

State Materials Laboratory Business Plan 2000

Mission Statement: "Together we support our customers and enhance construction quality by providing specialized technical expertise, materials testing and engineering services."

Key Customers, Suppliers and Stakeholders

Customers	Suppliers	Stakeholders
Regions	Academic Research Community	Industry
Industry	Regions	Regions
Service Centers	Industry	Local Agencies
Local Agencies	AASHTO	FHWA
	WAQTC	Transportation Commission

General Core Business Functions: Testing materials, designing engineering solutions and providing expert technical help.

Core Business Functions and Key Business Processes, by Division

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1. Pavements

- Pavement designs
 - ⇒ Key business processes:
 - * Perform field testing
 - * Analyze data
 - * Design pavement
 - * Report results and recommendations

- Pavement type selections
 - ⇒ Key business processes:
 - * Review data
 - * Analyze life cycle cost and select appropriate pavement type
 - * Report results and recommendations

- Pavement management
 - ⇒ Key business processes:
 - * Gather data through field testing/videoing
 - * Analyze data
 - * Report results

- Technical expertise
 - ⇒ Key business processes:
 - * Receive request for assistance
 - * Analyze situation
 - * Propose solutions and advise on course of action

- Research
 - ⇒ Key business processes:
 - * Review research needs
 - * Establish research protocols
 - * Perform research
 - * Report results
 - * Provide training and implementation

Core Business Functions and Key Business Processes, by Division

2. Construction Materials

- Testing materials
 - ⇒ Key business processes:
 - * Procuring samples (Sampling process)
 - * Performing tests (Testing process)
 - * Reporting results (Reporting process)
 - * Archiving results (Archiving process)

- ACP Mix designs
 - ⇒ Key business processes:
 - * Receive materials
 - * Run trial blends / trial mix designs
 - * Report results and recommendations

- PCC Mix designs
 - ⇒ Key business processes:
 - * Receive review requests from PE's and cities and counties
 - * Review the Mix designs
 - * Report recommendations

- RAMS
 - ⇒ Key business processes:
 - * Reviewing request
 - * Reporting results

- ROMS
 - ⇒ Key business processes:
 - * Preparing ROM
 - * Reporting results

- PS&E reviews
 - ⇒ Key business processes:
 - * Receive PS&E's
 - * Distribute PS&E's internally
 - * Sections review
 - * Send recommendations to submitter

Core Business Functions and Key Business Processes, by Division

- Materials Stewardship Audits
 - ⇒ Key business processes:
 - * Performing audit in the field office
 - * Resolving deficiencies
 - * Reporting results

- Fabrication Inspection
 - ⇒ Key business processes:
 - * Inspection
 - * Review of plants and QC plans
 - * Publishing reports
 - * Directing corrective action

- Coatings inspection
 - ⇒ Key business processes:
 - * Input to the PS&E on proper treatments
 - * Review PS&E's
 - * Field inspections of coatings operations
 - * Recommend changes to operations and standards if appropriate

- Technical expert help on Superpave
 - ⇒ Key business processes:
 - * Review mix design
 - * Fabricate and test mix design check samples
 - * Testing in the field
 - * Training of project offices

- Reporting results. Provide statewide support of the construction training program
 - ⇒ Key business processes:
 - * Track changes made to standards
 - * Conduct training
 - * Coordinate yearly trainers meetings
 - * Update training manuals
 - * Create new training materials

Core Business Functions and Key Business Processes, by Division

- Coordinate QC/QA for Materials statewide
 - ⇒ Key business processes:
 - * Insure AASHTO accreditation for Lab
 - * Maintain Quality system Manual
 - * Maintain qualified tester and verification program
 - * Develop acceptance processes

- Update created State and National materials standards
 - ⇒ Key business processes:
 - * AASHTO ballots
 - * ASTM Ballots
 - * NCHRP task groups
 - * AASHTO task groups
 - * Evaluate and write procedural and specification changes

- Work with select groups to resolve specification and test issues
 - ⇒ Key business processes:
 - * WACA joint task group
 - * APAW joint task group
 - * WAQTC
 - * West Coast user/producer for asphalt
 - * APAW joint training group
 - * NW prestress concrete association
 - * Asphalt suppliers in Washington
 - * WSDOT/ODOT joint spec meeting

Core Business Functions and Key Business Processes, by Division

3. Geotechnical

- Geotechnical site/subsurface characterization
 - ⇒ Key business processes:
 - * Drill test holes, obtain samples, and perform field tests
 - * Use, or contract out for, other available techniques to “view” subsurface conditions
 - * Perform laboratory tests to get material properties

- Foundations and cut/fill design
 - ⇒ Key business processes:
 - * Evaluation of test results
 - * Designing foundation and cut/fill
 - * Reporting results
 - * Providing construction support

- Unstable slope design
 - ⇒ Key business processes:
 - * Evaluation of test results
 - * Designing solution
 - * Reporting results
 - * Providing construction support

- Unstable slope management
 - ⇒ Key business processes:
 - * Reviewing slopes in field
 - * Cataloging slopes
 - * Prioritizing slopes
 - * Updating unstable slopes

- Technical management of pits and quarries
 - ⇒ Key business processes:
 - * Review region pit/quarry reports for technical content
 - * Provide customer access/input regarding pit/quarry database

Core Business Functions and Key Business Processes, by Division

4. Administration

- Payroll & Travel
 - ⇒ Key business processes:
 - * Receiving payroll or travel information from employees
 - * Checking for accuracy
 - * Reconciling errors
 - * Entering into computerized system
 - * Signature
 - * Disbursing warrants

- Accounts payable
 - ⇒ Key business processes:
 - * Receive invoice from vendor
 - * Send to section for ownership & work order to be charged
 - * Determine correct accounting coding
 - * Enter into computerized system
 - * Signature
 - * Verify payment made

- Accounts receivable
 - ⇒ Key business processes:
 - * Train region personnel on billing system
 - * Receive billing information from employees
 - * Transfer testing from testing system to billing system
 - * Enter hourly charges into billing system
 - * Conduct monthly transfer from billing system to department accounting system
 - * Produce invoice for outside sales customers
 - * Reconcile accounts and send delinquent payment notice, if needed

- Accounts Receivable - QPL
 - ⇒ Key business processes:
 - * Receive check for prepayment of testing
 - * Prepare cash receipt and enter into suspense account
 - * Create receivable for QPL work order charges entered into billing system
 - * Create cash receipt closing the open cash receivable from money deposited into suspense account

- Cost recovery stewardship
 - ⇒ Key business processes:

- * Gather cost data from various sources
- * Calculate rates
- * Publish rates
- * Monitor recovery
- * Update rates as needed
- Purchasing
 - ⇒ Key business processes:
 - * Gather purchasing needs
 - * Conduct bid process, if needed
 - * Order materials
 - * Coordinate delivery
 - * If capitol item, enter into inventory system
 - * Coordinate payment with accounting
 - * Surplus replaced equipment
- Consumable supplies
 - ⇒ Key business processes:
 - * Determine reorder point
 - * Order consumable supplies from State Contract, Central Stores, Region Stores, and outside vendors
 - * Stock shelves
- Equipment Inventory
 - ⇒ Key business processes:
 - * Distribute inventory sheets
 - * Conduct inventory at OSC
 - * Coordinate region inventory
 - * Audit returned region sheets
 - * Signature
 - * Submit final inventory sheets
- Facility & Equipment Maintenance
 - ⇒ Key business processes:
 - * Determine needs from PM schedule, Work orders, & observation
 - * Prioritize needs & schedule tasks
 - * Order supplies, parts, or equipment needed
 - * Complete task
 - * Final inspection
- Miscellaneous
 - ⇒ Key business processes:
 - * SCAN Access code & SCAN Plus cards for employees and coordinate telephone changes and additions
 - * Arrange for maintenance & repair of pool vehicles with region shop

- * Submit monthly report for IRS purpose for employees with state vehicle commute privileges
- * Prepare samples that require sizing such as rebar, strand, conduit, etc. with torch, band saw, cut off saw, machine lathe
- * Construct testing equipment not commercially available
- * Arrange Hazardous waste disposal, spill coordinator, weekly inspection of storage units, and prepare annual reports to Dept of Ecology
- * Building and office modifications as per work orders

Program Delivery Strategic Directions

ã Warranties (Link to Strategic Plan: WSDOT Mission Statement - *build and maintain transportation systems to serve our public*)

Requiring warranties on some items of work could be effective and could reduce workforce requirements. In paving, for example, the contractor would be responsible for the mix design and the methods of placement and compaction. We would save the hours of handling submittals and preparing designs. The Department could start working to develop and impose warranty specs on any type of work where the performance could be objectively measured and where the contractor could be allowed to control all factors affecting the outcome. There would be much administrative work to get to the first warranty spec, including work with the industry and approval by FHWA. There would also be a need for internal controls and procedures. A team would best undertake this effort. The goal would be a system of warranties that resulted in the greatest decrease in workforce/administration needs, with the least additional insurance cost.

Wisconsin DOT and Colorado DOT have successfully implemented warranties on their projects. Their systems eliminate the most risky projects (unintentionally in Wisconsin and intentionally in Colorado) resulting in the lowest possible insurance costs and the greatest contractor confidence. The warranty system grants contractors control over the variables that affect the final quality of the product. In Colorado, projects are first screened by the state for risk and then screened again by a contractor board, again for risk. Only the lowest risk jobs are advertised as warranty projects.

Responsible Org. Manager: Thomas E. Baker, State Materials Engineer

Objective: Develop a system of warranties that results in the greatest decrease in workforce/administration needs, with the least additional insurance cost.

<u>Targets:</u>	Implementation Plan	<u>Target Dates</u>
	1. Gather warranty system and specification data <ul style="list-style-type: none">• Colorado DOT• Wisconsin DOT	Spring 2001
	2. Draft Warranty System and specifications	Summer 2001
	3. Review Draft with partners	Winter 2001
	4. Test projects (one westside and one eastside)	Summer 2002
	5. Evaluate test projects and make adjustments	Winter 2002
	6. Large scale trials (5-10 projects statewide)	Summer 2003
	7. Evaluate large-scale trials and make adjustments	Winter 2003
	8. Implement full warranty system	Spring 2004

Performance Measures:

- Output: Functioning warranty system
- Outcome: decreased workforce/administration needs compared to additional insurance costs

ã Expand the use of QA/QC Specifications (Link to Strategic Plan: WSDOT Mission Statement - *build and maintain transportation systems to serve our public*)

QC/QA specifications for concrete and asphalt have increased overall quality while decreasing testing and workforce. Expanding the concept of statistical sampling and testing and reemphasizing the QC responsibilities of the contractor provides an opportunity to further increase quality and decrease workforce. Trial expansion into chip seal aggregate was successfully tested and all aggregates are possible candidates. Other materials might be candidates for QC/QA based specification. Taskforces led by the Materials lab and involving the Regions, APAW, WACA and others would move this initiative forward.

Responsible Org. Manager: Thomas E. Baker, State Materials Engineer

Objectives: Improve the contractor's quality control testing and the state's quality assurance (acceptance) testing using TOM based statistical process control methods.

<u>Targets:</u> Implementation plan:	<u>Target Dates</u>
a. Identify areas of opportunity	Spring 2001
o Aggregates	
▪ Gravel borrow	
▪ Chip seal aggregates	
▪ Gravel backfill for walls	
▪ CSBC	
▪ CSTC	
o ATB	
o Others	
b. Identify needed specification changes	Summer 2001
c. Set draft implementation plan	Fall 2001
o Schedule with:	
• Dates	
• Action items	
• Milestones	
d. Publish draft plan	Winter 2001
e. Join with partners to finish plan and implement changes	Spring 2002

Performance Measures:

- Output: Number of materials using the QA/QC statistical acceptance methods
- Outcome: reduction of overtesting or performing unnecessary testing; reduction in WSDOT performing QC testing for private construction companies

ã Materials Risk Analysis Management System (Link to Strategic Plan: WSDOT
Mission Statement - *build and maintain transportation systems to serve our public*)

Much of the materials testing we perform has a historical basis. A systematic review of all materials incorporated and accepted on WSDOT project would reveal which materials should be vigorously tested and which materials should be accepted by manufacturers certification. Materials would be evaluated for two risk categories: likelihood of failing the acceptance test and the consequences of that failure. Materials with very high risk of failing the acceptance test and a high negative consequence of that failure would be candidates for WSDOT acceptance testing. Materials with low risk of failing the acceptance test and a low negative consequence of that failure would be candidates for acceptance through manufacturers certification. The State Materials Lab would take the lead in this initiative, building review teams to include the Regions, OSC experts, and industry, as appropriate for each material.

Responsible Org. Manager: Thomas E. Baker, State Materials Engineer

Objectives: Use scarce resources to most efficiently test critical materials

<u>Targets:</u> Implementation plan:	<u>Target Dates</u>
a. Perform in-house risk assessment for draft plan	Spring 2001
▪ Review bid tabs	
▪ Perform risk analysis rating:	
○ Likely to fail to meet specification / test	
○ Likely to have large impact in failure	
b. Share results within WSDOT for review, comment, adjustment and consensus	Summer 2001
c. Identify needed spec changes	Winter 2001
d. Set draft implementation schedule	Spring 2002
e. Join with partners to finish plan, gain consensus, final adjustments and implement plan	Summer 2002

Performance Measures:

- Output: completion of systematic review of all materials testing and establishment of ongoing system to review and update materials risks
- Outcome: Effective testing program, one that tests high risk, high impact materials first