CITYWIDE PARKING - PARKING TECHNOLOGIES

DOCUMENT SUBSECTION: Fixed Transportation Equipment
MANAGING DEPARTMENT: Department of Transportation and Environmental Services
PROJECT LOCATION: Citywide
PROJECT AREA: Citywide
PRIMARY STRATEGIC THEME: Theme 10: Multimodal Transportation
ESTIMATE USEFUL LIFE: 6 - 10 Years

PROJECT DESCRIPTION & JUSTIFICATION
This project provides funding for the deployment of new parking technologies, such as real time parking occupancy systems for on-street spaces and parking garages/ lots, web-based interactive parking map, dynamic signage that illustrates real-time parking availability in city-owned garages, and other parking technologies. These technologies will mostly be off-the-shelf solutions requiring minimal design and engineering.

This project is fully funded with CMAQ/RSTP funds anticipated in FY 2018 – 2023. Specific projects contemplated include:

- FY 2018-2019: Phase I – Begin installing sensors in all City owned garages; develop a web-based application to provide real-time occupancy information; and install dynamic directional signage that would indicate real-time parking availability and direct parkers to available parking spaces.
- FY 2019-2020: Phase II – Develop, propose to Council, and then based on Council action possibly implement a variable pricing model for maximizing efficiencies at metered on-street spaces.
- FY 2020-2023: Phase III – Continue installing sensors in all City owned garages; continue installing sensors or similar technology in on-street spaces; and continue installing dynamic directional signage that would indicate real-time parking availability and direct parkers to available parking spaces; and coordinate off-street and on-street parking occupancy data into a combined web-based application.

Depending on technology selected to monitor on-street space utilization and availability, additional funding may be needed to complete this project, or the project’s scope may be need to be narrowed. The City has received a CMAQ / RSTP grant fund for FY 2023 in the amount of $250,000.

Once implemented, these technologies will support economic development by providing more efficient parking strategies and allowing the City to manage parking and traffic assets more efficiently.

EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION
T&ES Strategic Plan; Old Town Area Parking Study; Del Ray Parking Study

ADDITIONAL OPERATING IMPACTS
No additional operating impacts identified at this time.
No changes from prior CIP.

**PROJECT DESCRIPTION & JUSTIFICATION**

The Broadband Communications Link project includes the design and expansion of the City's fiber optic communications (broadband) network on Eisenhower Avenue between Van Dorn Street and Clermont Avenue. Currently, the traffic signals along Eisenhower Avenue operate independently of one another and are not synchronized. There is no communications infrastructure in place to connect any existing or new traffic signals to this system.

With the proposed development in Eisenhower West, new smart infrastructure and smart traffic signals to manage the anticipated increase in traffic will be required. This project aims to mitigate the impacts of proposed development along Eisenhower Avenue with the installation of communications conduit and fiber optic cable, surveillance cameras at key locations for real time traffic monitoring, and a communications network that will connect the new and existing traffic signals to provide synchronization along Eisenhower Avenue to mitigate the impacts of Victory Center related traffic.

This project will build onto the infrastructure installed with the ITS Integration project, which has already begun. It could also serve as a segment of the potential citywide broadband initiative.

**EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION**

N/A

**ADDITIONAL OPERATING IMPACTS**

No additional operating impacts identified at this time.
**Citywide Trans. Mgmt. Tech. - Intelligent Transportation Systems (ITS) Integration**

**Document Subsection:** Fixed Transportation Equipment  
**Managing Department:** Department of Transportation and Environmental Services  
**Project Location:** Citywide  
**Reporting Area:** Citywide  
**Primary Strategic Theme:** Theme 10: Multimodal Transportation  
**Estimate Useful Life:** Varies

**Prior year funding in the amount of $7.0 million transferred from this project to the new Traffic Adaptive Signal Control project. FY 2019 – FY 2023 funding adjusted to reflect separation of Traffic Adaptive Signal Control from the ITS Integration parent project.**

**Project Description & Justification**

This project provides funding for the design and installation of upgrades to the City's Intelligent Transportation System (ITS) initiative, which keeps City streets safe and running smoothly, while also laying the groundwork for emerging technologies that will shape transportation over the next five, 10, 20 years and beyond. Completion of this project will replace much of the City’s 30-year old traffic signal communications and allow public safety departments to monitor real time conditions on the City’s roadway network.

This project has four phases that largely focus on the design and installation of the City's fiber optic communications (broadband) network, which is the laying of cable that allows regional transportation agencies to communicate faster and more efficiently to manage traffic and respond to emergencies. The project also includes the installation of field devices such as traffic cameras, weather stations, flood monitoring equipment and pavement temperature sensors which capture data that can be used to reduce congestion.

The four phases are as follows:

- **Phase I**, which is complete, installed a broadband fiber optic communications network, 11 traffic surveillance cameras, and a management center at Business Center Drive.
- **Phase II**, which supplements the first phase, expands the broadband network and installs additional traffic surveillance cameras. It is scheduled to be complete in 2018.
- The **design for Phase III** is expected to begin in FY 2018 with construction beginning in late FY 2019. This phase includes the provision of pavement temperature sensors, weather stations and flood monitoring devices.
- The **design for Phase IV** is expected to begin in FY 2020 and construction in FY 2021. This phase will accommodate future vehicle-to-infrastructure and autonomous vehicle technology applications currently being developed by the Federal Government.

Funding for Traffic Adaptive Signal Control, which was previously included with this project, has been separated into a new CIP project of the same title.

**Changes from Prior Year CIP**

Prior year funding in the amount of $7.0 million transferred from this project to the new Traffic Adaptive Signal Control project. FY 2019 - FY 2023 funding adjusted to reflect separation of Traffic Adaptive Signal Control from the ITS Integration parent project.

**External or Internal Adopted Plan or Recommendation**

N/A

**Additional Operating Impacts**

No additional operating impacts identified at this time.
CITYWIDE TRANS. MGMT. TECH. - TRAFFIC CONTROL UPGRADE

DOCUMENT SUBSECTION: Fixed Transportation Equipment
MANAGING DEPARTMENT: Department of Transportation and Environmental Services
PROJECT LOCATION: Citywide
REPORTING AREA: Citywide
PRIMARY STRATEGIC THEME: Theme 10: Multimodal Transportation
ESTIMATE USEFUL LIFE: Varies

PROJECT DESCRIPTION & JUSTIFICATION
The Traffic Control Upgrade project funds ongoing capital maintenance and required traffic control hardware upgrades associated with implementation of the Citywide Transportation Management and ITS Integration project.

The project supports necessary technology upgrades associated with the City's new traffic surveillance cameras, broadband fiber optic communications network and hardware/systems in the management center used to monitor real-time traffic conditions. Additionally, this project provides funding for emergency repairs and replacement in cases of equipment failure of the existing traffic control system.

CHANGES FROM PRIOR YEAR CIP
No changes from prior CIP.

PROJECT DESCRIPTION & JUSTIFICATION
The Traffic Control Upgrade project funds ongoing capital maintenance and required traffic control hardware upgrades associated with implementation of the Citywide Transportation Management and ITS Integration project.

The project supports necessary technology upgrades associated with the City's new traffic surveillance cameras, broadband fiber optic communications network and hardware/systems in the management center used to monitor real-time traffic conditions. Additionally, this project provides funding for emergency repairs and replacement in cases of equipment failure of the existing traffic control system.

EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION
N/A

ADDITIONAL OPERATING IMPACTS
No additional operating impacts identified at this time.
This project funds the deployment of small-scale transportation technology projects to improve efficiency of transportation infrastructure including parking meters, traffic signals and signs. In FY 2019, the City plans to use mobile device (smart phone) technology to collect safety data associated with Vision Zero and which will also measure the movement of people in and around the City. This technology will improve the reliability and integrity of future transportation studies. These technologies will also contribute to the engineering improvements being implemented as part of the City's Vision Zero plan.

Prior year funding has been used to upgrade city parking meter modems from 2G to 3G to ensure continued operation and reliability as cellular providers phase out 2G service.
# Fixed Transportation Equipment

**Document Subsection:** Fixed Transportation Equipment  
**Managing Department:** Department of Transportation and Environmental Services  
**Project Location:** Citywide  
**Reporting Area:** Citywide  
**Primary Strategic Theme:** Theme 10: Multimodal Transportation  
**Estimate Useful Life:** Varies

**Project Description & Justification**

This project provides annual funding for the upgrade, maintenance and replacement of traffic control and parking equipment, as well as the installation of new traffic signals. Of particular importance is the replacement of traffic signal poles. Traffic signal poles have a design life of 25 to 30 years. With more than 250 signalized intersections in operation, numerous traffic signal poles throughout the City are approaching the end of their design life and will require replacement.

Funding is also provided for replacement of the multi-space meters in Old Town in FY 2023 ($1.5 million), which will have reached the end of their useful life and will need to be replaced. All funding will be used for the procurement of equipment and construction service.

Annual funding maintains the value of the City’s physical assets through the maintenance of critical traffic control infrastructure. Additionally, public safety concerns are addressed by installing new traffic signals to improve the safety at dangerous intersections.

**Changes from Prior Year CIP**

No changes from prior CIP.

**External or Internal Adopted Plan or Recommendation**

T&ES Strategic Plan

**Additional Operating Impacts**

The City typically installs a new traffic signal once every three years. The cost to maintain a traffic signal is $2,500 per year, which includes the cost to provide power to the traffic signal, as well as ongoing preventative maintenance and malfunction troubleshooting.

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### Fixed Transportation Equipment

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**Additional Operating Impact**

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Fixed Transportation Equipment (continued)

Fixed Transportation Equipment FY 2019 – FY 2021 Project List

| Fiscal Year 2019 | 
|-----------------|-----------------|
| Description                              | Amount          |
| Reconstruct signal at Beauregard & Fillmore | $150,000        |
| Reconstruct signal at King & Menokin       | $150,000        |
| Reconstruct signal at Columbus & Prince    | $120,000        |
| Reconstruct signal at Columbus & Madison   | $120,000        |
| Reconstruct signal at St. Asaph & Madison  | $120,000        |
| Reconstruct signal at St Asaph & Pendleton | $130,000        |
| Repair and upgrade of traffic signal vehicle detection | $30,000        |
| Knockdowns from accidents                   | $30,000         |
| **Total Fiscal Year 2019**                  | **$850,000**    |

| Fiscal Year 2020 | 
|-----------------|-----------------|
| Description                              | Amount          |
| Reconstruct signal at Duke & Alfred       | $130,000        |
| Reconstruct signal at Duke & Columbus     | $130,000        |
| Reconstruct signal at Columbus & Wythe    | $130,000        |
| Reconstruct signal at Alfred & Cameron    | $120,000        |
| Reconstruct signal at Alfred & Prince     | $120,000        |
| New signal (undermined location)          | $150,000        |
| Repair and upgrade of traffic signal vehicle detection | $40,000        |
| Knockdowns from accidents                   | $30,000         |
| **Total Fiscal Year 2020**                  | **$850,000**    |

| Fiscal Year 2021 | 
|-----------------|-----------------|
| Description                              | Amount          |
| Reconstruct signal at St. Asaph & Montgomery | $120,000        |
| Reconstruct signal at Columbus & Montgomery | $120,000        |
| Reconstruct signal at Seminary & Jordan   | $130,000        |
| Reconstruct signal at Quaker & Preston    | $150,000        |
| Reconstruct signal at Stevenson & Whiting | $150,000        |
| Reconstruct signal at Stevenson & Walker  | $130,000        |
| Repair and upgrade of traffic signal vehicle detection | $25,000        |
| Knockdowns from accidents                   | $25,000         |
| **Total Fiscal Year 2021**                  | **$850,000**    |
TRAFFIC ADAPTIVE SIGNAL CONTROL

DOCUMENT SUBSECTION: Fixed Transportation Equipment
MANAGING DEPARTMENT: Department of Transportation and Environmental Services
PROJECT LOCATION: Citywide
REPORTING AREA: Citywide
PRIMARY STRATEGIC THEME: Theme 10: Multimodal Transportation
ESTIMATE USEFUL LIFE: Varies

This is a new project for FY 2019. Funding originally included with the Citywide Transportation Management Technologies – ITS Integration Project has been transferred to this new project.

PROJECT DESCRIPTION & JUSTIFICATION

This project provides funding for the design and installation of traffic adaptive signal control systems. Traffic adaptive signal control is a traffic management strategy in which traffic signal timing changes, or adapts, based on actual traffic demand. It allows traffic signals to adjust to actual traffic demand and flow rather than variables that are less effective predictors of traffic patterns, such as time of day, and continuously synchronize with each other to optimize traffic flow throughout a network to better manage traffic flow on the City's roadways. This project will install new control software and hardware as well as traffic sensors to monitor traffic in real-time.

This project is funded through the Virginia Department of Transportation Smart Scale program. There are two phases to this project. The design for Phase I will begin in early FY 2019 with construction starting in early FY 2021. The design for Phase II will begin in FY 2022, and construction is anticipated to begin in FY 2023.

This funding was originally included with the ITS Integration parent project, but is now a standalone project.

BACKGROUND

EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

N/A

ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.