISION(S) (Date justification(s) for revision(s))

Specimens of the UHPC are to be subjected to freeze/thaw testing. A time extension is needed for the project because of unforeseeable problems with the freeze/thaw testing machine. Results of the freeze/thaw testing are critical to the recommendations for using the ultra high performance concrete.

*The original authorized total budget amount of the project
 **The authorized total budget amount as revised, if applicable
 *** The project life to date expenditure
 ****The current fiscal year's original budget amount
 *****The revised fiscal year budget amount, if applicable

MICHIGAN DEPARTMENT OF TRANSPORTATION
OFFICE OF RESEARCH AND BEST PRACTICES
QUARTERLY REPORT EVALUATION FORM

Project Manager:

Do you approve of the attached quarterly report form: Yes No

If no, please explain why:

Must be returned to ORBP within 10 working days

MICHIGAN DEPARTMENT OF TRANSPORTATION
OFFICE OF RESEARCH AND BEST PRACTICES
UNIVERSITY CONTRACT
INVOICE APPROVAL FORM

Please review the attached invoice and approve or disapprove.

RETURN TO ANNETTE NEALEY (E020).

Project Manager: R. Till **Invoice #:**

Date Invoice Received:

Date Invoice Sent to PM:

Title of Project:

University/Consultant: Michigan State University

Contract #: 06-0411 **Authorization #:**

Project #:

Notes: Invoice is for the period of .

Project Manager's Signature of Approval:

Date:

University Research Administrator's Signature of Approval:

Date:

Michigan Department of Transportation
Contract No. 2007-
CTC & Associates LLC
Invoice No. MDOT2'
Billing Period: 04-16-08 to 05-15-08

Activities Summary

Contract work area A: Peer Exchange

CTC worked with representatives of the Transportation Research Board to have the electronic version of the Peer Exchange final report posted to the American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee (RAC) Web page (<http://research.transportation.org>). The file went online April 23. On May 15, CTC delivered a draft cover letter from MDOT's Calvin Roberts to accompany the mail distribution of the print version of this report.

Contract work area B: Communications

CTC reviewed and provided comments on the draft of Michigan's Local Technical Assistance Program (Michigan Technological University) upcoming quarterly ORBP newsletter. CTC's Brian Hirt provided additional feedback to Michigan Tech's John Ryyanen to help explain questions from MDOT's Larry Tibbits.

A "Research Successes" book to be distributed at the July 2008 AASHTO RAC national meeting will feature four MDOT research projects. After working with ORBP to identify appropriate projects, CTC reviewed relevant research and documentation, interviewed project managers, wrote draft "research success" highlight documents, and revised these based on input from ORBP as well as from MDOT's Office of Communications. MDOT's submission was completed and delivered by the May 15 due date.

Based on the AASHTO RAC highlight documents, CTC has begun conceptualizing and drafting a slightly longer "Research Spotlight" summary document, which will be an MDOT publication featuring research that has had positive impacts in the state. These documents are under development based on input that Calvin Roberts' provided during a teleconference on April 24.

On May 2, CTC delivered to ORBP a draft Monday Memo item on the Peer Exchange and ORBP's two new FTEs.

Contract work area C: Research Administration Manual

The Research Administration Manual was sent out for review on April 17. Based on comments received internally and externally, MDOT's Angela Nelson shared with Brian Hirt initial feedback collected by ORBP. They discussed sections that will need to be revised, and Brian will make these and other changes after receiving a full list of changes from ORBP.

Contract work area D: ORBP Strategic Plan

In support of Calvin Roberts' assignment as Team Leader of the Strategic Objective Action Team on Best Practices, CTC has begun documenting transportation literature and research related to best practices, creativity, innovation and organizational change. CTC's synthesis of this literature search is in process.

Contract work area F: 2008 Research Program

On May 14, CTC delivered a draft response to questions directed to Calvin related to the Michigan Transportation Research Board, the Transportation Research Institute of Michigan, and how these organizations fit into the next research biennium.

As an introduction to the Research Executive Committee (REC) meeting to be held on August 25, CTC delivered to ORBP on April 25 a draft overview brief for distribution to the REC members highlighting the purpose of the committee and the importance of their attendance and participation in the August meeting.

Meetings

In addition to one-on-one contact as needed to conduct the activities described above, CTC was part of the following meetings and teleconferences:

- A teleconference on April 24 with MDOT's Calvin Roberts and Angela Nelson and CTC's Pat Casey and Brian Hirt

PAYMENT VOUCHER SUMMARY FORM (Rev 8/2006)

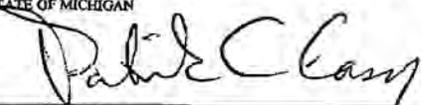
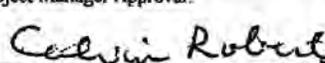
Contract Services Division

C&T

MTS

Design

T&S

1. MDOT CONTRACT NO.: 2007-		2. AUTHORIZATION LETTER/NUMBER:	
3. DATE: 5/24/2008	4. FEDERAL I.D. NUMBER:		5. MAIL CODE:
6. PAYEE NAME & REMITTANCE ADDRESS: CTC & Associates LLC 4805 Goldfinch Dr. Madison, Wisconsin 53714		7. PROJECT/SERVICE DESCRIPTION: Technical Communication Services	
CONTACT PERSON (PLEASE PRINT): Patrick C. Casey		8. CONTROL SECTION NUMBER:	
10. CONSULTANT CERTIFICATION: I HEREBY CERTIFY THAT THIS INVOICE IS A PROPER CHARGE TO THE STATE OF MICHIGAN 		9. SERVICE PERIOD: (PERIOD FOR AUTHORIZATION) FROM: 7/20/2007 TO: 9/19/2008	
11. VENDOR INVOICE NUMBER: MDOT.		12. MDOT PROJECT MANAGER: Calvin Roberts	
13. SERVICE MAXIMUM: \$	14. INVOICED TO DATE: \$	16. JOB NUMBER and AMOUNT (Include all suffixes)	
15. REMAINING BALANCE \$			
17. BILLING PERIOD: 4-16-2008 to 5-15-2008			
18. % COMPLETE TO DATE:	66%		
19. HOURS THIS PERIOD:	74.75		
20. FIXED FEE THIS PERIOD:	NA		
21. INVOICE AMOUNT:	\$		
22. RETAINAGE AMOUNT:	\$0.00		
23. PAY AMOUNT:	\$		
FOR CONTRACT SERVICES DIVISION USE ONLY			
Receiver Number:	Project Manager:	Billing Number:	
Date Invoice Received:	Project Manager Approval:	Date:	
Partial/Final Payment:		5/28/08	
Purchase Order Number (DPO):	Voucher ID#:		
A/P Date:	Paid Date:		
CSD Approval:			

APPENDIX C: Research Project Management



CTC & Associates LLC
 Technical Communications Services for
 Michigan Department of Transportation
 Contract NO. 2007
 Invoice NO. MDOT2
 Billing Period: 4-16-2008 to 5-15-2008

Detail of Expenses

Personnel	Week (begin Mon.)	Hours	Rate	Subtotal	Total
Principal	4/24/2008	1.5	\$	\$	
	4/28/2008	1	\$	\$	
	5/7/2008	1	\$	\$	\$
Senior Editor	4/17/2008	1.25	\$	\$	
	4/25/2008	0.75	\$	\$	
	5/2/2008	1	\$	\$	\$
Researcher/Writer	4/16/2008	5	\$	\$	
	4/17/2008	4	\$	\$	
	4/18/2008	2	\$	\$	
	4/21/2008	6.75	\$	\$	
	4/23/2008	3.25	\$	\$	
	4/24/2008	7.5	\$	\$	
	4/25/2008	2.25	\$	\$	
	4/28/2008	6.25	\$	\$	
	4/29/2008	3	\$	\$	
	4/30/2008	5.25	\$	\$	
	5/2/2008	1.25	\$	\$	
	5/5/2008	2.75	\$	\$	
	5/6/2008	1.5	\$	\$	
	5/7/2008	2	\$	\$	
	5/8/2008	1.5	\$	\$	
	5/9/2008	0.75	\$	\$	
	5/12/2008	2	\$	\$	
5/13/2008	3.25	\$	\$		
5/14/2008	4.75	\$	\$		
5/15/2008	3.25	\$	\$	\$	

Total Labor 74.75 \$
 Direct Costs (see attached) \$
Invoice Total \$

CTC & Associates LLC
Technical Communications Services for
Michigan Department of Transportation
Contract NO.

Index:

PCA: /

OB: /

PROJ#:

Phase:

Invoice NO. M1

Billing Period: 11-16-2007 to 12-15-2007

Detail of Direct Costs

Peer Exchange Meeting:			
(date)	(expense)	(name)	<i>Amount</i>
11/5/2007	Binders and tabs from Office Max	CTC & Associates	
11/6/2007	Binders from Staples	CTC & Associates	
11/6/2007	Color copies for binder covers and spines from Office Max	CTC & Associates	
11/8/2007	Copies for binders at Staples in Madison	CTC & Associates	
11/13/2007	Fedex shipping of binders	CTC & Associates	
11/13/2007	Fedex shipping of binders	CTC & Associates	
12/3/2007	Copies for meeting at Kinko's in Lansing	CTC & Associates	
12/3/2007	Lunch (\$7.25 x 3 people)		
12/3/2007	Team dinner at the Sheraton	CTC & Associates	
12/4/2007	Breakfast catering	CTC & Associates	
12/4/2007	Lunch catering	CTC & Associates	
12/4/2007	Dinner (\$16.50 x 3 people)		
12/5/2007	Lunch catering	CTC & Associates	
12/5/2007	Dinner (\$16.50 x 2 people)		
12/5/2007	Team dinner at the Cadillac Club	CTC & Associates	
12/6/2007	Lunch catering	CTC & Associates	
12/6/2007	Breakfast catering	CTC & Associates	
12/6/2007	Gas for rental car	CTC & Associates	
12/6/2007	Parking		
12/6/2007	Parking		
12/6/2007	Car rental		
12/6/2007	Parking		
12/6/2007	Dinner		
12/3 and 12/6/2007	Mileage (134 x \$.485)		
12/3-12/5/07	Internet charges in hotel room		
12/3-12/5/07	Internet charges in hotel room		
12/4-12/5/07	Internet charges in hotel room		

Total Direct Costs: \$

CTC & Associates LLC
Technical Communications Services for
Michigan Department of Transportation
Contract NO. 21
Invoice NO. MD1
Billing Period: 10-17-2007 to 11-15-2007

Detail of Direct Costs

Project Managers Meeting:			
(date)	(expense)	(name)	Amount
11/12/2007	Mileage (67 x .485 = \$64.99)		\$
11/12/2007	Airfare		\$
11/12/2007	Lodging		\$
11/13/2007	Airfare		\$
11/13/2007	Airfare		\$
11/13/2007	Car Rental		\$
11/13/2007	Lodging		\$
11/13/2007	Lodging		\$
11/13/2007	Lodging		\$
11/13/2007	Meals (lunch & dinner)		\$
11/13/2007	Meals (lunch & dinner)		\$
11/13/2007	Meals (lunch & dinner)		\$
11/14/2007	Meals (lunch & dinner)		\$
11/14/2007	Meals (lunch & dinner)		\$
11/14/2007	Meals (dinner)		\$
11/14/2007	Mileage (67mi x .485 = \$64.99)		\$
11/14/2007	Parking		\$

Total Direct Costs: \$

Payment History

Project Manager:

N/A

Invoice No. / Date	Amount Billed	Total Billed	Amount Retained	Total Retained	Amount Paid	Contract Balance	Fixed Fee	Total Fixed Fee	Fixed Fee Balance	% Billed	% Complete	DPO
1/19/2004 1	\$1,488.70	\$1,488.70	\$0.00	\$0.00	\$1,488.70	\$443,307.71	\$168.22	\$168.22	\$43,526.20	0.33%	2.0%	N5201877
1/30/2004 2	\$3,409.09	\$4,897.79	\$0.00	\$0.00	\$3,409.09	\$440,898.62	\$336.43	\$504.65	\$43,189.77	1.10%	6.0%	N5201877
1/12/2005 3	\$5,633.33	\$10,531.12	\$0.00	\$0.00	\$5,633.33	\$435,265.29	\$588.75	\$1,093.40	\$42,601.02	2.36%	13.0%	N5203773
2/6/2005 4	\$3,075.09	\$13,606.21	\$0.00	\$0.00	\$3,075.09	\$432,190.20	\$336.43	\$1,429.83	\$42,264.59	3.05%	17.0%	N5203773
3/1/2005 5	\$1,581.49	\$15,187.70	\$0.00	\$0.00	\$1,581.49	\$430,608.71	\$168.22	\$1,598.05	\$42,096.37	3.41%	19.0%	N5203773
4/10/2005 6	\$8,741.04	\$23,928.74	\$0.00	\$0.00	\$8,741.04	\$421,867.67	\$841.08	\$2,439.13	\$41,255.29	5.37%	29.0%	N5203773
5/3/2005 7	\$4,107.19	\$28,035.93	\$0.00	\$0.00	\$4,107.19	\$417,760.48	\$420.54	\$2,859.67	\$40,834.75	6.29%	34.0%	N5203773
6/2/2005 8	\$2,885.65	\$30,921.58	\$0.00	\$0.00	\$2,885.65	\$414,874.83	\$232.32	\$3,111.99	\$40,582.43	6.94%	37.0%	N5203773
7/7/2005 9	\$3,285.75	\$34,207.33	\$0.00	\$0.00	\$3,285.75	\$411,589.08	\$336.43	\$3,448.42	\$40,246.00	7.67%	41.0%	N5203773
8/24/2005 10	\$1,853.54	\$36,060.87	\$0.00	\$0.00	\$1,853.54	\$409,735.54	\$168.22	\$3,616.64	\$40,077.78	8.09%	43.0%	N5203773
9/23/2005 11	\$2,674.98	\$38,735.85	\$0.00	\$0.00	\$2,674.98	\$407,060.56	\$232.32	\$3,868.96	\$39,825.46	8.69%	46.0%	N5203773
10/25/2005 12	\$3,707.08	\$42,442.93	\$0.00	\$0.00	\$3,707.08	\$403,353.48	\$336.43	\$4,205.39	\$39,489.03	9.52%	50.0%	N5203773
11/16/2005 13	\$4,423.19	\$46,866.12	\$0.00	\$0.00	\$4,423.19	\$398,930.29	\$420.54	\$4,625.93	\$39,068.49	10.51%	55.0%	N5203773
12/7/2005 14	\$2,055.40	\$48,921.52	\$0.00	\$0.00	\$2,055.40	\$396,874.89	\$370.07	\$4,996.00	\$38,698.42	10.97%	59.4%	N5203773
1/10/2006 15	\$5,054.74	\$53,976.26	\$0.00	\$0.00	\$5,054.74	\$391,820.15	\$504.65	\$5,500.65	\$38,193.77	12.11%	65.4%	N5203773
2/7/2006 16	\$5,825.54	\$59,801.80	\$0.00	\$0.00	\$5,825.54	\$385,994.61	\$588.75	\$6,089.40	\$37,605.02	13.41%	72.4%	N5203773
3/8/2006 17	\$7,244.58	\$67,046.38	\$0.00	\$0.00	\$7,244.58	\$378,750.03	\$706.50	\$6,795.90	\$36,898.52	15.04%	80.8%	N5203773
4/20/2006 18	\$8,668.36	\$75,714.74	\$0.00	\$0.00	\$8,668.36	\$370,081.67	\$689.69	\$7,485.59	\$36,208.83	16.98%	89.0%	N5203773
5/11/2006 19	\$5,207.86	\$80,922.60	\$0.00	\$0.00	\$5,207.86	\$364,873.81	\$664.45	\$8,150.04	\$35,544.38	18.15%	96.9%	N5203773
6/7/2006 20	\$4,830.85	\$85,753.45	\$0.00	\$0.00	\$4,830.85	\$360,042.96	\$176.62	\$8,326.66	\$35,167.76	19.24%	99.0%	N5203773
8/15/2006 21	\$6,235.34	\$91,988.79	\$0.00	\$0.00	\$6,235.34	\$353,807.62	\$1,155.03	\$9,481.69	\$34,212.73	20.63%	99.0%	N6205954
9/13/2006 22	\$9,204.29	\$101,193.08	\$0.00	\$0.00	\$9,204.29	\$344,603.33	\$858.07	\$10,339.76	\$33,354.66	22.70%	72.3%	N6205954
10/3/2006 23	\$8,754.40	\$109,947.48	\$0.00	\$0.00	\$8,754.40	\$335,848.93	\$529.14	\$10,868.90	\$32,825.52	24.66%	76.0%	N6205954
11/13/2006 24	\$5,922.88	\$115,870.36	\$0.00	\$0.00	\$5,922.88	\$329,926.05	\$600.65	\$11,469.55	\$32,224.87	25.99%	76.0%	N6205954
12/4/2006 25	\$4,611.97	\$120,482.33	\$0.00	\$0.00	\$4,611.97	\$325,314.08	\$257.42	\$11,726.97	\$31,967.45	27.03%	82.0%	N6205954
1/10/2007 26	\$3,167.00	\$123,649.33	\$0.00	\$0.00	\$3,167.00	\$322,147.08	\$143.01	\$11,869.98	\$31,824.44	27.74%	83.0%	N6205954
2/7/2007 27	\$4,789.97	\$128,439.30	\$0.00	\$0.00	\$4,789.97	\$317,357.11	\$429.04	\$12,299.02	\$31,395.40	28.81%	86.0%	N6205954
3/9/2007 28	\$6,678.38	\$135,117.68	\$0.00	\$0.00	\$6,678.38	\$310,678.73	\$1,071.48	\$13,370.50	\$30,323.92	30.31%	30.6%	N6205954
4/9/2007 29	\$7,595.69	\$142,713.37	\$0.00	\$0.00	\$7,595.69	\$303,083.04	\$742.81	\$14,113.31	\$29,581.11	32.01%	32.3%	N6205954
5/3/2007 30	\$8,474.36	\$151,187.73	\$0.00	\$0.00	\$8,474.36	\$294,608.68	\$873.89	\$14,987.20	\$28,707.22	33.91%	34.3%	N6205954
6/7/2007 31	\$5,508.24	\$156,695.97	\$0.00	\$0.00	\$5,508.24	\$289,100.44	\$524.33	\$15,511.53	\$28,182.89	35.15%	35.5%	N6205954
7/18/2007 32	\$7,662.71	\$164,358.68	\$0.00	\$0.00	\$7,662.71	\$281,437.73	\$742.80	\$16,254.33	\$27,440.09	36.87%	37.2%	N6205954
8/6/2007 33	\$6,402.47	\$170,761.15	\$0.00	\$0.00	\$6,402.47	\$275,035.26	\$655.42	\$16,909.75	\$26,784.67	38.30%	38.7%	N6205954
9/18/2007 34	\$5,472.22	\$176,233.37	\$0.00	\$0.00	\$5,472.22	\$269,563.04	\$546.18	\$17,455.93	\$26,238.49	39.53%	40.0%	N6205954
10/16/2007 35	\$8,431.99	\$184,665.36	\$0.00	\$0.00	\$8,431.99	\$261,131.05	\$808.35	\$18,264.28	\$25,430.14	41.42%	41.8%	N6205954
11/5/2007 36	\$7,471.84	\$192,137.20	\$0.00	\$0.00	\$7,471.84	\$253,659.21	\$786.50	\$19,050.78	\$24,643.64	43.10%	43.6%	N6205954
12/4/2007 37	\$6,476.06	\$198,613.26	\$0.00	\$0.00	\$6,476.06	\$247,183.15	\$611.72	\$19,662.50	\$24,245.42	44.55%	45.0%	N6205954
1/4/2008 38	\$7,706.42	\$206,319.68	\$0.00	\$0.00	\$7,706.42	\$239,476.73	\$786.50	\$20,449.00	\$23,245.42	46.28%	46.8%	N6205954
2/12/2008 39	\$5,986.91	\$212,306.59	\$0.00	\$0.00	\$5,986.91	\$233,489.82	\$576.76	\$21,023.76	\$22,668.66	47.62%	48.1%	N6205954
3/12/2008 40	\$6,137.74	\$218,444.33	\$0.00	\$0.00	\$6,137.74	\$227,352.08	\$607.36	\$21,633.12	\$22,061.30	49.00%	49.51	N6205954
4/12/2008 41	\$7,777.05	\$226,221.38	\$0.00	\$0.00	\$7,777.05	\$219,575.03	\$803.97	\$22,437.09	\$21,257.33	50.75%	51.35	N6205954
5/12/2008 42	\$8,507.03	\$234,728.41	\$0.00	\$0.00	\$8,507.03	\$211,068.00	\$1,053.04	\$23,490.13	\$20,204.29	52.65%	53.76	N6205954
Total Amount Paid:	\$184,665.36		Latest Authorized Amount:		\$445,796.41		Fixed Fee:		\$43,694.42		Exp: 5/3/2009	

5/14/2008

401 S. Washington Square, Suite 103
Lansing, MI 48933

INVOICE

Michigan Department of Transportation
State Transportation Building, P.O. Box 30050
Lansing, MI 48909

Invoice no. 4840542
Project no.
Invoice date 05/01/08
Period ending 04/25/08
Contract no. 2004-0226 10
Final billing /Partial billing

Attn:

Research management services for a portion of MDOT's University contract research program

	CS	N/A	JN	N/A		
Contract no.						
DIRECT LABOR		(See Attached)			\$	3,069.00
Overhead and Burden		142.88%			\$	4,384.99
					\$	<u>7,453.99</u>
Profit	53.76%		x fixed fee max. of	\$43,694.42		
				\$23,490.12		
			Less Previously Invoiced	\$22,437.08		
			Fixed Fee This Invoice		\$	<u>1,053.04</u>
Total Direct Labor	(NSR)				\$	<u>8,507.03</u>
DIRECT COSTS						
SUBCONSULTANT EXPENSES		(See Attached)			\$	0.00
DIRECT EXPENSES		(See Attached)			\$	<u>0.00</u>
Total Direct Costs					\$	<u>0.00</u>
Sub-total					\$	8,507.03
Less Retainage					\$	0.00
TOTAL AMOUNT DUE					\$	<u><u>8,507.03</u></u>

Contract Amount \$445,796.41
Amount Billed-to-Date \$234,728.42
Amount Remaining \$211,067.99

Certified true and correct to the best of my knowledge



MONTHLY PROGRESS REPORT # 38

Research Project Management

Period Ending – April 2008

Date 05/01/2008

Plan Completion Date:



Authorization Expiration Date: 5/03/2009

A. Work Accomplished During the Previous Month

Total of 66hrs. for the month.

Approximately 44% of time was devoted to Project Manager duties for the following four authorized active projects:

Project #101739 UM: Discussed lab testing results and work progress on a revised work plan, per last progress review meeting.

Project #102001 MSU: Preparation and attendance at meeting between PI and RAP to discuss progress with interim plan for data comparison. Also, there was post-meeting discussion amongst RAP members.

Project #101999 MSU: As for previous month, coordinate continuing data search by MSU of MDOT's construction project files. Preparation and attendance at quarterly progress meeting.

Project #101997 MTU: As in March, discussion with PI and communication with PI on preparation of work plan for phase II of study.

About 5% of time as RAP participant for MSU project #102018.

About 34% of time spent on project initiation for FY 08, particularly UM project #102085 involving proposal and budget development by PI.

About 12% of time was attributed to continuing work on special project involving an old research pavement project (European Pavement on I-75) to prepare a report on its current performance and document current work improvements with active PM project.

About 5% of time to advise C&T research personnel in their work at their request.

B. Anticipated Work Items for the Upcoming Month

1. Continue project manager duties on projects previously discussed under work accomplished, plus others. Also, expect submittal of draft final report for UM project #101998 for technical review and general acceptance. Also, expect a draft work plan for review for MTU project #101997.
2. Continue assistance with program oversight and development of unauthorized FY 08 projects. Plus, possible participation as RAP member (projects where I'm not PM).
3. Possible general research work and consulting assistance, as directed.

C. Real or Anticipated Problems on the Project

None

D. Updated Detailed Project Schedule (Attachment "A")

1. No changes required.

E. Items Required from MDOT

1. None at this time

F. Copy of Verbal Contact Records for the Period (Attachment "B")

1. None at this time

EXAMPLE

APPENDIX C: Research Project Management

June 3, 2008

Michigan Department of Transportation
 Office of Research and National Best Practices
 8885 Ricks Road
 Lansing, Michigan 48909

Re:
 MDOT Project No.:
 Invoice period: 5/1/08-5/31/08
 MHI project #: 06022
 Invoice #: 16

Summary

1 Direct Labor

Name	Hours	Rate (\$/hr)	Total
	62	\$93.79	\$5,814.98
	146	\$93.79	\$13,693.34
	25	\$32.19	\$804.75
	0	\$62.10	\$0.00
	116	\$52.97	\$6,144.52
	11	\$60.29	\$663.19
	101	\$48.31	\$4,879.31
	0	\$36.37	\$0.00
	7	\$21.55	\$150.85
	32	\$15.15	\$484.80
	0	\$41.11	\$0.00
Subtotal	500		\$32,635.74

2 Overhead Costs
 160.82% times Direct Labor \$52,484.80

3 Fixed Fee
 11.00% of items 1 and 2 \$9,363.26

4 Cost of Money
 1.32% times Direct Labor \$430.79

5 Direct Costs:

Postage and Delivery	\$0.00
Equipment	\$0.00
Meeting Costs	\$24.15
Telephone & Internet	\$479.95
Reprographics	\$0.00
Subconsultant	\$0.00

\$21,772.34
 \$5,207.58
 \$0.00
 \$0.00

Travel costs:

Car	\$291.85
Gasoline	\$0.00
Parking & Tolls	\$127.00
Mileage	\$79.00
Air	\$1,989.00
Hotel	\$1,050.41
M & IE	\$248.00

Total Direct Costs \$31,269.28

6 TOTAL AMOUNT DUE

Total of items 1, 2, 3, 4 and 5 \$126,183.87

A. Work Performed in Reporting Period

Work Performed in Reporting Period
<p>Task 1 – Project Management</p> <ul style="list-style-type: none"> ▪ Performed ongoing project management activities ▪ Discussed, as needed, project with MDOT ▪ Supported MDOT in discussions with potential VII data providers and users ▪ Obtained access to USDOT/VIIC POC VII probe data from Booz-Allen ▪ Worked with MDOT, RCOC, and Orbital (Orbital Sciences Corporation) to get access to SEMSIM data
<p>Task 2 – Concept of Operations</p> <ul style="list-style-type: none"> ▪ Task complete; no activity
<p>Task 3 – Functional Requirements</p> <ul style="list-style-type: none"> ▪ Issued Final System Architecture Description
<p>Task 4 – Design</p> <ul style="list-style-type: none"> ▪ Completed design for First Prototype ▪ Continued documentation of system design
<p>Task 5 – First Prototype Suite</p> <ul style="list-style-type: none"> ▪ Continued collection of Chrysler fleet data ▪ Continued collection of MITS Center data ▪ Demonstrated integration of POC data with Chrysler and fixed detector data ▪ Updated presentation of prototype data based on MDOT feedback ▪ Supported MDOT presentation at ITS Michigan
<p>Task 6 – Second Prototype Suite</p> <ul style="list-style-type: none"> ▪ Began planning for applications and interfaces needed for second prototype ▪ Participated in and supported TMC of the Future conference calls
<p>Task 7 – Full Suite Prototype Application</p> <ul style="list-style-type: none"> ▪ No Activity
<p>Task 8 – Final Suite Prototype Application</p> <ul style="list-style-type: none"> ▪ No Activity
<p>Task 9 – Final Documentation and Reports</p> <ul style="list-style-type: none"> ▪ No Activity

B. Work Planned for Next Reporting Period

Work Planned for Next Reporting Period
<p>Task 1 – Project Management</p> <ul style="list-style-type: none"> ▪ Perform ongoing project management activities as required ▪ Support MDOT in discussions with potential VII data providers and users ▪ Obtain access to SEMSIM data
<p>Task 2 – Concept of Operations</p> <ul style="list-style-type: none"> ▪ Task complete; no activity planned
<p>Task 3 – Functional Requirements</p> <ul style="list-style-type: none"> ▪ Task complete; no activity planned
<p>Task 4 – Design</p> <ul style="list-style-type: none"> ▪ Continue specification of computational algorithms based on functional requirements <ul style="list-style-type: none"> ○ Traffic management ○ Weather response ○ Asset management ▪ Collect and integrate user feedback on design of user interfaces ▪ Prepare draft System Design Description
<p>Task 5 – First Prototype Suite</p> <ul style="list-style-type: none"> ▪ Develop computational services for traffic data aggregation on roadway segments ▪ Continue collection of Chrysler fleet data ▪ Continue collection of MITS Center data ▪ Prepare Software Kit for First Prototype
<p>Task 6 – Second Prototype Suite</p> <ul style="list-style-type: none"> ▪ Identify key development topics for second prototype ▪ Complete input services for USDOT/VIIC POC probe data ▪ Develop input service for SEMSIM probe data ▪ Continue support for TMC of the Future
<p>Task 7 – Full Suite Prototype Application</p> <ul style="list-style-type: none"> ▪ No Activity Planned
<p>Task 8 – Final Suite Prototype Application</p> <ul style="list-style-type: none"> ▪ No Activity Planned
<p>Task 9 – Final Documentation and Reports</p> <ul style="list-style-type: none"> ▪ No Activity Planned

C. Problems Encountered or Anticipated With Recommended Solutions

No problems identified.

EXAMPLE

Michigan Department
Of Transportation
5306 (03/08)

**OFFICE OF RESEARCH & BEST PRACTICES
STATEWIDE PLANNING & RESEARCH, PART II
RESEARCH PROJECT CHANGE REQUEST FORM**

PROJECT TITLE	
PROJECT MANAGER	PRINCIPAL INVESTIGATOR
RESEARCH AGENCY	RESEARCH MANAGER
CONTRACT/AUTHORIZATION #	SPR NUMBER
ORBP NUMBER	APPROVED TOTAL COST
PROJECT START DATE	APPROVED COMPLETION DATE

CHANGE REQUEST(S)

CHANGE IN STAFF

ORIGINAL STAFF PERSON	POSITION TITLE	EFFECTIVE DATE OF CHANGE
NEW STAFF PERSON		
REASON/JUSTIFICATION FOR CHANGE		

CHANGE IN SCOPE OF WORK

REQUESTED CHANGE
REASON/JUSTIFICATION FOR CHANGE

CHANGE IN COST

COST INCREASE/DECREASE	NEW COST
REASON/JUSTIFICATION FOR CHANGE	

CHANGE IN COMPLETION DATE

REASON/JUSTIFICATION FOR CHANGE	NEW COMPLETION DATE REQUESTED
---------------------------------	-------------------------------

PROJECT MANAGER SIGNATURE	DATE
ENGINEER OF RESEARCH AND BEST PRACTICES SIGNATURE	DATE

FHWA APPROVAL NEEDED? NO YES, If yes, complete the following

DATE FHWA APPROVAL REQUEST WAS SENT	DATE FHWA APPROVAL WAS RECEIVED
-------------------------------------	---------------------------------

CC: Project File

Michigan Department
of Transportation
0325 (08/04)

**SERVICE VENDOR
PERFORMANCE EVALUATION**

CONTRACT NO.

AUTHORIZATION NO.
(if applicable)

Page 1 of 4

Notes to Evaluator: Rate service vendor from 1 to 10. Behavioral statements are provided for ratings of 10, 8, 5, and 1 as guidance. Comments must be given for all questions rated. A rating of 7 or less must be documented in the project files. Choose N/A for items which do not apply.

The evaluator is to send the original to the contract administration office, with copies to the vendor being evaluated, the evaluator's project file, and Contract Services Division.

Note to Vendor: Any appeal of this evaluation must be filed within 14 calendar days of the signature date on this evaluation form. The appeal process details are available in Guidance Document Number 10157, Service Vendor Performance Evaluation Appeal Process.

ORGANIZATION --Select--	VENDOR NAME <input type="checkbox"/> Prime <input type="checkbox"/> Sub
VENDOR PROJECT MANAGER	SPECIAL PROJECT TYPE --Select--
PREQUALIFICATION CLASSIFICATION --Select--	WORK TYPE --Select--
EVALUATION TYPE --Select--	PROJECT COMPLEXITY --Select--

PROJECT ROUTE AND DESCRIPTION		
CONTROL SECTION	EVALUATION JOB NO.	CONTROLLING JOB NO.
SERVICE COMPLETION DATE	SERVICE ACCEPTANCE DATE	COST OF SERVICE

RATING (Whole Number)	Indicate your appraisal of the Vendor's performance and add comments for each question.
	Project Management
--Select--	<p>1. Was the vendor in control of the services provided to MDOT? Rating Description</p> <p>10 - Vendor displayed outstanding knowledge and control of the services and provided superior advice and counsel to the department that improved MDOT's project approach, including but not limited to communication with the public, coordination with local governments, or the project management considerations.</p> <p>8 - Vendor was always knowledgeable and in control of the services and clearly met the department's expectations.</p> <p>5 - Vendor was usually knowledgeable and in control but required guidance from department personnel.</p> <p>1 - Vendor demonstrated no control over the services and the project was harmed.</p> <p>Comments</p>
--Select--	<p>2. Did the vendor communicate adequately with the department staff? Rating Description</p> <p>10 - Vendor provided superior communications with the department, communicating in a thorough, concise and timely manner, and clearly exceeded the department's expectations by identifying problems and helping to define choices faced by the department.</p> <p>8 - Vendor always communicated with the department in a thorough, concise and timely manner and clearly met the department's expectations.</p> <p>5 - Vendor usually communicated with the department in a thorough, concise and timely manner. Department personnel occasionally had to initiate and clarify communications to move project forward.</p> <p>1 - Communication was lacking and the project was harmed.</p> <p>Comments</p>

RATING (Whole Number)	Indicate your appraisal of the Vendor's performance and add comments for each question. (continued)
--Select--	<p>3. Was the vendor responsive to requests from the department, including requests for information and requests to make changes in the work?</p> <p>Rating Description</p> <ul style="list-style-type: none"> 10 - Vendor anticipated the need for information or changes and proactively initiated action. 8 - Vendor was always responsive and promptly complied with all requests. 5 - Vendor was usually responsive or was occasionally resistant to requests for information or minor changes. 1 - Vendor was unresponsive and the project was harmed. <p>Comments</p>
Resources	
--Select--	<p>4. Did the vendor have competent and sufficient personnel with the technical expertise needed to successfully complete the project?</p> <p>Rating Description</p> <ul style="list-style-type: none"> 10 - Vendor provided personnel with superior qualifications who were able to complete the scope of services with minimal guidance or expertise given by MDOT. 8 - Vendor always provided personnel who were able to complete the scope of services with little more than the normal guidance or expertise given by MDOT. 5 - Vendor usually provided personnel who were able to complete the scope of services with little more than the normal guidance or expertise given by MDOT. Occasionally, the vendor's personnel demonstrated lack of knowledge and skill. 1 - Vendor did not provide competent and sufficient personnel to adequately perform the scope of services and the project was harmed. <p>Comments</p>
--Select--	<p>5. Did the vendor have adequate and sufficient resources other than personnel (equipment, manuals, etc.) to fulfill the requirements of the scope of services?</p> <p>Rating Description</p> <ul style="list-style-type: none"> 10 - All resources exceeded requirements to perform the scope of services. 8 - All resources met requirements to adequately perform the scope of services. 5 - Resources usually were adequate and sufficient to perform the scope of services. On some occasions, the vendor had to be notified to provide resources to meet requirements. 1 - Vendor did not have adequate and sufficient resources to perform the scope of services and the project as harmed. <p>Comments</p>
Work Performance	
--Select--	<p>6. Did the vendor follow good safety practices?</p> <p>Rating Description</p> <ul style="list-style-type: none"> 10 - Vendor took the initiative to ensure the safety and health of the employees. Safety equipment and devices were in excellent condition and were used by all vendor employees. 8 - Safety equipment and devices were in good condition and were used by vendor's employees. Vendor immediately carried out any requests by MDOT for changes in safety measures. 5 - Vendor usually ensured the safety and health of employees. Safety equipment and devices were in good condition and were used by vendor's employees. Vendor carried out requests by MDOT for changes in safety measures after written notification. 1 - Vendor's safety and health practices were unsatisfactory. MDOT imposed stoppages of work for safety issues. Vendor reluctantly made changes requested by MDOT or did not make the change. <p>Comments</p>

RATING (Whole Number)	Indicate your appraisal of the Vendor's performance and add comments for each question. (continued)
--Select--	<p>7. Did the vendor provide a quality work product?</p> <p>Rating Description</p> <p>10 - Vendor's work product was excellent (complete, accurate, and professional in appearance) and MDOT requirements were exceeded.</p> <p>8 - Vendor's work product was acceptable and MDOT requirements were met without a need for MDOT to identify deficiencies.</p> <p>5 - Vendor's work product met minimum requirements but required notification of deficiencies from MDOT.</p> <p>1 - Vendor's work product was unacceptable and clearly did not meet MDOT requirements, and the project was harmed.</p> <p>Comments</p>
--Select--	<p>8. Did the vendor properly notify and coordinate work with other affected parties such as utility companies, property owners, local units of government, and other MDOT areas?</p> <p>Rating Description</p> <p>10 - Vendor was proactive in initiating and executing notifications and project coordination activities.</p> <p>8 - Vendor always provided proper notification and coordinated with each affected party.</p> <p>5 - Vendor usually coordinated with, or gave proper notification to, all affected parties.</p> <p>1 - Vendor did not provide proper notification nor coordinate with affected parties, and the project was harmed.</p> <p>Comments</p>
--Select--	<p>9. Did the vendor meet the applicable environmental requirements, such as documentation, enforcement, obtaining permits, studies, etc.?</p> <p>Rating Description</p> <p>10 - Vendor was proactive in initiating and executing activities to meet environmental requirements without prompting by MDOT.</p> <p>8 - Vendor always met environmental requirements.</p> <p>5 - Vendor usually met environmental requirements.</p> <p>1 - Vendor's failure to meet environmental requirements harmed the project.</p> <p>Comments</p>
--Select--	<p>10. Did the vendor meet deliverable date requirements?</p> <p>Rating Description</p> <p>10 - Acceptable deliverables were always received more than 15% ahead of schedule.</p> <p>8 - Acceptable deliverables were always within the schedule.</p> <p>5 - Acceptable deliverables were usually received no more than 10% behind schedule.</p> <p>1 - Acceptable deliverables were usually received more than 25% behind schedule.</p> <p>Comments</p>
--Select--	<p>11. To the best of my knowledge, did the vendor comply with applicable federal, state and local laws and regulations and/or MDOT guidelines and procedures? This includes, but is not limited to, compliance with prompt payment to subvendors (completing attachment G), submitting accurate and timely invoices, and responding to contractual issues.</p> <p>Rating Description</p> <p>10 - Vendor displayed outstanding knowledge of applicable federal, state and/or local laws and regulations. In addition, the vendor was proactive in assuring they complied with MDOT guidelines and procedures and therefore needed no MDOT intervention.</p> <p>8 - Vendor always knew and complied with applicable federal, state and/or local laws and regulations. In addition, the vendor always followed MDOT guidelines and procedures with normal guidance or expertise given by MDOT.</p> <p>5 - Vendor was usually knowledgeable of applicable federal, state and/or local laws and regulations, but MDOT had to intervene occasionally to assure compliance. The vendor usually followed MDOT guidelines and procedures but needed more than the normal guidance or expertise by MDOT. Any problems were corrected immediately upon notification by MDOT.</p> <p>1 - Vendor failed to comply with applicable federal, state and/or local laws and regulations and/or the vendor failed to comply with MDOT guidelines and procedures.</p> <p>Comments</p>

APPENDIX C: Research Project Management

RATING (Whole Number)	Indicate your appraisal of the Vendor's performance and add comments for each question. (continued)
	Subvendor Management
--Select--	<p>12. Did the vendor coordinate work with subvendor's work, exercise authority over subvendors, provide notice of subvendor work schedule, and ensure that subvendors were in compliance with contract requirements?</p> <p>Rating Description</p> <p>10 - Vendor was proactive in exercising authority, coordinating and monitoring work operations of the subvendors to ensure acceptable completion of the scope of services.</p> <p>8 - Vendor always exercised authority, coordinated and monitored work operations with their subvendors to ensure acceptable completion of the scope of services.</p> <p>5 - Vendor usually exercised authority, coordinated and monitored work operations with their subvendors to ensure acceptable completion of the scope of services. Any problems were corrected immediately upon notification by MDOT.</p> <p>1 - Vendor's failure to exercise authority, coordinate and monitor work operations with their subvendors harmed the project.</p> <p>Comments</p>

OTHER COMMENTS

PROJECT MANAGER HAS NOTIFIED ANY SPECIALTY AREAS TO COMPLETE AN EVALUATION YES NO

IS THIS A PRIMARY EVALUATION OR A SPECIALTY AREA EVALUATION? --Select--

EVALUATED BY: (Please print) _____ DATE _____

EVALUATOR'S SIGNATURE _____



OFFICE OF RESEARCH &
BEST PRACTICES

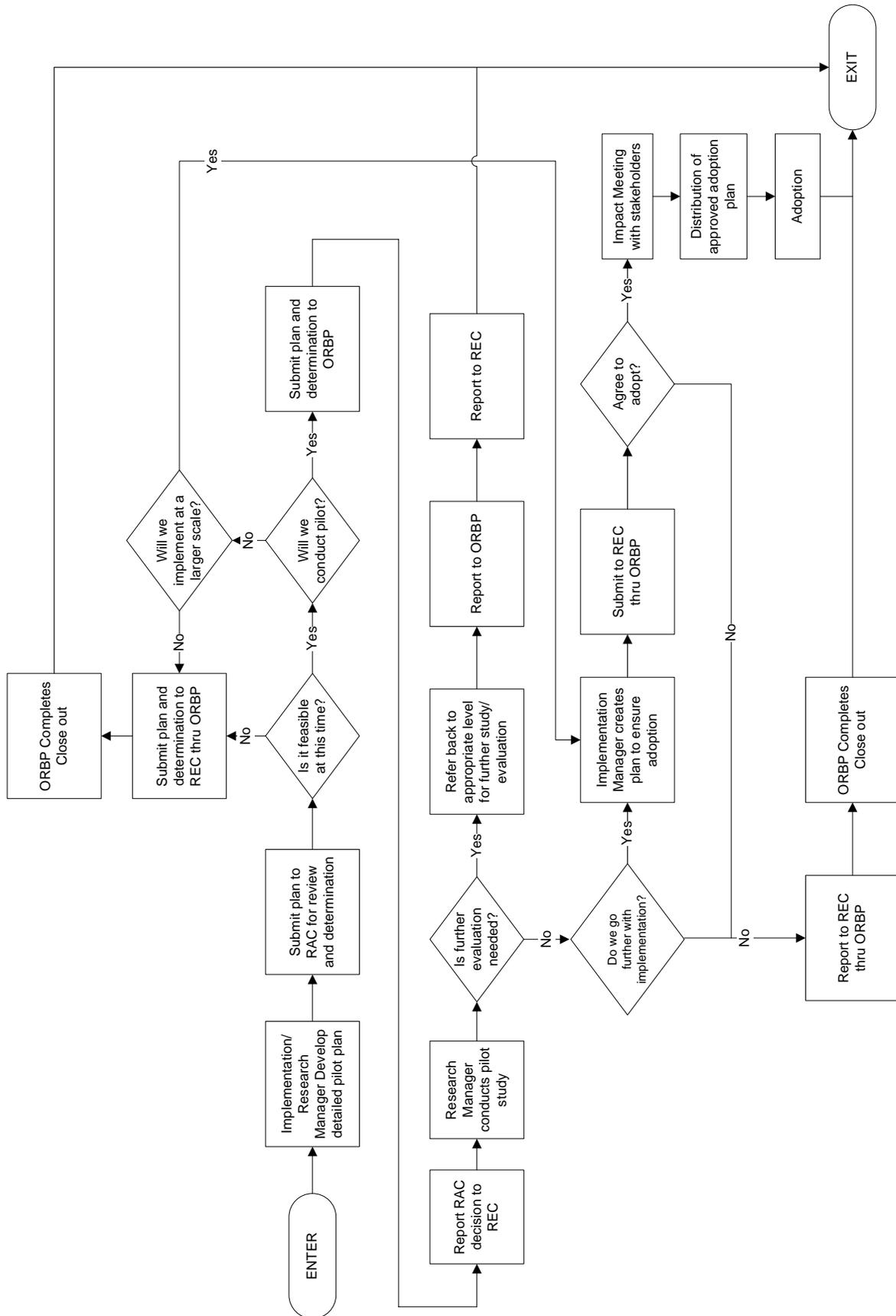
APPENDIX D

Implementation and Technology Transfer

Michigan Department of Transportation



**MDOT Office of Research and Best Practices
Adoption Process
Developed and revised by ORBP Team, October 2007**





Research Spotlight

D2

New Dynamic Signage Makes Lane Merges Smoother and Safer

Traffic research helps Michigan DOT explore technologies to positively impact driver behavior and improve traffic flow. Michigan DOT's research program strategically assesses potential new tools for managing traffic and making roads safer and less congested.

Problem

In a typical work zone that has lane closures, drivers do not merge at a single, defined point. As a result, the haphazard merging of traffic can cause sudden interruptions in traffic flow, longer delays, and the potential for accidents.

Different solutions to this problem have been tried in Michigan, across the United States, and in other countries with varying degrees of success. Each approach includes a defined merge point—either early (well in advance of the lane closure) or late (near the lane closure)—and uses static or dynamic signage.

Approach

Michigan DOT sought to demonstrate the effectiveness of a dynamic late lane merge system (DLLMS). The potential benefits were compelling:

- Late lane merging leaves usable traffic lanes open, which takes full advantage of road capacity to reduce queue lengths in freeway travel lanes.
- Dynamic signage responds to real-time changes in traffic patterns and can be automatically activated only when a merging system is needed.

This system also promises safety advantages as well, taking driver guesswork out of when to merge and thwarting aggressive driving among motorists who would otherwise drive past an early merge point.

Research

Michigan DOT undertook a field study of the DLLMS. This system's network of sensors continuously monitors traffic conditions in a construction zone. The sensors activate the DLLMS when a preset level of congestion is reached. Portable changeable message signs instruct drivers to stay in their current travel lane until reaching a specified merge point.



The DLLMS improves traffic flow and safety for vehicles merging in high-congestion work zones.

The DLLMS carefully takes into account human reaction and response factors in the frequency and complexity of the signage it uses. A typical series of activated signs display the following messages:

- Sign 1 (farthest from the taper). STOPPED TRAFFIC AHEAD / USE BOTH LANES
- Sign 2. USE BOTH LANES / STAY IN YOUR LANE
- Sign 3. TAKE YOUR TURN / MERGE HERE

At the merge point, drivers take turns in a “zipper-like” fashion, tapering from two lanes to one.

continued on back

Project Information

Report Name: *Evaluation of the Dynamic Late Lane Merge System at Freeway Construction Work Zones*

Start Date: April 2006
Completion Date: October 2006
Report Date: September 2007

Research Report Number: RC-1500
Contract Number: 2002-0546/A1
Total Cost: \$168,556
Cost Sharing: 20% MDOT, 80% FHWA through the SPR, Part II, Program

MDOT Project Manager

Dale Spencley
 Maintenance Division
 Michigan Department of Transportation
 6333 Old Lansing Road
 Lansing, Michigan 48917
 SpencleyD@michigan.gov
 517-322-3381



When the DLLMS is inactive, the signs flash typical construction messages, such as DRIVE SAFELY, MERGE 2 MILES AHEAD, and 45 WHERE WORKERS PRESENT.

To measure the system's effectiveness, Michigan DOT implemented a field study of the DLLMS on three sections of roads under construction in 2006, and compared it to a construction site where the system was not in place. The comparison site used identical signage as the DLLMS displays in its "off" mode. The study measured and analyzed data such as travel time, queue length, traffic speed, and traffic volume. It also recorded work zone traffic characteristics and vehicle merge locations using digital video cameras.

Results

The analysis showed the DLLMS fulfilled its intended function by significantly improving traffic flow. Delays were reduced and average travel speeds were higher at the test sites where the system was in use. Although not demonstrable with this small-scale implementation, investigators expect a measurable reduction in traffic accidents if the DLLMS were put into practice on a larger scale.

As part of this study, researchers also determined the most appropriate implementation strategies for this technology. Benefit-cost analysis provided specific guidelines on where this application can achieve the greatest savings, such as with freeways that experience long periods of high-volume traffic. This economic analysis included the costs associated with installing and operating the DLLMS. By comparison, the study highlighted

other traffic configurations, such as in rural locations, where early lane merging may be more appropriate than late lane merging.

Finally, the study recommended that a larger implementation of the DLLMS should include a media campaign to help familiarize Michigan drivers with this type of merging system.

"This system will become even more effective in relieving construction traffic as Michigan drivers get used to late lane merging."

*Dale Spencley, P.E.
Project Manager*

Value

As a result of this study, the DLLMS is now an option for work zone safety and traffic control in Michigan. When applied appropriately, the system will not only save travel time for motorists, but will provide additional positive effects of increased traffic flow, including lowered fuel consumption and air pollution.

These benefits combine to meet Michigan DOT's mission to enhance its transportation services while maintaining and improving its infrastructure. Research helped point the way to identifying a winning transportation technology in Michigan. ■

Michigan Department of Transportation



OFFICE OF RESEARCH &
BEST PRACTICES

Principal Investigator

Tapan Datta
Transportation Research Group
Department of Civil and Environmental Engineering
Wayne State University
Schaver Building, 5451 Cass Avenue
Room #208
Detroit, Michigan 48202
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For More on MDOT Research

Calvin Roberts
Office of Research & Best Practices
Michigan Department of Transportation
425 W. Ottawa Street
Lansing, Michigan 48933
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517-241-2780
www.michigan.gov/mdotresearch

This final report is available online at
http://michigan.gov/documents/mdot/MDOT_Research_Report_RC1500_Part1_209842_7.pdf or contact 517-636-0305.

Research Spotlight produced by CTC & Associates, LLC



ORBP Newsletter

D3



Inside This Issue:

Team Building

New name reflects global reach of research and best practices at MDOT.



Team building exercise helps refine the structure and operation of ORBP.



Mission and vision statements articulate the purpose and direction of the office.

Peer Exchange

Focused effort yields valuable insights into administration of Michigan's Transportation research cycle.



Michigan's transportation research community is healthy and well-respected; retaining staff and communicating with stakeholders will keep it strong.

Results

ORBP team unveils process for implementing research results.



Peer exchange report, updated Research Manual, and new Web site will help maximize the potential of the ORBP.

Continuous Improvement

Team building and peer exchange efforts provide a clear vision and a refined structure for the transportation research cycle in Michigan

Team Building

In his book *Path of Least Resistance for Managers* (1999), author Robert Fritz introduces the notion of a structural tension that exists in every organization. He describes this tension as the difference between an organization's current reality and a vision of what is possible for the organization in the future. "Tension creates a state of nonequilibrium," Fritz writes. He goes on to explain that the structure of an organization naturally attempts to restore equilibrium. In other words, structural tension causes movement between an organization's current reality and a vision; either the vision devolves until it resembles the current reality or the current reality evolves to become more like the vision. Structure is the key to making a current reality evolve toward a vision.

Casting Vision, Refining Structure

In early 2005, MDOT's leadership created a vision for an office that would orchestrate and coordinate all of MDOT's research efforts, and monitor both transportation research and operational practices nationwide to make sure valuable innovations and best practices in other places would not go unnoticed. In pursuit of this vision, MDOT's Office of Research and National Best Practices (ORNBP) was established on September 26, 2005. The purpose of the new office was to lead the department's research efforts and to collect and disseminate transportation best practices throughout MDOT, within Michigan and across the country. In late 2007, "National" was dropped from the name. The new name, Office of Research and Best Practices (ORBP), expands the scope and extends the vision for the office. "The name

change will better position us to exchange best practices and innovations globally, not just nationally," explained office administrator Calvin Roberts. "It will also enable us to more easily share Michigan's extraordinary transportation research talent and expertise with the global transportation community."

Since 2006, Roberts and his team have been working to align research investments with the Michigan Transportation Plan, which presents goals, objectives, strategies, and policy recommendations to set the direction for decisions and investments on the state transportation system through the year 2030. "Our team was assembled to make the most of every research opportunity within the department," explained Roberts. "We've realized some success, but the diversity of the groups we serve has made it difficult to develop a cohesive strategy. I felt we were missing key structural elements that would enable us

see "Team Building" on page 2

Peer Exchange

Business leader Andrew Carnegie once said, "The range of our collective vision is far greater when individual insights become one." It is perhaps with this in mind that the Federal Highway Administration (FHWA) established the peer exchange program with the Intermodal Surface Transportation Efficiency act of 1991. The program requires that each state department of transportation (DOT) agree to a peer exchange of its Research, Development, and Technology Transfer (RD&T) management process to be eligible for FHWA planning and research funds.

see "Peer Exchange" on page 2

Program (NCHRP) issued a report titled *Peer Exchange: a Value-added Program Management Tool* (2001). The report described the process for conducting an exchange conference, and it summarized the results of the first round of conferences. The program received wide acclaim from states that participated. Since then, several rounds of peer exchange conferences have been held with continued high levels of success and support.

Focusing the Efforts

The ORBP sponsored a peer exchange of MDOT's research program on December 3–6, 2007. In addition to four members from the ORBP team, the peer exchange panel (see Figure 1) included a representative from Pennsylvania State University, two representatives from the FHWA, and representatives from DOTs in Iowa, Louisiana, South Dakota, Utah, and Washington State. Leni Oman from Washington State served as chair of the panel. CTC & Associates, a technical communications firm from Madison, WI, that specializes in information design for public agencies and civil engineering firms, assisted the ORBP in facilitating the exchange.

The ORBP team assembled the panel based on expertise and experience in the following five focus areas:

1. Developing a research program
2. Identifying research needs
3. Partnering with universities
4. Managing research projects
5. Measuring and reporting performance

The focus areas address current needs within the MDOT research program. "We chose members whose programs followed a path of development similar to ours," Roberts explained. "We were encouraged to realize the great position we're in and we gained tremendous insights into making adjustments to refine our program."

Research a High Priority

The structural integrity of MDOT's research program, as identified by the panel, can be attributed to the deep interest in research among technical staff throughout the department and among universities, consultants, and industry professionals across the state. Michigan is home to a vibrant transportation research community and MDOT has a reputation for credible research that is regularly applied in other states. With six internationally known universities in the state, including two University Transportation Centers (UTCs) and an effective Local Technical Assistance Program (LTAP), MDOT has access to a wide range of valuable research and technology transfer facilities, services, and capabilities. In addition, the FHWA division office in Michigan is very supportive of MDOT's research program; the program regularly capitalizes on federal funding opportunities.

The panel also identified cultural strengths of the ORBP. Specifically, support of research by the highest levels of MDOT leadership, and commitment among the core ORBP staff to align the program with the direction of the department as a whole is a strong foundation for continued success. The ORBP's emphasis on pursuing research topics that cover all areas of transportation research, not just materials and construction, is evidence of this alignment.

Retention, Communication and Relationships

Areas where the ORBP team could face challenges in the future include maintaining technical expertise in-house; collecting, tracking and communicating research results; and nurturing the relationships that are necessary to continue the success and expansion of the program.



Back row, from left: Tim Croze, MDOT; Mark Morvant, Louisiana DOT; Mark Dunn, Iowa DOT; Dr. Sudhakar Kulkarni, MDOT; Marcia Kenney, Recently Retired from FHWA. Front row, from left: Blaine Leonard, Utah DOT; Dave Huff, South Dakota DOT; John Mason, Pennsylvania Transportation Institute; Calvin Roberts, MDOT; Leni Oman, Washington DOT; Andre Clover, MDOT; Angela Nelson, MDOT.

Figure 1. Peer Exchange Panel.

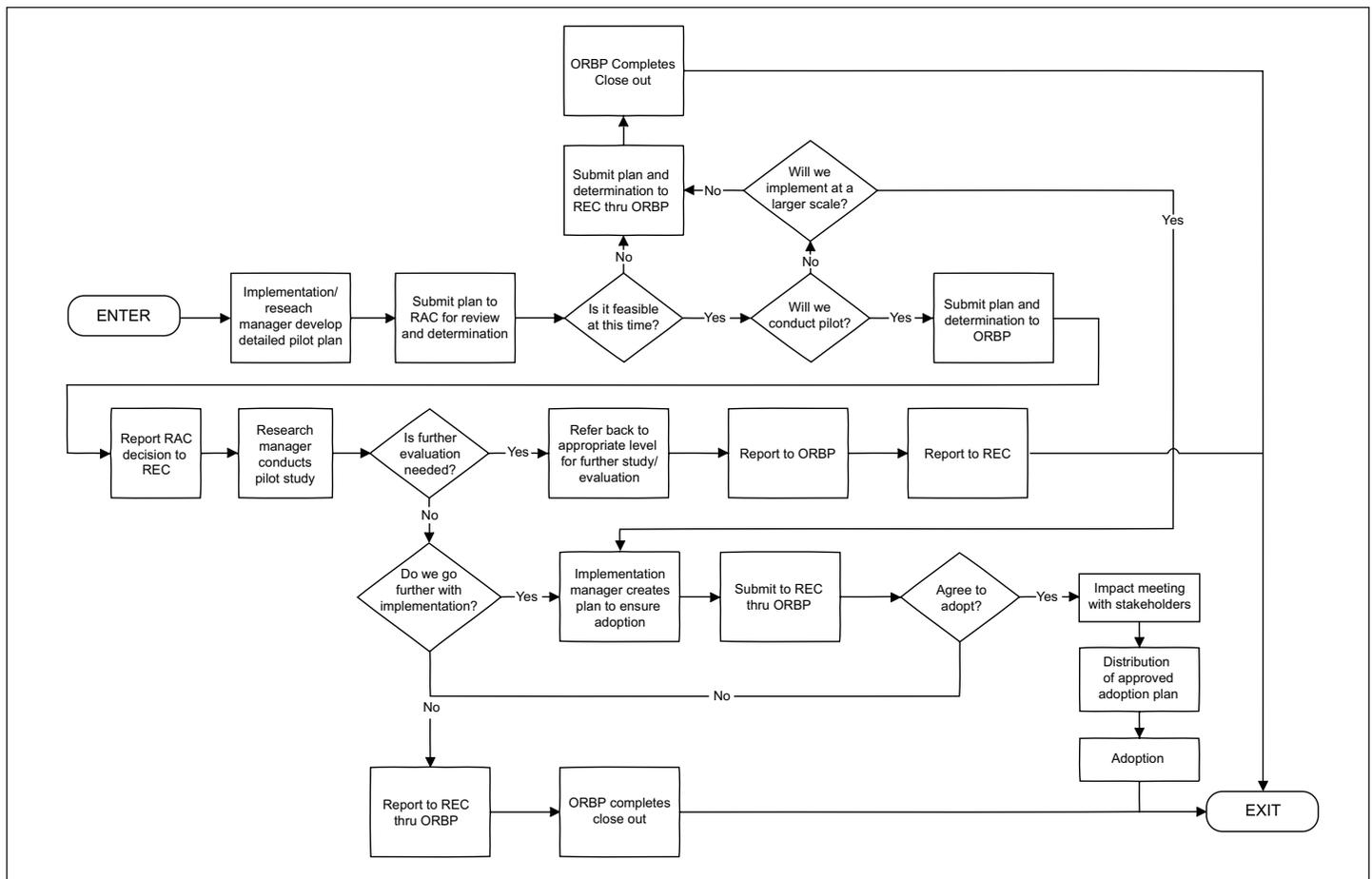


Figure 2. Overview of the Research Adoption Process.

Team Building + Peer Exchange = Results

Based on results of the team building effort and advice from the peer exchange, the ORBP team established a detailed plan for implementing research results (see Figure 2). This plan, referred to as the *adoption process*, will help principal investigators, project managers, and research managers develop implementation plans during the origination phase of a research project. “This piece of the transportation research cycle makes adoption of results a part of normal department operations, which will maximize the return on our research investments,” Roberts said.

Next Steps

To finalize this exciting period of self-examination and planning for the ORBP, and to take steps toward pursuing the full potential of Michigan’s research program, the team will complete three immediate projects. The first will be to publish a report that summarizes the peer exchange effort. The report will include specific observations and suggestions from the panel about how to achieve success in each focus area.

The second and third projects both address the need for good communication within the transportation research community. A research Web site is in development through the ORBP. The

Web site is currently available to the ORBP team; plans are in place to make it available outside of MDOT. An update of the department’s Research Administration Manual is scheduled to be released in February 2008. The manual was last updated in 2003, and does not reflect the new strategy for administering research in the state. “The new research manual will provide comprehensive guidance for all groups and individuals at all phases of the research cycle,” explained Roberts.

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