Section 10 – MoDOT Operations & Maintenance Plan

MoDOT Operations and Maintenance Plan

As shown in the table below, MoDOT spends approximately $500 million annually for operations which include Maintenance, Fleet, Facilities and Information Systems. The majority of these expenditures, approximately $430 million, are in Maintenance. This section will discuss the composition of the maintenance expenditures, their outcomes and what is planned for state fiscal year 2017.

Expenditures (Operations)	2012	2013	2014	2015	2016
Maintenance[1]	$430	$420	$444	$435	$430
Fleet, Facilities & Info. Systems[1]	$70	$70	$70	$67	$79

[1] Includes personal services and fringe benefits of MoDOT employees and expense & equipment costs. Costs are in millions.

Maintenance Composition

Some of the major components of maintenance efforts are pavements, bridges, emergency operations such as flooding, roadsides, traffic operations and winter operations. The most erratic of these components is winter operations. Expenditures in winter operations can range from $18 million to $75 million in a winter season. In order to assure that Missouri's transportation system is resilient during winter events, MoDOT has more than 3,000 employees who operate over 1,500 heavy-duty trucks from 170 facilities statewide. When needed, all of those trucks can be operated 24 hours a day for extended periods until operational goals have been met. Many MoDOT employees who are not in Maintenance, as well as seasonal hirers, assist in plowing snow. The expectation of a rapid and widespread response to statewide winter events is the driver for the staffing, facilities and equipment levels in MoDOT's Maintenance Division.

Maintenance efforts on MoDOT's more than 77,000 lane miles and almost 34,000 centerline miles of pavements are the single largest component of the maintenance expenditures. Typically, around $160 million is spent on pavements for various activities such as asphalt pavement repair, chip sealing, pot hole patching, full-depth concrete pavement replacement and striping. Many of these activities are planned and submitted for federal reimbursement such as chip sealing, asphalt pavement repair and full-depth concrete pavement replacements. Planning for these activities can be challenging with up to a $50 million difference in the winter operations expenditures levels. In 2016, more than $50 million in federal reimbursement was secured due to properly planned, executed and tracked in-house maintenance efforts. Other pavement maintenance efforts are simply reactive such as pot hole patching, the bulk of which occurs after the winter season in March.

Typical asphalt pavement repair

MoDOT's bridges are a critical component of the transportation system. A failure in a structure can result in a long-term interruption to the travelling public and highway-based commerce. MoDOT's over 10,000 bridges include approximately 3,000 large culvert structures. Bridges are inspected biennially and more frequently for major bridges and as needed if damage occurs or is identified. Bridge conditions are determined from these inspections and preventive and major maintenance efforts are planned. Preventive maintenance efforts include bridge flushing, bridge deck sealing, erosion prevention and channel clearing. Bridge flushing is the application of fresh water to the bridge surface and its supporting structure to ensure the chemicals and other materials applied for winter operations are removed from the bridge structure and will not promote deterioration of the bridge. The more than 7,000 bridges that are not simply larger culverts but typical spanning structures, are all flushed at least annually. Over ten percent of these bridges have their decks sealed annually to help preserve the bridge. MoDOT's 3,000 large culverts do not require flushing or sealing because they are usually buried.

One of the largest impacts MoDOT's maintenance operations have on Missouri's transportation system availability is its emergency operations. MoDOT's emergency operations deal with incidents ranging from a single-vehicle accident response to a major earthquake response and recovery. Other incidents include major flood response and recovery such as the Christmas 2015 flood. Incidents like a major flood usually have state and federal disaster declarations which allow the opportunity to recover some costs related to the response and recovery efforts. Maintenance staff members coordinate, track and report the activities that qualify for federal reimbursement during these events and during the recovery efforts following them. The most common role of emergency operations is the response to vehicle incidents that occur every day on Missouri's roads. MoDOT emergency response vehicles in Missouri's urban areas respond to lane-blocking incidents such as debris and crashes to keep traffic moving and reduce secondary crashes. These emergency response vehicles assist stranded or stalled motorists if they are not responding to a lane-blocking incident and they usually set up the initial traffic control for incidents. Maintenance crews establish traffic control after the initial traffic control by the emergency response vehicles for larger impact incidents such as multiple-vehicle crashes or incidents with a high severity of injuries. Many of these events and severe weather events such as tornados that impact Missouri's transportation system require a coordinated effort between MoDOT's emergency operations and the State Emergency Management Agency (SEMA). These coordinated efforts are led from MoDOT's central and regional emergency operations centers and the State Emergency Operations Center.

Roadside maintenance includes vegetation management such as mowing, herbicide applications, plant growth regulator applications and brush clearing. MoDOT mows over 400,000 acres of right of way annually. MoDOT's mowing policy is driven by safety concerns. Every year, a 15-foot pass of mowing outside the shoulder is performed to ensure sight distance requirements are not impeded by vegetation growth. Every other year, a 30-foot wide pass is mowed outside the shoulder to ensure trees do not grow in the recovery zone for run-off vehicles. Generally from one to three mowing runs occur every year with the 30-foot wide pass only occurring at the last mowing to minimize impacts to species such as pollinators. Trash collection through volunteer efforts from MoDOT's Adopt a Highway program (which is celebrating its 30th year in 2017) and through maintenance staff, result in the disposal

of over a half of a million bags of trash per year. This partnership with over 5,200 adopting groups provides MoDOT a value of $1million to $1.5 million per year in litter collection efforts.

Typical bridge deck seal

MoDOT emergency response vehicle assisting a major vehicular incident

Traffic operations manages over 2,500 traffic signals, over 250 dynamic message signs, over 600 traffic cameras and traffic management centers in Kansas City, Springfield and St. Louis. Over 70,000 miles of striping is performed annually. All of the signs on MoDOT's transportation system are inventoried and inspected biennially. Sign maintenance and replacement costs over $10 million per year. In addition, signals regularly undergo preventive maintenance checks and over $10 million in maintenance efforts are performed annually on signals.

Maintenance Outcomes

Many of the results from Maintenance efforts can be found in MoDOT's performance measures known as TRACKER. Winter operations try to minimize the time it takes from the completion of precipitation from a winter event to meeting the operational goals of clearing the roads. Pavement maintenance is measured by the percent of good pavements on the minor route system. The goal is to maintain the percent good and it is pursued with mostly preventive maintenance treatments and occasionally heavy maintenance efforts. Similarly, bridge maintenance is also measured by the percent of good bridges. Keeping this percent of good bridges is pursued mostly with preventive maintenance treatments with some heavy maintenance efforts. Emergency and Traffic operations have several measures driving their outcomes such as clearance times for incidents, freeway travel times and costs due to congestion. Roadside maintenance has Maintenance Division measures determining their efficiency and effectiveness. Unit prices of mowing and vegetation control are measured and compared to previous years as are overall roadside costs. The proper use of herbicides to reduce mowing and brush cutting costs are constantly reviewed and measured to ensure the most cost effective total vegetation management practices are implemented at MoDOT.

Maintenance Plans

Some maintenance activities are reactive and unpredictable such as pot-hole patching and winter operations, but the majority of maintenance work is planned, executed and tracked. These planned activities include chip seals, crack seals, asphalt pavement repairs, bridge deck seals, bridge flushing, striping, pipe culvert repairs and full-depth concrete pavement replacements. Of the $430 million in operations expenditures in 2016, $36.1 million was spent centrally and the rest was spent by the districts. Maps depicting several of these planned activities for the calendar year 2017 season for each district are on the following pages. Several of the expenditure categories from state fiscal year 2016 are shown on the maps as well. Due to the high availability of contract resources in the urban areas of Kansas City and St. Louis, and the high traffic volumes, the work plans vary greatly from the rural districts. More maintenance and system operations activities in the urban areas are focused on emergency response, traffic signal operations, sweeping, mowing and incident management rather than the typical roadway work in the rural districts. Traffic management centers are staffed 24 hours a day, seven days a week, to meet the vast system operation needs. A great deal of the urban operations is focused on emergency response compared to roadway work. The urban operations in Kansas City and St. Louis respond to over 50,000 incidents annually. Some urban roadway work is handled with contracted projects.