

## COVER PAGE

### Colorado Department of Transportation

FY 2019-20 CAPITAL CONSTRUCTION REQUESTS (LISTED IN OSPB PRIORITY ORDER)

NOT RECOMMENDED FOR FUNDING BY OSPB:

- Eisenhower-Johnson Memorial Tunnels Electrical System (new)

TOTAL: FY 2019-20 CAPITAL CONSTRUCTION STATE-FUNDED REQUEST AMOUNT = **\$1,000,000**

#### HISTORY OF STATE FUNDING

- **\$2.8 million** has been appropriated to the department on behalf of capital projects since FY 2014-15. This represents **0.3 percent** of the total amount appropriated on behalf of all capital construction and controlled maintenance projects during this period.
  
- **\$0.8 million** was appropriated in FY 2018-19

#### INVENTORY OF GENERAL FUND SUPPORTED FACILITIES

- The inventory of department facilities totals **3,652,382 GSF**. The department has no General Fund supported facilities. This total represents **4.6 percent** of the entire inventory of state buildings.

#### RECENT CDC VISITS

- New Region 4 Headquarters and State Patrol Troop Office, Greeley (June 2015)

#### OTHER INFORMATION

Pursuant to Section 43-1-113 (2.5), C.R.S., CDOT is required to submit a capital construction request for state highway reconstruction, repair, or maintenance projects to the CDC on or before October 1 each year.

Since FY 2010-11, the capital budget has included \$500,000 for transportation projects each year, funded through a General Fund Exempt account transfer. Moneys in the General Fund Exempt account are available because of the passage of Referendum C, which, beginning in FY 2010-11, allows the state to retain all revenues in excess of the TABOR limit, but less than the excess state revenue cap. This revenue may be spent, in part, on strategic transportation projects.

# Fiscal Year 2019-20 Capital Construction Request

## Transportation

*Eisenhower-Johnson Memorial Tunnels Electrical System*

### PROGRAM PLAN STATUS

2019-016

Approved Program Plan?  Date Approved:

### PRIORITY NUMBERS

Prioritized By	Priority	
DeptInst	1 of 1	
OSPB	62 of 62	Not recommended for funding.

### PRIOR APPROPRIATION AND REQUEST INFORMATION

Fund Source	Prior Approp.	FY 2019-20	FY 2020-21	Future Requests	Total Cost
CCF	\$0	\$1,000,000	\$0	\$0	\$1,000,000
<b>Total</b>	<b>\$0</b>	<b>\$1,000,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,000,000</b>

### ITEMIZED COST INFORMATION

Cost Item	Prior Approp.	FY 2019-20	FY 2020-21	Future Requests	Total Cost
Land Acquisition	\$0	\$0	\$0	\$0	\$0
Professional Services	\$0	\$152,381	\$0	\$0	\$152,381
Construction	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$800,000	\$0	\$0	\$800,000
Miscellaneous	\$0	\$0	\$0	\$0	\$0
Contingency	\$0	\$47,619	\$0	\$0	\$47,619
Software Acquisition	\$0	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$0</b>	<b>\$1,000,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,000,000</b>

### PROJECT STATUS

This is the second request for funding. Funding on behalf of the project was also requested for FY 2018-19.

### PROJECT DESCRIPTION / SCOPE OF WORK

The Colorado Department of Transportation (CDOT) is requesting state funds to install new electrical controllers on the ventilation and exhaust fans in the Eisenhower-Johnson Memorial Tunnels for both cost savings and operational benefits. CDOT currently operates 28 600-horsepower inductive motor fans in the tunnel complex, 14 for each portal. The primary purpose of the fans is to provide life-safety fire ventilation. Under the project, the department will install variable frequency drive controllers for the fans, which limit the current being supplied to the fans upon start-up, reducing electrical usage and the amount of time needed to get the fans up to full speed. The department would like to install a dedicated drive for each motor that operates the fans, but might decide to use a switching system to allow several motors to share a drive. The department will determine the preferred course of action during the design process.

**Cost assumption.** The cost assumption was determined through consultation with a tunnel owner in New Zealand that operates a variable frequency drive system, and through discussions with heavy electrical equipment suppliers. The project is not required to comply with the requirements of the High-Performance Certification or Art in Public Places programs because it purchases equipment and does not build or renovate a physical facility.

# Fiscal Year 2019-20 Capital Construction Request

## Transportation

### *Eisenhower-Johnson Memorial Tunnels Electrical System*

#### PROJECT JUSTIFICATION

CDOT explains that installing the new drives will result in economic benefits and more efficient operation of the exhaust system. When the fans are started using the current hardware, they pull eight to ten times their steady-state current until they are spinning at full speed, taxing the electrical supply. The department estimates that installing new technology under the project will save over \$150,000 per year in electrical costs based on the fans running full speed during peak periods, and additional cost savings will be realized during day-to-day use. Based on a 30-year life cycle for the new starting equipment, the department estimates the net-present value of the savings to be \$2.9 million. The fans will also get up to speed more quickly using the new system. Using the current system, each fan takes over 30 seconds to achieve full speed, and only one fan can be started at a time due to the limited capacity of the power lines feeding the system, which results in a total elapsed time of up to ten minutes for the system to be fully operational. Since the new system will allow multiple fans to start simultaneously, full operation can be achieved in under two minutes. The department says this difference in start-up time has life-safety implications during instances of fire when the exhaust system is relied upon to clear smoke and provide fresh air to trapped motorists.

#### PROGRAM INFORMATION

CDOT manages the Eisenhower-Johnson Memorial Tunnels along Interstate 70, which are 1.7 miles in length and bore through the Continental Divide about seven miles east of Frisco. The 28 600-horsepower inductive motor fans were installed when the tunnels were constructed in the 1970s.

#### PROJECT SCHEDULE

	Start Date	Completion Date
Design	July 2019	September 2019
Construction	January 2020	March 2020
Equipment		
Occupancy		

#### SOURCE OF CASH FUNDS

This project is not funded from cash sources.

#### OPERATING BUDGET

The department expects the project to result in operating cost reductions of about \$150,000 per year based on the electrical demand-dampening effect of the new equipment.

#### STAFF QUESTIONS AND ISSUES

None.