

## 6.0 Project List

After conducting the workshops and surveys, and consulting the relevant planning documents in the region, a list of ITS-related projects was developed to summarize all efforts. Tables 6.1, 6.2, and 6.3 show a summary of the projects considered at the three regional levels considered: State, Regional, and Local projects, respectively. The following information is provided for each project identified:

- **ITS Area** – The ITS functional area being addressed by each project.
- **ID** – An individual numeric ID unique to each project.
- **Name** – The project’s name
- **Description** – A brief description of the project
- **Related Needs** – A guide to the ITS gaps and needs addressed by each project, as presented in Section 3 of this report
- **Stakeholders** – An initial assessment of stakeholders involved. Stakeholders in **bold** represent primary stakeholders, which may be considered as the project’s lead. Other stakeholders mentioned are secondary stakeholders, which may be involved during the design and implementation of each project, but not necessarily leading it.
- **Timeframe** – An initial assessment of the expected timeframe the project can consider for implementation. Three time frames are being considered:
  - ● ● Short term project – Estimated to be implemented in 1 to 3 years.
  - ● ● Medium term project – Estimated to be implemented in 3 to 6 years.
  - ● ● Long term project – Estimated to be implemented in 6 to 9 years.
- **Expected Cost** – An initial estimation of a potential cost according to the project description. The costs are presented in three tiers:
 

|                    |   |
|--------------------|---|
| <b>Low Cost</b>    | A potentially low-cost project both for implementation as well as operation and maintenance (approximately below \$1 Million)       |
| <b>Medium Cost</b> | A relatively expensive project both for implementation as well as operation and maintenance (approximately from \$1 to \$5 Million) |
| <b>High Cost</b>   | An expensive project both for implementation as well as operation and maintenance (over \$5 Million)                                |

## 6.1 State Projects

**Table 6.1 State ITS Projects Identified**

| STATE PROJECTS                         |   |  |                         |              |           |               |
|--|---|--|-------------------------|--------------|-----------|---------------|
| ID                                     | Name  | Description  | Related Need (by ID)    | Stakeholders | Timeframe | Expected Cost |
| <b>ITS Function—Freeway Management</b> |   |  |                         |              |           |               |
| 1                                      | Freeway Management System (FMS) Expansion               | The FMS Expansion project's objective is to extend ODOT FMS field devices and communications on the freeway system, including expansion of: the TMC, DMS, CCTV, flow detection, freeway service patrols, hybrid communications systems, HAR, ramp metering, web-based services, and inter-agency communications networks.  | ID #1<br>ID #2          | State (ODOT) | ● ● ●     | High          |
| 2                                      | ODOT Advanced Traffic Management System (ATMS)          | ODOT is seeking a commercial off-the-shelf Advanced Traffic Management System software package to replace and expand the current in-house system. The new system shall consolidate resources (including Playbook), enhance capabilities, capture and archive roadway, traffic, speed, and weather data, provide functionality for forthcoming emerging technologies. | ID #1<br>ID #2<br>ID #3 | State (ODOT) | ● ● ●     | Medium        |
| 3                                      | Traffic Monitoring Management System Enhancements       | The objective of this project is to enhance/expand a Statewide Traffic Monitoring Management System created by ODOT.   | ID #1                   | State (ODOT) | ● ● ●     | Medium        |
| 4                                      | Transportation Systems Management and Operations (TSMO) | ODOT's TSMO Plan and ongoing TSMO efforts work to continue the implementation of TSMO strategies across the state's corridors.   | ID #2                   | State (ODOT) | ● ● ●     | Medium        |
| 5                                      | Freeway Managed Lanes                                   | Freeway managed lanes efforts implement managed lane technology on selected, priority corridors. Strategies may include hard shoulder running and dynamic lane control, with permanent overhead signs for managed lane operations.   | ID #2                   | State (ODOT) | ● ● ●     | High          |
| 6                                      | Freeway Ramp Metering                                   | Freeway ramp metering efforts implement controlled metering at freeway on-ramps to reduce mainline congestion.   | ID #2                   | State (ODOT) | ● ● ●     | High          |
| 7                                      | Freeway Speed Harmonization                             | Freeway speed harmonization efforts implement variable speed limits and speed harmonization on selected corridors to enhance regional mobility and reduce emissions.   | ID #2                   | State (ODOT) | ● ● ●     | High          |

## STATE PROJECTS

| ID  | Name  | Description   | Related Need (by ID)                 | Stakeholders                      | Timeframe | Expected Cost |
|---|---|---|--------------------------------------|-----------------------------------|-----------|---------------|
| <b>ITS Function—Traveler Information</b>          |   |   |                                      |                                   |           |               |
| 8   | Dynamic Message Signs (DMS)                           | DMS efforts install DMS signs in strategic locations throughout the region for improved freeway management and operations (enhancing safety, reliability, efficiency) and improved communication with travelers.  | ID #13                               | State (ODOT)<br>Regional (NOACA)  | ● ● ●     | Medium        |
| 9   | Fiber Optic Connectivity                              | Advancing fiber optic connectivity and coverage could support the development of various regional smart mobility technologies by installing fiber optic cable along key freeways in the region and local roadways, as well as by installing roadside detection units and traffic signal upgrades.   | ID #1                                | State (ODOT),<br>Regional (NOACA) | ● ● ●     | Medium        |
| 10  | Expand Traveler Information Delivery Methods          | Enhancing traveler information dissemination methods may include enhancing OHGO, information provided through cable TV stations, and new connections to private sector dissemination methods.   | ID #11<br>ID #12<br>ID #13<br>ID #14 | State (ODOT)                      | ● ● ●     | Low           |
| <b>ITS Function —Maintenance and Construction</b> |   |   |                                      |                                   |           |               |
| 11  | Maintenance Vehicle Upgrade                           | Maintenance vehicle upgrades pertaining to ITS include the purchasing of new instrumented multi-subsystem data collection vehicles and associated software and maintenance.   | ID #20                               | State (ODOT)                      | ● ● ●     | Low           |
| 12  | Expand Road Weather Information System (RWIS)         | RWIS expansion efforts may including installing additional RWIS stations at strategic locations. The project also considers testing mobile RWIS.  | ID #3<br>ID #20                      | State (ODOT)                      | ● ● ●     | Low           |
| 13  | Winter Maintenance                                    | Winter maintenance projects pertaining to ITS include: installing snow and ice detection management and advanced snow plow systems, as well as a pilot project to assess the use of RWIS integrated with advanced technology snow plows. This project also considers evaluating the use of private data collectors to expand data collection.   | ID #20                               | State (ODOT),<br>Regional (NOACA) | ● ● ●     | Medium        |
| 14  | Work Zone Reservation and Traveler Information System | This project is a joint effort between Ohio and Pennsylvania to implement the he Work Zone Reservation and Traveler Information System on the Turnpike. WZRTIS will enhance work zone operations and safety by providing accurate, standardized, and real-time work zone information across nearly 41,000 miles of roadway through Pennsylvania and Ohio. The system will also streamline work zone coordination between maintenance crews, construction crews, and | ID #13<br>ID #19                     | State (ODOT)                      | ● ● ●     | High          |

## STATE PROJECTS

| ID  | Name   | Description   | Related Need (by ID) | Stakeholders                      | Timeframe | Expected Cost |
|---|--|---|----------------------|-----------------------------------|-----------|---------------|
|   |  | traffic operation centers by modernizing the way work zones are scheduled and managed.  |                      |                                   |           |               |
| 15  | Work Zone Safety Improvements                                | ITS applications for work zones improve mobility and safety in work zones by helping to reduce crashes and incidents. Such applications generally alert drivers of a construction zone, roadway hazard, or speed change. This project also considers pilot projects to test portable CMS, queue detection, and integration with VSL systems.  | ID #18<br>ID #19     | State (ODOT)                      | ● ● ●     | Medium        |
| <b>ITS Function —Public Safety</b>  |  |   |                      |                                   |           |               |
| 16  | Highway-Rail Intersection Advanced Safety Systems            | This project's objective is to conduct a study that identifies priority highway-rail crossings and the preferred system to install advanced Highway-Rail Safety Systems at key crossings.   | --                   | State (ODOT),<br>Regional (NOACA) | ● ● ●     | Low           |
| 17  | Intersection Collision Warning Systems                       | This project considers the installation of Collision Warning Systems on key intersections with high collision rates. Technology may include alerting users of crossing traffic, as well as queue detection on heavy traffic arterials.  | --                   | State (ODOT)                      | ● ● ●     | Low           |
| 18  | Speed Radar-activated Chevrons                               | This project considers the installation of speed radar detection on key road curves, to alert users when taking a curve at high speeds.   | --                   | State (ODOT)                      | ● ● ●     | Low           |
| <b>ITS Function —Commercial Vehicle Operations and Freight Management</b> |  |   |                      |                                   |           |               |
| 19  | Deploy a Truck Parking Information Management System (TPIMS) | This project's objective is to develop and deploy an information management system that monitors available public and private truck parking spaces and publishes the information "real time" via the internet and roadside signs.   | ID #16<br>ID #17     | State (ODOT)                      | ● ● ●     | Medium        |
| <b>ITS Function —Emerging Technologies</b>                                |  |   |                      |                                   |           |               |
| 20  | Ohio Turnpike ACV Testing                                    | The 241-mile Ohio Turnpike is DriveOhio's site for testing ACVs. The turnpike is outfitted – end to end – with fiber-optic cable, and it already has been a testing site for self-driving trucks. Roadside units will be installed in a 60-mile stretch of the turnpike and onboard units will be installed and operational in fleet vehicles during the first quarter of 2018, giving the Ohio Turnpike Commission the ability to produce traffic and weather alerts for digitally connected vehicles and to use vehicle and road condition data to make better decisions about treating roads and managing incidents. | ID #2<br>ID #6       | State (ODOT)<br>Regional (NOACA)  | ● ● ●     | High          |

## STATE PROJECTS

| ID   | Name  | Description  | Related Need (by ID)                           | Stakeholders   | Timeframe   | Expected Cost |
|--|---|--|--|--|---|---------------|
| 21   | DriveOhio City Use Cases                        | ODOT is collaborating with Athens, Akron, Canton, Cincinnati, Cleveland, Dayton, Dublin, and Toledo for additional DriveOhio projects. Use cases that highlight each city's unique attributes are under development, ranging from workforce mobility, healthcare and education access, and mobility access for underserved, elderly and disabled populations.  | ID #8<br>ID #9                                 | State (ODOT),<br>Regional (NOACA)<br>City of Cleveland | <span style="color: blue;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | High          |
| <b>ITS Function —Emerging Technologies</b> |   |  |  |  |   |               |
| 22   | I-90 Lake Effect Corridor                       | ODOT is equipping 60 miles of I-90 with short-range digital communication units. It will also test wireless technologies designed to send and receive data from those units as well as units on public service vehicles. The data, combined with new variable speed limit signs, will help local officials and law enforcement better manage the roadway to reduce crashes and fatalities. The project considers an expansion to other corridors in the near future. | ID #21<br>ID #22<br>ID #23<br>ID #24<br>ID #25 | State (ODOT)   | <span style="color: blue;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | High          |
| 23   | Increase Electric Vehicle Infrastructure        | Efforts to increase electric vehicles in the public fleet include: increasing electric vehicle infrastructure (for instance by the design and construction of public fleet electric vehicle charging stations) and public fleet electric vehicle purchases.  | --   | State (ODOT)   | <span style="color: blue;">●</span> <span style="color: blue;">●</span> <span style="color: blue;">●</span> | High          |
| <b>ITS Function —Data Management</b>       |   |  |  |  |   |               |
| 24   | ODOT Traffic Monitoring Permanent Count Program | The effort advances the ODOT Traffic Monitoring Permanent Count Program, specifically by providing funding for items such as: supplies, utilities, software, counter maintenance, and an upgrade to the existing non-intrusive sensors and accessories.  | --   | State (ODOT)   | <span style="color: blue;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low           |
| 25   | Creation of a GIS Data Centralization Center    | The GIS Centralization Project will focus on an enterprise wide approach to managing geospatial resources providing for the development and integration of spatial data and GIS technology throughout ODOT.  | --   | State (ODOT)   | <span style="color: blue;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | High          |

## 6.2 Regional Projects

**Table 6.2 Regional ITS Projects Identified**

| Regional Projects                          |  |  |                                      |  |           |        |
|--|--|--|--------------------------------------|--|-----------|--------|
| ID   | Name   | Description  | Related Need (by ID)                 | Stakeholders                                       | Timeframe | Cost   |
| <b>ITS Function —Freeway Management</b>    |  |  |                                      |  |           |        |
| 26   | Regional Traffic Management Center (TMC)                             | The objective of this project is to create a regional TMC to coordinate traffic in the region and share information among stakeholders. TMC operation should address: traffic/road condition surveillance, traveler information control, and communication with ODOT TMC for collaborative operations.   | ID #1<br>ID #2<br>ID #4              | Regional (NOACA)<br>State (ODOT)                   |           | Medium |
| 27   | Regional Traveler Information System (TIS)                           | This project considers the development of a regional Traveler Information System to alert users in the region of road closures, events, and congested routes, providing reasonable alternatives routes, with an emphasis on arterial routes in the region.   | ID #11<br>ID #12<br>ID #13<br>ID #14 | Regional (NOACA)                                   |           | Low    |
| 28   | Regional Alternate Routes Planning                                   | Develop a plan and operational strategy for alternate routes for traffic diversion due to major incidents with a focus on coordination between ODOT-operated freeways and locally-operated arterials. Plans would identify thresholds for when a specific segment of the roadway is considered affected, which alternate route(s) to implement; which agencies should be involved, how they communicate, and their roles and responsibilities in traffic control, timing adjustments, traveler information; and what ITS assets (CCTV, DMS, etc.) should be utilized to monitor the situation and provide en-route traveler information. | ID #1<br>ID #1<br>ID #12<br>ID #13   | Regional (NOACA)<br>State (ODOT)<br>Municipalities |           | Low    |
| <b>ITS Function —Public Transportation</b> |  |  |                                      |  |           |        |
| 29   | GCRTA Computer Aided Dispatch (CAD)/Automatic Vehicle Location (AVL) | The goal of this effort is to implement Computer Aided Dispatch using Automatic Vehicle Location technology for GCRTA, including: Automatic Passenger Counters, Closed Caption Television (CCTV) surveillance systems, automated stop announcements, and an enhanced Radio Communication system.   | ID #7<br>ID #9                       | Regional (NOACA)                                   |           | Medium |
| 30   | Laketrans CAD/AVL  | The goal of this effort is to implement Computer Aided Dispatch using Automatic Vehicle Location technology for Laketrans, including: Automatic Passenger Counters, Closed Caption Television (CCTV) surveillance systems, automated stop announcements, and an enhanced Radio Communication system.   | ID #7<br>ID #9                       | Regional (NOACA)                                   |           | Medium |

## Regional Projects

| ID   | Name   | Description  | Related Need (by ID) | Stakeholders                        | Timeframe | Cost   |
|--|--|--|----------------------|-------------------------------------|-----------|--------|
| 31   | County Transit Agency ITS Updates                          | The objective of this effort is to update county transit vehicle ITS, including AVL systems for vehicles for Lorain and Medina counties as well as upgraded vehicle radios for Medina County.  | ID #7<br>ID #9       | Lorain County<br>Medina County      | ● ● ●     | Low    |
| 32   | GCRTA / Laketran Transit Vehicle Wi-Fi                     | This effort will install wireless internet (Wi-Fi) on GCRTA/Laketran buses.  | ID #26               | Regional (NOACA)                    | ● ● ●     | Low    |
| <b>ITS Function —Public Transportation</b> |  |  |                      |                                     |           |        |
| 33   | Enhance and expand GCRTA and Laketran Paratransit services | This effort will implement an advanced para-transit scheduling and dispatch system at Laketran, coordinated with GCRTA.  | ID #8                | Regional (NOACA)                    | ● ● ●     | Medium |
| 34   | Transit Signal Priority                                    | Study key transit corridors for applicability of bus traffic signal priority to improve transit travel time. Implement transit signal priority on traffic signals on identified corridor.  | ID #5                | Regional (NOACA), City of Cleveland | ● ● ●     | High   |
| 35   | GCRTA Kiosks at Transfer Points                            | This project will install kiosks inside key transfer points such as airports to assist out of town users in finding their way using public transit.  | ID #1                | Regional (NOACA), City of Cleveland | ● ● ●     | Low    |
| <b>ITS Function —Emerging Technologies</b> |  |  |                      |                                     |           |        |
| 36   | Hyperloop Feasibility                                      | NOACA and Hyperloop Transportation Technologies, Inc. (Hyperloop TT) have entered into a Public-Private Partnership (P3) to explore the feasibility of development of an ultra-high-speed Hyperloop transportation system in the Great Lakes Megaregion. | ID #2                | Regional (NOACA), State (ODOT)      | ● ● ●     | High   |

## 6.3 Local Projects

**Table 6.3 Local ITS Projects Identified**

| Local Projects                           |  |   |                      |  |           |               |
|--|--|---|----------------------|--|-----------|---------------|
| ID                                       | Name   | Description   | Related Need (by ID) | Stakeholders   | Timeframe | Cost          |
| <b>ITS Function —Arterial Management</b> |  |   |                      |  |           |               |
| 37                                       | Signal Timing Optimization Program                     | This effort will re-time traffic signals on arterial roadways of regional significance. NOACA will lead the effort to update signal operations across key corridors in the region, and across jurisdictional boundaries, seeking to minimize stops and delays, reduce fuel consumption and air pollution, maximize traffic flow along arterial roadways, and improve safety by reducing rear end crashes. | ID #4                | <b>Regional (NOACA)</b><br>Cuyahoga County<br>Geauga County<br>Lake County<br>Lorain County<br>Medina County<br>Cleveland                |           | <b>Low</b>    |
| 38                                       | Automated Traffic Signal Performance Measures (ATSPMs) | This project will collect data at signalized intersections and develop performance measures using ATSPMS technologies to proactively manage signals in the region.  | ID #2<br>ID #4       | <b>Regional (NOACA)</b><br>Cuyahoga County<br>Geauga County<br>Lake County<br>Lorain County<br>Medina County<br>Cleveland                |           | <b>Medium</b> |
| 39                                       | Municipal Signal Preemption                            | This effort will explore traffic signal preemption for emergency vehicles, which makes use of connected vehicle technology to preempt traffic signals so that emergency vehicle may safely and efficiently move through intersections.  | ID #5                | <b>Cuyahoga County</b><br><b>Geauga County</b><br><b>Lake County</b><br><b>Lorain County</b><br><b>Medina County</b><br><b>Cleveland</b> |           | <b>Medium</b> |
| 40                                       | Upgrade Traffic Signals in East Cleveland              | This project will upgrade traffic signals and signal systems along Euclid Avenue, Superior Avenue, Terrace Road, Noble Road, and Hayden Drive in East Cleveland.  | ID #4                | <b>Cuyahoga County</b>   |           | <b>Low</b>    |
| 41                                       | Upgrade traffic signals along US-20 and US-322         | This project will upgrade traffic signals along US-20 (Center Ridge Road), from west of Stoney Ridge Road to Lear Nagle Road, in North Ridgeville as well as traffic signal improvements along US-322 (Mayfield Road), from Kenilworth Road to Warrensville Center Road, in Cleveland Heights   | ID #4                | <b>Lorain County</b>   |           | <b>Low</b>    |

## Local Projects

| ID                                       | Name   | Description   | Related Need (by ID) | Stakeholders    | Timeframe   | Cost |
|--|--|---|----------------------|-----------------|---|------|
| <b>ITS Function —Arterial Management</b> |  |   |                      |                 |   |      |
| 42                                       | Rocky River Signals                              | This project will upgrade signals and pavement markings at 13 intersections along Center Ridge Road (US-20) from Hunter's Point (WCL) to Wooster Road in the City of Rocky River.   | ID #4                | Cuyahoga County | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |
| 43                                       | Strongsville Signals                             | This city-wide signal upgrade project will upgrade signals along SR-82 and US-42 in the City of Strongsville.   | ID #4                | Cuyahoga County | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |
| 44                                       | Lorain Traffic Signals                           | This Lorain County project will replace nine signals throughout project limits as well as upgrade ADA ramps.  | ID #4                | Lorain County   | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |
| 45                                       | Mayfield Heights Signals                         | This Cuyahoga County project will upgrade signals along the Mayfield Road corridor, from Iroquois Avenue to Gates Mills Towers Drive. It will replace four signals, partially upgrade 13 traffic signals, and install an advanced central control system. | ID #4                | Cuyahoga County | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |
| 46                                       | Beachwood Signals                                | This project will upgrade signals primarily along SR175 and Cedar Road in the City of Beachwood, north of the Chagrin Boulevard corridor.   | ID #4                | Cuyahoga County | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |
| 47                                       | Cleveland Heights Signals                        | This project will reconstruct 12 signals in northern Cleveland Heights along Monticello Boulevard, Taylor Road, and Noble Road, as well as remove four unwarranted signals.   | ID #4                | Cuyahoga County | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |
| 48                                       | Painesville Signals                              | This Lorain County project will replace signal controllers and vehicle detection at 14 intersections along the two corridors, Richmond Street (SR 283) and Mentor Avenue (US 20), and remove three unwarranted traffic signals.                           | ID #4                | Lake County     | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |
| 49                                       | University Heights                               | This project will upgrade twenty-one traffic signals within University Heights along Cedar Road, Warrensville-Center Road, Washington Boulevard, and S. Green Road, including complete reconstruction at four intersections.                              | ID #4                | Cuyahoga County | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |
| 50                                       | City of Cleveland Special Event Traffic Planning | This effort will develop plans, procedures, and systems to improve traffic conditions associated with special events such as concerts, sporting events, and festivals.  | ID #22               | Cleveland       | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span> | Low  |

### Local Projects

| ID   | Name  | Description   | Related Need (by ID)       | Stakeholders   | Timeframe   | Cost   |
|--|---|---|----------------------------|--|---|--------|
| <b>ITS Function —Parking Management</b>                |   |   |                            |  |   |        |
| 51   | Cuyahoga County Port Authority Automated Parking Facilities   | This project will implement automated parking facilities to show available parking at the airport as well as automated payment collection. The project will also install DMS signs in allocated parking locations to provide incoming flight information to people picking up travelers.  | --                         | Cuyahoga County  | <span style="color: orange;">●</span> <span style="color: orange;">●</span> <span style="color: gray;">●</span> | Medium |
| 52   | City of Cleveland Automated Parking Facilities  | This project will evaluate possible connected vehicle applications to provider travelers with parking information and assistance, and to automate features of parking systems. Includes the installation of parking meters that allow app-based payment.  | --                         | Cleveland  | <span style="color: orange;">●</span> <span style="color: orange;">●</span> <span style="color: gray;">●</span> | Medium |
| <b>ITS Function —Incident and Emergency Management</b> |   |   |                            |  |   |        |
| 53   | Cuyahoga County Evacuation Plan Updates   | This project will study and develop a plan to evacuate Cuyahoga County in case of an emergency affecting a mass area.   | ID #21<br>ID #24<br>ID #27 | Cuyahoga County  | <span style="color: orange;">●</span> <span style="color: gray;">●</span> <span style="color: gray;">●</span>   | Low    |
| 54   | Municipal Computer Aided Dispatch to Emergency Vehicle  | This effort will integrate computer aided dispatch in to the emergency management center, allowing operators to dispatch emergency response vehicles to the scene more rapidly.   | ID #25                     | Regional (NOACA)<br>Cuyahoga County<br>Geauga County<br>Lake County<br>Lorain County<br>Medina County<br>Cleveland | <span style="color: orange;">●</span> <span style="color: orange;">●</span> <span style="color: gray;">●</span> | Medium |
| <b>ITS Function —Public Safety</b>                     |   |   |                            |  |   |        |
| 55   | City of Cleveland / Cuyahoga County Port Security Camera Installation including Vehicle Tracking System (VTS) | With the aid of Homeland Security Funding, this effort will install cameras underneath existing bridges along the Cuyahoga River to monitor river traffic. There is also interest in cameras to monitor the position of lift bridges across the Cuyahoga River for both vehicular travel and boat traffic. These cameras could be part of the regional Traffic Management Center. | ID #26                     | Cuyahoga County<br>Cleveland   | <span style="color: orange;">●</span> <span style="color: orange;">●</span> <span style="color: gray;">●</span> | Medium |

## 8.0 Implementation Plan

One of the objectives set for the ITS Strategic Plan was to develop an initial assessment of projects and a proposed project implementation strategy. This section builds upon the projects identified and their analysis, to define a strategic path towards implementation.

The ITS projects identified and described in this report respond to a variety of needs in the region, from short term solutions to current problems to long term visions for the region. As such, projects may have different levels of detail in concept definition, making it challenging to compare these projects among each other to define a path for implementation. This section presents a strategy to compare and prioritize the projects identified, to define a strategic approach towards an implementation strategy.

The Strategic Plan implementation strategy is based on a project scoring analysis. In order to score the different types of projects fairly, it was important to identify scoring criteria that could be comparable among the different projects and the stages they currently are in. For this purpose, the following evaluation criteria were considered:

- **Relationship between projects** – Some of the ITS projects identified can be related among each other. For example, the first project considered “Freeway Management System (FMS) Expansion” may include other projects such as “Freeway Managed Lanes” and “Ramp Metering”. Meanwhile, there are other projects that may be more isolated, and may not help the implementation of other projects considered, like the “Work Zones Safety Improvements” or the “Highway-Rail Intersection Advanced Safety Systems”. To score the relationship between projects, each project was related to each other, and the number of projects related was added for each project. A score of 7 points was given to the project with the most projects related to it, and no points were given to independent projects.
- **Project relevance in the region** – To make sure that projects that are addressing regional ITS needs are given a higher priority, 5 points were given to the project that addresses the most ITS needs identified, while 0 points were given to projects that do not address any need.
- **Potential project costs** – An important characteristic to consider for project prioritization is the potential cost. Given that the project costs are not highly defined at this stage, a lower score of 3 points were given through this criteria, 3 points were given to projects considered as low cost, 2 points were given for medium cost projects, and 1 point was given to high cost projects.
- **Project maturity** – Finally, the project maturity was also considered, to make sure that projects that are already under consideration get a higher priority over projects that are still in concept design stage. If a project was found in the State or NOACA’s TIP, it was given 1 point, projects not being considered were not awarded points in this criteria.

Through this prioritization strategy, it was possible to score the projects and order them in order of relevance and importance to develop the implementation strategy. For this purpose all the scores were added for each project, and normalized by the total of all scores (16 points). The end result is a metric that can be used to compare and evaluate the projects for the development of the implementation strategy.

## 8.1 State Projects Implementation Strategy

Table 8.1 shows the total number of ITS projects considered in the ITS Strategic Plan at the State level. The projects are ordered according to the prioritization score, and bundled according to their expected time frame for implementation.

**Table 8.1 State ITS Project Prioritization**

| Time Frame  | Project ID | Project Name   | Score |
|-------------|------------|--|-------|
| Short term  | 2          | ODOT Advanced Traffic Management System (ATMS)               | 0.58  |
|             | 10         | Expand Traveler Information Delivery Methods                 | 0.52  |
|             | 1          | Freeway Management System (FMS) Expansion                    | 0.42  |
|             | 22         | I-90 Lake Effect Corridor                                    | 0.41  |
|             | 11         | Maintenance Vehicle Upgrade                                  | 0.36  |
|             | 3          | Traffic Monitoring Management System Enhancements            | 0.35  |
|             | 12         | Expand Road Weather Information System (RWIS)                | 0.35  |
|             | 24         | ODOT Traffic Monitoring Permanent Count Program              | 0.25  |
|             | 21         | DriveOhio City Use Cases                                     | 0.19  |
|             | 25         | Creation of a GIS Data Centralization Center                 | 0.16  |
| Medium term | 4          | Transportation Systems Management and Operations (TSMO)      | 0.43  |
|             | 9          | Fiber Optic Connectivity                                     | 0.30  |
|             | 8          | Dynamic Message Signs  | 0.27  |
|             | 14         | Work Zone Reservation and Traveler Information System        | 0.22  |
|             | 15         | Work Zone Safety Improvements                                | 0.22  |
|             | 20         | Ohio Turnpike ACV Testing                                    | 0.19  |
|             | 16         | Highway-Rail Intersection Advanced Safety Systems            | 0.19  |
|             | 13         | Winter Maintenance   | 0.19  |
| Long term   | 19         | Deploy a Truck Parking Information Management System (TPIMS) | 0.24  |
|             | 5          | Freeway Managed Lanes  | 0.23  |
|             | 7          | Freeway Speed Harmonization                                  | 0.23  |
|             | 6          | Freeway Ramp Metering  | 0.21  |
|             | 17         | Intersection Collision Warning Systems                       | 0.19  |
|             | 18         | Speed Radar-activated Chevrons                               | 0.19  |
|             | 23         | Increase Electric Vehicle Infrastructure                     | 0.14  |

Source: AECOM, Cambridge Systematics, Inc., NOACA.

## 8.2 Regional Projects Implementation Strategy

Table 8.2 shows the total number of ITS projects considered in the ITS Strategic Plan at the Regional level. The projects are ordered according to the prioritization score, and bundled according to their expected time frame for implementation.

**Table 8.2 Regional ITS Projects Prioritization**

| Time Frame  | Project ID | Project Name   | Score |
|-------------|------------|--|-------|
| Short term  | 28         | Regional Alternate Routes Planning                         | 0.53  |
|             | 31         | County Transit ITS Updates                                 | 0.33  |
|             | 29         | GCRTA CAD/AVL  | 0.31  |
|             | 30         | Laketran CAD/AVL   | 0.25  |
|             | 32         | GCRTA / Laketran Transit Vehicle WiFi                      | 0.25  |
|             | 33         | Enhance and expand GCRTA and Laketran Paratransit services | 0.16  |
| Medium term | 26         | Regional Traffic Management Center (TMC)                   | 0.72  |
|             | 27         | Regional Traveler Information System (TIS)                 | 0.52  |
|             | 35         | GCRTA Kiosks at Transfer Points                            | 0.25  |
|             | 34         | Transit Signal Priority                                    | 0.14  |
| Long term   | 36         | Hyperloop Feasibility                                      | 0.25  |

Source: AECOM, Cambridge Systematics, Inc., NOACA.

### 8.3 Local Projects Implementation Strategy

Table 8.3 shows the total number of ITS projects considered in the ITS Strategic Plan at the Local level. The projects are ordered according to the prioritization score, and bundled according to their expected time frame for implementation.

**Table 8.3 Local ITS Projects Prioritization**

| Time Frame  | Project ID | Project Name  | Table Header |
|-------------|------------|---|--------------|
| Short term  | 37         | Signal Timing Optimization Program  | 0.45         |
|             | 53         | Cuyahoga County Evacuation Plan Updates   | 0.44         |
|             | 38         | Automated Traffic Signal Performance Measures (ATSPMs)  | 0.42         |
|             | 40         | Upgrade Traffic Signals in East Cleveland   | 0.33         |
|             | 41         | Upgrade traffic signals along US-20 and US-322  | 0.33         |
|             | 42         | Rocky River Signals   | 0.33         |
|             | 43         | Strongsville Signals  | 0.33         |
|             | 44         | Lorain Traffic Signals  | 0.33         |
|             | 45         | Mayfield Heights Signals  | 0.33         |
|             | 46         | Beachwood Signals   | 0.33         |
|             | 47         | Cleveland Heights Signals   | 0.33         |
|             | 48         | Painesville Signals   | 0.33         |
|             | 49         | University Heights  | 0.33         |
|             | 50         | City of Cleveland Special Event Traffic Planning  | 0.27         |
|             | 39         | Municipal Signal Preemption   | 0.19         |
| Medium term | 54         | Municipal Computer Aided Dispatch to Emergency Vehicle  | 0.17         |
|             | 55         | City of Cleveland / Cuyahoga County Port Security Camera Installation including Vehicle Tracking System (VTS) | 0.16         |
|             | 51         | Cuyahoga County Port Authority Automated Parking Facilities   | 0.11         |
|             | 52         | City of Cleveland Automated Parking Facilities  | 0.09         |

Source: AECOM, Cambridge Systematics, Inc., NOACA.