FIVE MAJOR AREAS

✓ Evolving Process of Strategic Analysis
✓ New Paradigm in Transportation
✓ Current Activities in Asset Management
✓ Michigan Business Process
✓ Emerging Issues
EVOLVING PROCESS OF STRATEGIC ANALYSIS

From Needs Studies to Asset Management
NEEDS STUDIES
Key Objectives

✓ Produce for Legislature, Governor and the public a single volume of highway system inventories and revenues needed to retire deficiencies

✓ Serve as a backdrop to establish revenue increases and the distribution of funds

✓ Michigan conducted several – most extensive in 1984
PROBLEMS

- The funds needed to retire deficiencies were staggering: over $22 billion just for highways
- Assessments assumed that all dollar needs were of equal importance
- No prioritization of needs
- No standards or performance measures
1980’S
CRumbling INFRASTRUCTURE

✓ America in Ruins: Beyond the Public Works Pork Barrel
✓ Public Works Infrastructure: Policy Considerations for the 1980s
✓ Federal Policies for Infrastructure Management
✓ Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector
1990’S DECADE OF PERFORMANCE

✓ 1991: Passage of ISTEA
✓ 1993: Government Performance & Results Act
✓ 1994: EO 12893 – Principles for Federal Infrastructure Investment
✓ 1995: National Highway System Act
✓ 1998: TEA-21
✓ 1999: GASB Statement 34
WHAT IS DRIVING ASSET MANAGEMENT?

✓ Aging infrastructure and mature systems
✓ Public expectations
✓ Changes in leadership philosophy
  • Customer-driven
  • “Best Management Practices”
✓ Advanced management systems and improved technology
✓ Productivity of the system and economic growth
ASSET MANAGEMENT
BASIC APPROACH

✓ Set Goals and Objectives
✓ Collect Inventory and Condition Data
✓ Rates of Deterioration
✓ Performance Standards & Measures
✓ Life-Cycle Cost Analysis
✓ Investment Strategies
✓ Programs, Projects, and Practices
✓ Monitoring Feedback and Adjustments
ASSET MANAGEMENT

✓ A strategic approach to managing our infrastructure
  • Quality Performance
  • Continuous Improvement

✓ Investing wisely

✓ Data are “corporate assets”
NEW PARADIGM
NEW PARADIGM IN TRANSPORTATION

- Transportation Networks viewed as Utilities
- Investments in Assets rather than the traditional public idea of mere Expenditures of Funds
ASSET MANAGEMENT

✔ Asset management is the philosophy that best fits this paradigm
✔ A “strategic” approach to managing your infrastructure
✔ Provides a systematic process for maintaining, upgrading, and operating the assets cost-effectively
CONSISTS OF

✓ Thinking long-term rather than immediate need
✓ Continuous system performance assessment
✓ Collecting appropriate data
✓ Using technology and analytical tools
✓ Monitoring results
GOALS OF ASSET MANAGEMENT

✓ Build, preserve, and operate assets cost-effectively with improved performance
✓ Deliver to customers the best value for the dollars spent
✓ Enhance credibility and accountability
CRITICAL ELEMENTS

- Consider a range of alternatives in addressing problems and needs
- Procedures and evaluation criteria are consistent and reinforce policy goals and objectives
- Decisions based on relative merit and an understanding of comparative costs and consequences
- Investing wisely
MANAGING PAVEMENTS
NOT ROAD CONDITION

✓ Set targets
✓ Establish strategy to meet targets
✓ Establish cost-effective, long- & short-range programs
✓ Maximize benefits to motoring public
✓ Maximize pavement condition and minimize costs
✓ Maintain and improve future pavements
WHAT’S DIFFERENT?

• OLD PROCESS
  ✓ Tactical
  ✓ Reactive
  ✓ Compartmental & Piecemeal
  ✓ Stove Pipes
  ✓ Basic Tools
  ✓ “Slice in Time
  ✓ Deficiencies
  ✓ Retiring Backlog
  ✓ Look Backwards

• NEW PROCESS
  ✓ Strategic
  ✓ Proactive
  ✓ Integrated and Systematic
  ✓ Interdisciplinary
  ✓ Advanced Systems
  ✓ Continuous assessment
  ✓ Function of Road
  ✓ Systems Approach
  ✓ Forward Looking
CURRENT ACTIVITIES IN ASSET MANAGEMENT
CURRENT ACTIVITIES IN ASSET MANAGEMENT

- Nationally
- In Michigan – HB 5396
- Growing Partnerships
  - Universities
  - Industry Representatives
  - Financial Sector
  - Local Governments
MANY PARTNERSHIPS

- AASHTO Task Force on Asset Management
- FHWA – Office of Asset Management
- Other transportation agencies and providers
- Private Sector
- Universities – Regional Transportation Centers
AASHTO

- 1998: Established Task Force on Asset Management
- 1999: NCHRP Project to develop first generation asset management guide
- 1999/2000: Adoption of Strategic Plan
- 2002: Established a joint website
STRATEGIC PLAN

- Develop partnerships with public and private entities
- Develop and document an understanding of asset management
- Promote the development of tools, analysis methods, and research topics
- Inform member states on how to utilize asset management
- Assist member states in assessing and implementing asset management principles
ASSET MANAGEMENT GUIDE

✔ First Phase is completed and consists of 3 volumes
  • Synthesis of Asset Management Practice
  • Asset Management Framework
  • Recommended Research Program

✔ Second Phase is just beginning
  • Provide state agencies with a “rating” guide to judge how effectively they are implementing asset management principles
FEDERAL HIGHWAY ADMINISTRATION: OFFICE OF ASSET MANAGEMENT

✓ Created in response to strategic planning efforts
✓ 3 Key Responsibilities:
  • Provide national leadership in asset management principles for highway program administration
  • Develop asset management policies for pavement, bridge, and system preservation
  • Partner with AASHTO, other FHWA offices and others to conduct nationwide programs
MICHIGAN: HB 5396

- Special Committee issued a report in June 2000 that recommended that all road agencies use an asset management approach.
- HB 5396 was introduced last fall in the Michigan House of Representatives.
- Passed the House last December: 99-0.
- Senate is expected to pass it soon.
HB 5396

☑ Requires asset management approach
☑ State Transportation Commission will act as oversight body
☑ Sets up an 11-member Transportation Asset Management Council
☑ Common condition assessment and data collection process
☑ Establish an asset management strategy and common definitions
☑ Requires a joint multi-year road & bridge program
☑ Annual monitoring and reporting to STC and Legislature
☑ Funding will come from Michigan Transportation Fund
TRANSPORTATION ASSET MANAGEMENT COUNCIL

MISSION STATEMENT

To advise the State Transportation Commission on a statewide asset management strategy and the necessary procedures and analytical tools to implement such a strategy on Michigan’s highway system in a cost-effective, efficient manner.
GROWING PARTNERSHIPS
UNIVERSITIES

- Regional Transportation Centers
- Local Technical Assistance Program (LTAP)
- Need for developing curricula for training a new generation of engineers and planners
GROWING PARTNERSHIPS
PRIVATE & FINANCIAL SECTORS

؟

☑ Opportunities
GROWING PARTNERSHIPS
LOCAL GOVERNMENTS

✓ Pilot study with 5 counties, several cities and regional planning commissions
✓ Collection of road condition data on the federal-aid system
✓ Used PASER rating system
Genesee County Federal Aid

PASER Condition Ratings

- Good
- Fair
- Poor

Miles

0 100 200 300 400 500

GOOD  FAIR  POOR

PASER CONDITION RATING

Miles

0 2 4 6

Genesee County Federal Aid

PASER Condition Ratings

- Good
- Fair
- Poor
MICHIGAN’S ASSET MANAGEMENT PROCESS
MICHIGAN BUSINESS PROCESS

✓ Five Major Components:
  • Policy Goals & Objectives
  • Information & Data Collection
  • Planning & Programming
  • Program Delivery
  • Monitoring & Reporting

✓ Cash Flow Model
✓ Call for Projects
✓ 5-Year Road & Bridge Program
MDOT ASSETS

✓ Over 9,700 miles of road (27,000 lane miles) and 5,679 bridges
✓ 215 park-and-ride lots
✓ 2,400 trucks, maintenance vehicles, vans and cars
✓ 450,000 signs; 4,025 traffic lights; 8 million linear feet of guardrails
✓ 83 rest areas and 13 travel information centers
✓ 85 roadside parks and 27 scenic turnouts; 41 picnic sites and 2,400 picnic tables
✓ 163 pump houses; 188 water wells; 54 sewage disposal facilities and 64,000 catch basins
✓ Nearly 2,000 miles of non-motorized facilities; 700 miles of rail lines; 4,500 miles of fences
MDOT’S CONSTRUCT

✓ Policy goals and objectives
✓ Information and data collection
✓ Planning and programming
✓ Program delivery
✓ Monitoring and and reporting
POLICY GOALS & OBJECTIVES

✓ Reflect a comprehensive, long-term view of asset performance and cost
✓ Development of a strategic plan
✓ Managing for results
✓ Focus on performance
POLICY GOALS & OBJECTIVES

- Michigan Transportation Policy Plan
- State Long Range Plan
- MDOT’s Business Plan
- Program Specific Strategies
  - Strategy for Repairing & Rebuilding Roads
  - Freeway Modernization Strategy
  - Corridor Management Strategy
  - Access Management Strategy
  - Border Crossing & Trade Corridor Strategy
INFORMATION & DATA

- Maintain high-quality information that supports asset management and business process
- Collect and update data cost-effectively
- Data viewed as “corporate asset”
- Information automated and accessible to all parties
  - GIS Framework Project
  - Global Positioning Satellite (GPS)
PLANNING & PROGRAMMING

✔ Consider a range of alternatives in addressing problems and deficiencies
✔ Procedures and evaluation criteria are consistent and reinforce policy goals and objectives
✔ Decisions based on relative merit and an understanding of comparative costs and consequences
ALTERNATIVE ANALYSES

- Strategic rather than tactical
- Decisions made with regard to the long-range condition of the entire system
- Assessing improvements based on desired outcomes

Tools
- Road Quality Forecasting System
- Bridge Condition Forecasting System
PROGRAM DELIVERY

✓ Consider all available program delivery methods
  • Cost tracking
  • Options for delivery

✓ Track program output and outcomes
  • Feedback mechanism
  • Change process

✓ Communicate and apply outcomes internally and externally

✓ Deliver the approved program
  • Delivery measures
  • Change management
MONITORING & REPORTING

✓ Monitoring directly relates to selected performance measures
✓ Provide feedback on whether the activities undertaken are moving you toward achieving your goals and objectives
✓ Analysis feeds into the next round of proposed projects
MDOT PROCESS
HIGHWAYS & BRIDGES

- Strategic Analysis
- Ride Quality Forecasting/Remaining Service Life/Bridge Condition Forecasting
- Multi-Year Strategy
- Call for Projects
- Candidate List of Projects
- Prioritization Process
- 5-Year Program
- Monitor Progress
BASIS FOR DECISIONS

✓ Cash Flow Model
✓ Road Quality Forecasting System & Bridge Condition Forecasting System
✓ Call for Projects
  • Corridor Approach
  • Capital Preventive Maintenance Strategy
✓ Five-Year Road & Bridge Program
CASH FLOW MODEL

✓ Provides an evaluation of the amount and type of road & bridge projects that can be built with a given funding amount

✓ Calculates the expected expenditures and revenues for 7-10 years

✓ Revenues less expenditures yields the expected cash balance at the end of the year

✓ Allows management to approximate impact of:
  • New revenue sources
  • Changes in cost of projects
  • Change in timing of federal-aid reimbursements and lagged effect of expenditures

✓ Talk with Governor and Legislature about financial expectations and the resulting condition
RIDE QUALITY FORECASTING SYSTEM

- Strategy analysis tool to project results of pavement rehabilitation policies
- Remaining Service Life
- Collection of fixes that will extend the life of the road
- Analyze various pavement strategies and funding scenarios
PAVEMENT PRESERVATION
STRATEGIC OBJECTIVES

- Establish cost-effective, long- and short-range programs
- Maximize benefits to the motoring public
- Maximize pavement condition and minimize costs
- Manage pavements not road condition
STRATEGY ELEMENTS

✓ Mix of fixes
✓ Varying fix lives
✓ Short-term versus long-term
✓ Meet condition goals
HIGHWAYS: MIX OF FIXES

✓ CAPITAL PREVENTIVE MAINTENANCE:
  • Short-term fix: 10 years or less

✓ REHABILITATION:
  • Medium-term fix: 10-20 years

✓ RECONSTRUCTION:
  • Long-term fix: 20 years or more
CAPITAL PREVENTIVE MAINTENANCE TREATMENTS

FLEXIBLE & COMPOSITE
• Non-Structural Bituminous Overlay
• Surface Milling
• Chip Seals
• Micro-Surfacing
• Overband Crack Filling
• Bituminous Shoulder Ribbons
• Ultra Thin Overlay

RIGID PAVEMENTS
• Full Depth Concrete Pavement Repair
• Joint Resealing
• Spall Repair
• Crack Sealing
• Diamond Grinding
• Dowel Bar Retrofit
• Bituminous Shoulder Ribbons
• Open-graded Underdrain Cleaning and Repair
FIX LIVES: Bituminous

✓ Non-structural Bituminous Overlay
  • Flexible: 5-10 years
  • Composite: 4-9 years

✓ Surface Milling
  • Flexible: 5-10 years
  • Composite: 4-9 years

✓ Chip Seal
  • Flexible Single Seal: 3-6 years
  • Flexible Double Seal: 4-7 years

✓ Micro-Surfacing: Flexible
  • Single Course: 3-5 years
  • Double Course: 4-6 years

✓ Ultra-Thin Bituminous Overlay
  • Flexible: 3-5 years
  • Composite: 3-5 years
FIX LIVES: Concrete

- Full Depth Concrete Repair: Rigid
  - 3-10 years
- Diamond Grinding: Rigid
  - 3-5 years
- Concrete Pavement Restoration: Rigid
  - 3-5 years
Road Quality Forecast
Freeway & Nonfreeway

Percent Good

Year
1999 2009 2019 2029 2039

Freeway  Nonfreeway
BRIDGE STRATEGY
HISTORIC APPROACH

- Structure-by-structure basis
- Preservation strategies were reactive
- Limited investment on "good" and "fair" structures
- Maintenance was also reactive rather than preventive
BRIDGE CONDITION FORECASTING SYSTEM

- Need for a network modeling tool
  - Modeling information
  - Deterioration rates
  - Historic cost data

- Network impacts of work activities

- Assess current business practices
BCFS PROVIDES A NEW APPROACH

- Address all structures of critical concern
- Develop long-term network goals
- Emphasize preservation
- Pro-actively manage deterioration
- Develop comprehensive maintenance plan
- Commitment to allocate necessary resources
- Strengthen organizational commitment
BRIDGE PRESERVATION EFFORTS INCLUDE:

✓ Capital Scheduled Maintenance: Regularly scheduled activities that maintain serviceability
✓ Capital Preventive Maintenance: Scheduled work activities that restore element integrity
✓ Rehabilitation: Programmed work activities that improve element integrity
✓ Replacement: Replace various elements
CALL FOR PROJECTS

✓ Heart of our asset management process!
✓ Project lists developed based on identified investment strategies
✓ Fiscally-constrained
5-YEAR ROAD & BRIDGE PROGRAM

✓ Identifies current investment strategies
✓ Specific list of road and bridge projects
✓ Rolling 5-year period
PROGRAM TARGETS
PERCENT RATED “GOOD”

✓ HIGHWAYS:
  • 95% of trunk line freeways
  • 85% of trunk line non-freeways

✓ BRIDGES:
  • 95% of trunk line freeway bridges
  • 85% of trunk line non-freeway bridges
BENEFITS OF STRATEGY

✓ Systematic approach to network
✓ Pro-actively manages deterioration rates
✓ Commitment to do the right work at the right time
✓ Ability to meet established network goals
✓ Integrating regional strategies
EMERGING ISSUES
EMERGING ISSUES

✓ GASB Statement 34
✓ Safety & Security
✓ Reauthorization of Federal Program
✓ Role of Technology in Managing Transportation Systems
GOVERNMENT ACCOUNTING STANDARDS BOARD
STATEMENT 34

- Recommends that infrastructure investments be included in typical government financial reports
- Depreciate infrastructure assets
- Having an asset management process will allow you to use a “modified” approach
MODIFIED APPROACH

✓ Manage the system using a “management” system
✓ On-going, up-to-date inventory and condition assessment
✓ Identification and use of performance measures
✓ Assessing results of on-going maintenance and preservation activities
SAFETY & SECURITY

- 9-11 highlighted need for enhanced security
- Michigan – Extensive border crossings with Canada
  - 3 Major Locations
  - Bridges, Tunnels, Soo Locks
  - Leading state in terms of trade and crossings
AREAS OF CONCERN

✓ Make the border crossings safe without hampering the flow of trade
  • Biometric identifiers – retinal scans
  • Electronic systems
  • Inspections on both sides
  • Joint facilities

✓ Movements of hazardous and nuclear wastes and possible sabotage
FEDERAL RE-AUTHORIZATION

✓ Continue the momentum we began with ISTEA and carried on in TEA-21
ROLE OF TECHNOLOGY

✓ Smart cars, smart roads
✓ Aging population
✓ Hybrid vehicles and impact on revenues
✓ Fuel cell development
✓ Taxing miles driven rather than fuel consumed
CONCLUDING OBSERVATIONS

- A way of strategically managing our system in a cost-effective, efficient manner
- Investing rather than simply spending
- Managing pavements
- It’s using data and technology in a proactive rather than reactive way
- It is a sensible way of conducting business
IT’S THE WAY WE DO BUSINESS