Submitted By: Transportation & Public Works Department
Stephen Bailey, Director

Project Type: Streets/Roads/Bridges related projects - Transportation & Public Works Department

Previously submitted but not selected: Yes - TSPLOST 2023; Smart City Technology
Continuation Project: No

Executive Summary: The Smart City Technology project will enhance the safety and efficiency of ACC's roadway network through implementation of advanced roadway technologies. This project will prepare ACC for the future of transportation, including connected and autonomous vehicles. Key components include: Expanding fiber optic connectivity, implementing connected vehicle capabilities, enhancing pedestrian and bike detection systems, upgrading to adaptive signal systems, and using advanced vehicle detection technology. (This would be Transportation Improvements Technology Program, as there would be multiple sub-projects and there is no clearly defined location.)

Project Total Cost: $ 11,494,000 Total Operating Cost: $ 224,000

Does this Project require the acquisition of any land? Unsure

Project/Program Description: Key components of the project include:

1. Fiber Optic Network Expansion: Installation of approximately 45 miles of underground fiber optic cable to create a robust, high-speed communication backbone for the entire system.
2. Adaptive Traffic Signal Systems: Upgrade existing traffic signals to intelligent, adaptive systems that use real-time data and artificial intelligence to optimize traffic flow, reducing congestion and travel times.
3. Connected Vehicle Infrastructure: Implement Vehicle-to-Infrastructure (V2I) communication capabilities, allowing for the exchange of critical safety and operational data between vehicles and traffic management systems.
4. Advanced Detection Systems: Deploy state-of-the-art sensors for improved detection of vehicles, pedestrians, and bicycles at intersections and mid-block crossings, enhancing safety for all road users.
5. Emergency Vehicle and Transit Priority: Install preemption and priority systems on select roadways to facilitate faster response times for emergency vehicles and improved reliability for public transit.
6. Smart Pedestrian Crossings: Implement intelligent pedestrian crossing systems with automated detection and responsive signaling to enhance pedestrian safety in key areas.
7. Real-Time Traffic Information: Deploy variable message signs and integrate with mobile apps to provide drivers with up-to-date traffic conditions, alternative routes, and parking information.
8. Data Analytics and Management: Establish a central traffic management system with advanced analytics capabilities to process and analyze data from various sources, enabling data-driven decision-making and predictive maintenance.
9. Environmental Monitoring: Integrate environmental sensors to monitor air quality and weather conditions, supporting sustainability initiatives and providing valuable data for city planning.
10. Cybersecurity Measures: Implement robust cybersecurity protocols and systems to protect

the smart city infrastructure from potential threats and ensure data privacy.
This project will significantly improve traffic operations converting the current time-of-day signal system to an adaptive system that can predict and respond to changing traffic conditions. It will enhance safety through advanced detection and preemption systems, reducing the potential for collisions at intersections. The V2I capabilities will prepare Athens-Clarke County for the future of autonomous and connected vehicles.

How is this Project included in the Madison Athens-Clarke County Oconee Regional Transportation Study (MACORTS) long-range Transportation Improvement Plan (TIP)? Advanced Transportation Management System (ATMS) Project (V-8)

PROJECT JUSTIFICATION

How will the Project meet the stated Program Goals in the Mayor & Commission Strategic Plan to provide long-term, ongoing contributions to the Sustainable Transportation needs of the Athens-Clarke County?

Goal Area 5; Section A: Improve, expand, and maintain sidewalks, shared-use paths, and bike facilities to provide greater opportunities for residents to use active transportation safely: The Smart City Technology project enhances safety for active transportation users through advanced detection systems at intersections and mid-block crossings. These systems will improve the responsiveness of traffic signals to pedestrians and cyclists, creating a safer environment for non-motorized transportation. This encourages more residents to choose active transportation options, promoting a healthier and more sustainable community.

Goal Area 5; Section C: Expand multi-modal Transit access to reduce auto dependency and provide greater mobility for Athens residents: The project expands multi-modal transit access by implementing transit signal priority systems. These systems will improve public transit reliability and reduce travel times, making it a more attractive option for residents. Real-time traffic information provided through variable message signs and mobile apps will help transit users make informed decisions about their journeys, further encouraging the use of public transportation over personal vehicles.

Goal Area 5; Section D: Create more usable and aesthetically pleasing corridor connections between residential and commercial areas: The Smart City Technology project contributes to more usable and aesthetically pleasing corridor connections by optimizing traffic flow and reducing congestion. Adaptive traffic signal systems will improve the efficiency of major corridors, reducing idle times and enhancing the overall travel experience. This creates a more pleasant environment for both motorists and pedestrians, fostering better connections between residential and commercial areas.

Goal Area 5; Section E: Enhance safety for all modes of transportation: The project significantly enhances safety for all modes of transportation through multiple features: advanced vehicle, pedestrian, and bicycle detection systems; adaptive traffic signal control; emergency vehicle preemption; and connected vehicle infrastructure. These technologies work together to reduce conflict points, improve traffic flow, and provide real-time safety information, creating a safer transportation environment for drivers, pedestrians, cyclists, and transit users alike.

Goal Area 6; Section A: Develop well-planned new infrastructure according to future land use values and framework: The Smart City Technology project aligns with future land use values by developing a flexible, scalable infrastructure that can adapt to changing transportation needs. The fiber optic network and intelligent traffic systems create a foundation for future smart city initiatives. This forward-thinking approach ensures that the new infrastructure can support evolving technologies and changing community needs, promoting sustainable urban development.

Goal Area 6; Section B: Ensure equitable access to infrastructure to enhance safety and identity: The project ensures equitable access to infrastructure by implementing technologies that benefit all road users. Advanced detection systems and smart pedestrian crossings enhance safety for vulnerable users. Real-time traffic information improves accessibility for all residents, regardless of their mode of transportation. By creating a more efficient and responsive transportation network, the project promotes equitable mobility throughout the community.

Goal Area 6; Section C: Provide adequate funding for maintenance of existing and newly constructed infrastructure: The Smart City Technology project includes provisions for ongoing maintenance of the new infrastructure. The centralized traffic management system enables proactive maintenance through real-time monitoring and predictive analytics. This approach helps identify and address issues before they become critical, ensuring the longevity and reliability of the new systems while optimizing maintenance costs over time.

Goal Area 6; Section D: Follow through on commitment to 100% Clean and Renewable Energy resolution: The project supports the 100% Clean and Renewable Energy resolution by reducing traffic congestion and vehicle idle times, thereby decreasing overall emissions. The improved efficiency of the transportation network, coupled with the promotion of public transit and active transportation, contributes to a reduction in the community's carbon footprint. Additionally, the infrastructure can support future integration of electric vehicle charging stations and renewable energy sources.

Goal Area 6; Section E: Address ecosystem health, infrastructure sustainability, and resilience: The Smart City Technology project addresses ecosystem health and infrastructure sustainability through several features. Environmental sensors can monitor air quality, providing valuable data for environmental initiatives. By optimizing traffic flow and reducing congestion, the project helps decrease vehicle emissions, positively impacting air quality. The adaptive and flexible nature of the smart infrastructure ensures long-term resilience, allowing for updates and adjustments as new technologies are introduced.

Project Costs

Detailed project capital budget costs (to be funded from TSPLOST 2026 only):

Project Costs (round to thousand)		Amount
1. Land Acquisition / ROW / Easement:	$	250,000
2. Design Fees: (Min.12% of New Const.; 14% of reno,; 16% for LEED proj.)	$	742,000
3. Miscellaneous Fees: (Min. Minimum of 3% of Construction Costs – used for permitting, etc. Utilize minimum of 10% if land acquisition if necessary.	$	185,000
4. Construction:	$	6,180,000
5. Construction Contingency: (10% of the Construction line item)	$	618,000
6. Acquisition of Capital Equipment:	$	1,200,000
7. Testing:	$	185,000
8. Project Management: (4% of the total budget line items above)	$	374,000
9. Project Contingency: (10% of the total budget line items above)	$	973,000
10. Public Art: Calculated at 1% of the Construction line item.	$	62,000
11. Other 1: Cybersecurity Implementation	$	300,000
12. Other 2: Software Licensing and Integration	$	200,000
Project Subtotal:	$	11,269,000
14. Program Management (2% of Project Subtotal):	$	225,000
TSPLOST 2026 Project Total:	**$**	**11,494,000**

Project Financing

Is the proposed Project to receive funding from source(s) other than TSPLOST 2026? No

Operating Cost

Total Annual Net Operating Costs when Project is complete:

Only identify additional or net operating costs to be paid by ACCGov as a result of this Project. Identify the additional or net costs needed, above ACCGov's current operating budget, to operate the requested project; as well as any additional Project related revenues that would be generated. Provide budget costs for each identified category below.

Operating Costs (round to thousand)	Estimated Impact for Annual Operating Expenditures
TOTAL PROJECTED REVENUES FROM PROJECT	
PROJECTED EXPENDITURES	
1. Personnel Costs: from Appendix A	91,000
2. Annual Utilities:	
• Natural Gas:	
• Electrical:	15,000
• Water:	
• Sewer:	
• Phone:	2,000
• Solid Waste Collection:	
• Other:	
3. Operating Supplies:	10,000
4. Equipment Maintenance:	60,000
5. Facility Maintenance:	
6. Other: Software Licenses and Updates	25,000
7. Other: Cybersecurity Services	20,000
8. Other: Public Art Maintenance	1,000
TOTAL EXPENDITURES	
NET OPERATING COSTS OF PROJECT:	**$ 224,000**

New Staffing

Position	Title	Hourly Rate	# of Hours /wk	# of Positions	Total Annual Expense
Full Time	Network Technician			1	60,000
Full Time	Data Analyst	30	20	1	31,200

Network Technician – Network Technician (Full-time):

- Maintain and troubleshoot the fiber optic network infrastructure
- Monitor and manage the smart city technology systems, including traffic signals and sensors.

Data Analyst – Data Analyst

- Collect and analyze data from various smart city systems
- Develop and maintain dashboards for monitoring system performance and traffic patterns
- Generate regular reports

Smart City Technology Detailed Construction Cost Estimate:

- Fiber optic cable installation (45 miles): $3,560,000
- Traffic signal upgrades (100 intersections): $1,500,000
- Advanced detection systems: $500,000
- V2I communication devices: $300,000
- Variable message signs: $200,000
- Central management system hardware: $120,000
- Total Construction: $6,180,000