### MISSOURI DEPARTMENT OF TRANSPORTATION





### The Summer of 2020 certainly brought a fresh set of challenges

MoDOT experienced a significant loss of state transportation funding associated with state transportation revenue in the early months of the COVID-19 pandemic.

To help offset these declines, we implemented some internal cost savings measures, including slowing discretionary spending on equipment, materials and supplies since early March; reducing new hiring since February; and delaying advertising of of construction projects in May and June.

We also implemented a 12-week Shared Work program to save payroll costs. Another 1,000 employees took 5% pay cuts for a month. I'm very proud of the way MoDOT employees stepped up to the challenge. Those actions are expected to save \$14 million and enabled us to keep operating without layoffs.

There is some good news on the horizon. As the economy gradually re-opened, traffic came back from a low of 50% of volume compared to last year, to about 10-15% below last year, where it seems to be holding.

Motor vehicle sales tax revenues were strong in the month of May, offsetting some of the previous declines. In many ways, things are beginning to look up.

### Highway safety remains an issue

I am concerned by the alarming increase in Missouri traffic fatalities, particularly since they continue to grow as the summer progresses. Traffic deaths in Missouri are up substantially compared to 2019 and nearly three out of four of those fatalities involve unbuckled motorists. That figure is unacceptable, and we must redouble our efforts to combat this deadly public health crisis.

I am also troubled by the growing number of positive COVID-19 results among our MoDOT family. Though safety measures are in place at all MoDOT facilities and many MoDOT workers continue to work remotely, more employees are testing positive on what seems a daily basis.

Safety is vital to our mission and that includes keeping yourself safe. Please remember that when you can't keep a physical distance of at least six feet between you and another person, wearing a mask is the best way to protect all those with whom you might come in contact. Even when you can maintain that distance, wearing a mask and regular handwashing protocol will help prevent the spread of this deadly virus. These practices are as beneficial outside of work as they are while at work.

We need you. Stay safe.



### **MISSOURI**

### **Department of Transportation**

2020 Version 2.0



### **ASPIRATION**

We will provide a world-class transportation system that is safe, innovative, reliable, and dedicated to a prosperous Missouri

### **THEMES**

### **Safety**

Moving Missourians Safely

### **Service**

Providing Outstanding Customer Service, Delivering Efficient and Innovative Transportation Projects, Operating a Reliable Transportation System

### **Stability**

Managing Our Assets, Stabilizing Resources and Engaging our Workforce, Building a Prosperous Economy for All Missourians

### **INITIATIVES**

- Innovate to improve work zone and system-wide safety
  - Autonomous truckmounted attenuators
  - Deploy a suite of demonstrably impactful safety techniques through a design-build program structure
- improve partnerships with other agencies and leverage private sector
  - Predictive analytics to optimize winter operations

- Improve project management tools
  - Maintenance
     Management
     Information System
- Fleet and facilities optimization strategy implementation
- Increase employee engagement and recognition
  - Pay plan
  - Training and certifications
  - Evaluate job descriptions
  - Leadership coins
  - Succession planning
- Research and deploy alternative funding solutions
  - Cross-cabinet collaboration
- Leverage innovations to reduce costs and improve service quality



### **Road Conditions**

**Current Performance** = 92 percent major highways (5,546 miles) in good condition. 80 percent of minor highways (28,313) in good condition. **National Ranking** = Missouri had the 10th best pavements on the National Highway System. (FHWA Highway Statistics)



### **Customer Satisfaction**

Current Performance = 77 percent satisfied customers

National Ranking = Missouri trails the highest rated company on the

American Customer Satisfaction Index by only 9 percent.



### **Project Management**

**Current Performance** = Missouri road and bridge projects were delivered within 1.3 percent of the award amount and 92 percent were delivered ontime

National Ranking = Not available.



### Infrastructure for Business

Current Performance = No internal measure

National Ranking = A CNBC business study ranks Missouri's infrastructure as the 7th best for business.



### **Administrative Costs**

Current Performance = \$2,187 cost per mile

National Ranking = Missouri has the 3rd lowest administrative cost per mile.

\*2018-2019 data is not available



### **Congestion (travel time index)**

**Current Performance** = Kansas City - 1.15 St. Louis - 1.15 **National Ranking** =Out of 101 urban areas, Kansas City and St. Louis both ranked at 23rd as some of the least congested areas in the U.S. (*Texas Transportation Institute*)



### **Number of Fatalities**

**Current Performance** = 921 fatalities

**National Ranking** = Only 14 states experienced more motor vehicle deaths ranking Missouri 36th. (National Safety Council)



### **Bridge Conditions**

**Current Performance** = 9 percent of Missouri bridges in poor condition by deck area.

**National Ranking** = Missouri ranked 40th for the percent of bridges in poor condition by deck area. (FHWA Highway Statistics)



### Revenue

**Current Performance =** \$50,184 revenue per mile **National Ranking =** Missouri has the 48th lowest revenue per mile. *(FHWA Highway Statistics)* 



### **Employee Turnover**

Current Performance = 13.27 percent
National Ranking = Not available; However, Stretch Target = 6 percent.
(Price Waterhouse Cooper's Saratoga Institute benchmark data)

#### **RANKINGS**

1-10 =

11-20 =

21-30 =

31-40 = [

41-50 =

### **TANGIBLE**RESULTS

# (J) MODOTVALUE

### **SAFETY**

Be Safe

Moving Missourians Safely

Be Accountable

### **SERVICE**

Be Respectful

Be Inclusive

Providing Outstanding Customer Service

Delivering Efficient and Innovative Transportation Projects

Operating a Reliable Transportation System

Be Bold Be Better

### **STABILITY**

Be One Team

So we can be a great organization

Managing Our Assets

Stabilizing Resources and Engaging our Workforce

Building a Prosperous Economy for All Missourians

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## **SAFETY**

### Keep citizens and employees safe

- Use Innovation to Improve Work Zone and System-wide Safety
  - Autonomous Truck-mounted Attenuators
  - Deploy a Suite of Demonstrably Impactful Safety
     Techniques through a Design-build Program Structure
- Improve Partnerships with Other Agencies and Leverage Private Sector
  - Predictive analytics to optimize development of winter operations resources

### **Autonomous Truck-mounted Attenuator**

### **SAFETY CHAMPION:**

Becky Allmeroth, Chief Safety and Operations Officer

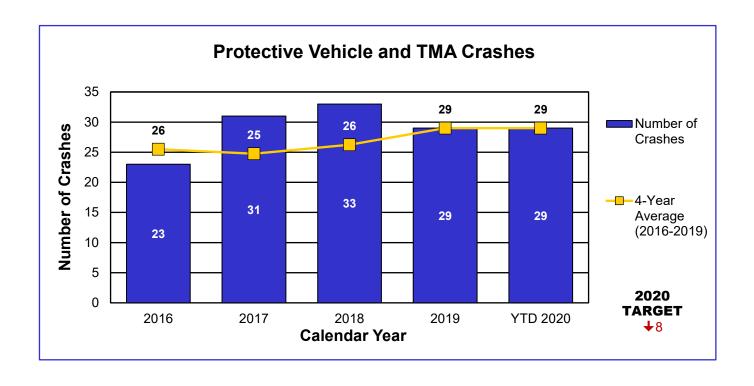
### **PROJECT MANAGERS:**

Chris Redline, District Engineer

### **PURPOSE OF THE PROJECT:**

MoDOT's commitment to safety applies to ourselves and our customers. In 2019, our Truck Mounted Attenuators (TMA) were involved in 29 crashes. The typical TMA incident is when a driver navigating through our work zone crashes into our vehicle or attenuator. The severity of these crashes range from simple 'fender benders' to complete collapse of the attenuator and total loss of the heavy duty dump truck. Through the first two quarters of 2020, we have matched last years total of 29 crashes. In the second quarter on 2020, there were 13 TMA crashes and five of our employees sought medical attention due to those crashes. MoDOT is investigating the viability of driverless truck-mounted attenuators to be used in moving operations such as sweeping and striping. Success of this project could pave the way to eliminate all injuries caused by drivers crashing into the rear TMA.

The project is evaluating leader-follower technology with the goal of removing operators from the rear TMA, the one most crashed into by drivers. During testing though, the rear TMA has a safety operator with the ability to immediately take over manual control of the truck. The driverless rear TMA simply follows the path of the staffed lead vehicle at adjustable distances. The system passed Phase 1 testing last May but began to exhibit navigation problems during Phase 2 testing in June. The contractor installed system upgrades late last year to correct the problems. Initial testing of the upgrades looked very promising. Social distancing requirements, as a result of the COVID-19 pandemic, prevents us from resuming testing since two operators need to be in the lead vehicle. We are prepared to resume testing once social distancing requirements allow.



# Deploy a Suite of Demonstrable Impactful Safety Techniques through Data-Driven Safety Analysis

### **SAFETY CHAMPION:**

Becky Allmeroth, Chief Safety and Operations Officer

### **PROJECT MANAGER:**

Jon Nelson, Assistant to the State Highway Safety and Traffic Engineer

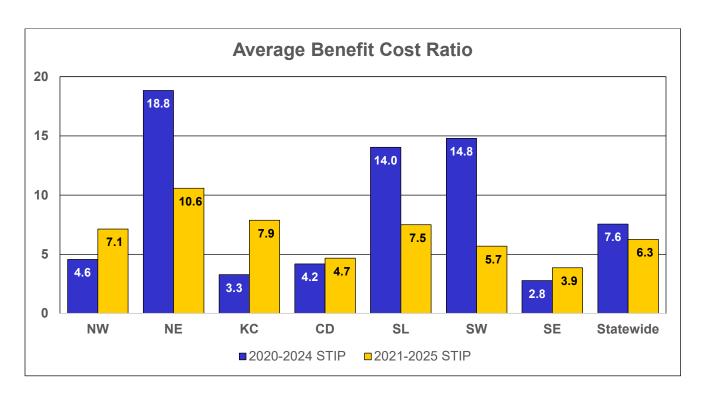
### **PURPOSE OF THE PROJECT:**

While many safety improvements can reduce fatal and serious injury crashes, using a data-driven approach allows the department to prioritize improvements with the greatest potential to prevent injuries and save lives. Objective and quantifiable analyses like those found in AASHTO's Highway Safety Manual can help determine the most cost-effective measures for various types of roadways. The data not only helps make better decisions during the project development phase, but also helps inform the public as to what safety benefits they can expect from their investment.

Data-driven safety analysis (DDSA) improvements may be identified on a project level basis or on a program level. For systemic analysis, DDSA is used to identify high-risk roadway features that correlate with particular crash types. Severe crashes are widely dispersed, and their location and frequency fluctuate over time. Systemic analysis identifies locations that are at risk for severe crashes, even if there is not a recent history of severe crashes. Low-cost countermeasures can then be applied systemically across those locations. This approach helps ensure funds are expended in the locations with the greatest risk for severe crashes.

The focus of this measure will be to track how DDSA is utilized in the districts to maximize safety funds. The measure will track the estimated number of fatal and serious injury crashes reduced for every safety dollar invested. The Highway Safety and Traffic Division will help review and prioritize safety projects during the draft Statewide Transportation Improvement Program phase and also help estimate the anticipated impacts on crashes. The data will be updated annually in accordance with the STIP cycle.

The following chart and table are based on estimated reductions in fatal and serious injury crashes resulting from projects included in the first three years of the STIP. Benefits are calculated over the expected life of the improvements. For the first three years of the 2021-2025 STIP, the department expects to see \$6.30 in return for every \$1 spent in safety improvements. While this represent a slight decrease in the expected return of the 2020-2024 STIP, the department has continued to refine analyses used to determine the impacts of safety improvements. This has resulted in more consistency across districts and less variability in the results.



Totals for State Fiscal Years 2021-2023							
	Estimated Severe Crashes Reduced (Over the Life of the Improvements)	Total Safety Dollars Programmed	Benefit Cost Ratio	Estimated Severe Crashes Reduced for Every \$1 Million Programmed			
NW	25	\$8,814,000	7.1	2.9			
NE	24	\$5,539,000	10.6	4.2			
KC	104	\$33,076,000	7.9	3.2			
CD	81	\$43,029,000	4.7	1.9			
SL	94	\$31,348,000	7.5	3.0			
SW	48	\$20,907,000	5.7	2.3			
SE	29	\$18,584,000	3.9	1.5			

Statewide	405	\$161,297,000	6.3	2.5

# Improve Partnerships with Other State Agencies and Leverage Private Sector

# Predictive Analytics to Optimize Winter Operation Resources

### **SAFETY CHAMPION:**

Becky Allmeroth, Chief Safety and Operations Officer

### **PROJECT MANAGER:**

Alex Wassman, Traffic Management and Operations Engineer

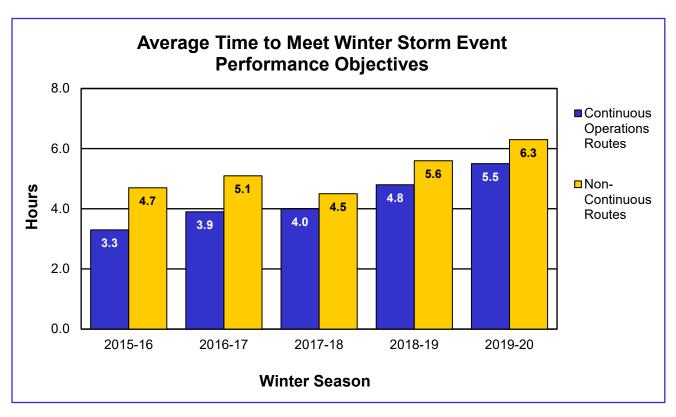
### **PURPOSE OF THE PROJECT:**

Costs associated with over or under preparedness of severe weather events aren't easily captured and are seldomly reported. Simple atmospheric weather forecasts do not tell the whole story and, as a result, MoDOT has sometimes incurred additional costs for storms which never materialized or been caught off guard when storms arrived in advance of expectations.

Road condition prediction is a better gauge for anticipating when conditions warrant treatment and advance traveler information. By partnering with FHWA on the Integrated Modeling for Road Condition Prediction pilot project, MoDOT will be the first DOT in the country to access a simple-to-use, web-based tool that utilizes both historic real-time data to more accurately predict when road conditions are likely to deteriorate. This will enable MoDOT staff to better prepare for adverse road conditions and strategically deploy crews where they are most needed.

This tool will provide the ability to predict conditions up to eight hours in the future and, conversely, enable accurate after-action reviews of MoDOT's response. This will facilitate improved efficiency of resources and timeliness in response.

# Improve Partnerships with Other State Agencies and Leverage Private Sector





# **SERVICE**

# Deliver transportation solutions of great value and use resources wisely

- Improve Project Management Tools
  - Maintenance Management System
- Fleet and Facilities Optimization Strategy Implementation

### Improve Project Management Tools

### **Maintenance Management System**

### **SERVICE CHAMPION:**

Eric Schroeter, Assistant Chief Engineer

### **PROJECT MANAGER**

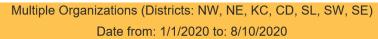
Michael Middleton, Maintenance Liaison Engineer

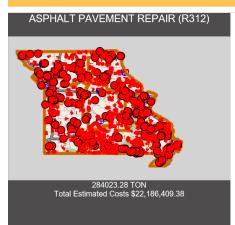
### **PURPOSE OF THE PROJECT:**

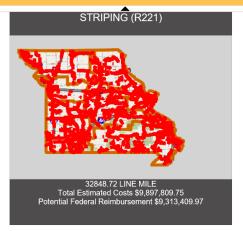
With maintenance staff constituting about 54% of salaried employment at MoDOT and with about 23% of MoDOT's budget used to accomplish maintenance related tasks, it makes sense to look at the challenges that staff has in recording and finding data related to what gets accomplished. The challenges in finding maintenance-related information is substantial due to multiple software programs and difficulty in documenting work.

MoDOT has implemented a Maintenance Management System that is a simple to use web-based program for capturing and reporting maintenance work data related. As of March 15, 2020, all 191 maintenance areas are utilizing MMS. There are nearly 2,800 maintenance workers daily entering their individual hours worked, job location and equipment and materials usage. The MMS Help Desk provides daily guidance to employees on MMS functions. Due to the benefits of MMS, utilization is significantly increasing in all areas of MoDOT.

Examples of the results are shown below.









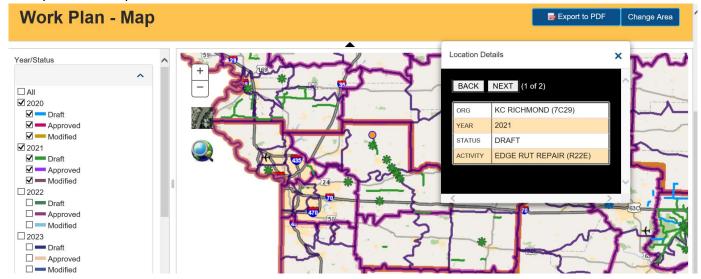
\$236,649.33 Total Surplus Consumable Inventory

29% of Fleet is Underutilized (Life) (944 units / 3304 units\*) \*Only applies to units that have a life utilization

### Improve Project Management Tools

To improve performance and ease of capturing accurate data, 65 enhancements have been implemented to the live environment of MMS during phase 2. Additional enhancements will be made as soon as work plans are implemented. Phase 2's new functionality is actively developing work plans. Initial testing of the work plans has begun with an anticipated implementation date of late fall 2020.

Examples of work plans are shown below.



### **Fleet Optimization**

### **SERVICE CHAMPION:**

Eric Schroeter, Assistant Chief Engineer

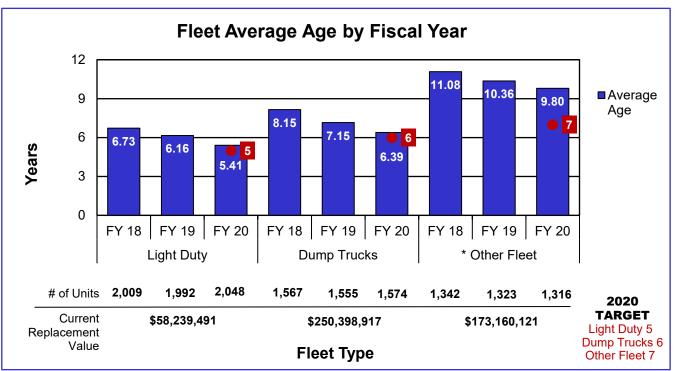
### **PROJECT MANAGER:**

Amy Niederhelm, Central Office General Services Manager

### **PURPOSE OF THE PROJECT:**

MoDOT must keep a dependable fleet to meet customer's needs. Fleet age is the best indication of fleet condition. The large investment in fleet, with a replacement value over \$480 million, emphasizes the importance. MoDOT is moving toward an asset management approach for fleet using data to plan fleet purchases over the next several years.

Fiscal year 2020 shows gradual decreases the average age for fleet types. The decreases are attributed to purchasing equipment based on the asset management approach. The goal is for the average age to be half the department's age threshold.



<sup>\*</sup> Other fleet includes equipment such as backhoes, loaders, tractors and specialty items like under bridge inspection units and stripers.

### **Facilities Optimization**

### **SERVICE CHAMPION:**

Eric Schroeter, Assistant Chief Engineer

### **PROJECT MANAGER:**

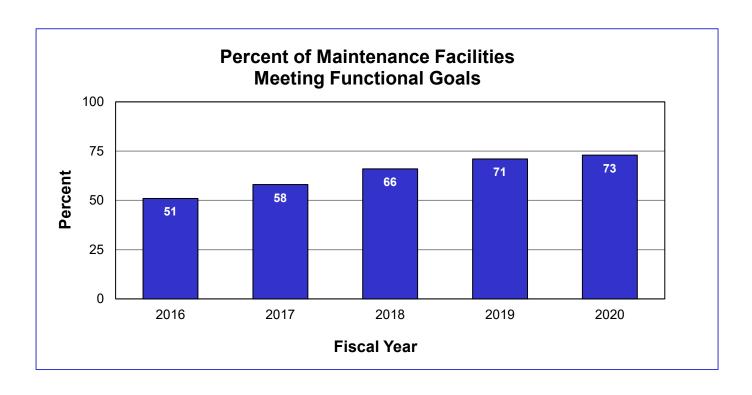
Levi Woods, Central Office General Services Manager

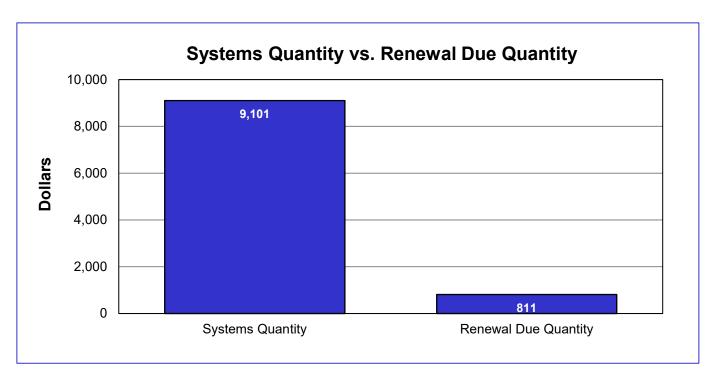
### **PURPOSE OF THE PROJECT:**

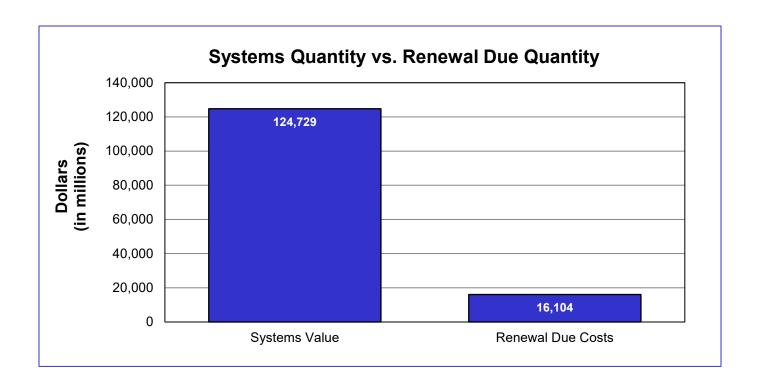
Facilities Optimization provides a similar asset management process for MoDOT facilities as is used by the Department for roadways. Like the Statewide Transportation Improvement Program, MoDOT facilities assets are placed into a rolling five-year budget based on needs. Facilities are currently funded at \$7.2 million annually for Capital Improvement and Asset Management purposes. The charts depict MoDOT's progress toward meeting the goal of having facilities that meet minimum functional needs and the facility systems maintained which keep the facility operational.

Facilities staff utilizes Vanderweil Facility Advisor, a computer-based program, to inventory, with age and condition of all buildings and improvements. Individual systems within the building are inventoried, with all units having a specified lifecycle. Based on actual annual inspections, the asset's lifecycle is determined to be either due for early replacement, replace at end of calculated life, or the lifecycle can be extended based on actual observed conditions. These options allow MoDOT the flexibility to optimize and maximize the useful life of each asset.

Facilities Asset Management and the Long Term Facilities Plan are currently funded at \$7.2 million annually. In 2014, the Long-Term Facilities Planning Team recognized in order to be functional and operate, facilities have many necessities including space for mechanics to work inside during inclement weather, adequate restrooms for employees, sufficient meeting space for muster sessions and cold storage for operational supplies and equipment. Due to ever changing conditions at MoDOT facilities, the Long Term Facilities Planning Team reviews the needs and allocation of funds for each program on an annual basis. Funds are then allocated to the Capital Asset Preservation Plan (CAPP or Asset Management) and the Long Term Facilities Plan (Capital Improvement Plan- CIP). The \$7.2 million budget is allocated based on needs with \$6.85 million allocated to the CAPP and CIP Plans, with the remaining funds available for asset management of weigh scales, rest area/welcome centers and design consultants.







### **STABILITY**

# Preserve and operate a reliable transportation system with an engaged workforce

- Increase Employee Engagement and Recognition
  - o Pay Plan
  - Training and Certifications
  - Evaluate Job Descriptions
  - Leadership Coins
  - Succession Planning
- Research and Deploy Alternative Funding Solutions
  - o Cross-cabinet Collaboration
- Leverage Innovations to Reduce Costs and Improve Service Quality

# Increase Employee Engagement and Recognition

### **Employee Engagement and Cost of Turnover**

### STABILITY CHAMPION:

Lester Woods, Chief Administrative Officer

### **PROJECT MANAGER:**

Paul Imhoff, Special Projects Coordinator

### **PURPOSE OF THE PROJECT:**

Employee turnover not only has a direct impact on MoDOT's ability to preserve and operate a reliable transportation system but also reflects the level of employee engagement within MoDOT. Increasing employee engagement and reducing turnover and its subsequent costs are prudent goals toward organizational stability and wise use of taxpayer dollars.

For fiscal year 2020, MoDOT turned over 642 employees. Applying a Society for Human Resources Management turnover cost calculator to these estimates, the hard cost of backfilling these positions is \$2.05 million for FY 2020. For the same period, the soft cost of turnover is estimated to be \$31.72 million. The total \$33.77 million is a 2.6 % decrease over FY 2019 total turnover cost. However, leave payouts for employees turning over each fiscal year does add to the overall cost of turnover.

Efforts to improve the stability of MoDOT by increasing employee engagement and retention have been implemented and continue.

• **Pay Plan:** For FY 2020, MoDOT implemented a pay plan on January 1, 2020 providing a 1.1 % cost of living increase, plus a two-step increase for salaried employees on steps 1-8 of their salary range, and a one-step increase for employees on step 9-17 of their range. Every salaried employee received at least a 3 % increase.

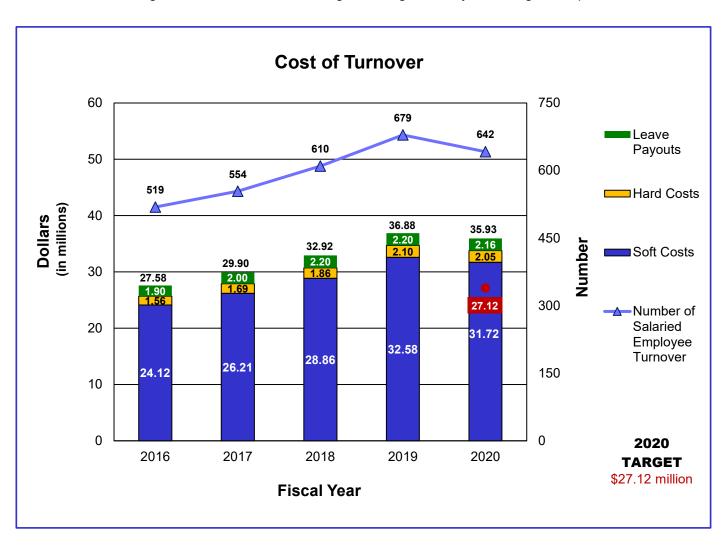
For FY 2021, MoDOT submitted a legislative budget request to fund a one-step pay increase for employees below step 10 of their pay ranges starting in January 2021, and for the first year of a three-year plan to raise pay for jobs that are least competitive with the market and have the highest rates of turnover. While the governor recommended these items, given the state's economic situation related to the pandemic, any pay plan in FY 2021 seems unlikely.

### Training and Certifications:

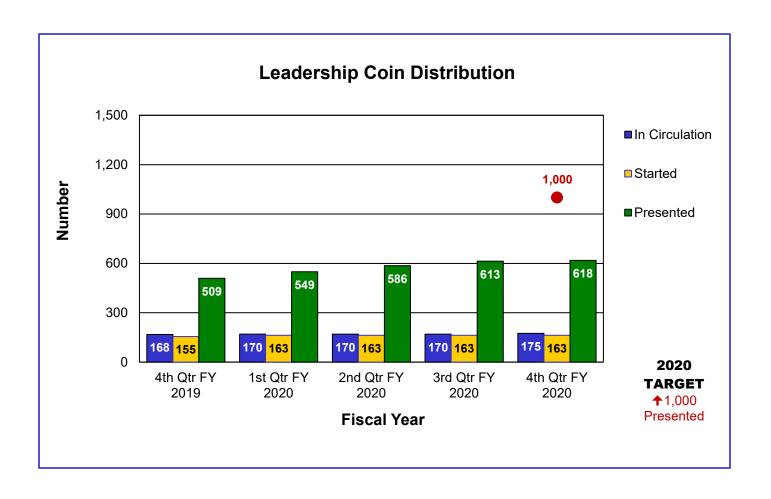
open for enrollment. The current emphasis is on helping people enroll in both the Department of Labor and Veteran's Affairs programs. In addition, a focused effort is underway to partner with the Department of Economic Development's Workforce Development Division to enhance MoDOT's recruitment efforts and develop partnerships with Missouri colleges and universities to grant college credit for employees who complete registered apprenticeships with MoDOT. There are currently 22 employees enrolled in the program, up from 5 in the first quarter of FY 2020.

# Increase Employee Engagement and Recognition

- Leadership Coins: The Leadership in Action recognition coin passing program has been in effect since September 2017. The purpose of the program is for coin holders to look for leaders within MoDOT who are actively demonstrating MoDOT's Values and/or moving MoDOT forward in the areas of Safety, Service or Stability. Each coin will be passed 10 times and will be subsequently retired. There are currently 175 coins in circulation that have been presented 618 times. Five coins have been retired.
- **Evaluate Job Descriptions:** This phase of the Succession Planning began in January 2020, starting with the Construction and Materials functions of the department. Those classifications are being validated. Meanwhile, Design and Right of Way have begun the process.



# Increase Employee Engagement and Recognition



# Research and Deploy Alternative Funding Solutions

### **Cross-Cabinet Collaboration**

### STABILITY CHAMPION:

Lester Woods. Chief Administrative Officer

### **PROJECT MANAGER:**

Liz Prestwood, Policy/Innovation Program Manager

### **PURPOSE OF THE PROJECT:**

The current Missouri vehicle registration fee is based on taxable horsepower, an archaic measure which bears no correlation with vehicle power, vehicle weight or impact caused on infrastructure. Missouri is the only state using taxable horsepower to assess vehicle registration fees.

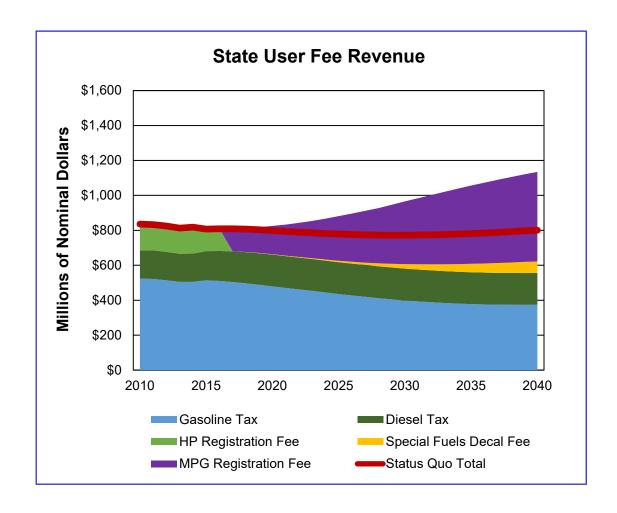
Missouri has been the recipient of three consecutive Surface Transportation System Funding Alternative (STSFA) federal grants totaling \$4,805,000. The first award was to perform pre-deployment activities for concept feasibility in the amount of \$250,000. Phase two award provided \$2,772,500 and is being used to determine existing system capabilities for implementation and further investigates the impacts to Missouri residents through a Highway Cost Allocation and Revenue Attribution Study (HCARAS) and Rural Urban Transportation Funding Analysis. In 2019, MoDOT received a third STSFA award in the amount of \$1,782,500 for the design and implementation of an MPG based registration fee. During the summer of 2020, MoDOT submitted a fourth grant proposal to receive additional funding to perform system modernization to collect the proposed MPG based registration fee. These grant awards should be announced by the end of the year.

The initial work and deliverables from the Department's STSFA activities modeled how an MPG-based fee could be used to supplement and/or replace the current registration fee schedule. The project team began work with Missouri Department of Revenue in 2018 to explore existing system capabilities to collect this type of fee and identify gaps. This DOR-led study concluded in January 2019. The consultant presented five options of varying costs to implement an MPG-based fee structure. This cross-cabinet effort is ongoing and the preferred implementation option has not been selected. Legislation was filed in the 2019, and the 2020 Missouri General Assembly supports this MPG-based registration fee. Due to COVID-19, the Missouri General Assembly ended their session early and only addressed critical bills like passing the state's budget.

To fully understand impacts of an MPG based registration fee, two additional studies have been completed. A revenue study demonstrated the typical impacts (per year, per mile, per driver, etc.) of highway use and will provided a quantitative basis for the fees attributed to non-gasoline and non-diesel vehicles. As a result of this study, the fee structure proposed has been adjusted to more equitably distribute the cost among highway users. The second study analyzed fees paid by rural and urban drivers under the proposed MPG-based registration fee system, considering the commuting behaviors and vehicle characteristics of highway users statewide. This study showed that urban drivers pay more in commuting costs based on the vehicle profiles and number of miles driven each year.

### **Alternative Funding Solutions**

The principal project goals are to generate revenue consistent with technological trends in the motor vehicle market and to ensure privacy and security for Missouri drivers while utilizing current adaptable technologies to collect and administer the fee.



# Leverage Innovations to Reduce Costs and Improve Service Quality

### **Innovations Challenge - Innovation Implementation**

### **STABILITY CHAMPION:**

Lester Woods, Chief Administrative Officer

### **PROJECT MANAGER:**

Kelly Backues, Transportation Planning Specialist

### **PURPOSE OF THE PROJECT:**

Preserving and operating a reliable transportation system takes an engaged workforce. MoDOT's Innovations Challenge program provides employees opportunity and recognition for their efforts to leverage innovations so the department may reduce costs and improve service quality.

The redesigned Innovations Challenge SharePoint site continues to serve as a great resource to MoDOT employees with easy to find documents and best practices database, as well as prior year virtual showcase videos. The statewide distribution of funds process to implement best practices was approved for the second year in a row, and 13 maintenance-related innovations were allotted funds to implement them statewide. Continuing the distribution of funds to implement best practices will continue to enhance the program's participation.

### Measure Under Development