2014-2018 TRANSPORTATION ASSET MANAGEMENT PLAN

Georgia Department of Transportation

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Appendices

I - EXECUTIVE SUMMARY

Georgia Department of Transportation recognizes that Asset Management is necessary for the successful long-term operation of its transportation system. The Georgia DOT Transportation Asset Management Plan (TAMP) has been developed to provide a framework for guiding the Department's Asset Management program and implementation efforts.

Georgia DOT has made steady progress in Asset Management since the program's inception. A TAM Steering Committee was formed to guide the direction and implementation of Asset Management principles in a comprehensive and collaborative manner.

Steps taken over the last year include development of a detailed TAM Implementation Plan to document specific next step actions for GDOT as well as development of a comparative/trade off analysis tool to evaluate the impact of investments in Maintenance, Safety and Capacity based on our agency performance goals. A new Asset Management and Reporting System is also under development.

Asset management is an opportunity to step back from the day-to-day operations and consider a strategic approach. The Department is now ready to move from planning to action with a goal of operating, maintaining, upgrading and expending physical assets effectively throughout their life cycle. The TAMP is also in compliance with new Federal regulations that require state DOT's to implement Asset Management and develop a TAM plan with associated performance measures for established levels of service.

Performance management has expanded accountability and protects public interest by assuring that results are achieved that benefit Georgians. To practice performance management, Department leaders must have accurate, timely, and relevant information for decision making along with the skills and knowledge to analyze results and make adjustments when needed.

Effective transportation asset management requires a thorough knowledge of the inventory and condition of assets, lifecycle costs, strategic goals and objectives as well as data on how assets are performing in response to stakeholder demand. Most importantly, transportation funds need to be utilized and allocated with responsible stewardship and maximum efficiency and effectiveness.

Because pavements and bridges represent the largest share of transportation assets, the Department's TAMP focused a significant effort on allocation of funds towards pavement preservation and bridge maintenance. Key drivers for the TAM include:

- Clear links between policy goals and objectives and decisions at all levels
- An understanding of the connection between proposed investments and expected results
- A long-term view of asset performance
- Decisions that are supported by good information
- A feedback loop from observed performance to planning and programming decisions

- Clear accountability
- Unification of all Georgia DOT data, processes and divisions
- Commitment by Georgia DOT leadership

The TAM plan progressively outlines the asset lifecycle of pavements, bridges and signs. It also describes asset design life and levels of service, asset condition & valuations, budget appropriation and the benchmarked target levels of service. Other supplemental information that contributes to TAM implementation is included in the Appendix.

Georgia Department of Transportation's Executive Leadership is committed to implementing Asset Management and Performance Management initiatives and to applying the principles and practices contained in this TAM plan for the benefit of Georgia's transportation system and its citizens.

Georgia Department of Transportation Chief Engineer:

Russell R. McMurry

Russell McMurry, P.E.
Chief Engineer

II- INTRODUCTION

Georgia Department of Transportation (GDOT) began the move towards the TAM approach in the fall of 2009. Previously the Department's investments were made in silos according to each asset category and location. This method led to a reactive "worst first" approach in managing programs and assigning resources and often required a larger allocation of funds due to the complete replacement of assets. Using this approach resulted in limited resources for investing in lower cost preventive measures.   This reactive approach to managing transportation infrastructure can result in a crisis-oriented organization.

Faced with budgetary constraints and an overwhelming need for investment in infrastructure, Georgia DOT looked for new ways to optimize investment decisions. To best maintain infrastructure, leadership determined that Transportation Asset Management, already utilized in other States DOTs, would be an effective approach for Georgia DOT. Key drivers for TAM include:

- Clear links between policy goals and objectives and decisions at all levels.

- An understanding of the connection between proposed investments and expected results.

- A long-term view of asset performance.

- Decisions that are supported by good information.

- A feedback loop from observed performance to planning and programming decisions.

- Clear accountability.

- Unification of all Georgia DOT data, processes and divisions.

- Commitment by Georgia DOT leadership

TAM provides the Department with an integrated, comprehensive and strategic approach to meet Georgia's transportation needs. TAM's key strength is that it is data-driven — decisions can be supported by the data it uses and generates, as well as by sound engineering judgment. At a time when funding for transportation is constrained and programs are forced to compete with each other, TAM is an effective tool to determine how best to spend every transportation dollar.

GDOT formally adopted the principles of Transportation Asset Management (TAM) in 2010 and developed a document that outlined the strategic direction on how the Department would incorporate the TAM philosophy into business processes and decision-making.

Georgia's Highway System consists of 123,456 miles of roadway. Of this amount, about 18,000 miles are on the State Highway System and maintained by GDOT forces. The remaining roadways are maintained by local governments throughout the State.

Georgia also has more than 14,700 bridges. GDOT is responsible for maintaining about 6,600 state and federal bridges. Local governments, are responsible for maintaining the more than 7,800 bridges on local roadways.

Even though the transportation network is Georgia's most valuable publicly owned asset and represents the majority of the state's assets, Georgia has underinvested in the network for the past 25 years. Despite the lack of competitive levels of investment, Georgia has some of the best-maintained roads in the country and has consistently ranked in the top five over the last four decades.

While there is a dedicated fund source– Motor Fuel Taxes –to maintain the network, Georgia DOT has not seen growth in Motor Fuel funds for the last several years due in-part to an increase in fuel efficient cars on the roadways and a decrease in motorist travel.

III – LEVELS OF SERVICE

Level of Service - Definition
In the area of TAM, Level of Service (LOS) is defined as a qualitative measure of the public's perception of an asset's condition or of the services provided by an agency. The Department uses three factors to determine its Performance LOS:

1. **Strategic objectives** –targeted condition levels that are closely tied to the Department's strategic goals.

2. **Department-wide performance measures** – quantifiable measures that are good indicators of where the Department stands at meeting its objectives.

3. **Customer feedback** – Georgia DOT values customer opinions and regularly conducts employee, motorist and/or public opinion polls to evaluate the services provided. The results are analyzed and measured against the Department's strategic goals and objectives.

The Levels of Service are directly related to the Department's strategic plan as shown in the strategy map below.
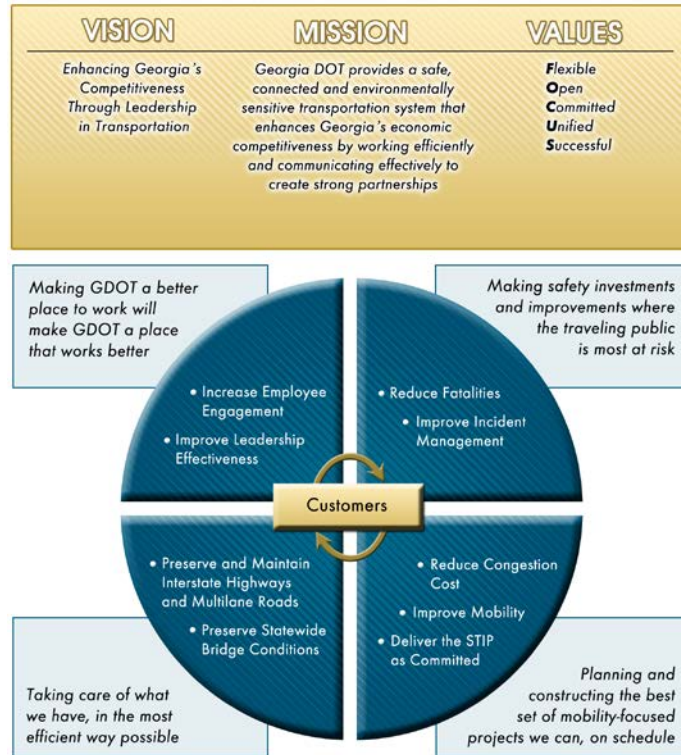
The strategic objectives are the measurable outcomes identified to move the Department toward attainment of the strategic goals using Asset Management principles. They define Georgia DOT's current target levels of condition.

FY 2013 Goals, Strategic Objectives and Performance Measures

Goal 3 Strategies

Goal 3 – Taking care of what we have in the most efficient way possible			
Objective	**Action Step/Strategy**	**Measure/Target**	**Division (Office) Responsible**
During FY2014, maintain Georgia's Interstates such that 90% or more are in "Fair" or better condition.	Develop a detailed pavement management implementation process for Interstates through the Georgia Asset Management System (GAMS)	Percentage of Interstate routes at a 'Fair' or better condition (COPACES rating of 75 or more) by the end of FY 2014	Permits and Operations (Maintenance)

During FY 2014, maintain Georgia's non-Interstate roads such that 90% or more are in "Fair" or better condition.	Develop a detailed pavement management implementation process for the Interstates through the Georgia Asset Management System (GAMS)	Percent of State-owned multilane, non-Interstate roads at a 'Fair' or better condition (COPACES rating of 70 or more) in FY 2014.	Permits and Operations (Maintenance)
During FY 2014, maintain 85% of State-owned bridges to meet or exceed the GDOT standard (strength and condition)	Implement element level inspections on state-owned structures	Percent of State-owned bridges that meet or exceed the GDOT standard (strength and condition) in FY 2014	Engineering (Bridge Design)
By the end of FY 2014, resolve 75% of all customer inquiries within the 3-day resolution time frame	Decrease the response time for resolution of customer inquiries (replaces Public Opinion Poll)	Percentage of customer inquiries resolved within the 3-day resolution timeframe in FY 2014 (target 75%)	Communications

Self-Assessment Survey and Gap Analysis

The first step in implementation of TAM throughout the Department was completion of the Asset Management Self-Assessment. A TAM task force, consisting of representatives from each department crucial in the TAM implementation process, was established. The members of the TAM task force completed the "Asset Management Self-Assessment Survey – Maintenance" (*Appendix 1*). Georgia DOT's Deputy Commissioner/Chief Engineer and FHWA's Assistant Division Administrator from Georgia also performed a higher level assessment. The results and risk factors were summarized. The specific areas of high concern or gaps that needed immediate attention were:

- Lack of commitment to setting priorities within a program.
- Resource allocations not guided by a performance-based approach using consistent criteria.
- Inconsistencies between programs and realistic future revenue projections.
- Limited cost history data for costing of options.
- Policies supporting a long-term, life cycle approach to evaluating investment benefits and costs.
- Maintenance strategies that involve monitoring, reporting, planning, scheduling and program control. *(Underway)*
- Data accessibility, data Integration and information systems integration. *(Underway)*
- Decision support tools and IT. *(Underway)*

It was evident from the Self-Assessment that accurate data was crucial to the implementation of TAM. To have a clear understanding of when and how data is collected, the TAM Task Force met weekly to present, review and analyze the available data collected and used in the Department. Each team

member gave a presentation on what data was collected in their office/division, the purpose of the data, which other offices collected the same data, and who used the data.

After the data was identified, reviewed and checked for duplicate collection, the TAM Task Force recommended that they transition into a new data governance group. The new body, known as the **Executive Data Governance Committee** is made up of Directors from various business units throughout the Department. The purpose of the EDGC is to assure data is integrated under one system, is available to all users, and is not collected by more than one office. The EDGC is a crucial link to the implementation of TAM because of its governance over data.

Customer Feedback

The Department's relevant stakeholders and key user groups are its customers. These include taxpayers, the traveling public, cities, counties and legislators, as well as Department personnel. Georgia DOT is committed to providing the best set of mobility services to stakeholders, to considering their priorities when planning and building projects, and to being transparent at all times.

Georgia DOT has incorporated customer feedback into its objectives and performance measures. The Department conducts public opinion surveys of randomly selected participants to evaluate the Department's performance in the areas of maintaining and improving the state highway system, environmental stewardship, communications and overall performance. Feedback from these survey tools is used to gauge how well the Department is meeting its overall objectives. The Department also conducts employee surveys to measure its performance regarding internal customers. Georgia DOT is dedicated to continually improving customer service.

Laws and Regulations that impact Transportation Asset Management at Georgia DOT
Congressional district fund balancing, or simply "balancing," refers to a Georgia law that requires Georgia DOT to distribute a percentage of its state and federal transportation improvement funds, excluding earmarks, equally among Georgia's 14 congressional districts over a five year period. The law was enacted during the 1999 Georgia General Assembly in response to concerns that some areas of the state were not receiving their fair share of highway funds and projects. The law originally required that 100 percent of Georgia DOT project funds be divided equally among the Congressional districts when averaged over a three-year period. Through the years, the General Assembly has modified the law so that the current requirement is for Georgia DOT to balance 80% of the funds it receives over a five-year period. The law was further modified during the 2013 Legislative Session to exempt interstate projects from congressional balancing and also exempt freight corridor projects if proposed by the Planning Director and approved by the GDOT Board. The State Transportation Board has the authority to waive the balancing requirement in cases where it conflicts with federal requirements or where other circumstances prevent timely project implementation. For example, the law was waived during the implementation of the $1.06 billion American Recovery and Reinvestment Act of 2009. A two-thirds vote of the State Transportation Board is required to waive the balancing requirements.

Georgia's congressional district balancing law presents a unique challenge to implementation and execution of TAM. The principles of TAM identify and guide programming and funding strategies based

on need; not location. As a result, if needs are not evenly distributed across the state, asset management funds may also not be evenly distributed. While this may present an additional challenge to complying with Congressional Balancing laws, it does not prohibit the use of TAM as congressional balancing requirements are not segregated to individual programs. In other words, the need may guide the Department to spend more Maintenance funds in one area or more Capacity funds in another, while still balancing overall funding throughout the state in compliance with the law.

Agency Risk Assessment and Management as it Applies to Asset Management

The evaluation of risk plays a big part in integrating TAM principles into the Agency's business strategies. Risk should play a key role in influencing decisions. In the most basic terms risk is determining how susceptible an asset is to a natural or manmade hazard that would prevent or limit the asset in serving its identified purpose. When considering risk to an asset, generally the following questions are considered:

- How likely will an event or hazard occur that could impact the asset?
- What is the consequence to the asset if the event or hazard occurs?
- What is the impact to the agency or public if the asset can no longer perform its function?

AGENCY RISK	STRATEGIES TO ADDRESS RISK
Lack of Staffing Resources	• Targeted external recruitment initiatives. • Filling vacancies using temporary staffing. • Utilizing contract services.
Access to assets due to natural emergencies	• Review/update Emergency Management Plan (EMP) annually. • Make certain staff has proper training. • Test EMP using relevant scenarios to evaluate staff, ensure protocols are coordinated with other respondents and identify gaps.
Project Delivery Schedules	• Determine need for outsourced services. • Educate Project Managers on various risks to schedules. • Include adequate time for contract negotiation.
Insufficient/Sustainable Funding	• Continue communication with the Georgia General Assembly. • Transportation Investment Act (TIA) – A one percent regional sales tax to fund transportation improvements. • Monitor the next Federal transportation bill through AASHTO.

As TAM is implemented throughout the Agency, the champion of each asset must evaluate the risk associated with the asset. This is critical to establish funding scenarios for various assets and programs.

GDOT-Owned Assets

GDOT is responsible for the majority of the state's assets. These assets and their estimated financial worth are summarized in the table below. Because the value for determining the Vehicle Network extends far beyond materials and labor costs, the cost to the citizens of Georgia varies greatly, is based on location and is therefore omitted.

ACTIVITY	ASSET COMPONENTS	QUANTITY	MEASURE	FINANCIAL WORTH
Vehicle Network	Road Pavements	18,903	Miles *(Center Line)*	N/A
	Road Bridges	6646	Number	$6,265,500,000.00
	Freight Track Miles	540	Miles	$ 27,000,000.00
[1]**Facilities**	Welcome Centers	9	Number	$ 14,617,105.48
	Rest Areas	17	Number	$ 21,330,890.60
	District Offices	7	Number	$ 70,250,000.00
	Area Offices	43	Number	$ 64,500,000.00
	Maintenance Offices	275	Number	$ 93,782,883.85
	Storage facilities	482	Number	$ 10,257,761.00
	TMC's	2	Number	$ 38,973,409.00
Network Control and Management	Traffic Signals *(on State Routes)*	5800	Number	$783,000,000.00
	Traffic Signals *(State Maintained)*	2417	Number	$326,295,000.00
	Traffic Signs	3,000,000	Number	**
	Road Markings	18,903	Miles	**
	Fiber Optic Communication	280	Miles	$ 33,000,000.00
	Changeable Message Signs	115	Number	$ 17,000,000.00
	CCTV Cameras	620	Number	$ 12,000,000.00
	VDS Cameras	2800	Number	$ 35,000,000.00
	Ramp Meters	170	Number	$ 20,000,000.00
Parking	Park n Ride Lots	93	Locations	$ 19,017,435.00
	Xpress Stations	21	Locations	$141,047,315.00
Vehicles and Equipment	Vehicles and Equipment	8874	Pieces	$44,510,000.00

ACTIVITY	ASSET COMPONENTS	QUANTITY	MEASURE	FINANCIAL WORTH
IT Equipment	Server Equipment	640	Pieces	$1,544,991.71
	Network Equipment	369	Pieces	$ 682,640.79
	Workstations	5100	Pieces	$5,387,408.14
	Printers	684	Pieces	$ 237,695.30
	VoIP	1,357	Pieces	$ 450,000.00

[1] **Welcome center** totals include all buildings with dollar values; **District totals** include Special forces, Bridge Inspection, Permits, Records, Lab, Ditching, Survey, Traffic Ops, and Training, where identified; **Maintenance** includes all maintenance-related buildings other than storage. It also includes Signal Shop, Sign Shop, and Motorpool, Asphalt Shop, "Special Outfits," and Bridge Maintenance, where specified; **Area entries** include all buildings that could be associated with Area Offices, except maintenance and storage. Area entries also include training buildings, except those identified as belonging to the District. **Storage** includes any building that could be associated with storing anything, to include salt pits, vehicle and equipment sheds and barns, etc.; **District 7** totals subsume GO-related buildings, such as OES, OPE, the OGC, ROW, HERO, etc.

** We are currently in the process of collecting data to determine Financial Worth.

IV - LIFE CYCLE MANAGEMENT

Life Cycle Management is characterized as "maintaining existing system performance at a constant desired level while minimizing resource consumption and externalities over the long term."[2] The emphasis is on long term preservation and sustainability without sacrificing system performance or public safety.

At Georgia DOT, asset life cycle management involves looking at an asset over its life span and applying preservation treatments to prolong its remaining useful life. Different asset preservation methods significantly prolong an asset's useful life while keeping performance at the most optimal level affordable. Also, preservation is significantly less costly than replacement.

As part of its initial TAM implementation, Georgia DOT applied Life Cycle Management in the areas of Pavements, Bridges and Signs. The following describes how this strategy was applied to those various areas.

[2] Supplement to the AASHTO Transportation Asset Management Guide: Volume 2-A Focus on Implementation

LIFE CYCLE MANAGEMENT – PAVEMENTS

A. Performance Service Level Statement

Georgia's roads are maintained at an optimum level to provide a safe and reliable means of travel. A key strategic goal is to "Take care of what we have in the most efficient way possible," and it encompasses the following objectives:

- *Maintain a COPACES Rating of 75 or more on all interstates*
- *Maintain a COPACES Rating of 70 or more on multi-lane non-interstate state routes*

B. How do we do this?

Georgia DOT's maintenance program addresses needs of interstates and roadways identified through scheduled inspections as well as those reported by other means, such as performance reports and the public. Needs range from pavement deficiencies (potholes, edge ruts) and drainage conditions (ditching, shoulder clipping, shoulder rebuilding, slope repairs) to vegetation issues. Scheduled maintenance inspection programs are in place to ensure that our roadways are safe. These include **CO**mputerized **Pa**vements **C**ondition **E**valuation **S**ystems (COPACES), concrete surveys, biennial drainage inspections, day inspections and night inspections.

The maintenance program utilizes a rating system to determine asset condition. Inspections are done for the following asset categories:

- COPACES and Concrete survey – address **pavement** conditions via a rating system based on type and severity of identified distresses.

- Biennial Drainage Inspections – address **drainage structure** conditions via a rating system based on type and severity of identified distresses.

- Day inspections – conducted annually to ensure that deficiencies (potholes, edge rutting, and vegetation) are noted and recorded in our Highway Maintenance Management System (HMMS) for future scheduling.

- Night inspections – conducted annually to ensure that nighttime deficiencies (such as retro-reflectivity of signs, raised pavement markings [RPMs] and pavement markings) are noted and recorded in HMMS for future scheduling.

A roadway is recommended for resurfacing when the COPACES rating is 70 or below; prioritization of actual resurfacing is dependent on priority (which considers both the COPACES rating and risk) and funding availability. Roadway reconstruction is based on lab recommendation and is typically done well after the roadway has rated 70 or below.

C. About Georgia's Pavements

Georgia's highway system is considered one of the best maintained in the nation. The system is designed to network city streets, county roads, state highways, national highways and interstates to form a system of public roads that efficiently carries travelers and goods. Georgia's highway system is made of:

- State Highway System   17,984 miles *(Temporary SR mileage included)*

- County Roads   79,917 miles

- City Streets   21,541 miles

- [3]Other Public   4,104 miles

  123,456 miles

D. Key Issues

Georgia DOT's Pavement Management team faces various challenges and issues regarding the implementation of preservation. Some of these include:

- Current pavement budget needs are $1.3 billion with funding of the Maintenance Lump Sum category set at $135 million through FY-2014. Several large projects are being funded outside the Lump Sum category in order to leverage the available funding.

- Pavement preservation is the primary maintenance function.   Preventing water from penetrating the base material is a primary objective as longevity of the pavement structure is dependent on this.

- It is essential to use the correct resurfacing treatment. Different distresses require different treatments (or combinations of treatments) to ensure roadway longevity.

- Reconstruction/major rehabilitation on high traffic volume roads have time constraints and may not be accessible during daytime.

E. Strategies for Managing These Issues

- Forecasting pavement maintenance is done by the state maintenance office. To best utilize motor fuel dollars, much of the work has been planned to use as little equipment and materials as possible. The statewide maintenance plan is being implemented to address maintenance needs in the most economically beneficial way.

- Using the correct resurfacing treatment is accomplished through the COPACES process and field inspections by trained personnel who take into account the type and severity of the distresses,

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[3] Other public includes roads under Federal jurisdiction (such as Military Bases, U.S. Forest, or National Park Service Roads) or roads under authority and jurisdiction of another local or state agency such as State Parks or Universities. Also, includes roads where authority or ownership is un-resolved. (Office of Transportation Data)

and, on occasion, lab recommendations. Drainage issues are addressed as part of the resurfacing project or prior to the project.

- The Maintenance Office has treatment selection guidelines in place that are dependent upon the type and severity of the identified distresses and predicted funding levels.

- Time restrictions due to high traffic volumes and other factors are considered during the project planning phase.

- Implementation of an improved Maintenance Management System is underway.

F.   Asset Value - Pavements

About 95 percent of GDOT roadways are asphaltic concrete. The remaining five percent are concrete roadways, typically limited to interstates or interstate type facilities. The primary road base types are sandy clay, graded aggregate, asphaltic concrete, soil cement and concrete. Because determining the asset value for pavements extends far beyond materials and labor costs, the cost to the citizens of Georgia varies greatly and is based on location, it is therefore omitted.

The table below lists how pavement conditions are measured and evaluated to meet established performance targets: maintain 90 percent of Interstates at a COPACES rating of 75 or better; maintain 90 percent of Non-Interstates at a COPACES rating of 70 or better.

Strategic Objective	Performance Measure	Current Status
Percent of interstates with a COPACES Rating of 75 or greater	Pavements evaluated are divided into mile-long segments. The average is determined by taking the cumulative total number of asphalt interstate miles with a COPACES Rating of 75 or greater, divided by the total number of all asphalt miles, expressed as a percentage.	76%
Percent of non-interstates with a COPACES Rating of 70 or greater	Cumulative total number of asphalt non-interstate miles with a COPACES Rating of 70 or greater, divided by the total number of all asphalt non-interstate miles.	71%

G.   Remaining Life - Pavements

GDOT has not determined the overall remaining life of its pavements. Instead, the Maintenance Office annually evaluates every mile of every road and determines the remaining life cycle based on these inspections. On average, concrete pavements have a life of 50 years while asphalt pavements last 10 years.

H. Asset Risks and Ways to Manage Risk – Pavements

To better utilize Department resources, the risk matrix (*see Risk Factor Matrix on page 16*) was developed. The matrix assigns a risk factor to each route based on criteria that directly affects the condition of the asset. When several routes receive the same COPACES rating through our annual evaluation of pavement conditions, the matrix using these key factors and criteria to determine the best use of the limited available resources. The analysis first considers the functional classification of the route; then the AADT, percent truck traffic, and finally the population of the county the route is located in. Once the total risk factor is determined, the annual COPACES rating score is divided by the total risk factor to determine the modified COPACES rating. This modified COPACES rating prioritizes the needed work in order to best maintain the entire system.

RISK FACTOR MATRIX - PAVEMENTS

Federal Functional Classification	Base Unit	AADT							Truck %		County Population						Total Risk Factor	Adjusted Paces
		<100,000	50,000-99,999	35,000-49,999	25,000-34,999	15,000-24,999	7,000-14,999	<6,999	>12%	<12%	>600,000	300,000-599,999	200,000-299,000	100,000-199,00	50,000-99,999	<49,999		
Interstates																		
Urban	1.00	0.60	0.50	0.40	0.30	0.20	0.10	0.00	0.50	0.30	0.50	0.40	0.40	0.30	0.20	0.10		
Rural	1.00	0.40	0.30	0.20	0.10	0.00	0.00	0.00	0.50	0.30	0.30	0.20	0.20	0.15	0.10	0.00		
Freeways																		
Urban Freeway and Expressway	1.00	0.30	0.20	0.10	0.00	0.00	0.00	0.00	0.30	0.10	0.40	0.35	0.30	0.20	0.10	0.05		
Arterials																		
Urban Principal Arterial	1.00	0.30	0.20	0.10	0.00	0.00	0.00	0.00	0.30	0.20	0.40	0.35	0.30	0.20	0.20	0.10		
Urban Minor Arterial	1.00	0.20	0.10	0.00	0.00	0.00	0.00	0.00	0.30	0.10	0.30	0.25	0.20	0.10	0.10	0.00		
Rural Principal Arterial	1.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.10	0.20	0.15	0.10	0.00	0.00	0.00		
Rural Minor Arterial	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.10	0.10	0.00	0.00	0.00	0.00	0.00		
Collectors																		
Urban Collector	1.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.10	0.30	0.25	0.20	0.10	0.10	0.00		
Rural Major Collector	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.10	0.20	0.15	0.10	0.00	0.00	0.00		
Rural Minor Collector	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.10	0.10	0.05	0.00	0.00	0.00	0.00		
Local																		
Urban Local Road	1.00																	
Rural Local Road	1.00																	

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I. Revenue Plan

It is estimated that revenue of $1.6 billion is needed for pavement preservation in the next 4 years (2014-2017) to maintain the level of service GDOT has consistently provided. The trend of anticipated expenditures by year is shown in the table and graphs below.

Year	$Major Rehabilitation	$Major Prevention	$Minor Prevention	Overall Comparative Rating Score*	Percent of Pavement in Varying Conditions				
					Excellent (%)	Good (%)	Fair (%)	Poor (%)	Bad (%)
2010	$339,935,700	$291,087,300	$20,006,900	81.2	30	24	25	16	5
2011	$4,446,700	$167,565,700	$22,665,300	85.3	41	24	25	8	2
2012	$0	$189,044,700	$25,254,100	84.9	38	27	25	8	2
2013	$43,285,600	$212,776,400	$29,376,200	84.5	36	28	26	8	2
2014	$50,970,900	$248,504,100	$34,301,800	84.4	34	28	27	8	2
2015	$40,391,900	$290,812,700	$39,679,800	84.3	34	28	28	9	1
2016	$24,992,600	$336,689,300	$45,422,900	84.3	34	28	28	9	1
2017	$12,015,600	$385,496,800	$51,611,700	84.3	34	28	28	9	1
2018	$3,160,700	$438,033,300	$58,390,200	84.3	34	28	29	9	1
2019	$0	$495,114,500	$65,933,300	84.3	34	28	28	9	1
2020	$0	$0	$0	84.3	34	28	28	9	1

Adjusted COPACES rating

Pavement Condition Distribution by Year:
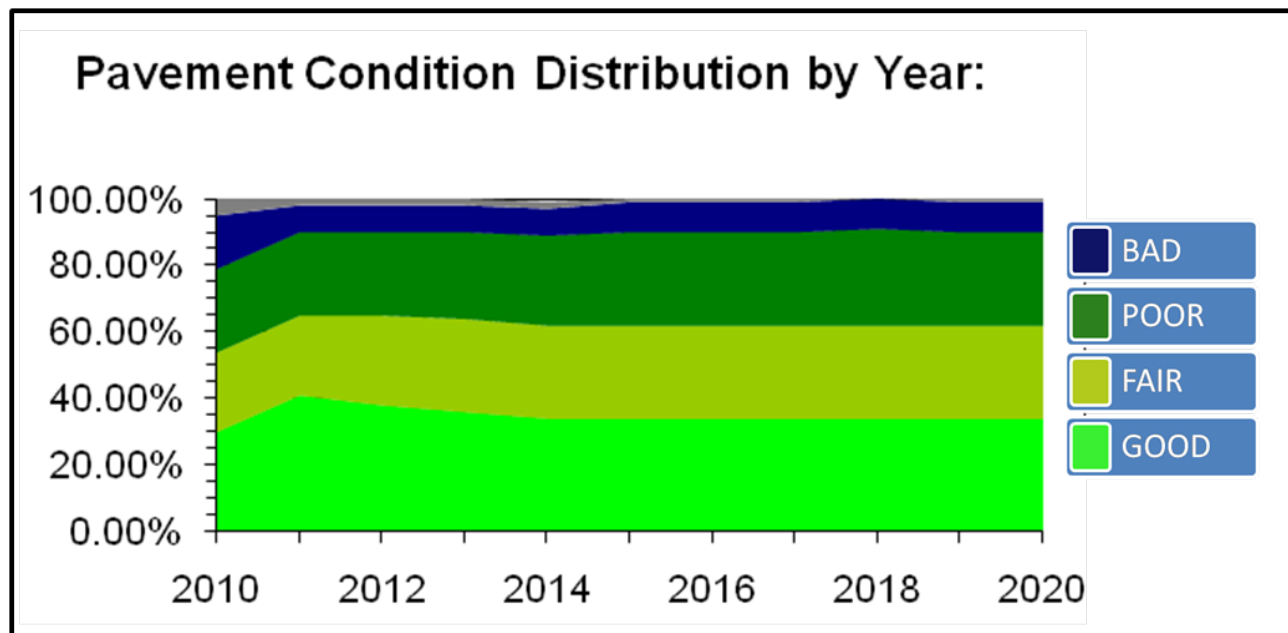
Pavement conditions and related COPACES ratings are described as follows:

Good (80-90) –A roadway in good condition ranges from a new road surface to the beginning signs of aging. This roadway contains some cracks in the riding surface and is beginning to fade in color.

Fair (70-80) –A roadway in fair condition is beginning to shows signs of advancing cracks in the wheel paths (where you drive) and across the lanes. The cracks in this section should either be sealed or scheduled to be sealed.

Poor (60-70) – A roadway in poor condition has advanced cracking through a majority of the riding surface.   The cracks may begin to resemble an alligator skin pattern. This roadway may have several patched areas.

Bad (0-60) – A bad roadway is severely cracked from one end to the other. The cracks look like an alligator skin and sections have started popping out creating numerous potholes.

Historical Expenditures

The graph below indicates pavement maintenance spending over the past 10 years:
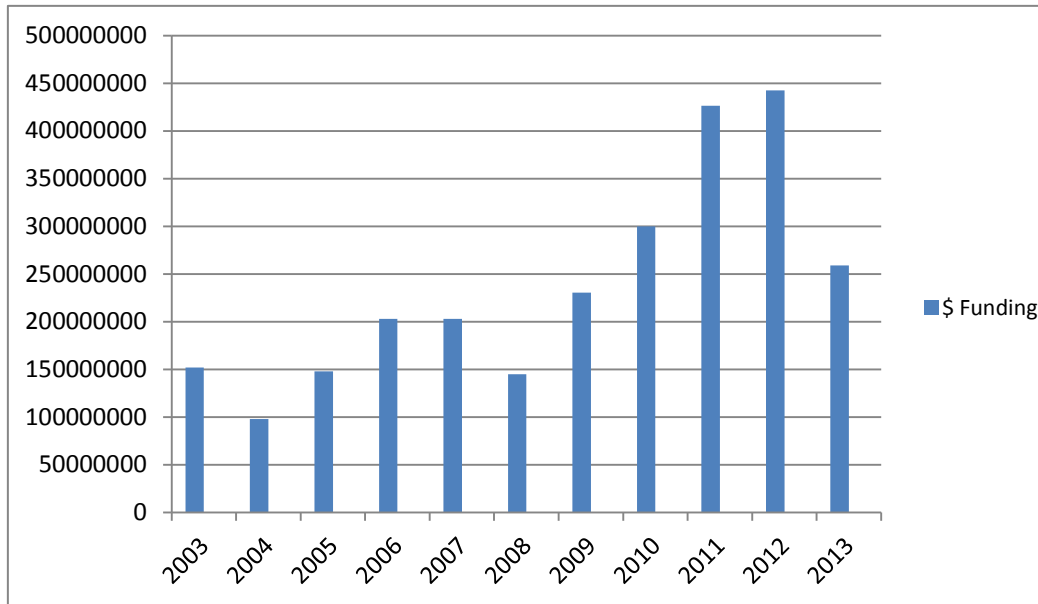
Source: Construction Bidding Administration

J. Data Reliability

TAM is guided by data driven processes; therefore it is imperative that Georgia DOT is confident in the reliability of the data being used. This is currently a challenge for the Department. The tables below indicate Georgia DOT's confidence in the reliability of the roadway asset and condition information in our database.

Road Surfacing

Data Attribute	Very Uncertain	Certain	Reliable	Highly Reliable
Asset quantity				X
Asset age	X			
Condition			X	
Performance			X	

Road Bases

Data Attribute	Very Uncertain	Certain	Reliable	Highly Reliable
Asset quantity	X			
Asset age	X			
Condition		X		
Performance			X	

K. Summary

The State Maintenance Office guides GDOT in the overall decision-making process for all statewide pavement preservation. To keep pavement maintenance practices efficient, the Department explores the use of new and improved materials, techniques and equipment.

LIFE CYCLE MANAGEMENT – BRIDGES

A. Service Level Statement

Georgia's bridges are maintained at a level to provide a safe and reliable means of travel. With respect to bridges, that goal encompasses the following objective:

- *Maintain State-owned bridges such that 85% meet or exceed the GDOT standard.*

Bridge standards are defined as follows:

Good – The structure has only minor problems noted.

Satisfactory – The structure shows some minor deterioration in structural elements.

Fair – All primary structural elements are sound, but may have minor deficiencies. These deficiencies could include minor section loss, cracking, spalling or scour.

B. How do we do this?

The Bridge Maintenance Unit (BMU) in the Office of Bridges and Structures is responsible for inspecting bridge structures and being in compliance with Code of Federal Regulations (CFR) TITLE 23, PART 650, Subpart C – National Bridge Inspection Standards (NBIS). The NBIS, established by FHWA, defines a "bridge structure" and sets minimum requirements for inspecting bridge structures. Compliance with NBIS inspection guidelines is a requirement of the law.

Bridge inspections are conducted using a two-part process:

1) **Inspection** – Bridge inspectors conduct on-site bridge structure inspections to determine and report current conditions.

2) **Load Rating** – Bridge engineers use the inspection report, plans and structural programs to analyze the bridge structure to determine the load carrying capacity. If the capacity is less than legal truck weights, the bridge structure will require posting (signs at the ends of the bridge structure detailing the maximum allowable truck weights) or closing.

A key component of compliance with NBIS requirements is to annually submit reports to FHWA documenting that NBIS requirements have been met.

In addition to inspecting and load rating bridge structures, the BMU has other responsibilities including, but not limited to:

- Maintaining the Bridge Information Management System (BIMS) in order to effectively manage bridge assets throughout the state

- Communicating with local bridge owners regarding posting requirements and routine maintenance

- Mobilizing inspection and maintenance resources to address emergency needs (flooding, bridge collisions, etc.)

C. About Georgia's Bridges

Georgia DOT maintains over 6,600 bridge structures. A highway "bridge structure" is a structure carrying traffic loads with a minimum clear span length of 20 feet measured at the centerline of the roadway. It is erected over a depression or an obstruction, such as water, a highway or railway. The term "bridge" is intended to pertain to culvert and pipe structures as well as traditional bridge types.

D. Key Issues

- There are approximately 6,600 on-system or state owned bridges in Georgia. Assuming an average maximum life span of 75 years, this means that on average GDOT should replace 88 bridges per year. This equates to a yearly cost of $176 million. Current funding limits allow approximately $85 million per year to be spent on bridge replacements.

- The Interstate system is approaching 60 years of age. Until now most bridges were replaced as a part of widening projects. In years to come, Georgia DOT will need to strategically replace interstate bridges for other reasons (condition, load capacity, etc.)

- In addition to bridge replacements, routine bridge maintenance must be addressed on the state system. This includes painting, deck and joint sealing, and scour repair. Larger maintenance issues such as joint replacement, deck replacement and damaged beam replacement must also be addressed. It is important going forward to ensure that the "right" maintenance is done at the "right" time for the "right" bridges.

E. Strategies for Managing Key Issues

- Like other assets, the Department's policy on bridge replacement has been skewed toward a "worst first" method of prioritization. In addition, certain conditions triggered automatic replacement of the structure, even if there was very low risk.

- Recent changes require that the State Bridge Maintenance Engineer prepare a project Need and Purpose statement for a bridge project. This will enable the Bridge Office to determine from the bridge inspection report whether a rehabilitation or a total replacement is more appropriate for a structure.

- Construction strategies should be identified to allow cost-effective bridge projects to be implemented sooner and faster.

- A policy should be developed to determine and document how Georgia DOT will identify Bridge Preservation projects with a goal of achieving the maximum agency and user benefit with the alloted funding. Implementation of a new Bridge Management System is underway and will move towards addressing this concern.

- Conducting element-level inspections.

F. Asset Value – Bridges

The total value of Georgia's bridges is indicated in the table below. The value is based on current average replacement costs. The exact value of individual bridges varies.

Structure Location	Total Number of Structures	Total Deck Area (Sq Ft)	Replacement Cost per Sq Ft	Total Replacement Cost
Interstates	1128	24,851,969	$105	$2,609,456,745
US Routes	1921	22,144,533	$90	$1,993,007,970
State Routes	3041	27,208,570	$90	$2,448,771,300
Off System State Owned	563	9,469,021	$90	$852,211,890
TOTAL	**6653**	**83,674,093**		**$7,903,447,905**

The following table shows the number of bridges that currently fall below desired target levels and the amount of funding required to bring them to the desired target level.

Strategic Objective	Number of Bridges Below Target Level	Total Deck Area(Sq Ft)	Cost of Bridge (per Sq Ft)	Total Cost
Maintain interstate bridges such that they can carry all legal loads	0	0	$105	$0
Maintain interstate bridges such that they, at a minimum, have decks that are in good condition	261	4,499,000	$55	$247,445,000
Maintain U.S. Route bridges such that they can carry all legal loads	20	185,000	$90	$16,650,000
Maintain U.S. Route bridges such that they, at a minimum, have decks that are in satisfactory condition	132	1,845,000	$45	$83,025,000
Maintain State Route bridges such that they can carry all legal loads	66	518,000	$90	$46,620,000
Maintain State Route bridges such that they, at a minimum, have decks that are in fair condition	39	573,000	$45	$25,785,000
Maintain Off-System State-Owned bridges such that they can carry all legal loads	15	131,000	$90	$11,790,000
Maintain Off-System State-Owned bridges such that they, at a minimum, have decks that are in fair condition	7	96,000	$45	$4,320,000
Funds Needed to Move Current Assets to Desired Target Levels				$435,635,000

G. Remaining Service Life – Bridges

Bridges experience a natural aging process. Each bridge is unique in the way it ages due to varying factors including material makeup, weather and traffic loads. While there is no way to define an exact useful bridge life, for the purpose of asset management, useful life is considered to be 75 years. The following table shows the existing age of bridges in the state.

Route Type	Bridge Age (in years)												
	0 – 10	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89	90 – 100	100+	Total	Average Age
Interstate	32	35	141	280	453	187	0	0	0	0	0	1128	39.7
US Route	175	202	286	172	202	297	163	205	195	22	2	1921	45
State Route	300	263	464	266	309	629	326	346	117	18	3	3041	43.6
Off System State Owned	35	45	85	120	177	92	5	4	0	0	0	563	36.6
Totals	**542**	**545**	**976**	**838**	**1141**	**1205**	**494**	**555**	**312**	**40**	**5**	**6653**	**42.8**

H. Asset Risks and Ways to Manage Risk - Bridges

The greatest risk associated with bridge structures is the loss of the structure for the purpose it was constructed and the potential for human loss should a bridge fail.   A bridge can deteriorate to the point that it loses its ability to carry full loading for the road system of which it is a part. When this occurs, the bridge must be posted for a lower load capacity. If a route has a posted bridge, then a vehicle weighing more than the amount posted must use an alternate route. Vehicles using these alternate routes incur additional user costs due to the longer route traveled. Considering this, bridges with the greatest risk potential are those that carry the highest volume of traffic and have the longest "detour length" for alternate routes.

Risk also increases as the classification of the road system increases. Interstates generally have the highest risk while Off-System routes generally have the lowest risk.

In addition to the inspection and analysis methods previously mentioned, the Bridge Prioritization Ranking (BPR) formula was developed to assist in ranking the state's bridge

projects. This tool concentrates the Department's efforts on structures with the greatest combined risk, rather than on those in the poorest condition or "worst first".

The Bridge Prioritization Ranking formula is based on two principles: structural capacity and user demand. Structural capacity is based on the strength of the structure to carry vehicle loads, the condition of the different components of the bridge and the type of structure. User demand considers the amount of traffic crossing the bridge, the length of the detour if the bridge is not in service, restrictions on truck weight and classification of the roadway.

The Bridge Office uses the ranking from the BPR to identify which bridges are candidates for rehabilitation or replacement and where these bridges need to be scheduled in the construction work program.

The Department is currently in the process of transitioning to a new Asset Management system. However in the interim, GDOT is using the Bridge Information Management System (BIMS) which contains standard data elements for each bridge (state-owned and locally-owned) in Georgia. These data elements are collected and updated by the Bridge Maintenance Unit (BMU) during a scheduled inspection or when conditions change and the BMU is required to inspect a bridge. Four data elements (HS Inventory, ADT, Bypass Length and Bridge Condition) are given a higher weight than others in the formula.

Components of the Bridge Prioritization Ranking formula

- Inventory Rating - an indicator of the bridge's load carrying capacity. In essence, this answers the question "How strong is this bridge?"

- Average Daily Traffic - the number of vehicles, on average per day, that use the bridge each year

- Bypass -the distance, in miles, that a vehicle must travel if the bridge is posted or closed

- Bridge Condition – a factor that indicates the overall condition of the bridge deck, substructure and superstructure

- Risk Factor - used to weigh the risk associated with the various classifications of roadway systems for which the bridge is a part. This is not a NBIS data item.

Additional weight is also given to bridges with timber components, reduced weight limits, repairs, substandard vertical or horizontal clearance, fracture, critical and unknown or scour critical foundations.

The Bridge Prioritization Formula considers risk factors for bridge projects and serves as a tool and starting point to guide decision making. Georgia DOT prepares a new State Transportation Improvement Program (STIP) annually. During STIP development bridge projects are ranked using the formula. Other factors including congressional balancing, proximity to other relevant work, and engineering judgment are considered to establish a final ranking of projects. The

development of the 2011-2014 STIP was the first time the bridge formula was used for ranking projects. A standard method for optimizing decisions regarding maintenance strategies for bridges is in progress as part of the Bridge Maintenance System under development.

I.   **Revenue Plan**

Assuming a 75-year useful life, GDOT would need to replace approximately 88 bridges annually. Coupled with annual maintenance and repair requirements, this equates to approximately $107 million annually. The following graph shows the trend of on-system bridge funds that were authorized over the past five years. Totals include projects that were authorized for Maintenance, New Construction, Reconstruction/Rehab and Replacement.
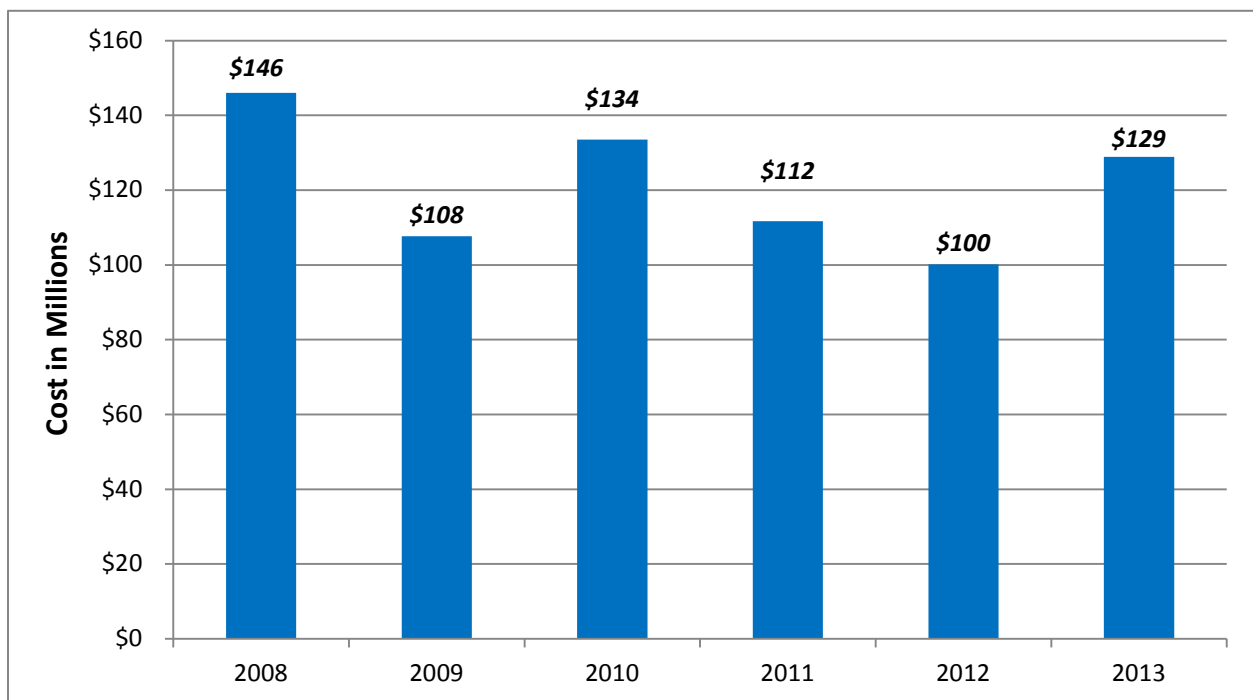
Source: Office of Financial Management

J. Data Reliability

The table below indicates Georgia DOT's confidence in the reliability of the asset and condition information in our database:

Bridges

Data Attribute	Very Uncertain	Certain	Reliable	Highly Reliable
Asset quantity				X
Asset age				X
Condition		X		
Performance		X		

K. Summary

Due to budgetary constraints, Georgia DOT has deferred some planned bridge maintenance. As faster deterioration of inventory occurs, deferring maintenance repairs can increase the risk of greater life cycle costs. Required maintenance never stabilizes — it only gets worse.

Recently, Georgia DOT reorganized and combined bridge design and bridge maintenance into a single Office of Bridges and Structures. Through this comprehensive lens, this office can drive all bridge maintenance and replacement activities and projects.

LIFE CYCLE MANAGEMENT – HIGHWAY SIGNS

A. Service Level Statement

Georgia's signs are maintained at the minimum retro-reflectivity levels prescribed in the current Manual on Uniform Traffic Control Devices (MUTCD). Well-maintained signs contribute to the safe and orderly movement of motorists.

B. How Do We Do This?

Georgia DOT maintains its signs through the Sign Inventory Maintenance System (SIM II) and by monitoring retro-reflectivity measurements. Sign maintenance activities also include day and night inspections, preventive maintenance (sign cleaning, vegetation control), and repairing or replacing signs when needed.

C. About Georgia's Highway Signs

While Georgia has not historically kept a comprehensive sign inventory, this process is underway. Georgia DOT estimates that there are approximately 3 million highway signs on state facilities. These consist of Type I Signs – less than 9 ft²; Type II Signs – more than 9 ft²; ground mounted panel type signs; and overhead panel type signs. Sign categories include regulatory, warning and guide signs. Support types include wood, square tube, u-channel, wood strain poles, steel strain poles, concrete strain poles, overhead span wire and overhead structural supports.

D. Key Issues

To be compliant with the revised MUTCD, a sign inventory management methodology was in place by January 2012. The method, SIMS II, is in place and collecting inventory data has begun. Once the database is developed, a comprehensive sign management system can be incorporated in the Agency's overall Asset Management System currently under development.

Another issue facing GDOT is the number of missing signs. The cost and quantity of missing signs is unknown. This may be the result of a decrease in funds allocated to the renewal program. The three year production trend captures the following:

Year	Fiscal Year 2008	Fiscal Year 2009	Fiscal Year 2010
Georgia Corrections Industries	$2,708,843	$791,514	$623,724
GDOT	$461,336	$447,430	$302,996
TOTAL	**$3,170,185**	**$1,238,944**	**$926,720**

E. Strategies for Managing These Issues

In order to determine the condition of the signs, a precise inventory must be completed. To assist with data collection, GDOT has begun a data collection process that will track sign location and type in the agency Asset Management System. In addition, new signs will include barcodes which can be used to track crucial sign information and be included in the asset management system.

F. Asset Value – Highway Signs

Based on the assumption that there are 3,000,000 signs, estimated values are:

Size	Cost Calculation	Value	Structure
Average – 4 ft^2/sign	14,000,000 ft^2 X $4.00/ft^2	$56,000,000	Signs only
Average – 9 ft^2/sign	31,500,000 ft^2 X $4.00/ft^2	$126,000,000	Signs only
Average – 12 ft^2/sign	42,000,000 ft^2 X $4.00/ft^2	$168,000,000	Signs only

G. Remaining Life – Highway Signs

The useful life of highway signs is defined as the length of time that the asset maintains a retro-reflectivity at or above the minimum level required by FHWA as found in the MUTCD. While the actual useful life will vary, it could also be considered, as the length of time the manufacturer will warrant the product. The manufacturer's warranty for sign sheeting material is 10 years. Other components have a warranty of more than 10 years.

Shorter useful life could be for example, a stop sign fabricated with ASTM D4956 and Type IX sheeting could be damaged due to an accident and only have a useful life of five years. On the

other hand, a speed limit sign fabricated with the same type of sheeting could be in service for 13 years and still meet or exceed the minimum level of retro-reflectivity, resulting in a longer useful life.   Potentially, 10 percent of the existing signs may be deficient.

Red series or regulatory signs on the state facilities are repaired or replaced within 24 hours after they become non-functional.

H. Asset Risks and Ways to Manage Risk – Highway Signs

Potential safety risks associated with not repairing or replacing red series or regulatory signs within 24 hours could be high. There are numerous occurrences across the country where a missing or damaged stop sign may have contributed to a crash that led to serious injury and death.

An aggressive plan to repair and replace signs is in place. To comply with federal MUTCD guidelines, GDOT personnel continue to routinely perform daytime and nighttime sign inspections as part of the Highway Maintenance Management System (HMMS) and to implement one or a combination of the methods below:

- Visual Assessment – Nighttime visual inspection of retro-reflectivity may be conducted by qualitative observation using one or a combination of the following:

  - *Calibration signs* – This method uses sample signs that are at or near minimum levels. During nighttime inspection, the observer views the sample signs from a vehicle and compares them against in-place signs to determine those that need replacement.

  - *Comparison panels* – This method involves obtaining sample panels at or near minimum levels. During nighttime inspection, the inspector clips the panel to the in-place sign to make a direct comparison. If the panel appears brighter, then the sign must be replaced.

  - *Consistent parameters* – This method uses consistency as a reasonable way to inspect for non-compliant signs. Observations are made at regular highway speeds from the right travel lane.

- Expected Sign Life – This method calculates sign life from known sign retro-reflectivity deterioration rates based on sheeting color and sheeting type. Individual signs are replaced when they reach the end of their expected service life. Most GDOT signs have a decal on the back of the sign that has the fabrication date and installation date indicated.

- Blanket Replacement – This method involves replacing all signs along a corridor, within an area, or of same sign and sheeting type.

I. Financial Plan

Taking into account the 3,000,000 signs and 10 percent of them that are not in compliance annually, the estimated revenue needed to maintain signs at the minimum level of compliance over the next 10 years, would be a minimum of $5,600,000 per year. Maintenance and data collection expenditures are funded by State Motor Fuel tax and Federal Funds.

From FY 2011 to FY 2013, the maintenance expenditure for sign replacement decreased from $8,822,500 to $6,558,465 or 26%.

J. Data Reliability

Since Georgia DOT has not traditionally maintained sign inventory data, assumptions regarding total number of highway sign assets are not reliable. Data collection began during FY 2011.

K. Summary

Districts perform routine daytime and nighttime inspections to identify signs that have low retro-reflectivity. Regulatory signs such as "STOP," "YIELD," "DO NOT ENTER" or "WRONG WAY," are repaired or replaced within 24 hours after the sign becomes non-functional. Expenditures on replacement signs purchased through Georgia Correctional Industries have decreased 70% over the last several years. In addition, sign maintenance, which includes repair and/or replacement, has decreased over 40% as well. These failures to perform sign replacement could cause GDOT to be out of compliance with new MUTCD minimum guidelines for sign retro-reflectivity. With completion of a sign inventory management system, GDOT will use the TAM approach to execute highway sign maintenance.

V – GROWTH AND DEMAND

There are demographic, political, and economic trends that both shape the need for the services provided by the Georgia DOT and influence how the Department will utilize Asset Management principles to meet future needs. An environmental scan was conducted for the Department which provides data and information that paints a picture of the environment in which the Agency operates.

Population Growth

Today, Georgia ranks among the faster growing states demographically and is adding people at a higher rate than the national average. Georgia's population more than doubled between 1970 and 2010, adding more people than all but three states. Even though the rise in population has recently slowed with the recession, Georgia has maintained higher growth than the U.S. average, benefiting from its location at the center of the South, the most populous

region in the country and one of the fastest growing. The pace of the state's population growth puts pressure on all aspects of Georgia's infrastructure: its water systems, schools, healthcare facilities, etc. In particular, the state's transportation system must accommodate the needs of an increasing number of residents, retirees, businesses and workers, and do so reliably, safely, and efficiently. Additionally, population growth also has a direct bearing on transportation demand. More people take more trips, require more services, and need more goods to sustain themselves.

Economic Indicators

Georgia's economy also contributes to demand for the movement of people and goods. Economic growth, like population, increases trips and volumes for all transportation modes. Recent trends in the Georgia economy including employment, unemployment, income, and gross domestic product (the value of goods and services produced by Georgia) as well as the state's economic structure are contributing factors to how the transportation system is used and maintained.

From a jobs perspective, the Georgia economy employed over 3.9 million people in 2012. Similar to population, Georgia has also experienced substantial long-term increases in jobs (more than doubling between 1970 and 2010). Jobs translate into trips as more people commute, shop, and buy services, and are also a reflection of overall business activity affecting freight.

Georgia's transportation system underpins the state's $420 billion (2012 dollars) economy (an economy roughly similar in size to South Africa and Argentina). Georgia's gross domestic product (GDP), a universal measure of economic size and activity, grew by 11 percent between 2000 and 2011 (adjusted for inflation), well below the 17 percent increase in U.S. GDP posted over the same period.

The Georgia economy is dynamic and its competitiveness in the world market is fostered by the efficient movement of goods to keep costs down and customers supplied. The transportation network also brings people together for face-to-face meetings and links businesses to opportunities in distant markets, both global and domestic. All businesses need Georgia's transportation network and services to provide safe, reliable travel for workers. The Georgia transportation network provides the foundation on which industries crucial to the state economy can grow.

Economic Structure

Georgia's economic structure helps to define transportation needs in the state. Several "freight-intensive" industries (mining, agriculture, manufacturing, energy, construction, retail,

and logistics and distribution) have a significant impact on trucking, rail, air cargo, and deep sea shipping needs. On the other hand, growth in services industries (finance, managerial, professional, education, and healthcare) tend to affect personal/passenger-related travel although services have distinct freight transportation needs (parcel deliveries), as well. The tourism industry has clear transportation needs, both for freight (deliveries to restaurants and hotels) and visitor access and mobility.
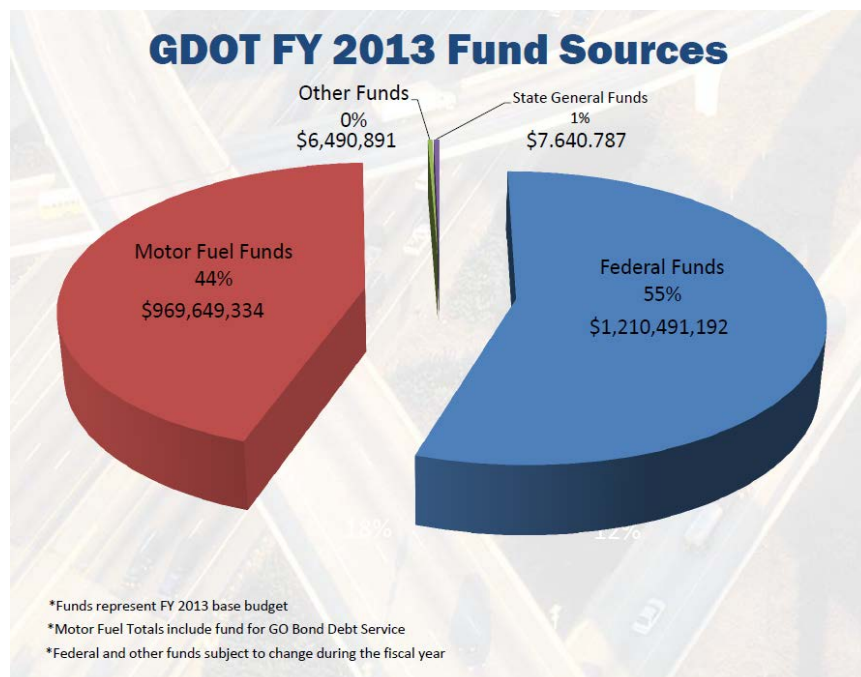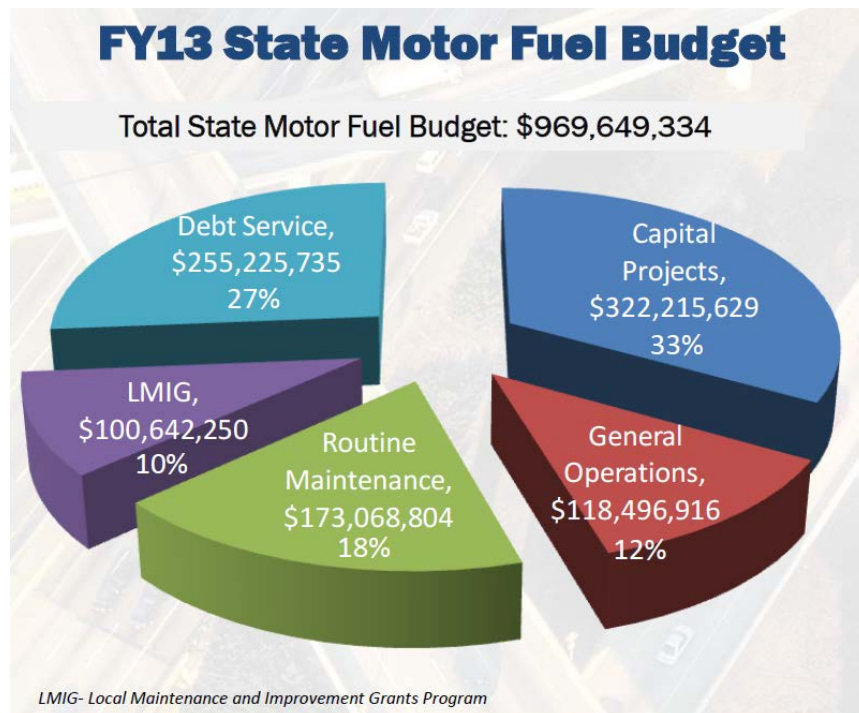
Economic Impact on Transportation

Transportation is strongly impacted by the economy. A thriving economy creates more demand for transportation throughout all transportation sectors. The trends indicate that the recession has had an impact on Georgia's economy. However, Georgia still remains one of the largest economic drivers in the Southeast and one of the largest economies in the United States. As a result, it is critical that GDOT pursues Asset Management principles to preserve the transportation system which will provide efficient movement of goods and people and keep up with Georgia's growing economy.

VI – FINANCIAL SUMMARY

Georgia DOT Budget

Georgia DOT's FY 2013 budget is $2.011 billion; the previous year's budget (FY 2012) was $1.964 billion. In both years, over 99 percent of the funding was from motor fuel taxes, federal funds, and other sources; less than 1 percent was from State General Funds. The charts below show GDOT fund sources and motor fuel budget allocation.

GDOT FY 2013 Fund Sources

Other Funds
0%
$6,490,891

State General Funds
1%
$7.640.787

Motor Fuel Funds
44%
$969,649,334

Federal Funds
55%
$1,210,491,192

*Funds represent FY 2013 base budget
*Motor Fuel Totals include fund for GO Bond Debt Service
*Federal and other funds subject to change during the fiscal year

FY13 State Motor Fuel Budget

Total State Motor Fuel Budget: $969,649,334

- Debt Service, $255,225,735 27%
- Capital Projects, $322,215,629 33%
- LMIG, $100,642,250 10%
- Routine Maintenance, $173,068,804 18%
- General Operations, $118,496,916 12%

LMIG- Local Maintenance and Improvement Grants Program

It is important to note that proceeds from the state's motor fuel taxes are constitutionally earmarked to support projects on Georgia's roads and bridges, like Local Maintenance Improvement Grants, and to provide matching funds for the state's federally-funded road projects. In addition, motor fuel collections fund the Department's annual general operations budget (routine maintenance, emergency assistance).   Georgia is also one of the few states that require its DOT to repay annual debt service with motor fuel tax collections off the top.

The Department uses the current year's funding to determine future budget needs. Consequently, it is important that the Department carefully plans future expenditures based on Asset Management principles.

VII – TAM PRACTICES

Georgia DOT has made steady progress in Asset Management since the program's inception. A TAM Steering Committee was formed to guide the direction and implementation of Asset Management principles in a comprehensive and collaborative manner.

Steps taken over the last year include development of a detailed TAM Implementation Plan to document specific next step actions for GDOT as well as development of a comparative/trade off analysis tool to evaluate the impact of investment in Maintenance, Safety and Capacity based on our agency performance goals.

A new Asset Management and Reporting System is also under development to include:

- Routine Maintenance *(HMMS)* and Pavement *(GPMS)* Management tools

- Capability to evaluate and recommend Capital Maintenance vs. Routine Maintenance solutions

- Inventory of existing and proposed signs

- Traffic Signal Management

- Bridge Management

- Fleet Management

- Exploring the ability to expand to include additional assets – Sign Management, Large Culverts, Safety and Facilities

The goal is to ultimately have one system that can efficiently manage each asset as well as evaluate investments versus performance.

Additionally, Georgia DOT is actively developing a GIS Data Visualization tool containing asset inventory, traffic data, asset condition, and mobility. This information will be available for viewing on a layered basis. The Department will also use Videolog technology to gather inventory data for pavements and other roadside assets. This methodology is being pilot-tested in the coming year.

The Department's Maintenance Office has also looked into alternative procurement methods to purchase equipment. For further details, see the Equipment White Paper in Appendix IV.

Asset Management is a continual process. As processes are defined for the various Georgia DOT asset categories and additional assets are added to the GDOT asset management system, this plan will be updated to include sections similar to those currently incorporated for pavements, bridges and signs.

For TAM to be fully implemented and understood by all levels of the organization, transparency is required. To do this, Georgia DOT has developed a tool to allow easy access to our performance measures and their results to the public. This tool is commonly known as the GDOT Dashboard. It is important that the Department establish effective measures to guide Departmental decisions. For this reason, the Leadership Team has identified the Performance Measures required to guide crucial decisions regarding Departmental policy and funding decisions.

It will take time to solidify TAM within the Department. As that happens, GDOT will inform cities and counties of its TAM practices and encourage them to adopt these processes for their

own use. This will enable cities and counties to become more proactive in protecting their assets. The Department will communicate asset management information including the benefits of following this approach, to Georgia's local government and municipal partners.

VIII – PERFORMANCE MANAGEMENT

The successful implementation of asset management depends on the use of performance management by GDOT Leadership. Asset Management and Performance Management are two sides of the same coin. Performance management is a two-step process. In the first step, performance measures are developed to determine if the Department is achieving the targets set in the strategic objectives; this determines if GDOT is meeting the level of service for assets included in the Asset Management plan. In the second step, the results of the performance measures are used to make decisions and take corrective action where necessary, or to implement strategies and initiatives to get things back on track.   GDOT strives to use Performance Management to make efficient and transparent decisions regarding issues impacting the transportation system.

VIII – IMPROVEMENT PLAN

PAVEMENTS

The State Maintenance Office guides GDOT in the overall decision-making process for all statewide pavement preservation. To keep pavement maintenance practices efficient, the Department explores the use of new and improved materials, techniques and equipment.

Improvement strategies for maintaining pavements include:

- Implementing the asset management system
- Implementing training
- Explore the development of an internal database

BRIDGES

Budgetary constraints have caused Georgia DOT to defer some planned maintenance. As faster deterioration of inventory occurs, deferring maintenance repair can increase the risk of life cycle cost being greater. Required maintenance never stabilizes — it only gets worse.

Recently, Georgia DOT reorganized and combined bridge design and bridge maintenance into a single Office of Bridges and Structures. Through this comprehensive lens, this office can drive all bridge maintenance and replacement activities and projects.

Improvement strategies for maintaining bridges include:

- Identifying funding strategies based on need; not location per TAM principles.
- Updating and publishing the Bridge Maintenance Manual
- Addressing severe staffing issue facing Office of Bridges and Structures
- Periodically reviewing of the prioritization formula including refinements as necessary

HIGHWAY SIGNS

Districts perform routine daytime and nighttime inspections to identify signs that have low retro-reflectivity. Regulatory signs such as "STOP," "YIELD," "DO NOT ENTER" or "WRONG WAY," are repaired or replaced within 24 hours after the sign becomes non-functional. Expenditures on replacement signs purchased through Georgia Correctional Industries have decreased 70.8% over the last several years. In addition, sign maintenance, which includes repair and/or replacement, has decreased over 40% during those same years. These failures to perform sign replacement could cause GDOT to be out of compliance with new MUTCD minimum guidelines for sign retro-reflectivity. With completion of a sign inventory management system, GDOT will use the TAM approach to execute highway sign maintenance.

Improvement strategies for maintaining highway signs include:

- Acquiring portable handheld reflect-o-meters for verification and validation of questionable highway signs.

- Acquiring data collection devices - Georgia DOT will acquire handheld barcode scanners to assist with data collection.

- Identifying signs that have exceeded their useful service life

  - Barcodes will be affixed to the back of each sign and specific data will be recorded

  - Overhead sign structures are more costly to maintain compared to standard flat sheet aluminum signs. Fabrication costs are 3 ½ times more expensive and even more costly if the overhead structure does not meet new design guidelines and replacement is required.

APPENDICES

Georgia Asset Management Implementation Plan

prepared for

**Georgia Department of Transportation
Organizational Performance Management**

prepared by

Cambridge Systematics, Inc.

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1.1   GDOT Strategic Approach

The American Association of State Highway and Transportation Officials (AASHTO) defines transportation asset management as "a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle." At the Georgia Department of Transportation (GDOT), asset management has been adopted as a practice of making better decisions based on well-defined goals, objectives and targets, and quality data and information with the consideration of risk. In this capacity, GDOT views asset management as a tool that will assist the agency in meeting its strategic goals.

In its FY 2013 Strategic Plan, GDOT has defined four strategic goals that outline the priorities of the agency. The agency's goals, linked to the State of Georgia's strategic goals, include:

- Making GDOT a better place to work will make GDOT a place that works better;

- Making safety investments and improvements where the traveling public is most at risk;

- Taking care of what we have, in the most efficient way possible; and

- Planning and constructing the best set of mobility focused projects we can, on schedule.

With these goals in mind, the agency incorporates strategic planning, asset management and performance management as tools to deliver transportation services effectively to the public. GDOT has developed an asset management framework focused on managing its transportation assets effectively. This framework is based on four key asset management objectives:

- Develop a comprehensive asset inventory with performance management;

- Consistently manage asset data;

- Ensure data-driven investment decisions; and

- Institutionalize asset management within the agency and state.

1.2   Development of the Asset Management Implementation Plan

This document outlines the plan to implement asset management as a business practice at GDOT. The plan highlights objectives, strategies, and action items to guide the agency in a step-by-step implementation process. The objectives and strategies were developed based on research of asset management practices at other states and interviews with managers of key programs within GDOT who will contribute significantly to the success of the program.

A state-of-the-practice summary was compiled based on asset management plans developed by the Departments of Transportation (DOT) in California, Colorado, Michigan, Missouri (Rail Implementation Plan), Oregon, and Utah. The goal was to understand the structure of these asset management implementation plans, the elements they contain and the approach these agencies used towards asset management.

Internally, the main sources of information were the Division of Organizational Performance Management document *Transportation Asset Management: The Strategic Direction of GDOT* and interviews conducted in May 2012. Other resources include the GDOT FY2013 Strategic Plan Update and research work conducted by the Georgia Institute of Technology on asset management and performance measures at GDOT. The objectives and strategies were developed based on the review of best practices and GDOT's specific issues and needs.

The action plan concludes with a list of specific tasks and action items that will move GDOT towards implementation of asset management within the agency.

2.0   <u>STATUS OF ASSET MANAGEMENT AT GDOT</u>

GDOT began the move towards asset management practice in the fall of 2009. Prior to this, a "worst-first" approach had been used in infrastructure maintenance practices which can result in crisis-oriented solutions. The main driver for the push towards asset management is GDOT's strong desire to make the most efficient use of agency resources. Significant budgetary constraints and growing infrastructure investment needs highlight the necessity to understand the performance impacts of funding allocations and major decision making. Implementing asset management will require quality data and information that supports all GDOT processes, and divisions.

In the first quarter of FY2011, a Transportation Asset Management (TAM) Task Force was established in an effort to formalize GDOT's commitment to asset management. The group included representatives from each of the divisions critical to TAM implementation and was first charged with completing an Asset Management Self-Assessment Survey that helped to identify areas of high concern with respect to maintenance. Key findings from the self-assessment included several areas of focus for GDOT: developing a performance-based approach to resource allocation, developing life cycle approaches to evaluating investment benefits and costs, and improving data accessibility and integration.

In an effort to institutionalize TAM as a business process in the agency, GDOT has also taken steps to establish the role of asset management in strategic planning. In February 2010, then Commissioner Vance C. Smith, Jr., formally announced the implementation of TAM in the department, which was followed by communication from Organizational Performance Management (OPM) to District Engineers. To take advantage of the progress in other state DOTs with respect to TAM, two members of GDOT's leadership attended a TAM Scanning Tour which included visits to the states of Washington, Indiana, and North Carolina.

GDOT has centralized agency information technology (IT) operations to remedy long established (legacy) stovepipes of information that limit coordination. The proposed asset management implementation steps below are intended to leverage GDOT's existing data governance structure (GDOT policy 8075-2, Data Management Strategy). GDOT IT implements required processes, procedures, standards and additional policies that ensure the ready availability of data and systems to support GDOT's evaluation of potential investments

GDOT IT has established information technology management structure or governance processes to work with all GDOT businesses as partners to identify knowledge gaps and business needs, and accordingly develop or assist in implementing new tools and techniques for agency wide usage.

2.1   GDOT's Existing TAM Tools

GDOT had seven main asset management tools, including:

- The Highway Maintenance Management System (HMMS) tracks the daily work of maintenance crews throughout the state, allowing the department to develop a work program for tracking costs.[4]

- The Computerized Pavement Condition Evaluation System (COPACES) is an assessment survey that rates every mile of every road each year.

- The Pipe Inventory (PI) is a module of the HMMS and provides condition assessments of pipes.

- The Highway Performance Monitoring System (HPMS) is a subset of the Federated Road Enhancement Database collected for the Federal Highway Administration (FHWA).

- The Life-Cycle Cost Analysis (LCCA) tool provides comparisons of the life-cycle costs for different pavement types.

- The Bridge Information Management System (BIMS) holds input data from bridge inspections and generally holds more data than the federally required National Bridge Inventory (NBI).

- The Georgia Pavement Management System (GPAMS) provides forecast data for COPACES each year and helps with analysis and prioritization, giving GDOT the ability to better predict current and future needs.

GDOT also has additional tools that can contribute to asset management, including an inventory of signals (maintained by individual districts), utility assessment tools, Transportation Data Viewer, an Enterprise GIS database that includes crash, traffic count, and other data, as well as software tools that are used to meet the financial reporting requirements of Governmental Accounting Standards Board (GASB) 34.

2.2   GDOT's Current TAM Practices

Tables 2.1 through 2.4 present GDOT's state-of-the-practice as compared to asset management practices documented in AASHTO's Transportation Asset Management Guide.[5] The benchmarks in the tables were developed based on a synthesis of industry best practices. The tables address the full range of DOT infrastructure management activities and are organized around the following categories:

- **Policy Goals and Objectives –** Does policy guidance encourage and provide incentives for good asset management?

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[4] The HMMS is currently being redeveloped.

[5] Cambridge Systematics, Inc., *Transportation Asset Management Guide*, prepared for National Cooperative Highway Research Program (NCHRP) Project 20-24(11).

- **Planning and Programming** – Do resource allocation decisions reflect good practice in asset management?

- **Program Delivery** – Do oversight techniques and follow-through reflect good industry practice?

- **Information and Analysis** – Do information resources effectively support asset management policy and decisions?

The information in Tables 2.1 through 2.4 has been organized in four columns. The first column identifies the most important basic characteristics of good asset management practice applicable to U.S. transportation agencies. The second column lists specific evaluation criteria by which these characteristics can be evaluated. The third column describes the current state-of-the art for each criterion. The fourth column describes the current practice at GDOT derived from interviews with key personnel, the TAM Task Force Asset Management Self-Assessment Survey, and key GDOT documents.

Table 2.1   Policy Goals and Objectives

Does policy guidance encourage and provide incentives for good asset management?

Characteristics	Criteria	Benchmark – State-of-the-Art	GDOT State of Practice
1. Policy goals and objectives reflect a comprehensive, long-term view of asset performance and cost.	Defined goals and objectives	Goals and objectives are comprehensive, integrated with other statewide policy objectives, and supported by quantitative and measurable performance measures or criteria.	GDOT's Strategic Plan has well defined goals and objectives that are linked to the State of Georgia's strategic goals. GDOT has also identified quantifiable, department-wide performance measures.
	Asset management as a key catalyst for decision and action	Principles of good asset management are articulated in an agency business plan and clearly recognized throughout the agency as the driving force for resource allocation and utilization.	GDOT has pursued the implementation of asset management since 2009. GDOT's FY2013 Strategic Plan Update adopted the principles of TAM for use in managing its transportation infrastructure.
	Life-cycle perspective	Goals and objectives embody the perspective of life-cycle economic analyses of asset performance and cost, and encourage strategies with long-term benefits.	GDOT is developing analysis tools built on life-cycle analysis perspectives.
2. Goals and objectives embody the public interest in good stewardship of transportation assets.	Recognition of asset condition, performance, and public acceptance in policy formulation	This recognition entails the following characteristics: • Policy goals and objectives encourage a business-model, customer-oriented approach to asset management. • Reliable information on asset condition and public perceptions thereof is accounted for in updating policy objectives.	GDOT's goals and objectives address key areas of customer interest. Historically, customer information has been gathered periodically. Through previous work, GDOT is actively engaged in furthering the development of asset management throughout the department.
	Public reporting and accountability	Reported system performance is measured against policy goals and objectives.	GDOT's Performance Dashboard presents several measures within each of GDOT's goals and is updated continuously.

Characteristics	Criteria	Benchmark – State-of-the-Art	GDOT State of Practice
3. Policy formulation allows the agency latitude in arriving at performance-driven decisions on resource allocation.	Political process	Political decisions on resource allocation among modes or programs are strongly influenced by objective information on expected performance.	GDOT has finalized a tradeoff analysis tool to provide information to key decision makers.
	Agency decision-making	The agency makes resource allocation decisions among programs and across geographic regions based on expected performance rather than by historical splits or formulas that do not correlate with an objective indication of system condition.	GDOT is required by law to distribute funding across its congressional districts. This legal requirement creates some constraints on a performance-based resource allocation process but does not prevent it.
4. The agency proactively helps to formulate effective asset management policy.	Engagement with policy-makers	The agency actively engages with political leaders and other policy-makers to define expectations of system performance, frame alternative approaches, and outline the consequences of decisions and courses of action relative to these expectations.	GDOT worked actively with members of its Board to develop the current strategic plan. GDOT has also established an Asset Management Steering Committee that consists of agency leaders who are responsible for collecting, storing or managing data.
	Provision of information	The agency's asset management systems are designed and applied to yield meaningful information on policy choices and consequences.	GDOT has made significant investments in data and analysis tools, including current improvements to HMMS and GPAMS, and the development tradeoff analysis tool to help evaluate policy choices.

Table 2.2   Planning and Programming
Do resource allocation decisions reflect good practice in asset management?

Characteristics	Criteria	Benchmark – State-of-the-Art	GDOT State of Practice
1. Planning and programming procedures and criteria are consistent and reinforce policy goals and objectives.	Fiscally responsible planning	Development of statewide long-range plans can be demonstrated to be consistent with policy goals and objectives and with realistic projections of future revenue.	By law, the GDOT Director of Planning (appointed by Governor) is responsible for funding allocation decisions. In practice, these decisions have been aligned with agency goals and objectives.
	Program prioritization	Funding allocation and project prioritization criteria are consistent with and support the State's and the agency's policy goals and objectives.	GDOT is required by law to distribute funding equally across its congressional districts.
	Updates and revisions	Updates and revisions to the planning and program development process are performed regularly to reflect changes affecting asset management priorities in the areas of: • Policy (e.g., preserving existing investments, economic development); • Technology (e.g., new design procedures or materials); or • Emerging Issues (e.g., updated environmental regulations; identification of potentially catastrophic risks to asset condition or performance).	GDOT makes regular updates to planning, and program development processes to reflect current available information. GDOT regularly updates both its strategic plan (annually) and its long range transportation plan (every 4-5 years). GDOT has actively invested in technology to support asset management, including updates to the HMMS, the Project Prioritization Process tool, utility assessment and others.
2. Planning and program development consider a range of alternatives in addressing system needs or deficiencies.	Planning alternatives	Long-range planning identifies and evaluates a range of program alternatives and, as appropriate, modal alternatives to meet present and future transportation demand.	GDOT's long range transportation plan examines key policy and investment alternatives.
	Project scope, cost, benefits, impact on performance	Program development, guided by adopted plans, formulates projects of appropriate scope and develops realistic estimates of their costs, benefits, and impacts on system performance.	GDOT uses several methods (i.e. local delivery, in-house design, consultant design, etc.) including Design-Build to address system needs or deficiencies.

3. Performance-based concepts guide planning and program development.	Performance-based budgeting	Recommended programs and budgets are tied to performance budgeting concepts entailing: • Structuring of costs by activity, and • Relationships of costs to levels of service or performance measures.	A tradeoff analysis tool is in final development designed to inform decision makers of possible trade off benefits based on various levels of investment in safety, maintenance, capacity.
	Benchmark achievement	The planning and programming process indicates (or "defines") the resources required to maintain existing assets at target performance levels and at least life-cycle cost.	GDOT sets targets and publishes a performance dashboard.
	System monitoring	Performance measures or levels of service are defined and regularly applied to quantify the impacts of program decisions and actions and to provide feedback for future planning and programming priorities, or consideration of adjustments in policy objectives.	Strategic objectives, action items, and system performance are reviewed and provided to OPB quarterly.
	Reporting	Progress toward stated programmatic system performance targets is measured and reported regularly.	Performance towards targets measured and reported at least quarterly.
4. Resource allocations and program tradeoffs are based on relative merit and an understanding of comparative costs and consequences.	Program building	Organization of projects within programs (program building) results from statewide competition among projects based on objective criteria.	GDOT uses project prioritization and other tools to evaluate projects. Consideration is given to the required funding distribution across the State.
	Consistency	Projects being designed and built respond to, and are consistent with, overall policy guidance for system performance.	A review of the existing system is performed yearly to evaluate performance.
	Program tradeoffs	Tradeoffs between programs (e.g., Preservation versus Improvement) are based upon analyses of life-cycle benefits and costs, rather than arbitrary formulas or historical splits.	A tradeoff analysis tool has been developed to help inform decision making.
	Communication	The implications of more or less resources allocated to each program are clearly communicated in terms of selected performance measures.	A tradeoff analysis tool has been developed to help inform decision making.

Table 2.3   Program Delivery
Do oversight techniques and follow-through reflect good industry practice?

Characteristics	Criteria	Benchmark – State-of-the-Art	GDOT State of Practice
1. The agency considers all available methods of program delivery.	Cost tracking	The agency knows its costs for delivering its programs and services (e.g., by activity, bid item, or resource class).	GDOT assesses capitol program delivery for opportunities to deliver more efficiently using alternative delivery methods to include Design-Build.
	Options for delivery	The agency periodically evaluates its options for delivering programs and services (e.g., agency employees, intergovernmental agreements, partnering, outsourcing, and managed competition).	Innovative Program Delivery scrubs the program annually for Design-Build suitability. This risk-based assessment is also performed whenever a candidate project is identified.
2. The agency tracks program outputs and outcomes.	Feedback mechanism	The agency has the ability to easily track actual project and service delivery against the program plan so that adjustments can be made.	GDOT tracks project delivery (on time, on budget) on its performance dashboard.
	Change process	A formal program change process exists to make needed adjustments in cost, schedule, and scope; document causes; and reallocate funds.	
3. Reports on program delivery accomplishments are communicated and applied.	Internal	Department executives and program managers are regularly informed of progress; a well-understood mechanism exists to make needed adjustments.	GDOT reviews performance measures and actual performance on a bi-weekly basis.
	External	Policy-makers and key stakeholders are kept informed of program status and adjustments.	GDOT publishes an online dashboard to report performance.
4. The approved program is delivered efficiently and effectively.	Delivery measures	Measures are defined and tracked to gauge successful program delivery in terms of schedule, cost, and scope.	GDOT tracks project delivery (on time, on budget) on its performance dashboard.

Table 2.4   Information and Analysis
Do information resources effectively support asset management policy and decisions?

Characteristics	Criteria	Benchmark – State-of-the-Art	GDOT State of Practice
1. The agency maintains high-quality information needed to support asset management.	Asset inventory	The agency maintains an inventory of assets that is a complete, accurate, and current description of infrastructure for which the agency is responsible.	GDOT tracks information for many parts of the system, especially pavement and bridge. ITS and Signals are tracked with the Safety Management System. HMMS is currently being redeveloped.
	Asset condition	Asset condition data are updated on a periodic schedule sufficient to meet regulatory requirements (e.g., bridge inspection data) and to provide timely and accurate information on status and performance.	GDOT maintains all data items on required schedules. GDOT is exploring the value in collecting data on assets besides pavements and bridges.
	Customer perceptions	Information on customer perceptions is updated regularly through surveys, focus groups, complaint tracking, or other means, to gauge public perception of asset condition and agency performance, and to respond thereto.	Public Opinion Survey are historically conducted every two years to determine the public's satisfaction with department services and transportation system quality.
	Program outputs	Information on actual costs and accomplishments by project, asset category, work type, and location are maintained in a form that can be utilized to track actual cost versus performance and improve cost estimation techniques.	GDOT tracks project delivery (on time, on budget) on its performance dashboard.
2. The agency collects and updates asset management data in a cost effective manner.	Data collection technology	The agency applies the appropriate mix of data collection technology (e.g., visual, automated, remote sensing) to ensure high quality data and to provide cost-effective coverage needed to maintain the quality information base discussed above.	GDOT is exploring data collection and management techniques. Additional work may be needed to effectively manage data as a key asset.

	Sampling methodology	The sampling methodology is demonstrated to be appropriate in terms of network coverage, sample size, and frequency, and in the training and team assignments needed to ensure objectivity, consistency, and repeatability.	
3. Information is automated and on platforms accessible to those needing it – relates to both data-bases and systems.	System technology and integration	The agency's single-asset management systems and databases have been updated and integrated to enable consistent information on all asset categories to be accessible to multiple applications, and to provide managers at various organizational levels the information and tools needed for effective asset management.	GDOT is working on improving data integration through the implementation of the Georgia Asset Management System (GAMS) which will incorporate HMMS and other asset management tools. Currently, a geographic basis for asset data is lacking.
	Data administration	Information requirements and/or standards for asset management are in place to ensure that future system and database development efforts within the agency will integrate with existing systems and meet asset management information and analysis improvement needs.	Frontline manager training is proposed for future system and database development.
	Geo-referencing	Systems and information are based upon a common geographic referencing system and a common map-based interface for analysis, display, and reporting.	
4. Effective decision-support tools are available for asset management.	Strategy analysis	The agency has decision-support tools that facilitate exploration of capital versus maintenance tradeoffs for different asset classes.	GDOT has tools for some assets – notably GPAMS for pavement, but not others (e.g., Bridge). The Georgia Asset Management System (GAMS) currently under development will serve as a tool to assist in managing asset tradeoffs. GDOT is also using national tools to help fill this gap.
	Project analysis	The agency has tools that support consistent analysis of project costs and impacts, using a life-cycle cost perspective.	

3.0   ACTION PLAN

The asset management action plan is comprised of three levels: objectives, strategies, and action items. The objectives define four main categories that explain the desired outcomes of GDOT's asset management program, with strategies specifying work steps for the plan (summarized in Table 3.1).

Table 3.1   Summary of GDOT Asset Management Implementation Plan Objectives and Strategies

OBJECTIVES		STRATEGIES
1. Develop a comprehensive asset inventory with performance measurement	1.1	Identify critical assets for performance measurement and inventory
	1.2	Identify ability to support performance measures with existing data and tools
	1.3	Identify shortcomings and update data collection tools as necessary
	1.4	Integrate assets and performance measures into GDOT enterprise information systems
2. Consistently manage asset data	2.1	Ensure compliance to State and Federal standards such as the Congressional District Balancing Law or financial reporting (GASB)
	2.2	Ensure application of GDOT data standards and governance principles
3. Ensure data-driven investment decisions	3.1	Clearly establish data-driven resource allocation
	3.2	Develop asset condition prediction models where possible
4. Institutionalize asset management within agency and state	4.1	Ensure efficient employee transitioning into asset management practice to influence agency culture
	4.2	Meet with each Division to develop strategies for institutionalizing asset management and risk management
	4.3	Monitor asset management use as a business process throughout agency
	4.4	Improve external understanding of how GDOT uses asset management to allocate resources and improve integration with cities and counties (i.e., use of GDOT information by cities and counties, and availability of city/county data to GDOT)
	4.5	Develop a risk register matrix, heat map (or equivalent) and other risk management strategies to assist decision makers

A detailed action plan for each strategy that provides a checklist for GDOT to track progress made in implementing asset management is provided. The action

items outline the recommended steps to take towards implementing asset management at GDOT. Each action item is listed with a timeframe, unit responsible, resources needed and expected outcome or output.

The timeframe is the period that implementation of the action item is recommended defined as follows:

- Near-term: up to 1 year

- Mid-term: 1 to 3 years

- Long-term: 3 to 5 years

Because asset management is an ongoing practice, no specific date is suggested where implementation will be complete. Instead, these periods represent recommended start times for the action items and as action items are completed, GDOT's asset management program maturity will continue to grow. In many cases, action items precede others so this has to be considered when implementing the plan.

The unit responsible refers to the Division or Office within GDOT that is responsible for carrying out the action item. The roles and responsibilities of different parties to be involved in this implementation process are further described in Section 3.2.

Many of the action items require resources from other action items when completed or from other processes within GDOT. These are also identified with the action items.

Finally, the expected outcome or output of each action item is listed. These serve as targets that can be used to measure GDOT's performance throughout this process.

3.1 Action Items

The following tables list the recommended action items. While the action items are numbered, no specific sequence is recommended and some action items may be carried out concurrently.

Objective 1: Develop a Comprehensive Asset Inventory

Strategy 1.1 Identify Critical Assets for Performance Measurement and Inventory

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
1.1.1 Identify critical and supporting assets that are responsive to GDOT's organizational goals	Ongoing	Divisions/Offices responsible for individual asset types in coordination with Organizational Performance Management	• GDOT Strategic Plan • GDOT Asset Management Plan • Georgia Tech CTAMS report	• Documentation of critical and supporting assets to support overall asset management approach
1.1.2 Identify performance measures* to evaluate critical assets that support GDOT's mission and goals	Complete	Organizational Performance Management	• GDOT Strategic Plan • GDOT Asset Management Plan	• System performance measures established by OPM in conjunction with other offices
1.1.3 Determine roles, responsibilities, and costs for maintenance and improvement of these assets.	Mid to Long	Multiple Divisions and Offices depending on asset owners	• Documentation from Action 1.1.1	• Comprehensive list of assets that support GDOT goals

GDOT's system performance measures are established by the Office of Organizational Performance Management in conjunction with all of GDOT's offices and divisions to support the evaluation of GDOT's goals. They can be found at http://www.dot.ga.gov/statistics/performance/Pages/default.aspx

Strategy 1.2 Identify Ability to Support Performance Measures with Existing Data and Tools

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
1.2.1 Conduct inventory of current data collection tools and database systems, i.e. TRANSPi	Ongoing	Information Technology	• None, already completed	• Documentation of existing data collection tools
1.2.2 Evaluate GDOT's ability to calculate system performance measures for critical and supporting assets	Ongoing	Performance measurement and data owners in multiple Divisions and Offices Information Technology Organizational Performance Management	• Documentation from Strategy 1.1.2 and 1.1.4 • Access to database systems	• List of system performance measures established by OPM in conjunction with other offices and ability to support these measures with current data and tools

Strategy 1.3 Update Data Collection Tools as Necessary

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
1.3.1 Identify gaps in current data based on performance measures	Near	Information Technology/Organizational Performance Management	• Performance measures as defined from Strategy 1.1.2	• Data needs assessment report
1.3.2 Investigate technological advances in data collection tools and analysis methodologies	Ongoing	Data owners in multiple Divisions and Offices	• National research on data collection	• Report on recommended data collection tools for procurement
1.3.3 Develop data collection and tool development plan that meets GDOT technology standards	Ongoing	Information Technology in coordination with data owners in multiple Divisions and Offices	• List of existing data collection tools, gaps, funding sources and technological advances from Strategy 1.2 and actions 1.3.1 and 1.3.2	• Feasibility report for procurement • RTAG research report to recommend improvements to the quality and utilization of effective data collection and governance
1.3.4 Procure new data and tools for Department	Ongoing	Information Technology / Procurement	• Prioritized list of tools for investment	• Data collection tools consistent with strategy

Strategy 1.4 Integrate Assets and Performance Measures into GDOT Enterprise Information Systems

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
1.4.1 Identify methods to integrate information for additional assets and performance measures into GDOT enterprise information systems	Mid to Long	Information Technology Multiple Divisions and Offices depending on asset owners	• Performance measures from Strategy 1.1	• Data integration report
1.4.2 Identify methods to optimize collection of data to support GDOT asset management objectives	Ongoing	Information Technology in conjunction with data owners	• Inventory of data collection efforts from Strategy 1.1	• Continuous improvement in data collection efforts
1.4.3 Identify mobile applications and other technology investments to improve access to data and tools	Long	Information Technology Data and system owners/users	• List of key asset data and tools	• Mobile/technology development plan

Objective 2: Consistently Manage Asset Data

Strategy 2.1 Ensure Compliance to State and Federal Standards

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
2.1.2 Identify Federal and State requirements that relate to asset management, infrastructure, financial reporting, etc.	Near to Mid	Legal Services/Division of Finance/ OPM	• MAP21 rule-making (to be determined) and Federal / State Codes	• Documentation of Federal requirements
2.1.3 Evaluate areas of concern with Federal requirements and determine ways to address inconsistencies	Near to Mid	Legal Services Organizational Performance Management	• Federal requirements documented from Action 2.1.2	• Illustrated Federal compliance or plans identified to maintain compliance

Strategy 2.2 Ensure application of GDOT Data Standards and Governance Principles

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
2.2.1 Establish formal data governance principles for GDOT data	Completed	Information Technology	• Technology Tool Standard • System Security Life Cycle Management • GDOT Technology Architecture and IT Security • IT Security Program Management • Data Classification Guidance • IT Business Continuity and Disaster Recovery Plan • Patch and Vulnerability Management Program	• Data governance standards for GDOT data
2.2.2 Inventory existing data systems and document data field definitions, i.e. source code	Ongoing	Information Technology	• See above	• Detailed description of available databases and data fields
2.2.3 Conduct data management training sessions to ensure clarity and understanding of data standards	Mid to Long	Information Technology Training & Development		• Uniformity of understanding of data standards, database systems and actual data throughout GDOT
2.2.4 Integrate data systems, i.e. data warehouse according to IT data integration plan	Mid to Long	Information Technology	• IT Data integration plan	• Continue transition to integrated enterprise information system
2.1.5 Audit integrated system to address data duplication	Mid to Long	Information Technology		• Improved data quality and accuracy

Objective 3: Ensure Data-Driven Investment Decisions

Strategy 3.1 Establish Data-Driven Resource Allocation Strategies

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
3.1.1 Investigate decision-making approaches and funding allocation methods in other agencies at both strategic and program levels	Complete	Organizational Performance Management		• List of recommended decision-making/funding allocation tools and methods at both strategic and program levels
3.1.2 Develop tools for tradeoff analysis at program level	Complete	Organizational Performance Management, Office of Planning, Multiple Divisions	• May use input from list created in Action 3.1.1	• Tradeoff analysis tool
3.1.3 Define funding allocation criteria for each program category	Near	Multiple Divisions and Offices depending on program category	• Performance measures developed in Strategy 1.1	• Clearly defined resource allocation criteria
3.1.4 Explore options for funding allocation/decision-making approaches at program level by asset/office and make selections, where possible	Near	Multiple Divisions and Offices depending on asset category	• Research results from Action 3.1.3	• Selections of funding allocation tools for each asset category
3.1.5 Develop manual for funding allocation strategies to ensure clear understanding of purpose and use	Near to Mid	Organizational Performance Management, Office of Planning	• Funding allocation tools at both strategic and program levels	• Funding allocation strategy manual(s)
3.1.6 Conduct training of staff to implement and fully understand funding allocation strategies	Mid to Long	Training & Development	• Funding allocation strategy manual(s)	• Clear understanding of funding allocation strategies at both strategic and program levels
3.1.7 Utilize integrated database system, i.e. data warehouse to make integrated decisions	Mid to Long	GDOT Management Information Technology	• Database system from Action 2.1.4	• Integrated strategic maintenance approach

Strategy 3.2 Develop Asset Condition Prediction Models

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
3.2.1 Describe key assets to be included in tradeoff analysis methodology	Complete	Organizational Performance Management with multiple Divisions and Offices	• Information on asset data and tools from Objectives 1 and 2	• List of asset classes or programs to be included in the tradeoff analysis tool
3.2.2 Review available tools and approaches for predicting asset inventory and condition	Complete	Organizational Performance Management with multiple Divisions and Offices	• Asset classes to be included in the tradeoff analysis tool from Action 3.2.1	• Description of available tools to predict future performance
3.2.3 Develop asset management system to track asset inventory and condition to inform decisions and resource allocation and report performance	Near	Information Technology with multiple Divisions and Offices		• Integrated inventory and condition tool to recommend/guide decisions regarding existing assets
3.2.5 Calibrate asset prediction curves used in tradeoff tool as needed to implement long term strategy	Long	Organizational Performance Management with multiple Divisions and Offices	• Long term strategy from Action 3.2.3	• New asset prediction models

Objective 4: Institutionalize Asset Management

Strategy 4.1 Ensure Efficient Employee Transitioning on Asset Management Practice

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
4.1.1 Develop asset management training material and schedule for all staff	On-going	Organizational Performance Management Human Resources Training & Development	• AASHTO Asset Management Guide Vol. I and II • National Highway Institute Asset Management Training • GDOT Asset Management Strategic Direction • Other research reports/papers	• Asset management training manual • Asset management training schedule
4.1.2 Develop a risk matrix, heat map (or equivalent) and other risk management strategies that will assist decision makers on:	Near	Organizational Performance Management	• Risk Register • Risk Matrix • Heat Map (or equivalent)	• Process for decision making utilizing risks o Develop risk strategies to manage the assets (i.e., reduce or eliminate risk of losing an asset)
	Long			o Determine what resources (personnel and funding) are dedicated to managing assets
4.1.3 Meet with each Division to develop strategies for institutionalizing asset management and risk management within business units	Near	Organizational Performance Management		• Process for decision making utilizing asset management

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
4.1.4 Through Work Force Planning evaluate staffing structure to improve asset management integration	Long	Human Resources Budget Services Organizational Performance Management		• Work Force Planning recommendations
4.1.5 Implement recommended staffing changes (if any)	Long	GDOT management Human Resources	• List of recommendations from Action 4.1.3	• Approval for staffing changes if applicable

Strategy 4.2 Monitor Asset Management Use at GDOT

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
4.2.1 Moderate steering committee with agency-wide representation to direct asset management implementation	Complete	Organizational Performance Management		• Formal asset management steering committee with clearly established roles
4.2.2 Develop asset management communication plan and update as necessary	Ongoing	Organizational Performance Management	• GDOT Strategic Plan • GDOT Asset Management Communication Plan	• Completed Asset Management Communication Plan
4.2.3 Establish strategies to monitor asset management practice within GDOT (e.g., monthly implementation progress update sessions)	Mid	Organizational Performance Management	• GDOT Asset Management Communication Plan	• Agency-wide understanding on asset management implementation progress
4.2.4 Conduct recurring "Lunch and Learn" sessions on asset management-related topics (e.g., Understanding Your Role) as an extension of training	Ongoing	Organizational Performance Management Training	• GDOT Asset Management Communication Plan	• Continuous agency-wide understanding of the purpose and use of asset management

Strategy 4.3 Improve external understanding of asset management and consider extensions to cities and counties

Action Item	Timeframe	Unit Responsible	Resources Needed	Expected Output/Outcome
4.3.1 Expand use of website material to provide information to public on asset management initiatives	Near to Mid	Communications Information Technology Organizational Performance Management		• Increased transparency of asset management implementation at GDOT
4.3.2 Develop communication materials (such as GDOT Asset Management Brochure) to disseminate more information on asset management to public and stakeholders	Complete	Organizational Performance Management Communications		• Increased stakeholder understanding of asset management
4.3.3 Identify city/county departments that have shown interest in asset management	Long	Division of Local Grants & Field Services		• List of possible local partners in asset management
4.3.4 Conduct meetings with city/county departments to discuss their role in managing Georgia's infrastructure	Long	Division of Local Grants & Field Services Organizational Performance Management		• Agreements on statewide asset management approach where applicable
4.3.5 Coordinate with Local Technical Assistance Program (LTAP) to disseminate information to local governments	Long	Division of Local Grants & Field Services Organizational Performance Management		• Agreements on statewide asset management approach where applicable

3.2 Implementation Roles

Effective implementation of asset management at GDOT will require participation from employees at all levels throughout the agency. Implementing asset management as a business practice requires specific adjustments to GDOT's traditional approach to making decisions and overall agency culture. There are key Divisions, Offices and personnel within GDOT that will play important roles in the asset management implementation process. These roles are roles and responsibilities are defined to maintain clarity and establish expectations for accountability.

Asset Management Steering Committee

Action Item 4.2.1 recommends designating a steering committee to support OPM in implementing asset management. This asset management steering committee should have representation from Information Technology (IT), and offices within the Division of Operations and Permits and Finance as well as from GDOT districts, with special emphasis on the offices that will play a significant role in the implementation process. This team will help ensure agency-wide representation in the asset management effort and make sure that all employee voices are heard throughout asset management implementation.

Organizational Performance Management (OPM)

Organizational Performance Management is responsible for implementing and administering the asset management program. Through a coordinated effort with offices throughout the agency, OPM can provide tools and information to steer the Department in the right direction with regards to asset management and ensure that GDOT is working towards meeting its strategic goals. OPM is also responsible for GDOT's performance management especially as it relates to asset management implementation and practice.

Information Technology (IT)

Information Technology (IT) enables business system, like Asset Management, by providing core support in two key areas.

1. The collection, storage, and analysis of data. Per agency policy GDOT IT has established agency wide IT infrastructure that leverages resource across the agency.

2. Presentation and communication of the analytical results to decision makers inside and outside the agency. IT has implemented a data center with shared IT resources and centralized operations that allow for communication, including geographic information systems.

IT performs a program coordination role that includes:

- Providing recommendations, review and/or delivery of IT systems to support agency wide data collection, storage and reporting structures

- Developing technical architecture and standards that support maintenance and retention of GDOT information (data) asset to meet identified agency business needs, in conjunction with business data owners

- Supporting state mandated information security program and accordingly implement security controls and perform regular security assessment of GDOT data

- Developing, implementing and performing data management tasks for life-cycle management of GDOT data assets

Office of Transportation Data (OTD)

Data and data management are at the core of asset management practice. Without quality data and effective data management, decisions made in the agency will be flawed. The Office of Transportation Data will support the management of asset data and systems. OTD will work with other offices to support data integration, which will improve GDOT's use of asset management as a business practice.

Division of Engineering; Division of Local Grants & Field Services; Office of Maintenance; Office of Traffic Operations; and Office of Utilities

The offices within the Division of Engineering, Division of Operations/Permits and the District Offices are all crucial to the implementation of asset management. These offices can provide data on the infrastructure assets which will feed into the core of the asset management program. Eventually these units will also be directly responsible for ensuring that asset management is actually practiced on the ground.

General Counsel/Division of Administration

The Offices of Human Resources, Training and Development and Legal Services are all essential to the successful integration of asset management into GDOT's agency culture. These offices will ensure that GDOT maintains compliance to State and Federal requirements while ensuring that employees receive the necessary information and training to use asset management principles in their day to day decision-making.

Communications Office

Internal and external communication of asset management principles will improve understanding and provide general clarity to GDOT employees and stakeholders. The Communications Office is responsible for developing communication strategies for asset management implementation where necessary.

Division of Finance

The offices within the Division of Finance are responsible for ensuring that GDOT's asset management program can be supported financially.

Performance Management Implementation Plan

Table of Contents

II. OVERVIEW

A. *Purpose:*

The purpose of this document is to provide guidance and outline procedures regarding the implementation of performance management in GDOT.

B. *Definition:*

Performance management is defined as *an ongoing, systematic approach to achieving results through data-based decision making.*

Performance management (PM) works hand-in-hand with Asset management (AM). Along with Strategic planning, they form the three legs of a stool that supports GDOT's primary function; to provide a safe, reliable transportation system for Georgians.

Performance management is a two-step process. The first step is performance measurement which evaluates the achievement of a specific target. The second, performance management, uses the results of the performance measures to make decisions and developing strategies to correct identified deficiencies. The result is an agency that meets the targets and goals established in its overall Strategic plan. Whether managing people or physical assets, *performance management* involves making assessments and decisions based on clearly articulated objectives and associated targets. Simply put, performance management is using data as well as engineering judgment and experience to making sound and definitive decisions.

C. *Principles*

1. Focus on the end goal

Performance management focuses on the end result, rather than processes or compliance issues. The end result is normally expressed in terms of a measureable objective such as "Reducing fatalities by 41 each calendar year." Throughout GDOT the desired focus is on reaching the targets that have been set to demonstrate accomplishment of the specific strategic objective.

2. Set relevant measures

To be relevant, performance measures and their targets must focus on the key performance indicators (KPIs) that accomplish the strategic objective being pursued. This will vary, depending upon the target audience. The target audience of GDOT's Performance Dashboard, which houses its agency-level measures, is the citizens of Georgia, the Governor, the Board, and the Legislature. These performance measures are big picture measures.

Divisional or office level measures may require more specific information. Focusing on the appropriate KPIs minimizes the chance of developing more performance measure measures than needed and the issue of measuring things for measurement sake.

3. Data to be used should be readily available, easy to access, use, and understand

When determining the data needed to for a performance measure, consideration should be given to the availability of the data. This is critical to the duplication and automation of performance measure results. It is also important for supporting the transparency of the measure.

4. Align Performance Measures with the agency Goals

Performance measures should ultimately relate to or "map back to" a strategic objective detailed in the GDOT Strategic Plan. GDOT's strategic objectives and strategic goals in turn map back to the Governor's strategic goals.

5. Practices are sustainable over time and across organizational changes

Performance management should become standard or institutionalized behavior, throughout GDOT. By doing so, it will continue regardless of changes in administration and organizational structure.

III. ROLES AND RESPONSIBILITIES

Support from the leadership team is critical to the successful implementation of performance management. Leadership should model effective performance management behavior.

1. Division Directors, Office Heads and District Engineers

Division Directors, Office Heads, and District Engineers are primarily responsible for the implementation of performance management within their respective areas. Champions at the appropriate managerial level should be accountable for tracking, monitoring and proposing direction for the performance measures.

Organizational Performance Management (OPM) is responsibilities for overseeing the development and maintenance of GDOT performance dashboards (external and internal); providing support and assistance to GDOT Divisions, Districts, and Offices in developing appropriate performance measures and scorecards, and acting as the focal point for the collection and distribution of performance results to external agencies such as FHWA and OPB. These are important tools that assist in the implementation of Performance Measurement. More importantly OPM serves as a resource for encouraging other to use Performance Management as a component of their everyday decision making process.

IV. DEVELOPING PERFORMANCE MEASURES

Performance measures are used to evaluate our success or failure in meeting objective, strategy, or initiative targets. To be of benefit, however, they must be carefully crafted. The steps in the performance measure development process are outlined below.

1. Determine Key Performance Indicator(s)

A given strategic objective or strategy will have a number of activities that will impact its success. However, not all are of equal in importance. The most critical factor, the "deal breaker", becomes the KPI.

2. Set Targets

Identifying targets can be difficult. Consideration of the risk and consequence of not making the target should be given. Also, corrective actions should be considered that can be taken when the target cannot be met. Otherwise, the target may not be effective.

3. Document Performance Measures

Performance measures should contain three components:

- What is to be done (i.e., the task)
- By when (i.e., the deadline)
- How well? (i.e., according to agreed professional or internal GDOT standards of completion e.g., accuracy)

Good performance measures have the following characteristics:

- **Relevant:** relevant to the intended audience
- **Understandable:** clear, concise, and easy for a non-specialist to comprehend.
- **Timely:** uses data that is available frequently enough to have value in making decisions.
- **Comparable:** uses data that is consistent enough to determine if performance is getting better, worse or staying about the same.
- **Reliable:** uses a data source that is defendable, replicable and accurate
- **Cost effective** – results of the measure justify the time and effort to collect, record, display, and analyze the data.
- **Can be influenced**: results of the measure can be changed or adjusted in order to produce better performance results.

B. *Scorecards and Dashboards*

A scorecard is a collection of performance measures belonging to a group or area (e.g., team, Office, or Division). It is simply a visual representation of the status of each performance measure. Below is an example of an Office scorecard.

Design Group: Rudd   8.14.2012

# of Active Projects = 18

Design Activity	Quality		Schedule				Current Design Status
	Avg. score	# of tasks	% on time	% late	# of tasks	Response time	
Concept	100	1	0%	100%	2		
Preliminary Design							
Geometric Review	94	1					
PFPR	86	8	75%	25%	8	13	
ROW Plans	87	3	75%	25%	4		
Final Design							
FFPR	89	9	78%	22%	9	12	
Final Plans	91	4					
Letting Schedule							
Plans to ES			100%	0%	6		
Plans to CBA			100%	0%	5		

Current Design Status

On Schedule ■ At Risk ■ Behind
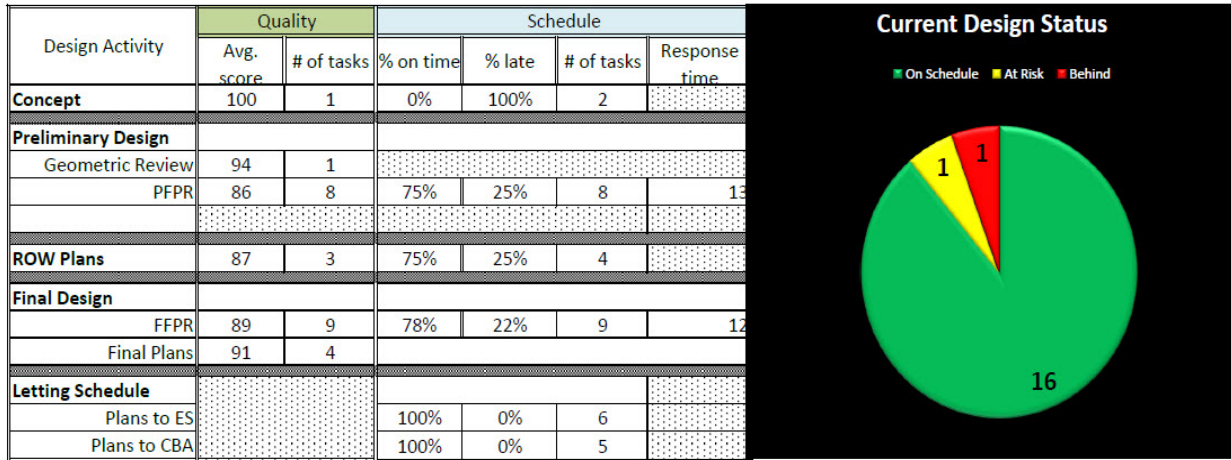
Scorecards can take on various formats. The Department is working towards the development of an Internal Performance Dashboard (IPD). This GDOT IPD will contain a toolset that enables Divisions and Offices to build their own scorecards.

C. *Manage Performance*

The final – and most critical – step to Performance Management is the creation of an environment that allows managers to use the data gathered to make decisions. Unless the data is used to make decisions and take action, it is just data – information with no purpose. A good way to use the data is to make the scorecard part of a meeting agenda; the basis of a conversation. The focus is then on results, or the lack thereof. The question then becomes, "Why are we not Green, and what are we going to do to get things back on track?"

1. Overcome Resistance to Change

Perhaps the single biggest hurdle to implementing performance management is resistance to change, especially to the notion of being judged on the basis of a "score." Too often, employees can rationalize missing a target by chalking it up to a variety of external factors. Employees should be encouraged to "keep score". Performance Measures can be used to identify better ways to accomplish the mission, identify additionally needed resources or celebrate successes. Performance Management and a culture of continuous quality improvement go hand in hand.

Staff should also be reminded that performance targets are not written in stone – they can be changed based on circumstances. As employees become more efficient at meeting and/or exceeding the established performance target, it may be time to 'raise the bar.' Likewise, if they consistently struggle to meet expectations or fail consistently to do so, the task and its associated performance target should be reevaluated. Performance management lends itself to a process of continuous review and modification.

An effective technique to overcome resistance is to incentivize performance. Recognize top performers, and ensure that news of their achievements is spread throughout your area. This can be as simple as announcing the month's top performers in an email, or as elaborate as presenting certificates.

2. Communication

To be successful, performance management must be embraced both by managers and employees. A communications plan is under development to educate and encourage the use of performance management.

V. REPORTING

Agency level measures have been established and are reflected in the GDOT Dashboard. Divisions and Office heads should begin planning strategies for implementing performance management within their respective areas. The agency-level strategic goals and objectives are the starting point. Divisions and Offices can create performance measures for individual areas that track individual accomplishments while ultimately mapping to agency goals and objectives. As the Internal Performance Dashboard is developed, Division and Office level measures will be housed there.   Staff from OPM is available to guide and advise in the development of measures when needed.

Communications Plan for
Asset Management

Situation analysis

In light of huge investments in the nation's existing transportation infrastructure and shrinking transportation funding to maintain it, USDOT/FHWA have provided guidance to state DOTs throughout the nation via the Transportation Asset Management (TAM) initiative. TAM is a strategic and systematic process of operating, maintaining, upgrading and expanding physical assets, with the objective of better decision-making. In summary, TAM will help state DOTs maintain their respective systems at a pre-determined condition level for the smallest financial investment.

At Georgia DOT, TAM was initiated the fall of 2009 with the establishment of the TAM office as part of the Chief Engineer's staff. Like any new initiative, "start-up" activities needed to be performed, including staffing; research of existing data, systems and tools Department-wide; review of additional FHWA guidance; review of TAM implementation in other states; drafting a Transportation Asset Management Plan for implementation throughout the entire Department.

With the Plan now complete, it is critical that a communications plan be put in place that effectively presents TAM to the Department's internal and external audiences.

Goals of the Communications Plan

- Strategically promote awareness of TAM to key audiences;
- Promote value of and buy-in of TAM practices within the organization; and
- Measure the outcome/results of our strategies to ensure their effectiveness.

Target Audiences

There are many target audiences that will either need to:

- Gain general awareness about the concept of TAM and its potential benefits for the Department and the state;

- Champion TAM and its important role in the achievement of the Department's strategic goals; and/or
- Fully understand and routinely utilize TAM's practices as a part of the new way the Department will conduct business.

- Internal Target Audience
  - State Transportation Board
  - Senior managers
  - Employees

- External Target Audience
  - United States Department of Transportation (USDOT)/Federal Highway Administration (FHWA)
  - American Association of State Highway Transportation Officials (AASHTO), American Road and Transportation Builders Association (ARTBA) and other industry organizations
  - Partner transportation agencies
  - Consultants
  - Contractors
  - Legislators
  - Local government officials
  - General public
  - Media outlets

Key Messages

- In light of dwindling funding and continuing transportation demands, TAM will help us prioritize the work;
- TAM is a shift from allocation of resources to "worst first" to the "most at-risk first";
- TAM will help us achieve the Department's strategic goals to preserve the system, to ensure safety for the travelling public, and to provide good stewardship/customer service; and
- TAM practices are applicable to all offices.

Key messages in sound bites:

- TAM is an example of good stewardship of the taxpayers' money.
- TAM will benefit local governments as well as Georgia DOT.
- TAM -- just like managing your own home – addresses the greatest risks first.

- TAM is a better way to do business.

Communication Strategies

Audience		Strategies	Timeframe
Internal	State Transportation Board	▪ <u>Communication with key Board Members</u> – in contexts of maintenance efforts, fiscal responsibility and information we will be sharing with legislators and local government officials ○ Include information on TAM in Board orientation presentation ▪ <u>One-on-one meetings</u> with some or all Board members regarding TAM priorities in their respective districts. ▪ <u>Powerpoint presentations and talking points</u> prepared on TAM for each Board member to use in his/her district community meetings.	Near

Internal	Senior Managers	▪ <u>Create TAM Steering Committee</u> of key Champions (Director of Organizational Performance Management, Director of Engineering, Director of Permits and Operations, Director of Field Services, Chief Engineer) and senior managers from Information Technology (IT), and others as needed for periodic standing meetings to discuss past/current activities and future needs.
		   ○ Steering Committee reports to Commissioner's Senior Staff Meetings each quarter.
		▪ <u>Develop matrix tool</u> that engages all senior managers in determining where they can apply TAM in their respective areas.
		   ○ Tool will also determine what new responsibilities, if any,
			Complete

		are assigned to employees within each office, including: asset inventory, asset condition review/rating, schedule of reassessments, reporting risk, etc. ▪ <u>Teleconferences</u> on TAM by District Engineers to each of their respective Area Engineers which defines effort, outlines their new responsibilities and the matrix tool documentation.	Mid
			Long
Internal	Employees	▪ <u>Correspondences from and speeches by the Commissioner</u> on strategic goals, fiscal responsibility, maintenance concerns, safety, customer service, etc., will always mention our progress in TAM. o Fiscal year-end correspondences will compile and congratulate employees	Complete

		for statewide TAM effort. ▪ <u>TAM's MyGDOT webpage</u> will be developed as the source "for all things TAM" including the Transportation Asset Management Plan (TAMP), progress made, copy that illustrates how some offices successfully "made the switch," quarterly updates to refresh info o Develop survey tool to place on myGDOT that will show employees the differences in the "worst first" vs "most at-risk first" concepts – get them to answer a few questions about their home maintenance issues and prioritize them based on "most at-risk first"	Near

		▪ <u>TAM Champion presentations</u> to smaller employee groups, i.e., Georgia DOT Engineers Association (GDOTEA), maintenance and IT Teams, etc.
		▪ <u>TAM Champion participation in internal learning opportunities</u>, i.e. teleconferences, Summer Lunch & Learn programs.
		▪ <u>Create an award/recognition</u> for outstanding TAM performance and/or include TAM category in existing recognition program.
		    o Inclusion in PERW and Annual Meetings
		▪ <u>Included articles on TAM in Department printed and electronic employee publications</u>.
		    o Explain TAM purpose and benefits
			Long

			Near
			Complete
			Long
			Complete

External	USDOT/FHWA	▪ <u>Continued discussions</u> with FHWA staff on program and communications guidance from USDOT.
		   ○ Periodic progress reports.
		   ○ Participation in training and information-sharing webinars and other opportunities with state DOTs.
			Ongoing

External	AASHTO & Other National Industry Associations	▪ <u>Participation in /presentations to these groups</u> to convey Georgia DOT's progress in TAM, especially as Reauthorization performance measures become known
		   ○ AASHTO Subcommittee on Asset Management
		   ○ Ask to be on agenda at
			Long

		associations' annual conferences	
External	Partner Transportation Agencies *(Metropolitan Atlanta Rapid Transit Authority, Georgia Regional Transportation Authority, Atlanta Regional Commission)*	▪ <u>Distribute Department printed and electronic publications</u> that include articles on TAM to these groups. o Explain TAM purpose and benefits ▪ <u>TAM Champion makes presentations</u> at board meetings of our partner agencies.	Long Long

External	Local Governments and Local Government Organizations *(Georgia Municipal Association, Association of County Commissioners of Georgia, Georgia City-County Management Association, etc.)*	▪ <u>Correspondences from TAM Champion</u> and/or Commissioner on TAM to membership of these organizations (mayors, county commissioners, city and county managers, etc.) with focus on the stewardship and safety benefits of the effort.
		▪ <u>Seek links</u> between their organizations' web pages and our external TAM page.
		    ▪ TAM web banner placement on organizations' sites.
		▪ <u>Write articles on TAM</u> for placement in organizations' printed and electronic publications to their members.
		▪ <u>Identify local government champions to write op-eds</u> in local newspapers on benefits of TAM.
		▪ <u>Distribute Department's printed and electronic publications</u> that include articles on TAM to these groups.
		    o Explain TAM purpose and benefits
		▪ <u>TAM Champion makes presentations</u> at conferences of these groups.
		▪ <u>Write constituency services responses</u> to local government concerns about roadway maintenance issues.
			Long
			
			Long
			
			Long

			Long
			Long
			Long
External	Legislators	▪ <u>Correspondences from Commissioner and/or Board chairman</u> on TAM to all legislators with focus on the stewardship, fiscal responsibility and safety benefits of the effort. 　　o　Include link to our external TAM page. ▪ <u>Distribute Department's printed and electronic publications</u> geared to legislators with articles on TAM before and during the legislative session. 　　o　Explain TAM purpose and benefits. ▪ <u>TAM Champion makes presentations</u> to General Assembly before and during legislative session. 　　o　Seek presentation opportunities to delegations.	Long Long

			Long

External	General Public, Business, Civic and Community Groups	▪ <u>A pro-active statewide print and broadcast media relations effort</u> will spotlight the Department's TAM efforts.
		
		    o Maximize opportunities to tell the TAM story (i.e., when roadway maintenance concerns (bridges, pavement, signage) are raised, funding issues are raised, as program milestones are achieved, Georgia Tech study is released, etc.
		
		▪ <u>TAM Champion and/or Commissioner make presentations</u> to business, civic and community groups (i.e. local chambers of commerce, Rotary Clubs, Kiwanis Clubs, etc.) across the state.
		
		▪ <u>Use local government champions to write op-eds in local newspapers</u> on benefits of TAM.
		
		▪ <u>Drive visitors to Department website to TAM external site</u>
		    o TAM web banner teaser on home page directs to TAM page
		    o TAM press releases posted on home page and press page
		
		▪ <u>Write constituency services responses</u> to the public's concerns about roadway maintenance issues.
			Long
			
			Long
			
			Long

			Long
			Long

Measurement tools - External

- How many presentations to external groups were made?
- What is the readership/distribution of our print and electronic publications?
- How many visits/hits were recorded on the TAM webpage?
- How many press releases did the Department generate on TAM?
- How many print and broadcast clips on TAM did we collect? How many were positive/neutral/negative?

Measurement tools - Internal

- How many internal small group meetings and/or trainings were focused on/included TAM?
- How many employees played the online TAM survey game?
- Is TAM included in the promotion of the Department's performance and recognition efforts?

EQUIPMENT WHITE PAPER – ALTERNATIVE PROCUREMENT METHODS

Situation analysis

In order to continue to provide the level of service the public expects, the Department's Maintenance workforce must have operational equipment and other resources to meet established performance targets. This paper will address the challenges the Department is faced with in making equipment purchases and outline several alternatives that will enable us to move beyond the current process.

Problem/Challenge

The Department has faced challenges purchasing new equipment for a number of years due to the effects of constrained budgets. The complexity and rigidity of procurement procedures may have discouraged some alternative purchasing methods and encouraged pure purchase and ownership. The quality of the Department's equipment has declined due to extended life cycles and the lack of funding resources for capital purchases.

Alternative Procurement Methods

This section will include a description of each alternative.

1. A **municipal lease** is a tax exempt lease especially designed for state and local municipalities. Municipal leases are typically used to acquire capital equipment under attractive economical terms and conditions. Special provision by the Internal Revenue Service allows the Lessor to be exempt from income tax charges on Municipal Lease revenue. These savings are passed along to municipalities. A non-appropriation clause is typically included in a Municipal Lease that allows release of the payment obligation of the Lessee under certain conditions.   Simply put, if the legislature or funding authority fails to appropriate funds, the equipment is returned to the Lessor with no further obligation. The department is currently under a Municipal Lease agreement with John Deere for 20 mowing tractors.

2. **Traditional leasing,** when feasible and when executed, correctly can be an efficient and cost-effective alternative to purchasing. Traditional leasing provides an immediate equipment usage benefit and it defers payment over time without the immediate budgetary burden of large capital investments. Leasing also allows the department an alternative to obtain usage of equipment for non-routine or seasonal activities. A traditional lease does not involve the Department obtaining ownership of the equipment. The vendor retains ownership and the department obtains usage of the equipment for a specific amount of time.

3. Currently leasing obligations for equipment are limited to one annual term with no guarantees of additional renewal commitments. Though renewal terms are allowed, vendors typically establish more costly leasing prices based on one term commitments.   The department is considering and researching legislative proposals that would allow **multiyear leases on equipment** which should ultimately lower cost.

4. **Renting equipment** is another favorable purchasing alternative. The department recently awarded a Heavy Equipment Rental Contract to nine successful vendors statewide. This contract provides the department rental resources for equipment to be used typically on short term basis. Infrequent or emergency activities

require immediate response. In the past the department considered this as standby equipment to be used only as needed. The rental contract offers immediate response of equipment resources without obligation of ownership, maintenance, or repairs. The rental contract also offers resources for short term replacement of routine daily use department owned equipment in need of costly, time consuming repairs and services.

5. **Renting equipment with an option to buy** is a purchasing tool that allows the department to retain ownership of a rented piece of equipment upon reaching a predetermined threshold of terms and payment. A rent to own option may be the most effective direction if rental payment totals are estimated to reach fair market value of a piece of equipment if extended usage is necessary.

6. Other purchasing options currently being researched by the department are **Buy Back** and **Trade In** methods.

Value to the Department

Benefits of leasing or renting equipment include deferred payment with immediate equipment usage benefits. Warranties and service maintenance agreements are available for leased or rented equipment should shop and warehouse resources become limited. Also, the department would not have the burden of owning and maintaining depreciating assets when seasonal, emergency, or infrequent uses are typical. Leasing and renting would challenge managers to assess equipment usage needs on a job to job basis and reduce the Department's need for equipment ownership.

In FY 13 the Department leased 20 mowing tractors deferring payment through a five-year municipal lease. The annual lease payment in FY 13 was approximately the same amount in FY 12 used to purchase four mowing tractors. By using the equipment lease alternative in FY 13, the Department will enhance its mowing equipment resources by five times over that of the FY 12 purchases.

The variables that must be considered when leasing or renting equipment are:

1. Purchase price verses total lease payment

2. Timeliness of costly maintenance services (renting or traditional lease allows equipment to be turned in prior to obligation)

3. Usage requirement and extended need for equipment

4. Residual value verses salvage value (lease vs. owning)

5. When will equipment technology become obsolete?

6. Annual depreciation

   Instances of equipment purchased specifically for one job and sold upon completion would require use of early identification methods to determine whether to keep older equipment for other jobs or to sell or trade it while there is some residual value.

7. Monthly lease costs

8. Equipment usage (equipment hours charged to jobs) and ownership and maintenance costs are not cut-and-dry considerations. Explore the possibility of charging rental equipment directly to project rather than overhead.

9. Ownership & maintenance costs - economic life of the equipment, salvage value and depreciation.

   a. How long will the equipment be used? If the period of use will be relatively short, leasing may be preferred over purchase.
   b. What is the technological life? When will the equipment become obsolete? Leasing may be advisable when equipment becomes obsolete quickly
   c. What is the physical life of the equipment? When will the equipment be worn out? You may be better off leasing if the total cost of the lease for the application life or the technological life is less than the purchase price.
   d. The salvage value for each asset could be high or could be next to nothing.

Conclusion

The Department's current replacement plan for over 8600 pieces of equipment is based on ratings, usage, and financial replacement resources. Much of the Department's equipment inventory is beyond its useful life cycle. Replacement costs to restore the equipment inventory to within policy and standard are between $30 and $40 million. Leasing and renting equipment reduces the Department's need to own much of its inventory and also reduces the financial obligation needed to restore its inventory to the required level of service.

The challenge in leasing and renting equipment is to identify potential weaknesses in managing equipment usage and vendor availability. Beneficial factors to leasing and renting equipment include funding effectiveness, reduced maintenance and repair obligations and immediate emergency equipment response. The necessity to own each piece of equipment used by the Department is no longer vital or efficient. External vendor resources can provide much of the Department's needed equipment on demand.

OPE SUPPORT FOR THE TOTAL COST OF OWNERSHIP STUDY

The Office of Property and Equipment (OPE) is conducting an evaluation of alternative acquisition strategies for obtaining needed equipment, such as vehicles, machines, etc. In order to evaluate the success of the various strategies, a Total Cost of Ownership (TCO) approach will be used, which focuses on ownership or life cycle costs of the equipment. OPM proposes a number of performance measures which can be used to compare the efficiency of different acquisition strategies for each item of equipment. These include, but are not limited to the evaluation of the following:

- Monthly operating costs per type of equipment (excluding items such as fuel which are common to all acquisition strategies)
- Average operating costs per activity code

- Maintenance costs per hour of operation
- Optimal disposal/recovery point (i.e. after how many months of service do we get the best return when disposing of the vehicle)

A detailed evaluation plan will be developed that can be reviewed throughout the project. Final results will assist the Department in moving forward with the most efficient strategies for maintaining our equipment assets.

APPENDIX V

GDOT ASSET MANAGEMENT SELF ASSESSMENT SURVEY

APPENDIX V

GDOT ASSET MANAGEMENT SELF ASSESSMENT SURVEY - MAINTENANCE
All Inputs

Section 1 OPERATION, MANAGEMENT, AND INFORMATION ON ASSETS
Please answer the following questions on the overall agency system:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Our agency continually seeks to improve the efficiency of data collection (e.g., through sampling techniques, use of automated equipment, other methods appropriate to our transportation system).			X		
Our agency has a complete and up-to-date inventory of our major assets. Information on the condition of our assets is collected regularly.			X		
Our agency has established standards for geographic referencing that allow us to bring together information for different asset classes.			X		

Please answer the following questions on asset processes:

	Little or no knowledge	Little knowledge & ad hoc	Good knowledge & ad hoc processes	Consistent processes & partially documented	Extensive knowledge & partially documented	Fully documented & externally audited
Processes for making optimized asset renewal decisions by choosing the most economical solution time to renew / replace an asset. (eg. Does the process include all options for life extension including non asset solutions using life cycle cost analysis?)		X				
Processes for determining what assets to collect performance data on and for undertaking the collection. (eg. How well is the asset performing? Is there a data standard defining this?)			X			
Processes for undertaking asset valuations. (eg. Are asset valuations undertaken and is the method documented? Is there a method to assess the quality of that valuation?)		X				
Processes for determining the effective lives or residual economic lives of all assets in the register. (eg. Are these lives based on real data?)	X					

	Little or no knowledge	Little knowledge & ad hoc	Good knowledge & ad hoc processes	Consistent processes & partially documented	Extensive knowledge & partially documented	Fully documented & externally audited
Processes for determining what historical cost data should be collected on individual assets and how should this be archived. (eg. Can all the historic costs associated with a critical asset be reported?)	X					
Processes for determining what assets to collect performance data on and for undertaking the collection. (eg. How well is the asset performing? Is there a data standard defining this?)			X			
Processes for analyzing risks, including the understanding of its make up and the ranking of the risks. (eg. Which part of the business represents the greatest risk? What is the greatest risk?)	X					

Processes for managing risk reduction, including the assessment of mitigation options. (eg. How should the risk be mitigated and how are the risks tracked and reported?)	X				
Processes for rationalizing the existing asset portfolio and disposal of unwanted assets. (eg. Identifying assets for disposal, mothballing or transfer to improve business effectiveness to reduce cost and release funds for other purposes.)	X				
Processes for disposing of assets. The processes for good governance and ethical behavior in this area. (eg. Are these assets removed from the asset register and on other asset systems, eg. The GIS?)		N/A			
Processes for developing and maintaining operation manuals. (eg. Are new assets automatically included and how often are they reviewed? How should operators update the manuals when procedures change?)	X				

Please answer the following questions on management systems:

	None	Card/paper system or spreadsheet	Developed in-house - eg. MS Access	Externally developed & most functionality utilized	Externally developed - interfaced with other systems & functionality fully utilized
Complaints or Enquiries System. (eg. System to store the details and track customer complaints and enquires from receipt to conclusion.)			X		
Asset Register System. (eg. System to store asset hierarchy and attributes for all assets that make up the asset system.)		X			
Geographic Information System. (eg. System to spatially store asset locations and key attributes for all distributed and linear /networked assets including the base locations of assets.)		X			
Maintenance Management System. (eg. System to manage maintenance activities		X			
Job Resource Management System. (eg. System to create and track work orders covering labor, plant, specialist tools and materials.)				X	
Inventory Spares and Purchasing System. (eg. System to track quantity and purchasing of spare parts. This system is linked to the construction and maintenance / operations systems and staff needs.)		X			
Asset Failure Prediction. (eg. Prediction of failure in terms of capacity, reliability, condition, performance and outages/ emergency failures. These allow the organization to model the full range of level of service failures.)	X				
Risk Assessment Information System. (eg. System used for undertaking and storing risk assessments for both the consequences of failure and probability of failure.)	X				
Data Warehouse. (eg. System to store, manage and report on data from other information systems. This system should complete basic manipulation and produce regular reports.)			X		

	None	35% Accurate & complete	50% Accurate & complete	65% Accurate & complete	80% Accurate & complete	95% Accurate & complete
Life Cycle Cost Modeling System. (eg. System for modeling the life cycle costs of different asset options and solutions for new assets where no spent costs are involved. It allows all supply options to be considered.)	X					
Maintenance Analysis Systems. (e.g. Systems that perform Reliability Centered Maintenance type analysis.)				X		
Store/Stock Optimization Systems. (eg. Systems for optimizing the level of stores and spare parts to be carried for like assets across the organization.)			X			
Plans and Drawings Information System. (eg. System to manage, store and access the detailed drawings of all facilities and buildings.)				X		
Operations and Maintenance Manuals Storage System. (eg. Electronic System to store and track operations and maintenance manual materials.)				X		
Emergency Response Plans Information System. (eg. System to store and track emergency response plans, linked through to the asset register in accordance with the data standard.)	X					
Knowledge Management System. (eg. System to store papers, guidelines, manuals, policies in relation to life cycle Asset Management of the organisation asset portfolio etc.)					X	
Condition Assessment Records System. (eg. System to store condition data, and to analyse this with respect to the parameters or required levels of service.)			X			

Please answer the following questions on management systems:

	None	35% Accurate & complete	50% Accurate & complete	65% Accurate & complete	80% Accurate & complete	95% Accurate & complete
Asset Spatial Data. (eg. Spatial data stored within the GIS. Especially, all distributed linear assets and locations of larger facilities.)			X			
Drawing / Plans. (eg. Drawings and plans of assets and facilities.)				X		
Basic physical attributes. (eg. Size, material, installation date, model etc.)		X				
Detailed physical attributes. (eg. Manufacturer, spare parts and numbers etc.)		X				
Asset condition data. (eg. Rating of asset condition data.)		X				
Asset performance data. (eg. Recording and rating of asset performance.)		X				
Life Cycle Cost Histories. (eg. Stored history of life cycle cost analysis calculations.)	X					
Risk Assessment Data. (eg. Risk assessment data including probability and consequence of failure, and the subsequent business risk exposure.)	X					

Please answer the following questions on management systems:

	None	Developed business case	Aging technology or some usage	Business wide usage	Business wide usage - interfaced with other systems
Mobile Computing Facilities. (eg. Pocket PC's, laptops and tablets PC's to be used by field operations and maintenace staff for rapid data entry and live access and updating of work orders.)			X		

Please answer the following questions on management systems:

	Assets are unable to be grouped	Assets can be grouped in one way only	Assets can be grouped in two or more ways,	Assets can be grouped in any way
Asset Categorization. (eg. Ability to group assets by type, location, material, facility etc. for reporting and manipulation.)	X			

Please answer the following questions on management systems:

	None	Service type	Facility or system level	Asset type level	Asset level	Maintenance managed item level
Asset Hierarchical Structure. (eg. The level (maintenance managed item) to which asset information is collected and the ability to amalgamate asset costs and performance.)	X					

Section 2 PROJECT INFORMATION, SELECTION, PRIORITIZATION, AND MANAGEMENT

Please answer the following questions on planning and programming:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Policy guidance on resource allocation allows our agency sufficient flexibility to pursue a performance-based approach.		X			
Criteria used to set program priorities, select projects, and allocate resources are consistent with stated policy objectives and defined performance measures.		X			
Our agency's programs are consistent with realistic projections of future revenues.		X			
Our agency's programs are based on realistic estimates of costs, benefits, and impacts on system performance.		X			
Our agency solicits input from all affected parties to ensure that project scope is consistent with objectives of the project.			X		
Our agency uses well-defined program delivery measures to track adherence to project scope, schedule, and budget.			X		

	Little or no knowledge	Little knowledge & ad hoc processes	Good knowledge & ad hoc processes	Consistent processes & partially documented	Extensive knowledge & partially documented	Fully documented & externally audited
Processes for controlling inventory or stock. (eg. Are work orders linked to the required spare parts? Are these spare parts ordered in advance of completing the work order?)	X					
Processes for planning future work load and required resources. (eg. Does the organization predict and balance future work load for different skills and numbers of staff for all life cycle functions?)		X				
Processes for prioritizing work orders. (eg. Are work orders allocated an rating or criticality score? Are these based on the risk to the business?)	X					

	No Data	35% Accurate & complete	50% Accurate & complete	65% Accurate & complete	80% Accurate & complete	95% Accurate & complete
Works and / or resource management data. (eg. The data related to the resource elements of work order history including labor, plant and materials work performed, in both capital and recurrent activities.)	X					
Cost history data. (eg. Full cost history of maintenance and operation activities together with depreciation and capital use charges where applicable.)	X					
Data for costing of options. (eg. Cost summary for standard construction and rehabilitation techniques, maintenance and operational activities and options.)		X				

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Section 3 LONG TERM, STRATEGIC PLANNING
Please answer the following questions on strategic planning.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Policies support a long-term, life-cycle approach to evaluating investment benefits and costs.		X			

Section 4 MAINTENANCE

Please answer the following questions on maintenance strategies:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Our agency monitors actual system performance and compares these values to targets projected for its maintenance and operations program.		X			

	Little or no knowledge	Little knowledge & ad hoc processes	Good knowledge & ad hoc processes	Consistent processes & partially documented	Extensive knowledge & partially documented
Processes for tracking and reporting maintenance costs. (eg. Are these costs available at an maintenance managed item level and capable of being amalgamated to a facility or asset level and being reported on?)		X			
Processes for maintenance planning. (eg. Is there a process for defining how each asset / asset type will be maintained? What is the basis for determining the maintenance procedure or activity for a single asset? Does this process cover all assets?)		X			
Processes for maintenance scheduling. (eg. How does the organization determine the maintenance schedule or intervals for the prescribed maintenance activity?)		X			
Processes for monitoring and controlling the maintenance program. (eg. Is there adequate reporting and feedback from field staff and information systems to enable the complete understanding of what is happening to the assets?)		X			
Processes for developing and maintaining contents of the Maintenance Manuals and Instructions. (eg. Are new assets automatically included and how often are they reviewed? What is the process by which the responsible staff can update them? Is the format specified?)	X				
Processes for reviewing and analyzing maintenance programs. (eg. Is this a systematic process? Are the trigger points and processes understood by all?)		X			
Processes for developing maintenance strategies that incorporate the overall business drivers for maintenace, capital and system performance. (eg. Is there a corporate wide approach to developing maintenance strategies that covers all assets and amalgamate to higher levels?)	X				

	No Data	35% Accurate & complete	50% Accurate & complete	65% Accurate & complete	80% Accurate & complete
Maintenance Data. (eg. Detailed maintenance history including activity and timing.)		X			

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	None	Under development	Documented in some business areas	Documented & covering whole business	Documented & fully implemented across whole business
Quality of the Maintenance Manuals and Instructions. (eg. Do these exist and cover all business units/divisions and assets types?)			X		
Maintenace policy that defines where the organisation undertakes maintenance of its assets. (eg. Does a corporate wide policy exist and is it related to business goals and cost analysis ?)			X		

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Section 5 PRESERVATION

Please answer the following questions on preservation:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Policy guidance supports preservation of existing infrastructure assets.			X		
Capital versus maintenance expenditure tradeoffs are explicitly considered in the preservation of assets like pavements and bridges.			X		
The preservation program budget is based upon analyses of least-life-cycle cost rather than exclusive reliance on worst-first strategies.		X			
Our agency monitors actual system performance and compares these values to targets projected for its capital preservation program.	X				

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Section 6 TRADE OFF ANALYSIS

Please answer the following questions regarding the analysis of trade-offs:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Capital versus maintenance expenditure tradeoffs are explicitly considered in the preservation of assets like pavements and bridges.			X		
Capital versus operations tradeoffs are explicitly considered in seeking to improve traffic movement.			X		

Section 7 DATA STRATEGY AND ACCESSIBILITY

Please answer the following questions regarding data accessibility and information:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Agency managers and staff at different levels can quickly and conveniently obtain information they need about asset characteristics, location, usage, condition, or performance.		X			
	None	Developed business case	Implementation has started	Some systems are interfaced/integrated	All required system are interfaced/integrated - no data is duplicated
Information Systems are well integrated. (eg. The information systems are linked and data can be accessed from different access / entry points, eg. GIS /CMMS. Only one point of data update is required.)		X			
	Local access only	Developed business case	Some sites connected	All remote sites connected with some slow speed connections	All required system are interfaced/integrated - no data is duplicated
Access and Response of Information Systems. (eg. Staff have ready access to the information systems and response times are acceptable for both data entry and update.)			X		

Section 8 DECISION SUPPORT TOOLS AND INFORMATION SYSTEMS
Please answer the following questions on decision support tools/information systems.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Information on actual work accomplishments and costs is used to improve the cost-projection capabilities of our asset management systems.		X			
Information on changes in asset condition over time is used to improve forecasts of asset life and deterioration in our asset management systems.		X			
Our agency uses asset management decision-support tools to: Calculate and report actual system performance		X			
Our agency uses asset management decision-support tools to: Identify system deficiencies or needs			X		
Our agency uses asset management decision-support tools to: Rank candidate projects for the capital program		X			
Our agency uses asset management decision support tools to: Forecast future system performance given a proposed program of projects		X			
Our agency uses asset management decision-support tools to: Forecast future system performance under different mixes of investment levels by program category	X				
Our agency can easily produce map displays showing needs/deficiencies for different asset classes and planned/programmed projects.		X			
Information on actual work accomplishments and costs is used to improve the cost-projection capabilities of our asset management systems.		X			
User friendliness of information systems. (eg. Are the information easy to use, quick to learn and make data input / extraction easy?)	X				

Section 9 PEOPLE ISSUES

Please answer the following questions regarding personnel:

	Little or no knowledge	Little knowledge & ad hoc processes	Good knowledge & ad hoc processes	Consistent processes & partially documented	Extensive knowledge & partially documented	Fully documented & externally audited
Processes to manage and implement change through the business. (eg. How does the organization respond to change? What mechanisms have been put in place to assist the change process and make it part of the culture?)		X				
Processes for reviewing whether the appropriate skills and staff numbers are available. (eg. Can the required skills be accessed in both Asset Management and project work? Do you have a process to justify staffing levels from best appropriate Asset Management practices?)		X				
Processes for managing human resources across the business. (eg. Staffing skills and numbers are known and predictions are made of future needs? New staff are inducted and trained in Asset Management to suit needs? Succession planning is catered for?		X				
Processes for the development and implementation of training programs. (eg. Are regular training sessions held? Have skill deficiencies been identified? Is training matched to the business needs?)			X			
Processes for the management of knowledge throughout the business. (eg. How does the business update and manage critical business and sector knowledge? How is this disseminated to staff?)		X				

	None	Under development	Documented in some business areas	Documented & covering whole business	Documented & fully implemented across whole business	
Working knowledge of the profile of the organizations staff skills and ages. (eg. Has a skill and age matrix been developed?)	X					
Good attitude and culture. (eg. Does the organization have a 'can do' attitude? Is the staff culture and attitude/enthusiasm treated as critical by the organization)			X			

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Section 10 CUSTOMER RELATIONS/COLLABORATION

Please answer the following questions regarding customer relations:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Not Sure
Policy guidance considers customer perceptions and expectations.			X		
Our customers contribute to the process that formulates policy goals and objectives.		X			
Our agency regularly communicates to customers and other stakeholders our accomplishments in meeting policy objectives.			X		
Our agency works with political leaders and other stakeholders to present funding options and consequences as part of our budget proposal.			X		
We periodically distribute reports of performance measures relevant to customer/stakeholder satisfaction with transportation system and services.		X			
Our agency regularly collects customer perceptions of asset condition and performance.			X		

	Little or no knowledge	Little knowledge & ad hoc processes	Good knowledge & ad hoc processes	Consistent processes & partially documented	Extensive knowledge & partially documented	Fully documented & externally audited
Processes for undertaking, analyzing and responding to customer and stakeholder surveys. (eg. Are surveys conducted and reported on?)			X			
Processes for working with customers, regulators and other stakeholders during long term strategic planning. (eg. Informing, seeking and incorporating feedback.)			X			
Processes for handling customer and stakeholder complaints. (eg. Are these tracked through the business from receipt to resolution? Is the customer kept informed of the progress of their complaint?)			X			