Mapping of Ten Smart Travel Systems to Vision

Northern Virginia District (NOVA)
Smart Travel Program

Virginia Department of Transportation

December 1999

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PREFACE

Virginia Department of Transportation (VDOT) Northern Virginia District's (NOVA's) Smart Travel Program can be described as ten inter-related systems that work together. Like pieces in a puzzle, the ten systems are related and form the complete picture of Smart Travel in NOVA. The ten NOVA Smart Travel Systems are as follows:

- Planning and Policy
- Surface Street Management
- Freeway Management
- Incident Management
- Multi-modal Support
- Customer service
- Communications
- Traveler Information
- Asset Management
- Payment System

Additionally, there are spot safety improvement projects that are independent of any of these ten systems. Such projects operate autonomously to resolve localized operational issues.

This document shows the mapping of projects that fall under the ten systems. Each of the projects, recommended or existing/planned is mapped to functions, objectives, goals and vision statement. Existing/planned projects are shown in gray and recommended (short and long-term) projects are shown in white.

System 1 - Mapping of the Planning and Policy System

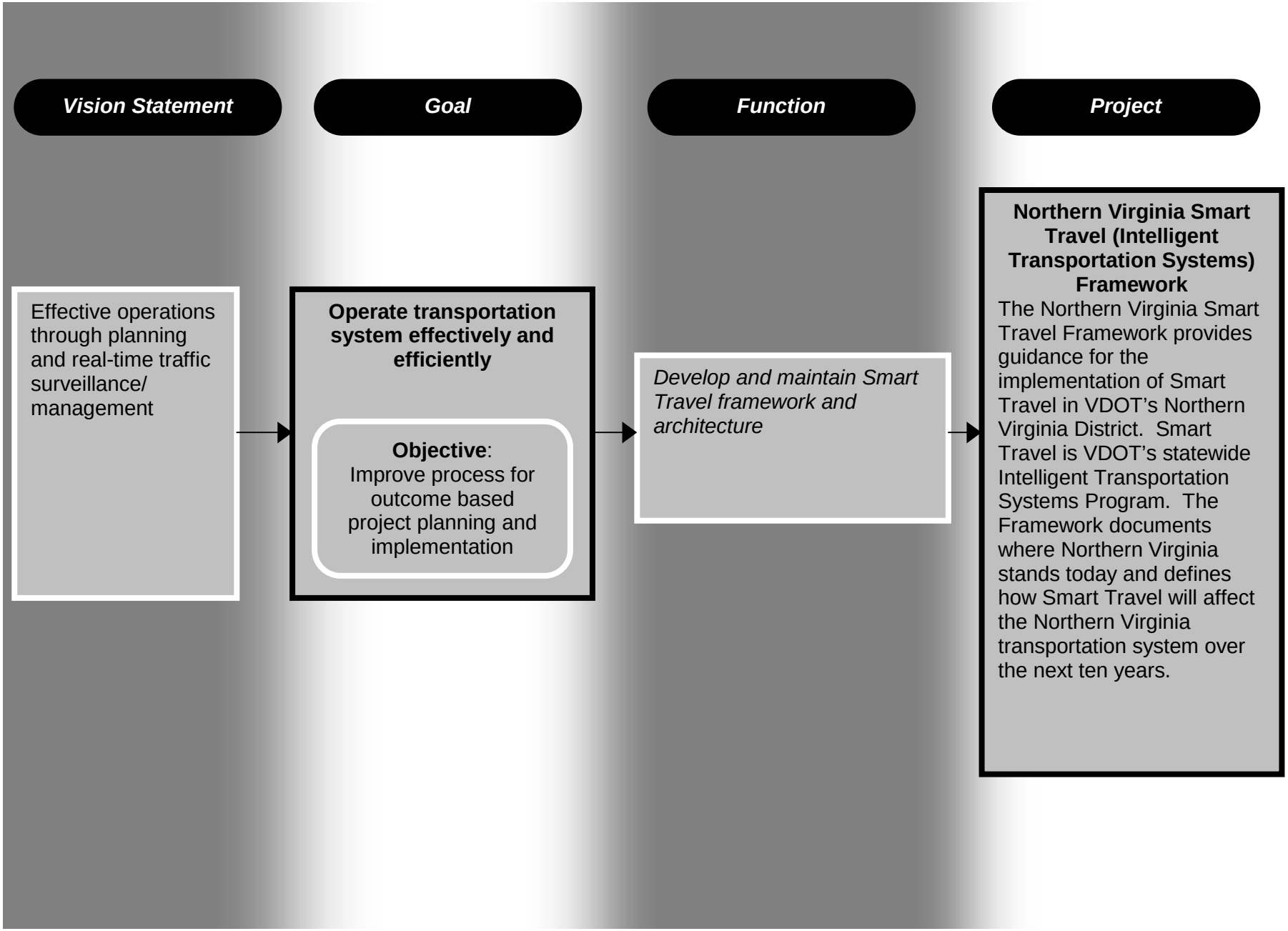
The Planning and Policy System is largely made up of internal policy and planning processes to ensure the consideration of all ITS alternatives, and that proposed systems are consistent with the overall local, regional and statewide transportation framework. Smart Travel planning and policy projects are continuous activities that respond to changes in technology, strategic priorities, or business practices. Further, the planning and policy system evaluates deployments to determine their effectiveness and contribution to the strategic planning initiatives.

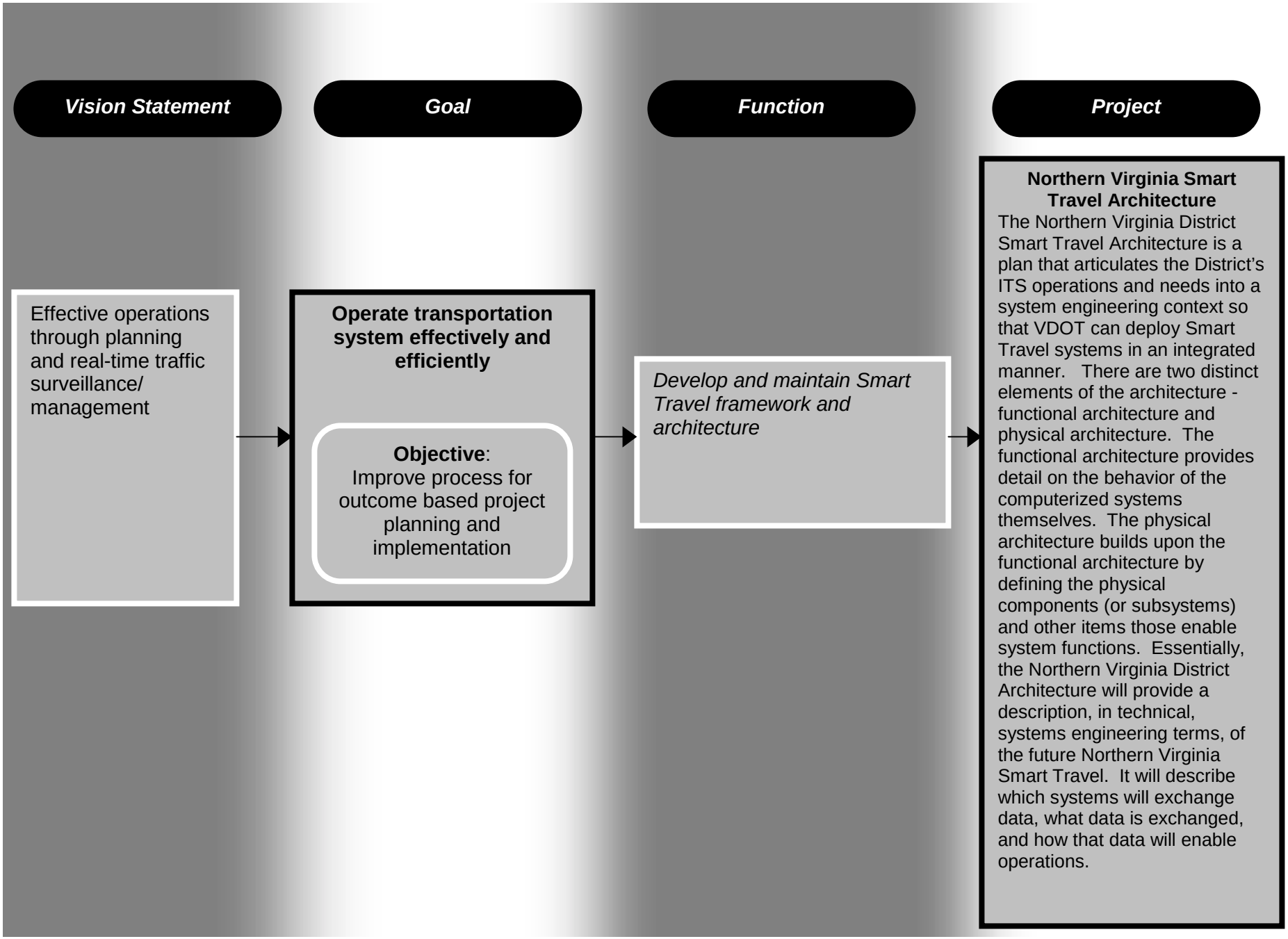
The following projects are included under the Planning and Policy System:

- *NOVA Smart Travel Framework*
- *NOVA Smart Travel Architecture*
- **Smart Travel Integration and Standards Guidelines**
- **Congestion Mapping System**
- **Operations and Management Planning**
- **Decision Support System for Resource Sharing Initiatives**
- **Smart Travel (GIS) Inventory System**
- **Professional Capacity Building**
- **Traffic Data Archiving System**
- **Smart Travel Program Outreach**
- **Decision Support for Smart Travel Implementations**
- **Smart Travel Strategic Planning**
- **Coordination with Six-Year Improvement Plan**
- **Deployment Tracking**
- **Smart Travel Spot Safety Project Ranking Criteria**
- **Technical Support to Dulles Toll Road Technology Task Group**

Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement. As the *Smart Travel Spot Safety Project Ranking Criteria is a* spot safety project in nature, the mapping of this project is not shown.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Develop and maintain Smart Travel framework and architecture
Northern Virginia Smart Travel (Intelligent Transportation Systems) Framework
The Northern Virginia Smart Travel Framework provides guidance for the implementation of Smart Travel in VDOT's Northern Virginia District. Smart Travel is VDOT's statewide Intelligent Transportation Systems Program. The Framework documents where Northern Virginia stands today and defines how Smart Travel will affect the Northern Virginia transportation system over the next ten years.


Vision Statement
Goal
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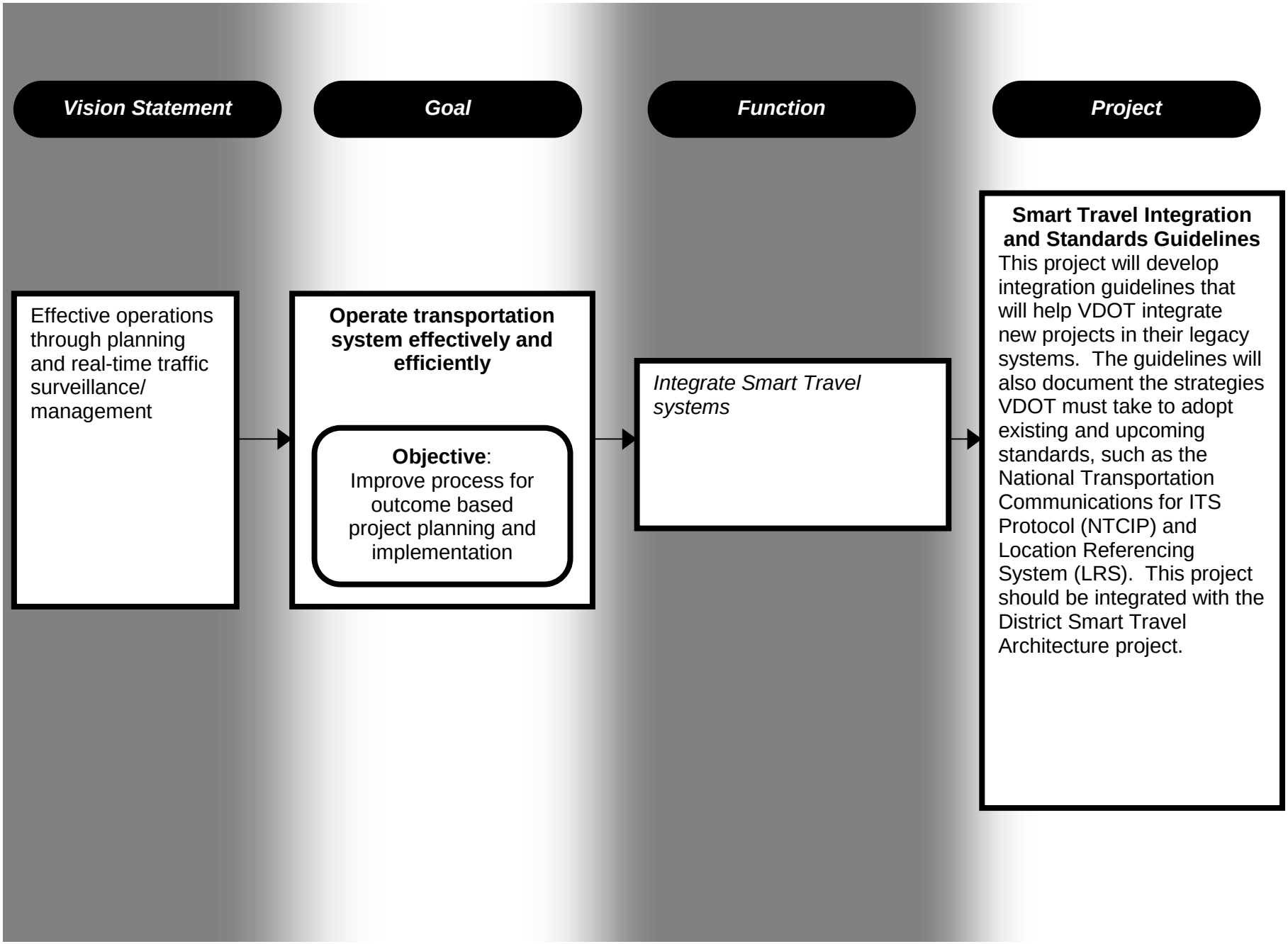
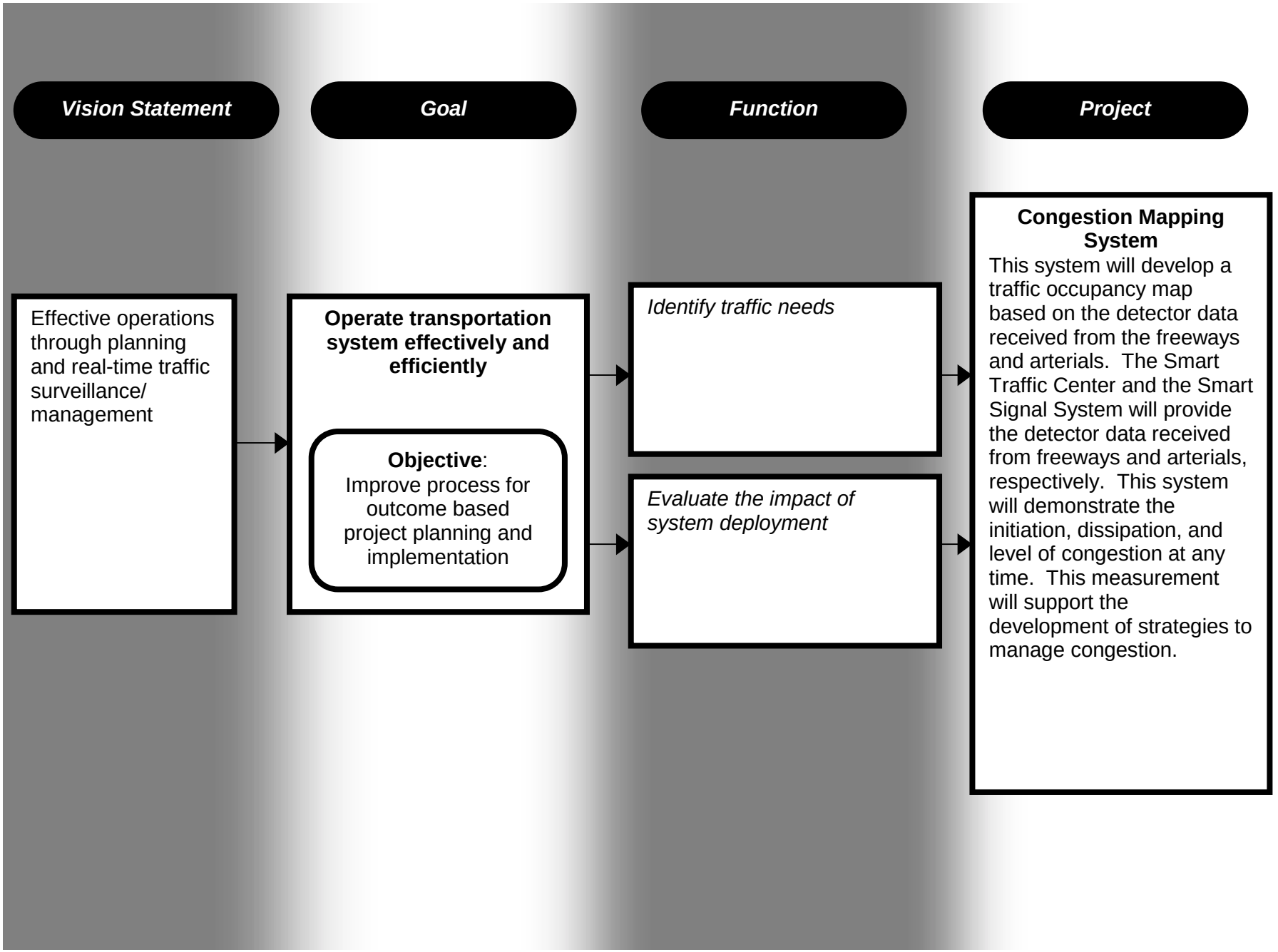
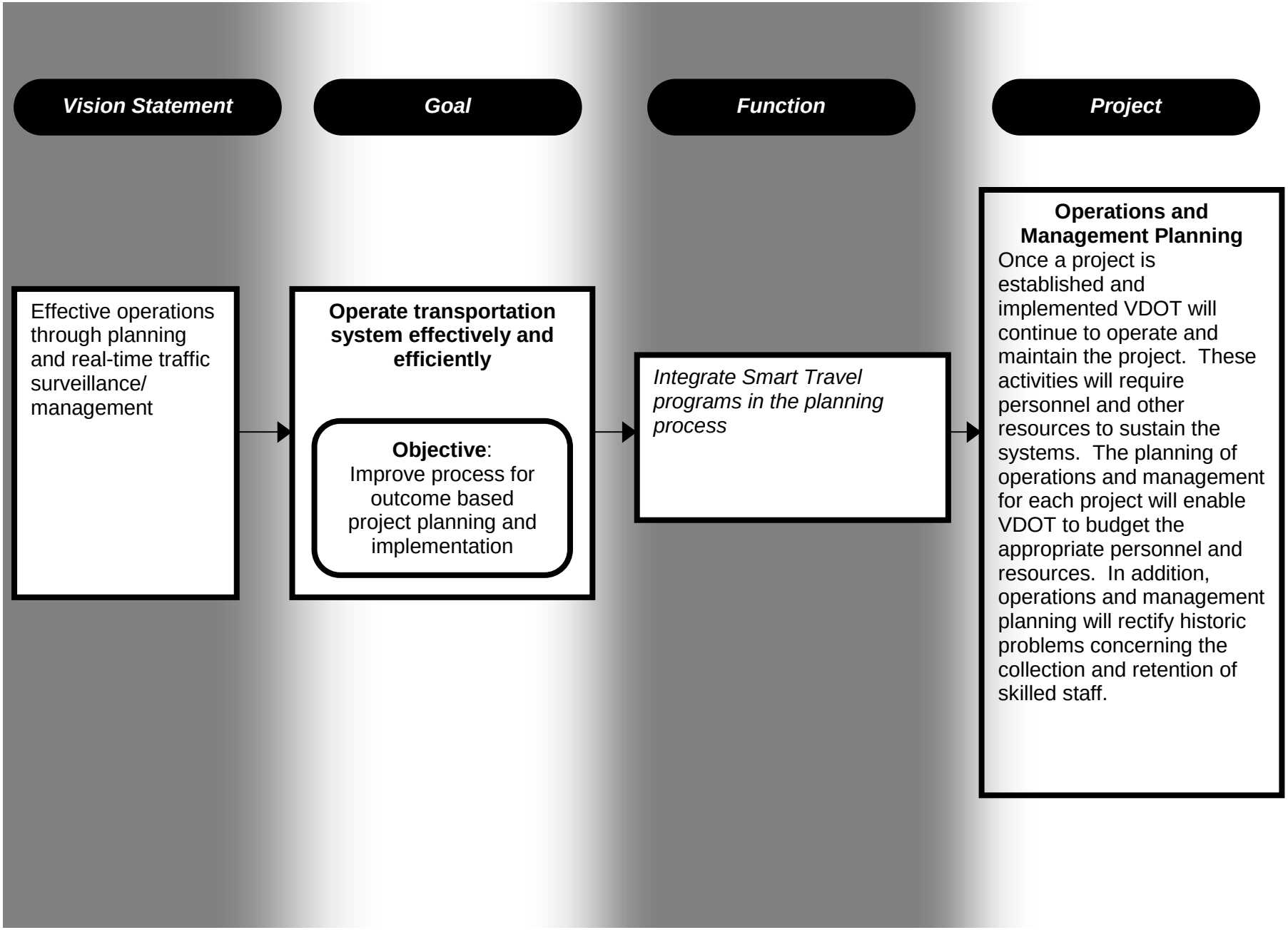
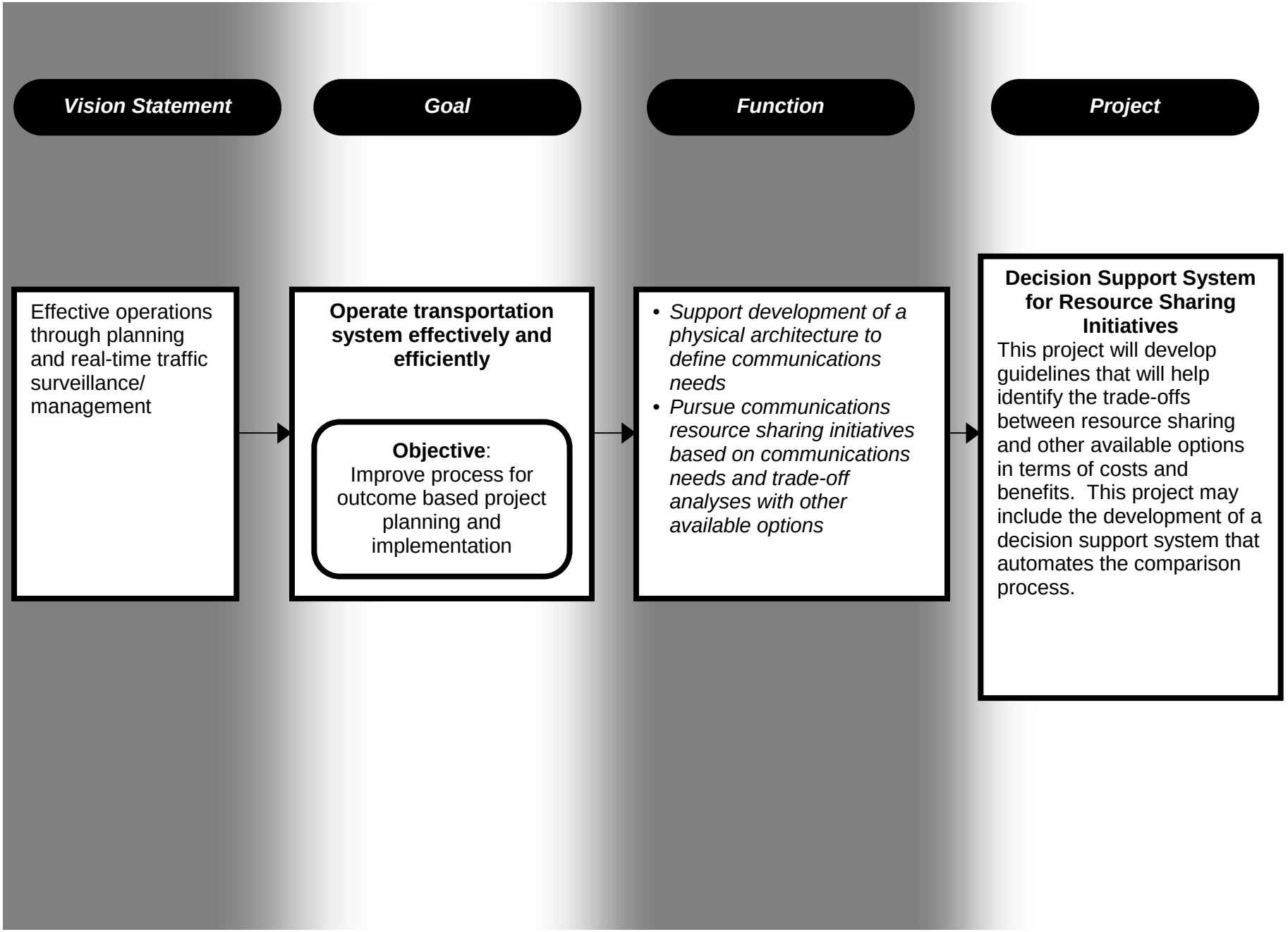
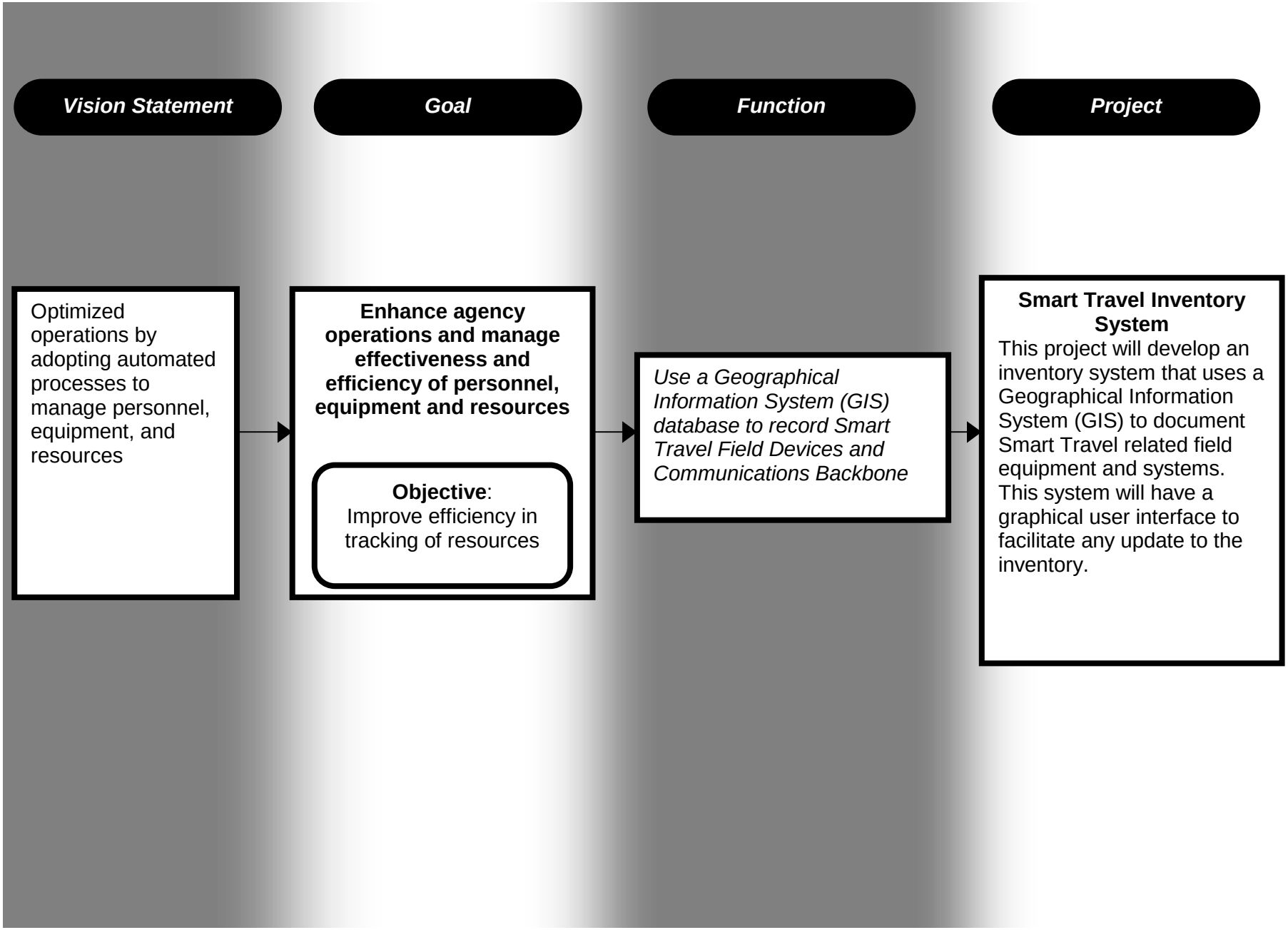
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Develop and maintain Smart Travel framework and architecture
Northern Virginia Smart Travel Architecture
The Northern Virginia District Smart Travel Architecture is a plan that articulates the District's ITS operations and needs into a system engineering context so that VDOT can deploy Smart Travel systems in an integrated manner. There are two distinct elements of the architecture - functional architecture and physical architecture. The functional architecture provides detail on the behavior of the computerized systems themselves. The physical architecture builds upon the functional architecture by defining the physical components (or subsystems) and other items those enable system functions. Essentially, the Northern Virginia District Architecture will provide a description, in technical, systems engineering terms, of the future Northern Virginia Smart Travel. It will describe which systems will exchange data, what data is exchanged, and how that data will enable operations.

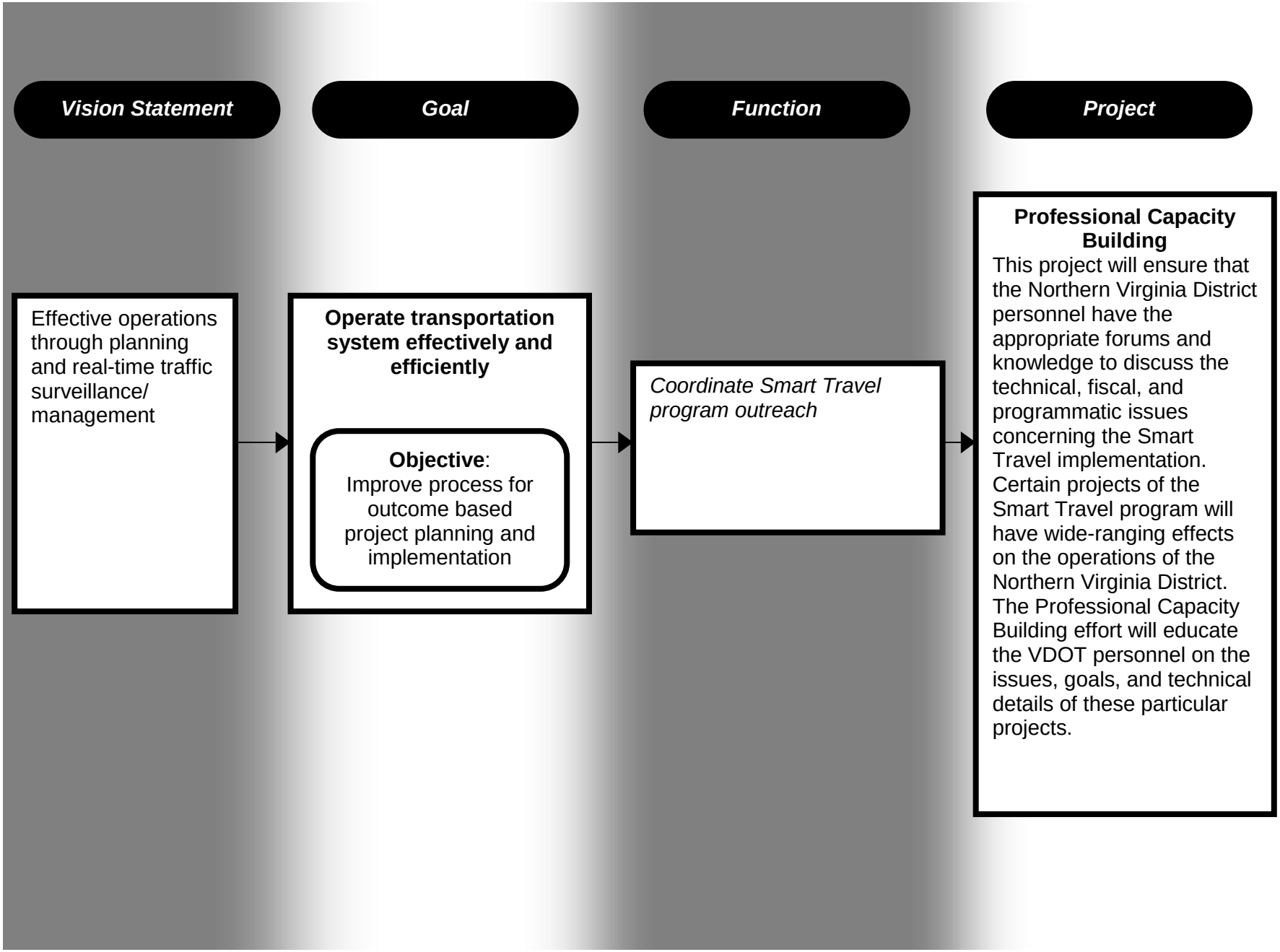

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Integrate Smart Travel systems
Smart Travel Integration and Standards Guidelines
This project will develop integration guidelines that will help VDOT integrate new projects in their legacy systems. The guidelines will also document the strategies VDOT must take to adopt existing and upcoming standards, such as the National Transportation Communications for ITS Protocol (NTCIP) and Location Referencing System (LRS). This project should be integrated with the District Smart Travel Architecture project.

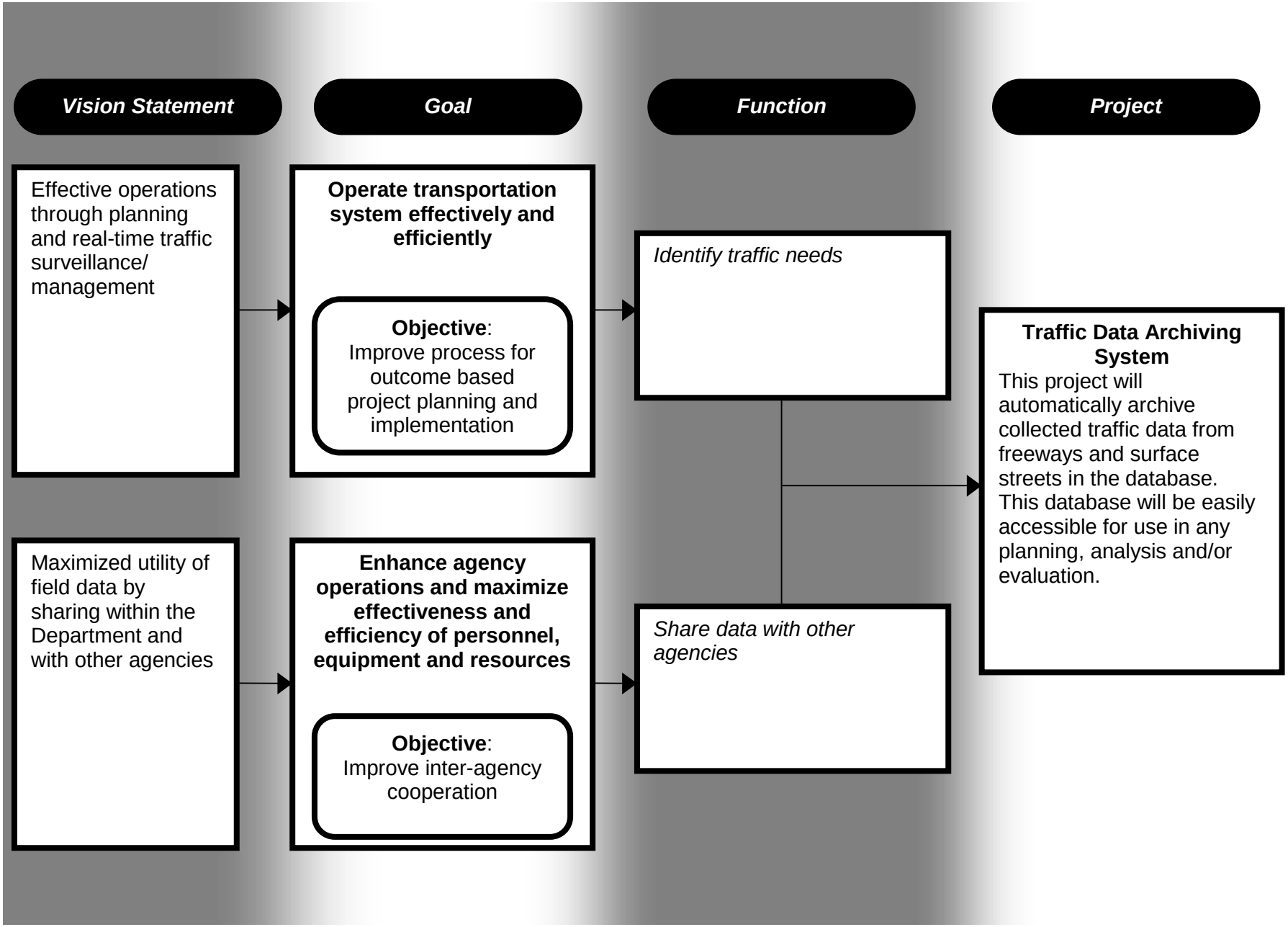

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Identify traffic needs
Evaluate the impact of system deployment
Congestion Mapping System
This system will develop a traffic occupancy map based on the detector data received from the freeways and arterials. The Smart Traffic Center and the Smart Signal System will provide the detector data received from freeways and arterials, respectively. This system will demonstrate the initiation, dissipation, and level of congestion at any time. This measurement will support the development of strategies to manage congestion.

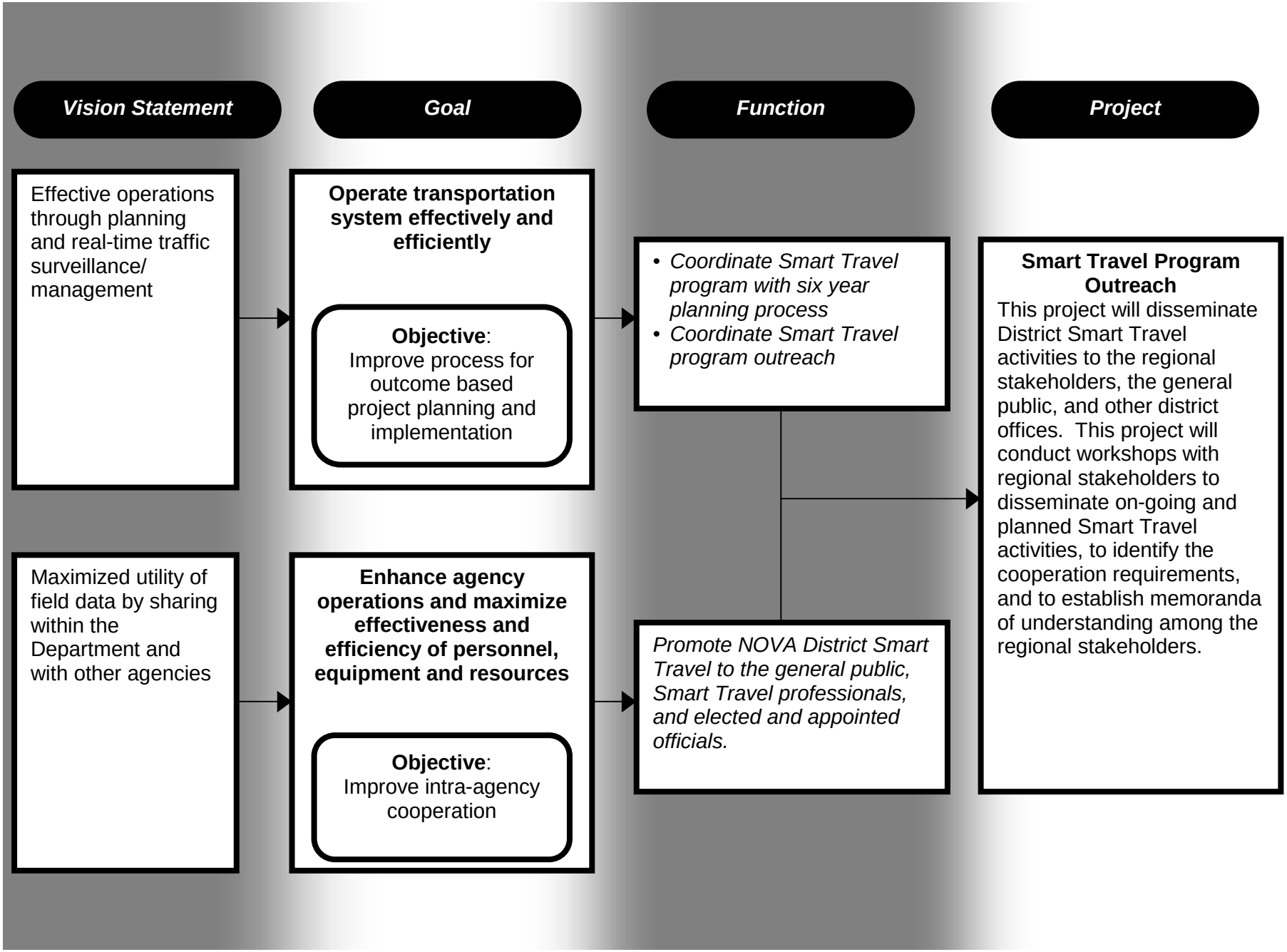

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Integrate Smart Travel programs in the planning process
Operations and Management Planning
Once a project is established and implemented VDOT will continue to operate and maintain the project. These activities will require personnel and other resources to sustain the systems. The planning of operations and management for each project will enable VDOT to budget the appropriate personnel and resources. In addition, operations and management planning will rectify historic problems concerning the collection and retention of skilled staff.

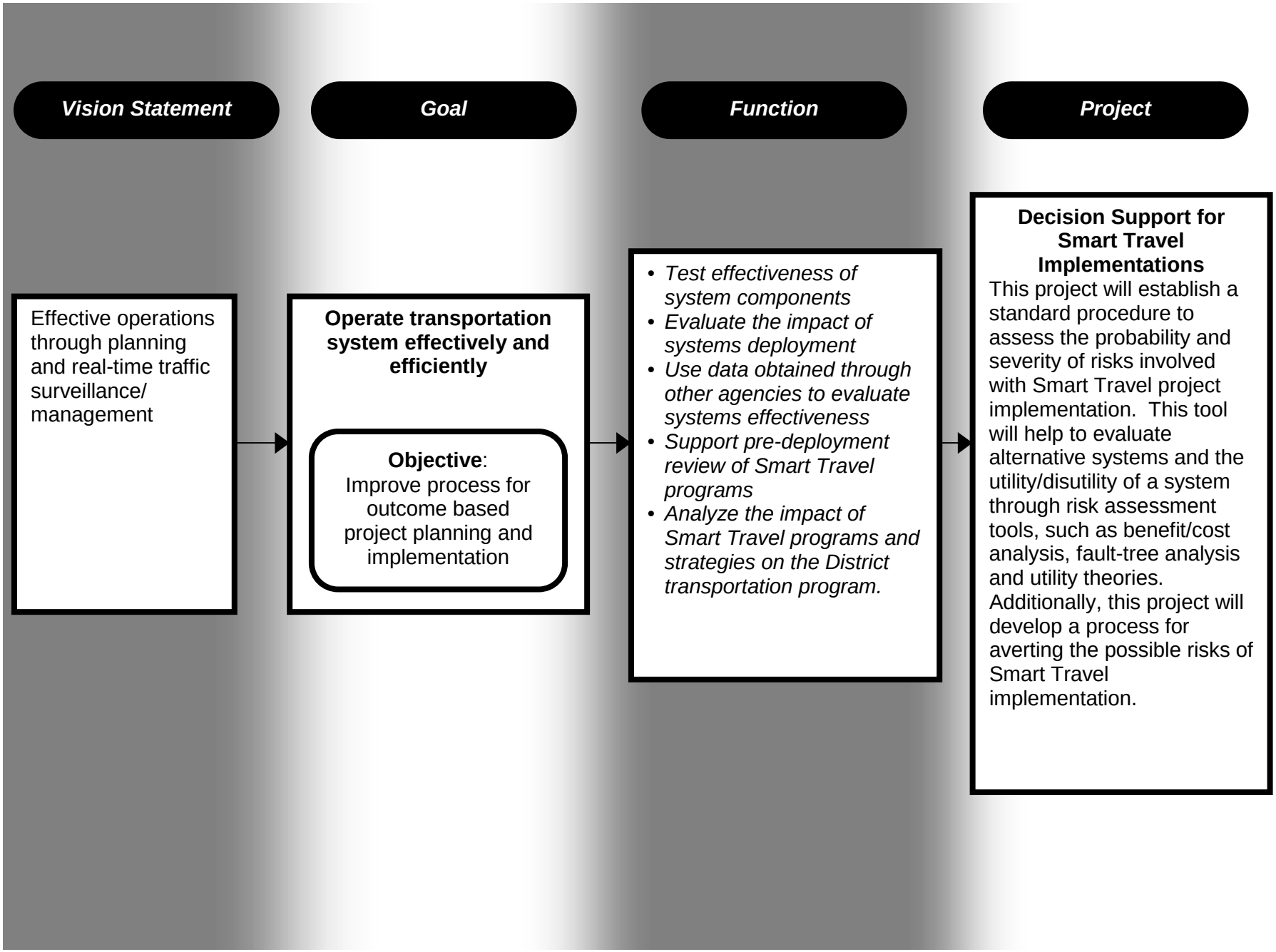

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
• Support development of a physical architecture to define communications needs
• Pursue communications resource sharing initiatives based on communications needs and trade-off analyses with other available options
Decision Support System for Resource Sharing Initiatives
This project will develop guidelines that will help identify the trade-offs between resource sharing and other available options in terms of costs and benefits. This project may include the development of a decision support system that automates the comparison process.

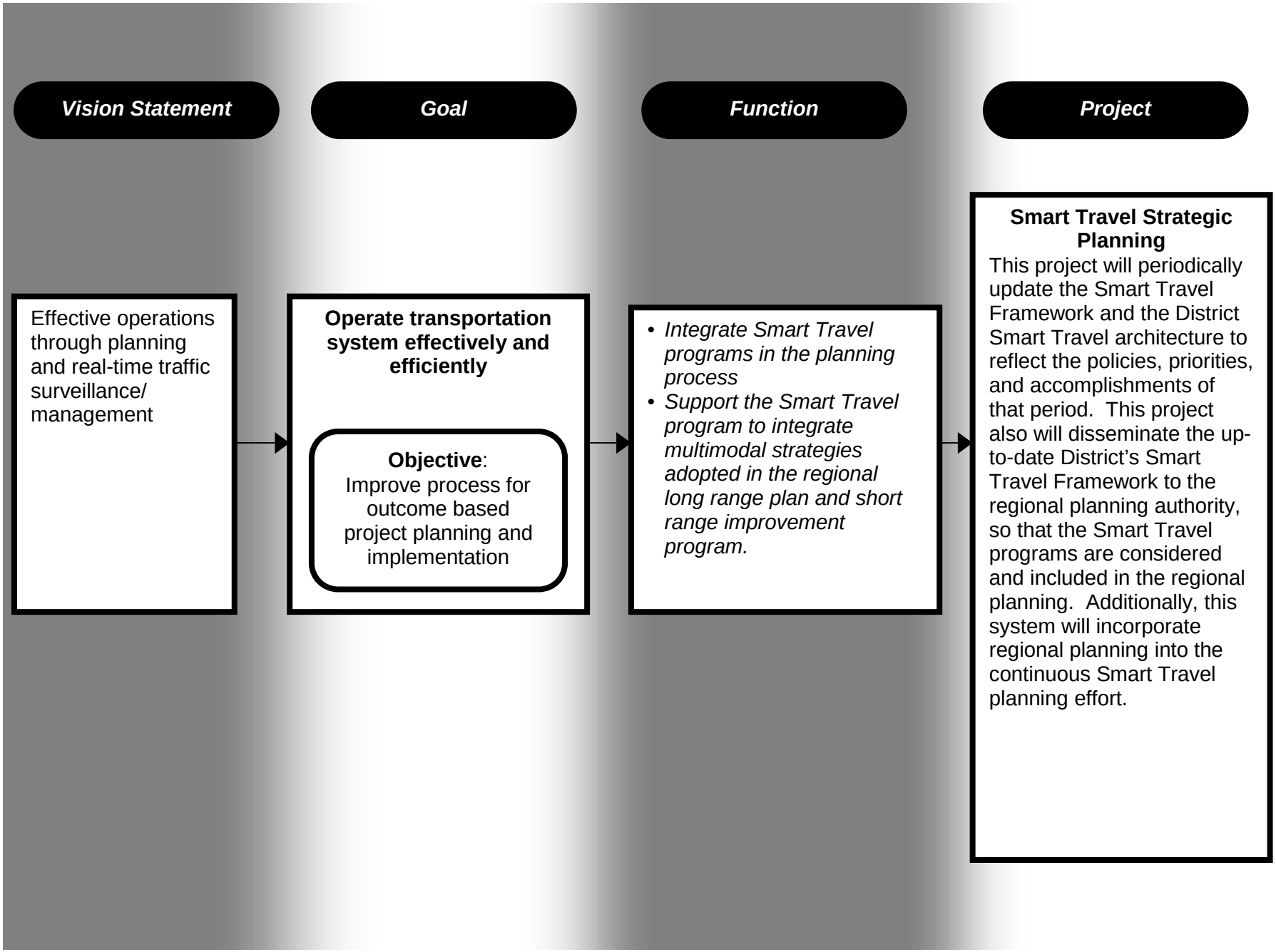

Vision Statement
Goal
Function
Project
Optimized operations by adopting automated processes to manage personnel, equipment, and resources
Enhance agency operations and manage effectiveness and efficiency of personnel, equipment and resources
Objective: Improve efficiency in tracking of resources
Use a Geographical Information System (GIS) database to record Smart Travel Field Devices and Communications Backbone
Smart Travel Inventory System
This project will develop an inventory system that uses a Geographical Information System (GIS) to document Smart Travel related field equipment and systems. This system will have a graphical user interface to facilitate any update to the inventory.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Coordinate Smart Travel program outreach
Professional Capacity Building
This project will ensure that the Northern Virginia District personnel have the appropriate forums and knowledge to discuss the technical, fiscal, and programmatic issues concerning the Smart Travel implementation. Certain projects of the Smart Travel program will have wide-ranging effects on the operations of the Northern Virginia District. The Professional Capacity Building effort will educate the VDOT personnel on the issues, goals, and technical details of these particular projects.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Identify traffic needs
Traffic Data Archiving System
This project will automatically archive collected traffic data from freeways and surface streets in the database. This database will be easily accessible for use in any planning, analysis and/or evaluation.
Maximized utility of field data by sharing within the Department and with other agencies
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment and resources
Objective: Improve inter-agency cooperation
Share data with other agencies


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
• Coordinate Smart Travel program with six year planning process
• Coordinate Smart Travel program outreach
Smart Travel Program Outreach
This project will disseminate District Smart Travel activities to the regional stakeholders, the general public, and other district offices. This project will conduct workshops with regional stakeholders to disseminate on-going and planned Smart Travel activities, to identify the cooperation requirements, and to establish memoranda of understanding among the regional stakeholders.
Maximized utility of field data by sharing within the Department and with other agencies
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment and resources
Objective: Improve intra-agency cooperation
Promote NOVA District Smart Travel to the general public, Smart Travel professionals, and elected and appointed officials.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
• Test effectiveness of system components
• Evaluate the impact of systems deployment
• Use data obtained through other agencies to evaluate systems effectiveness
• Support pre-deployment review of Smart Travel programs
• Analyze the impact of Smart Travel programs and strategies on the District transportation program.
Decision Support for Smart Travel Implementations
This project will establish a standard procedure to assess the probability and severity of risks involved with Smart Travel project implementation. This tool will help to evaluate alternative systems and the utility/disutility of a system through risk assessment tools, such as benefit/cost analysis, fault-tree analysis and utility theories. Additionally, this project will develop a process for averting the possible risks of Smart Travel implementation.


Vision Statement
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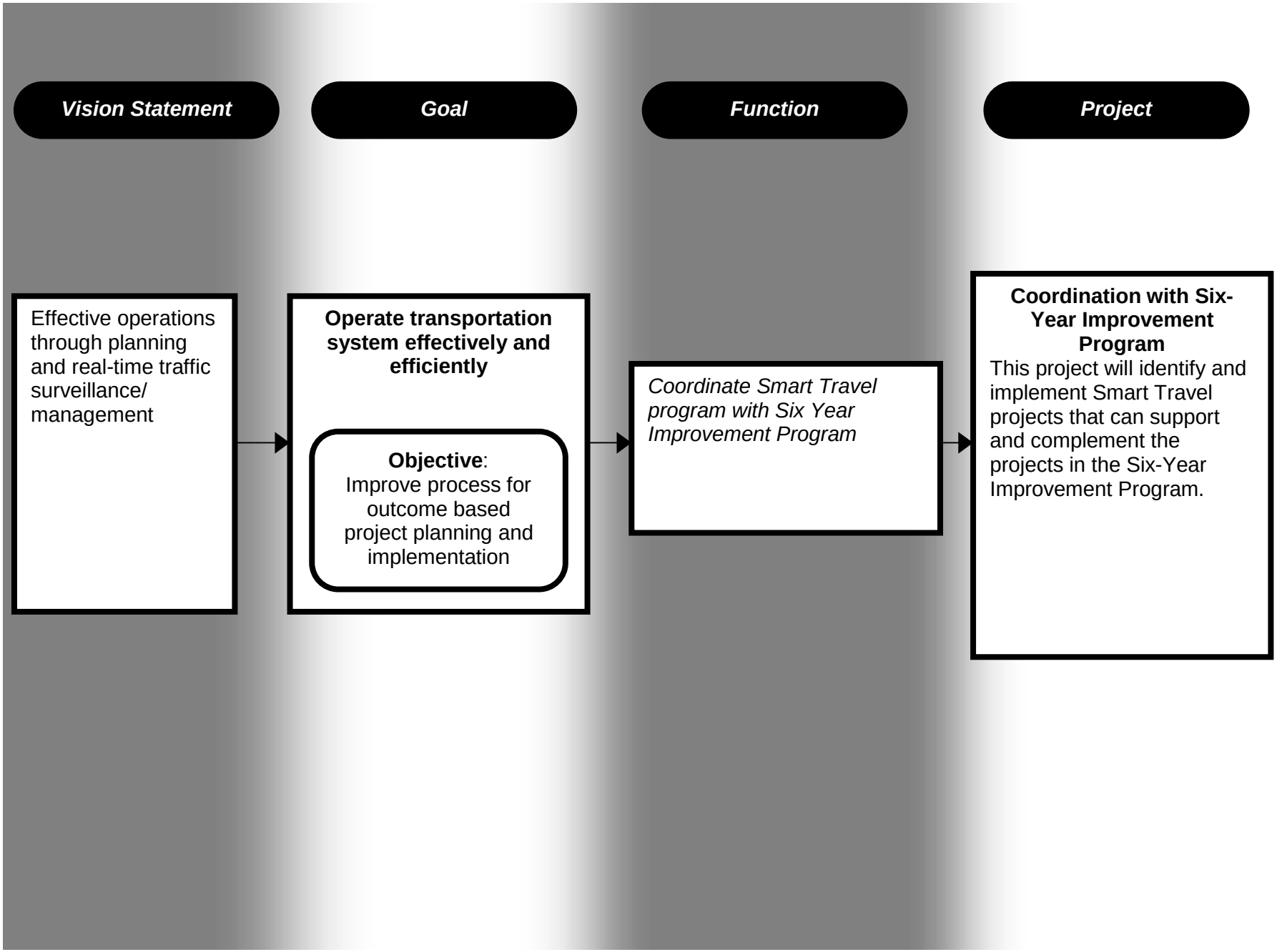
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
• Integrate Smart Travel programs in the planning process
• Support the Smart Travel program to integrate multimodal strategies adopted in the regional long range plan and short range improvement program.
Smart Travel Strategic Planning
This project will periodically update the Smart Travel Framework and the District Smart Travel architecture to reflect the policies, priorities, and accomplishments of that period. This project also will disseminate the up-to-date District's Smart Travel Framework to the regional planning authority, so that the Smart Travel programs are considered and included in the regional planning. Additionally, this system will incorporate regional planning into the continuous Smart Travel planning effort.


Vision Statement
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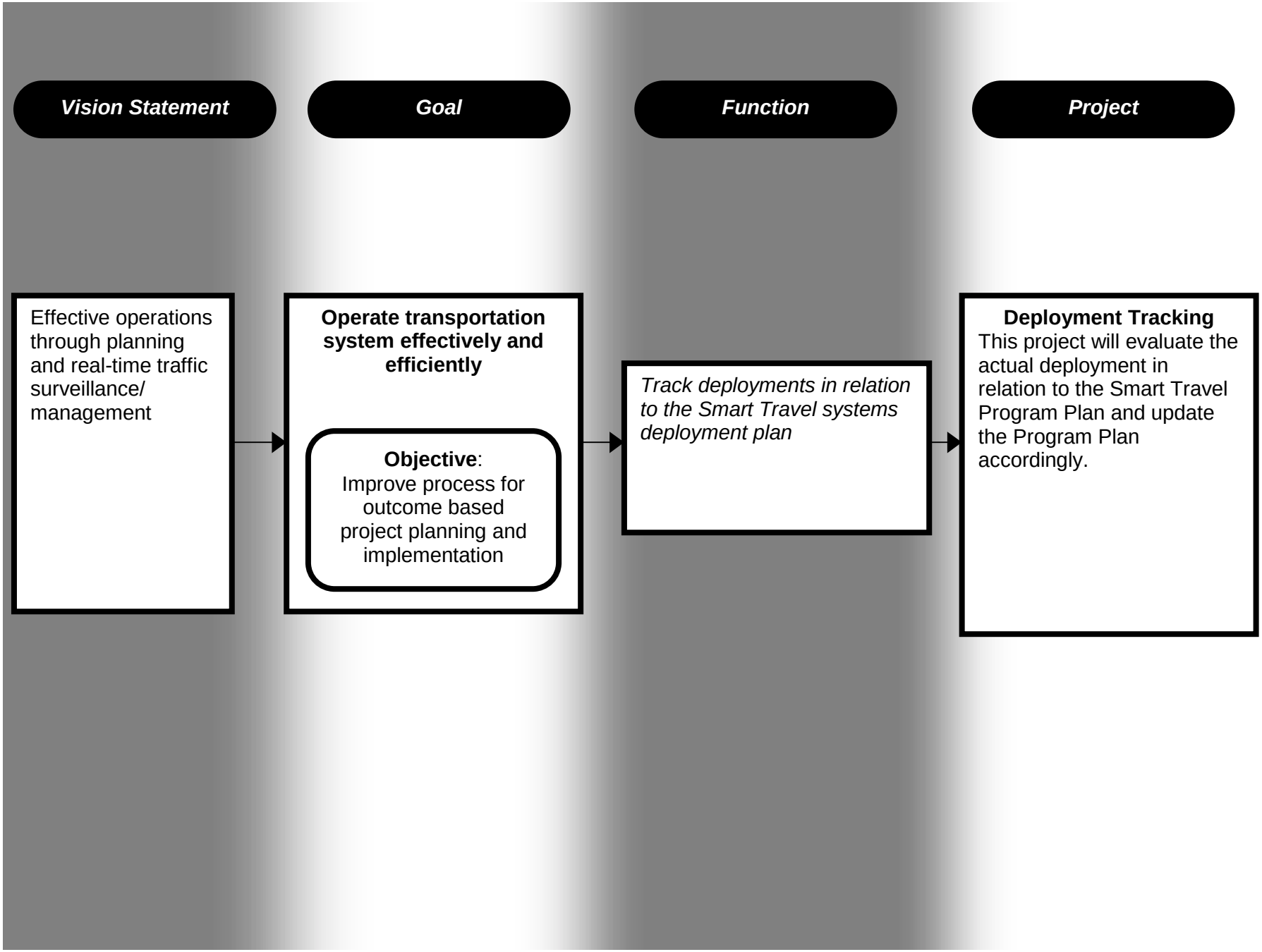
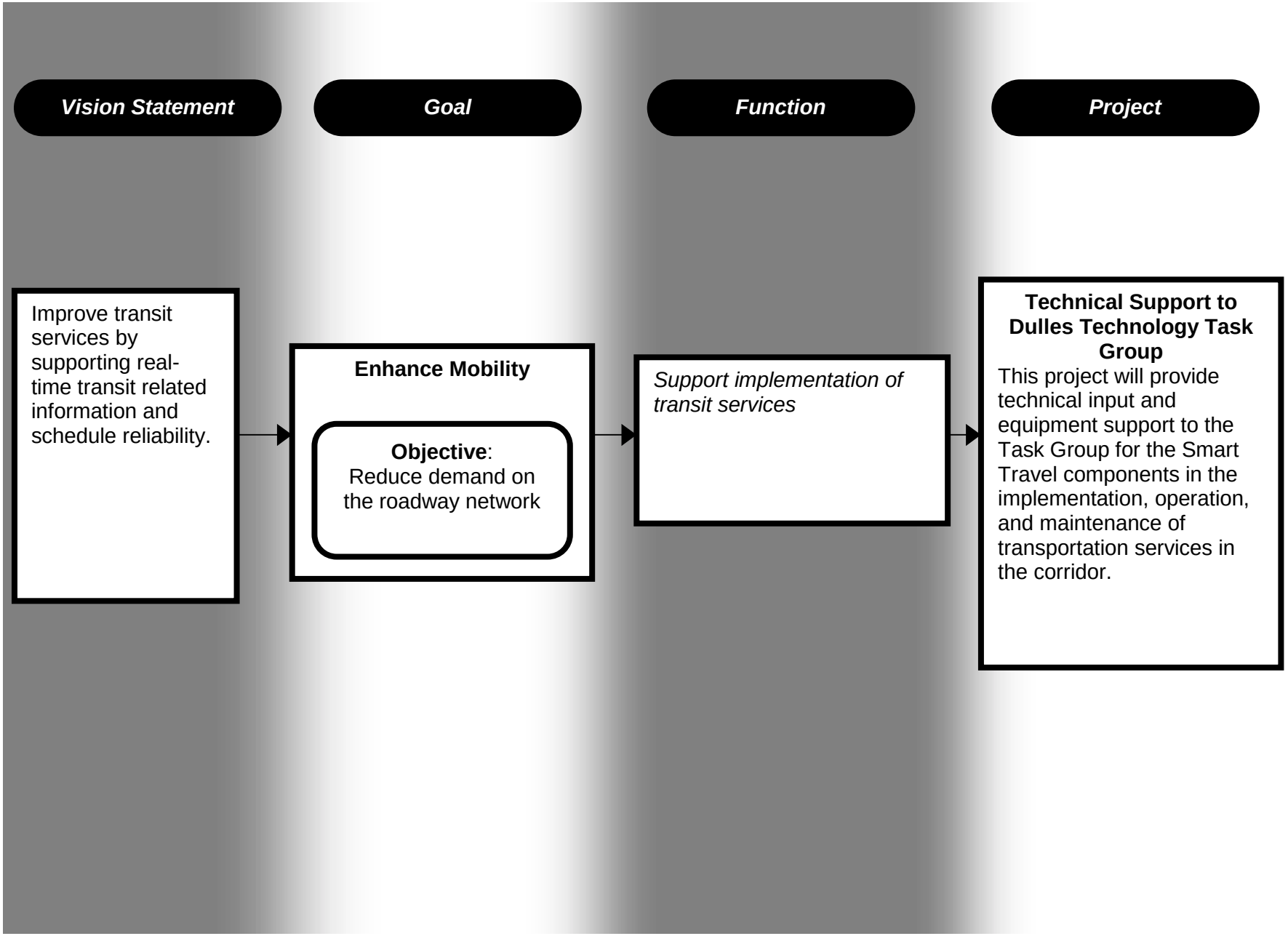
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Coordinate Smart Travel program with Six Year Improvement Program
Coordination with Six-Year Improvement Program
This project will identify and implement Smart Travel projects that can support and complement the projects in the Six-Year Improvement Program.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Track deployments in relation to the Smart Travel systems deployment plan
Deployment Tracking
This project will evaluate the actual deployment in relation to the Smart Travel Program Plan and update the Program Plan accordingly.


Vision Statement
Goal
Function
Project
Improve transit services by supporting real-time transit related information and schedule reliability.
Enhance Mobility
Objective: Reduce demand on the roadway network
Support implementation of transit services
Technical Support to Dulles Technology Task Group
This project will provide technical input and equipment support to the Task Group for the Smart Travel components in the implementation, operation, and maintenance of transportation services in the corridor.

System 2 – Surface Street Management System

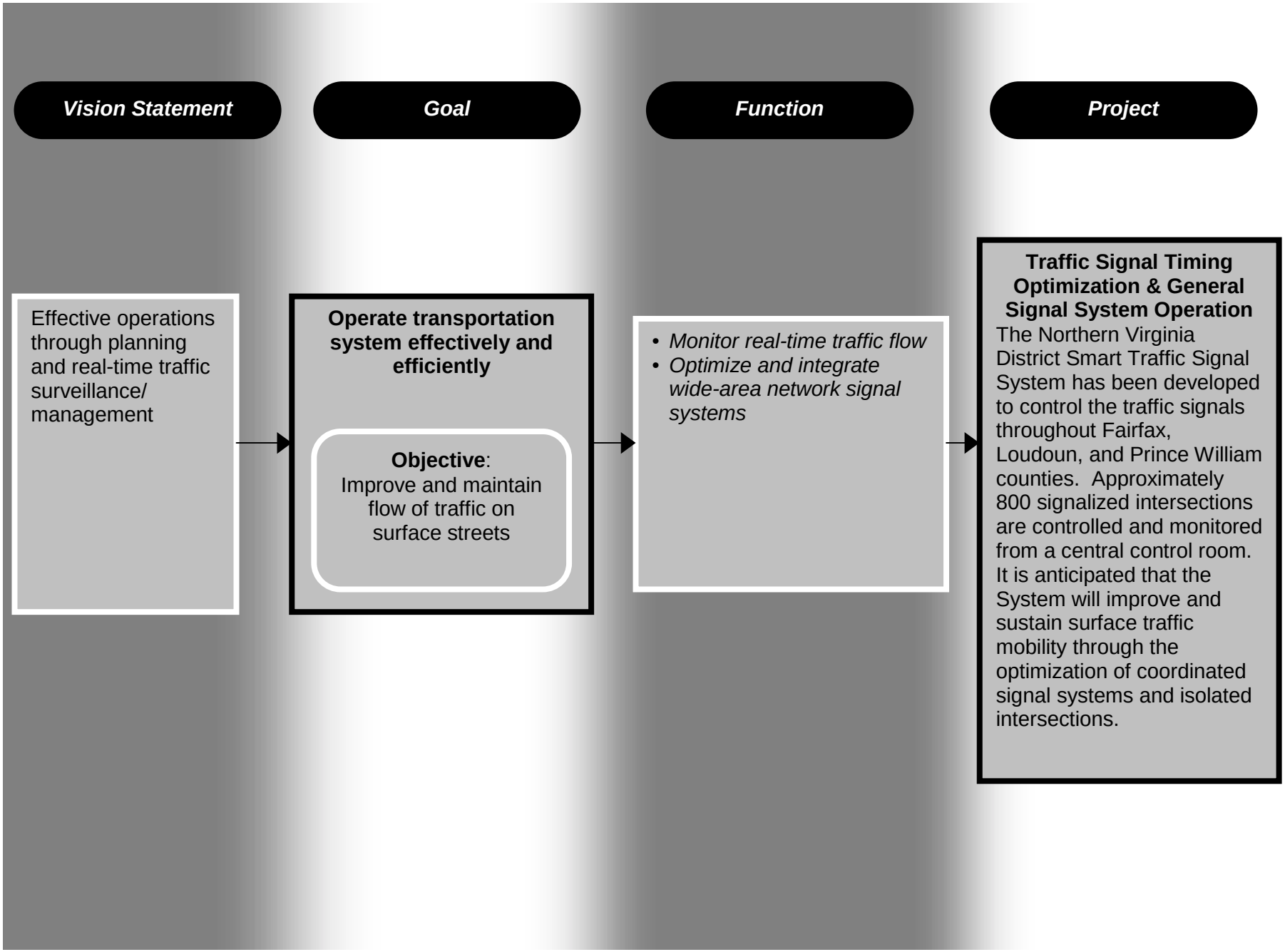
The surface street management system enables comprehensive management of critical arterial roads within NOVA. While NOVA maintains signals on the primary routes in the region, other jurisdictions operate and maintain some secondary roadways. Projects in this system ensure regional coordination to optimize traffic flow during peak periods, incidents, and special events.

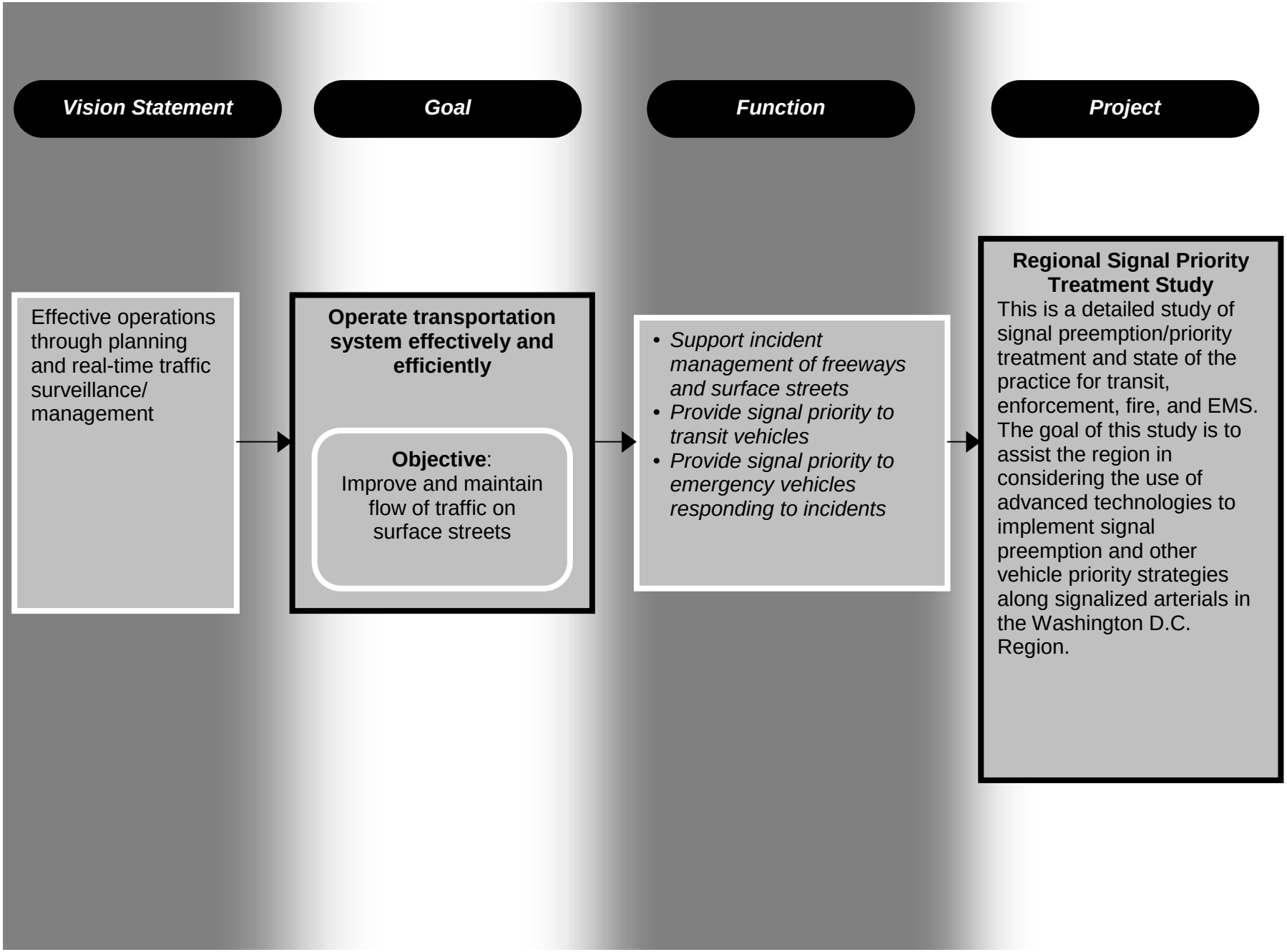
The following projects are included under the Surface Street Management System:

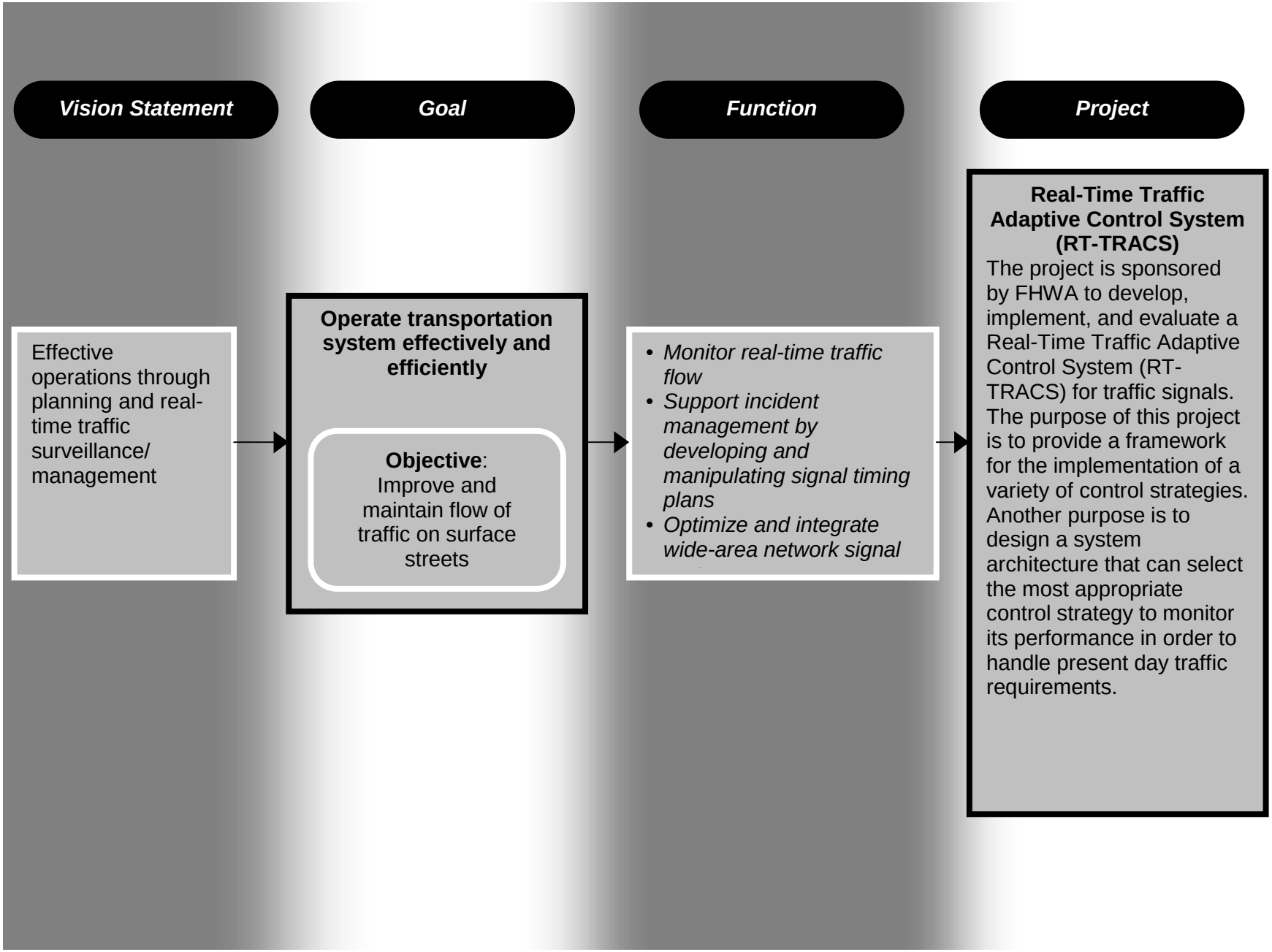
- *Traffic Signal Timing Optimization and General Signal System Operation*
- *Regional Signal Priority Treatment Study*
- *Real- Time Adaptive Control System*
- *Collision Countermeasures for Unsignalized Intersections*
- *Northern Virginia Smart Traffic Signal System*
- Regional Signal Coordination
- Signal Priority for Transit/Emergency Vehicles
- **Traffic Signal System Field Maintenance**
- **Traffic Control Software Maintenance**
- **Traffic Control Software/Hardware Upgrade**
- Real- Time Adaptive Control System (RT-TRACS) Implementation
- **Signal System Evaluation**
- Traffic Control Communication Study
- **Integration of Developer installed Signals with Smart Travel**
- **Red Light Running Cameras**
- **Head-on Traffic Warning System and Evaluation**
- De-icing System Evaluation
- Automated Pedestrian Safety System
- Bicyclist Safety Enhancement
- **Grade Crossing Safety Enhancement**
- **Spot Safety Project Placeholder**

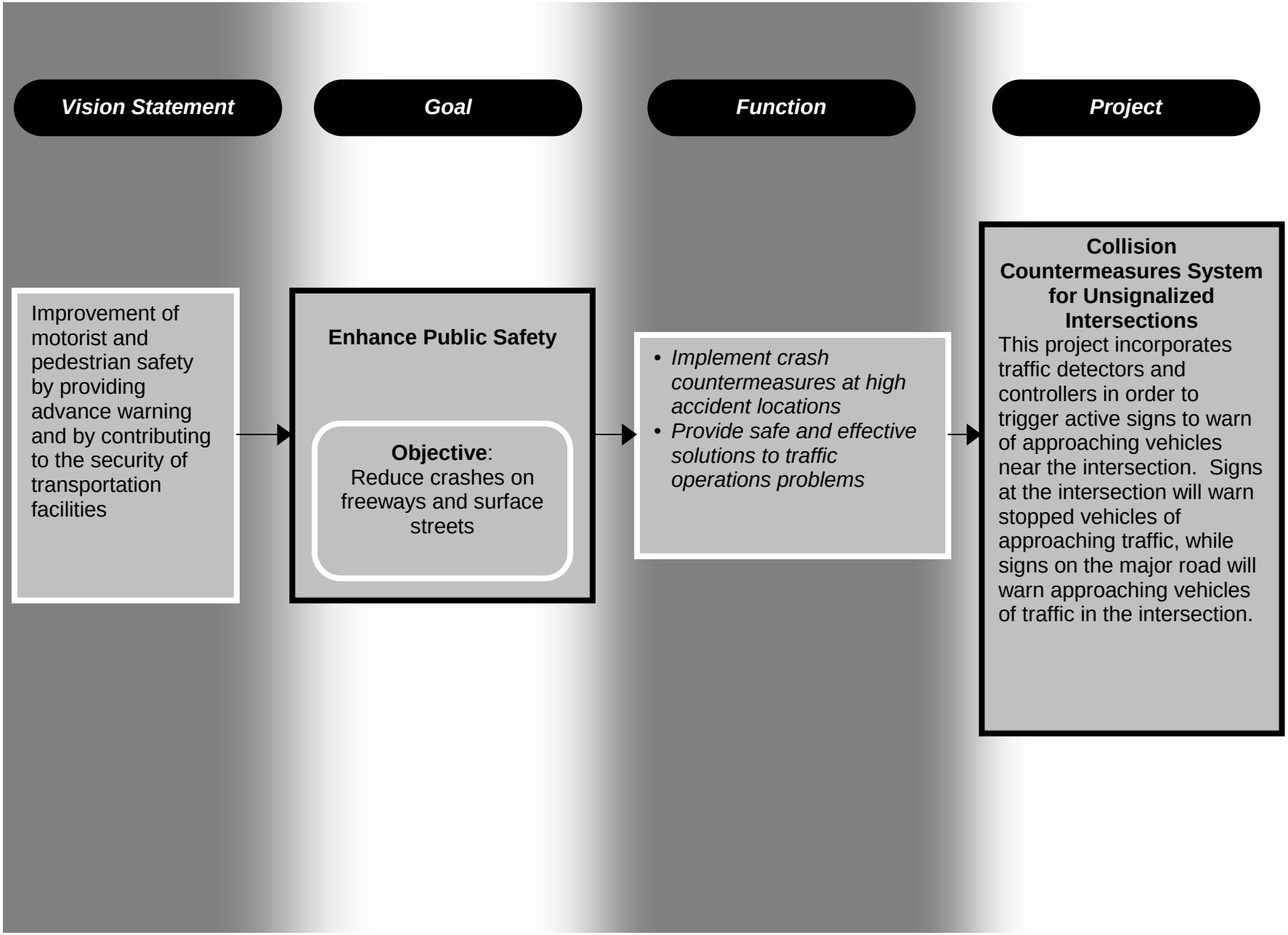
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

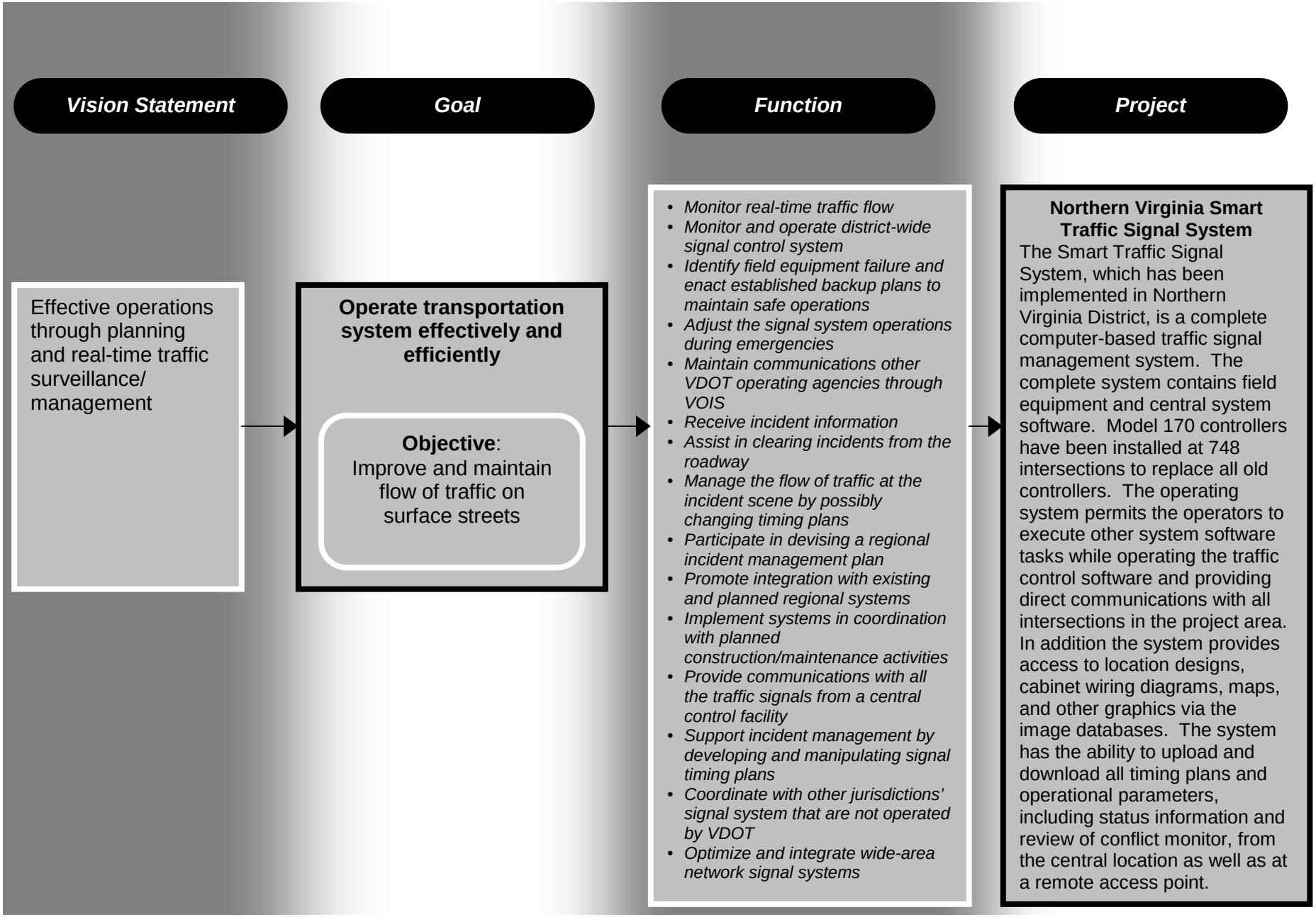
The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement. As the *Integration of Developer installed Signals with Smart Travel, Red Light Running Cameras, Head-on Traffic Warning System and Evaluation, De-icing System Evaluation, Automated Pedestrian Safety System, Bicyclist Safety Enhancement, Grade Crossing Safety Enhancement* and *Spot Safety Project Placeholder* are spot safety projects in nature, the mapping of these projects are not shown. Also, a mapping of the *Signal System Evaluation* is not included, as this project is an evaluation of the *Northern Virginia Smart Traffic Signal System* project.

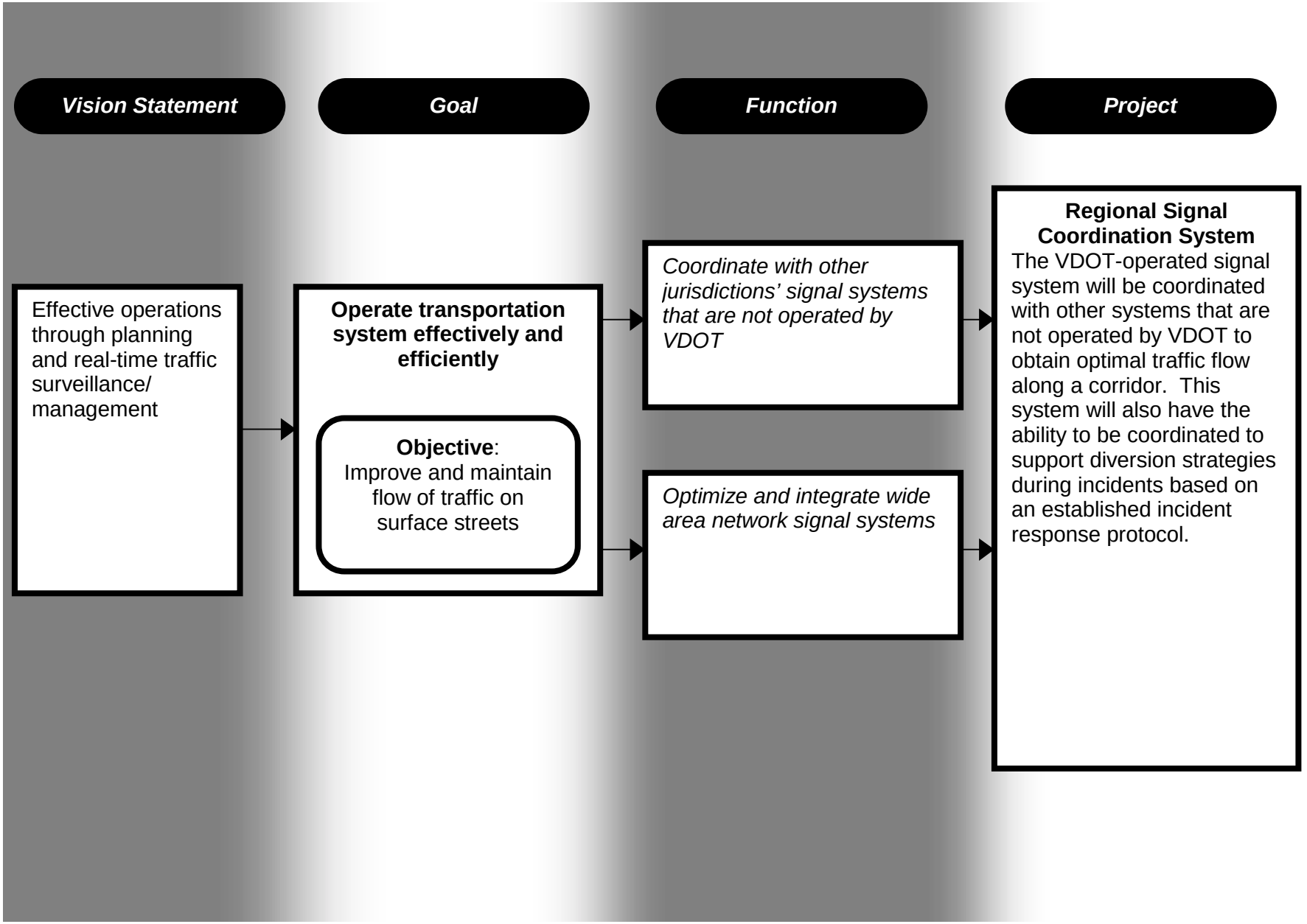

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
• Monitor real-time traffic flow
• Optimize and integrate wide-area network signal systems
Traffic Signal Timing Optimization & General Signal System Operation
The Northern Virginia District Smart Traffic Signal System has been developed to control the traffic signals throughout Fairfax, Loudoun, and Prince William counties. Approximately 800 signalized intersections are controlled and monitored from a central control room. It is anticipated that the System will improve and sustain surface traffic mobility through the optimization of coordinated signal systems and isolated intersections.

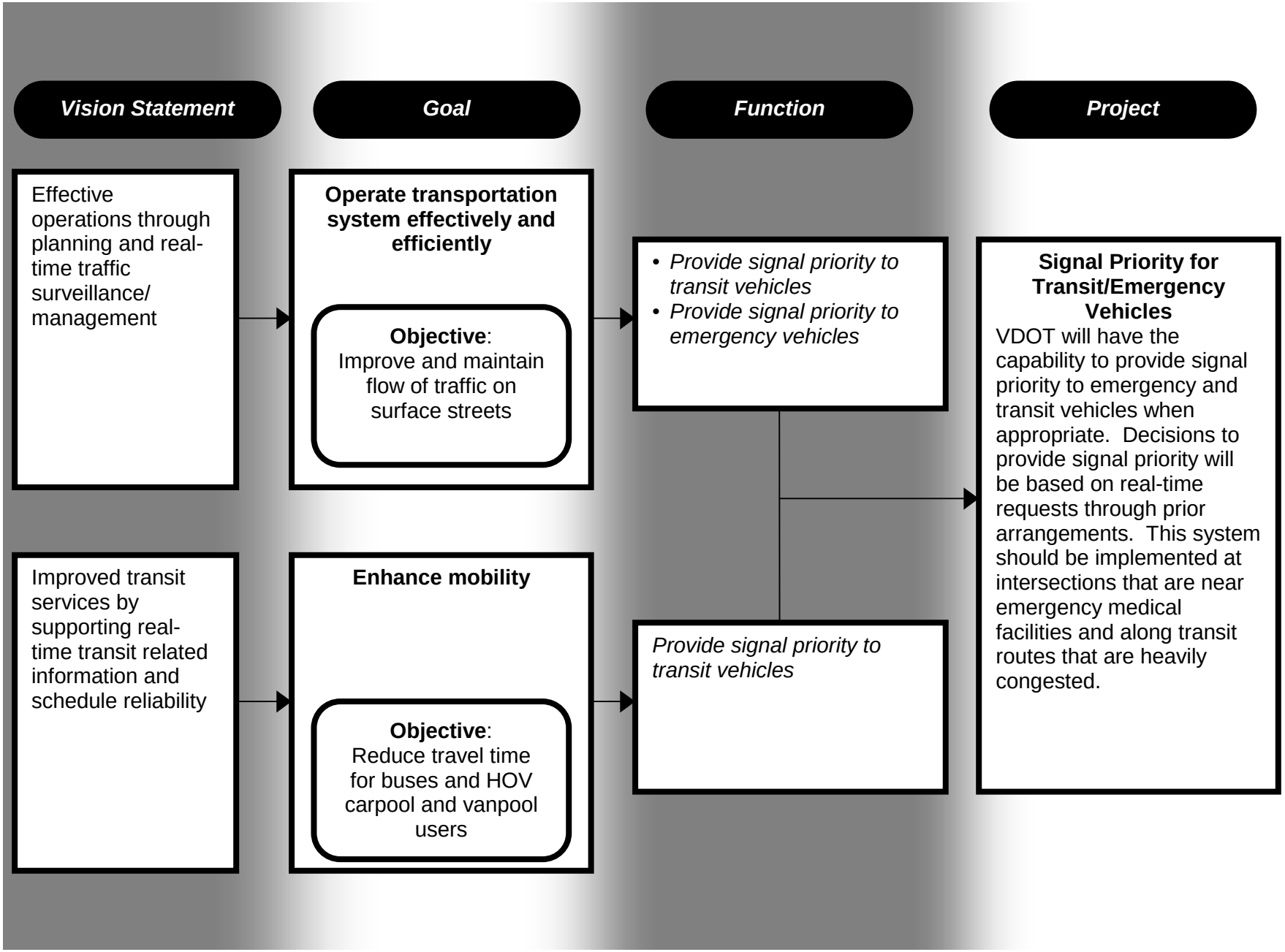

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
• Support incident management of freeways and surface streets
• Provide signal priority to transit vehicles
• Provide signal priority to emergency vehicles responding to incidents
Regional Signal Priority Treatment Study
This is a detailed study of signal preemption/priority treatment and state of the practice for transit, enforcement, fire, and EMS. The goal of this study is to assist the region in considering the use of advanced technologies to implement signal preemption and other vehicle priority strategies along signalized arterials in the Washington D.C. Region.

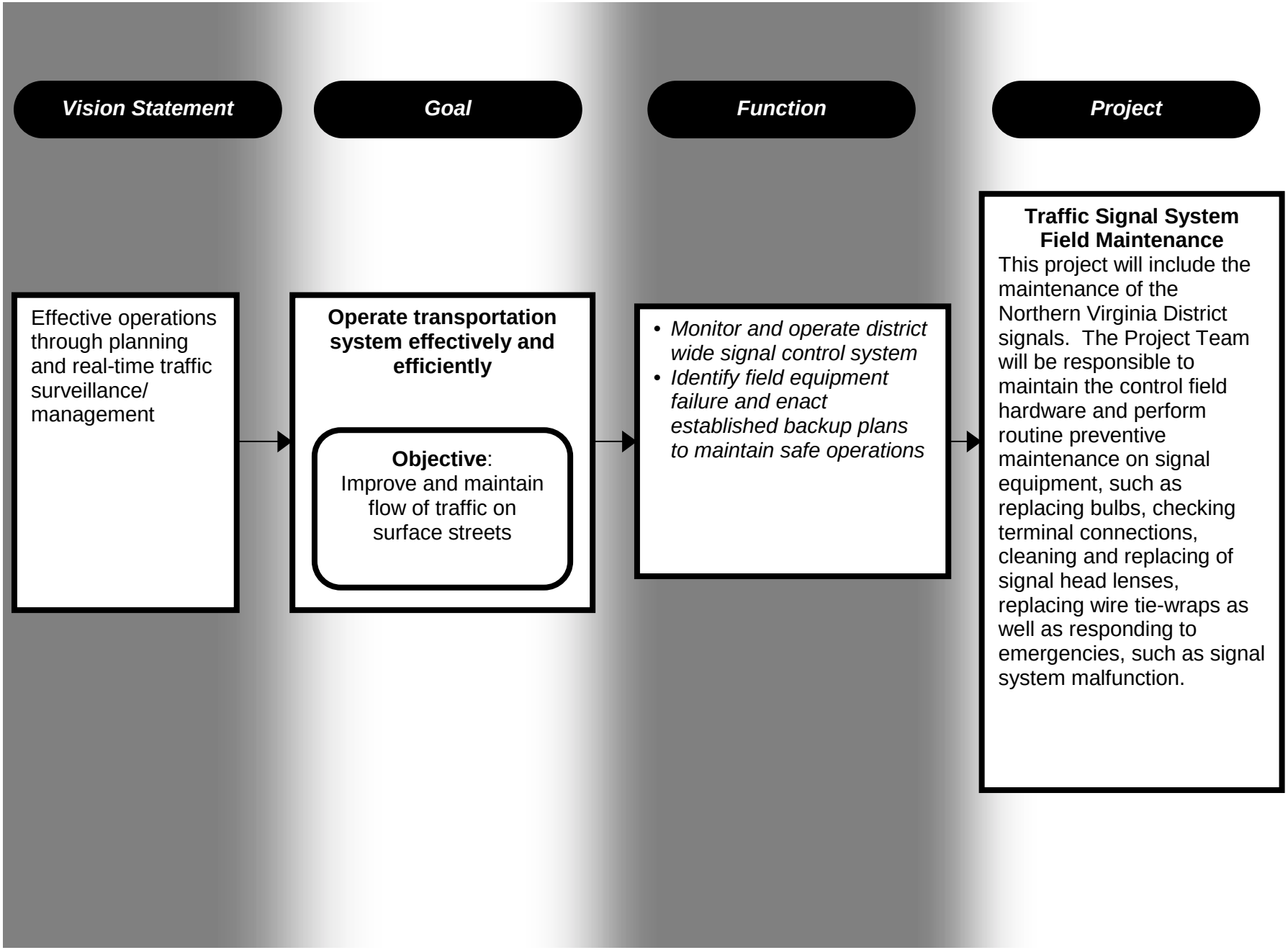

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
• Monitor real-time traffic flow
• Support incident management by developing and manipulating signal timing plans
• Optimize and integrate wide-area network signal
Real-Time Traffic Adaptive Control System (RT-TRACS)
The project is sponsored by FHWA to develop, implement, and evaluate a Real-Time Traffic Adaptive Control System (RT-TRACS) for traffic signals. The purpose of this project is to provide a framework for the implementation of a variety of control strategies. Another purpose is to design a system architecture that can select the most appropriate control strategy to monitor its performance in order to handle present day traffic requirements.

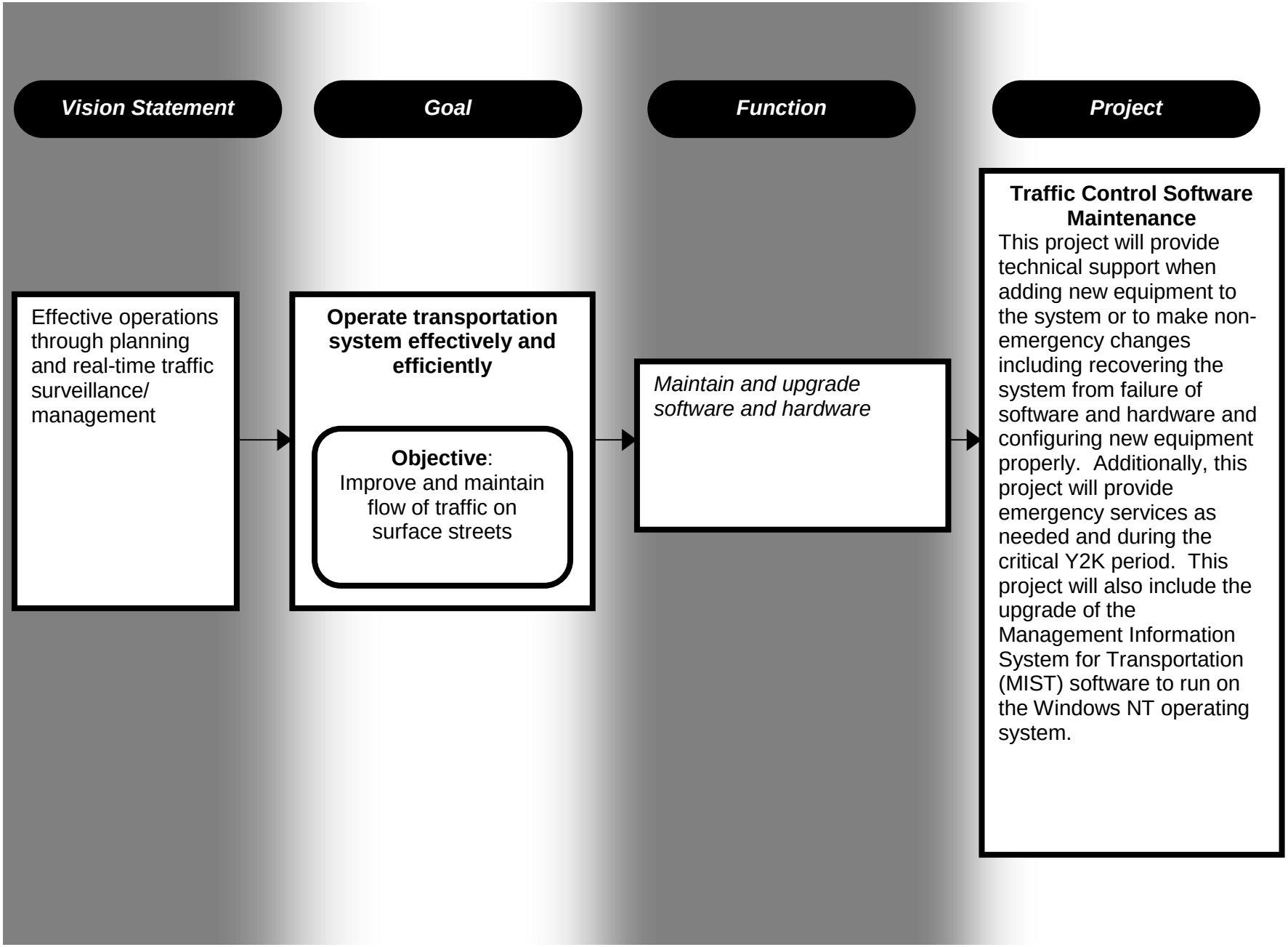

Vision Statement
Goal
Function
Project
Improvement of motorist and pedestrian safety by providing advance warning and by contributing to the security of transportation facilities
Enhance Public Safety
Objective: Reduce crashes on freeways and surface streets
• Implement crash countermeasures at high accident locations
• Provide safe and effective solutions to traffic operations problems
Collision Countermeasures System for Unsignalized Intersections
This project incorporates traffic detectors and controllers in order to trigger active signs to warn of approaching vehicles near the intersection. Signs at the intersection will warn stopped vehicles of approaching traffic, while signs on the major road will warn approaching vehicles of traffic in the intersection.

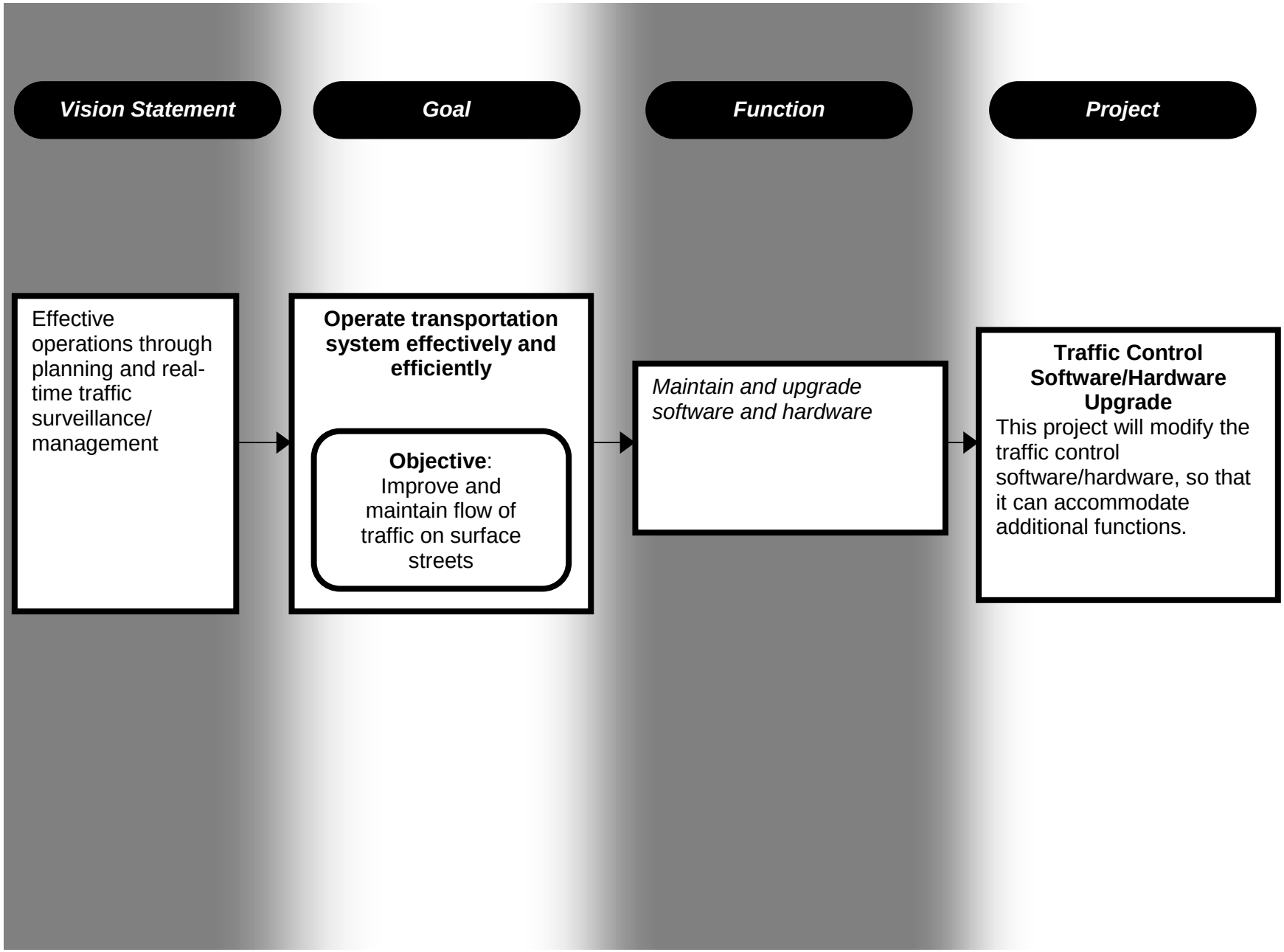

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
• Monitor real-time traffic flow
• Monitor and operate district-wide signal control system
• Identify field equipment failure and enact established backup plans to maintain safe operations
• Adjust the signal system operations during emergencies
• Maintain communications other VDOT operating agencies through VOIS
• Receive incident information
• Assist in clearing incidents from the roadway
• Manage the flow of traffic at the incident scene by possibly changing timing plans
• Participate in devising a regional incident management plan
• Promote integration with existing and planned regional systems
• Implement systems in coordination with planned construction/maintenance activities
• Provide communications with all the traffic signals from a central control facility
• Support incident management by developing and manipulating signal timing plans
• Coordinate with other jurisdictions' signal system that are not operated by VDOT
• Optimize and integrate wide-area network signal systems
Northern Virginia Smart Traffic Signal System
The Smart Traffic Signal System, which has been implemented in Northern Virginia District, is a complete computer-based traffic signal management system. The complete system contains field equipment and central system software. Model 170 controllers have been installed at 748 intersections to replace all old controllers. The operating system permits the operators to execute other system software tasks while operating the traffic control software and providing direct communications with all intersections in the project area. In addition the system provides access to location designs, cabinet wiring diagrams, maps, and other graphics via the image databases. The system has the ability to upload and download all timing plans and operational parameters, including status information and review of conflict monitor, from the central location as well as at a remote access point.

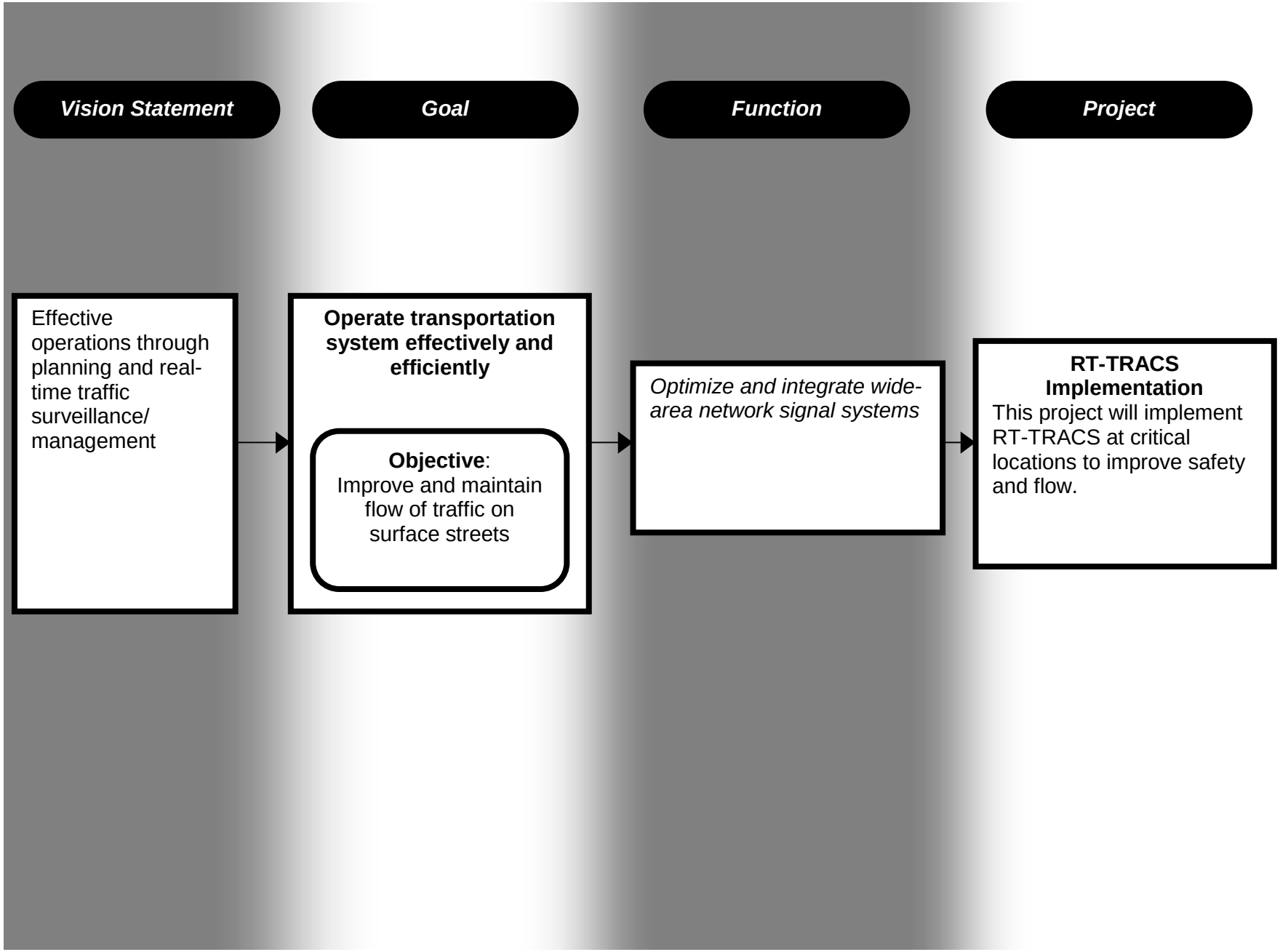

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
Coordinate with other jurisdictions' signal systems that are not operated by VDOT
Optimize and integrate wide area network signal systems
Regional Signal Coordination System
The VDOT-operated signal system will be coordinated with other systems that are not operated by VDOT to obtain optimal traffic flow along a corridor. This system will also have the ability to be coordinated to support diversion strategies during incidents based on an established incident response protocol.

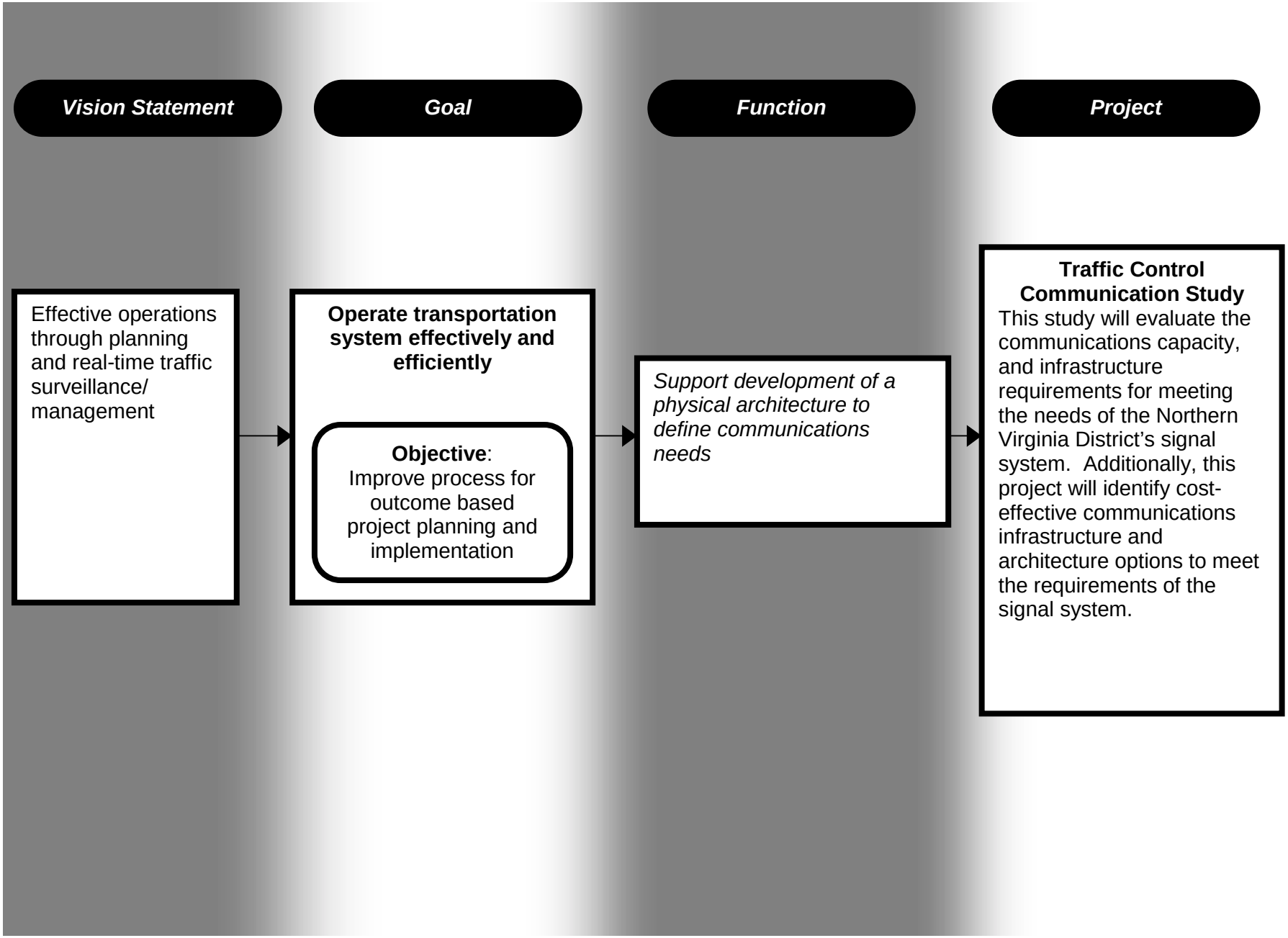

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
• Provide signal priority to transit vehicles
• Provide signal priority to emergency vehicles
Improved transit services by supporting real-time transit related information and schedule reliability
Enhance mobility
Objective: Reduce travel time for buses and HOV carpool and vanpool users
Provide signal priority to transit vehicles
Signal Priority for Transit/Emergency Vehicles
VDOT will have the capability to provide signal priority to emergency and transit vehicles when appropriate. Decisions to provide signal priority will be based on real-time requests through prior arrangements. This system should be implemented at intersections that are near emergency medical facilities and along transit routes that are heavily congested.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
• Monitor and operate district wide signal control system
• Identify field equipment failure and enact established backup plans to maintain safe operations
Traffic Signal System Field Maintenance
This project will include the maintenance of the Northern Virginia District signals. The Project Team will be responsible to maintain the control field hardware and perform routine preventive maintenance on signal equipment, such as replacing bulbs, checking terminal connections, cleaning and replacing of signal head lenses, replacing wire tie-wraps as well as responding to emergencies, such as signal system malfunction.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
Maintain and upgrade software and hardware
Traffic Control Software Maintenance
This project will provide technical support when adding new equipment to the system or to make non-emergency changes including recovering the system from failure of software and hardware and configuring new equipment properly. Additionally, this project will provide emergency services as needed and during the critical Y2K period. This project will also include the upgrade of the Management Information System for Transportation (MIST) software to run on the Windows NT operating system.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
Maintain and upgrade software and hardware
Traffic Control Software/Hardware Upgrade
This project will modify the traffic control software/hardware, so that it can accommodate additional functions.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
Optimize and integrate wide-area network signal systems
RT-TRACS Implementation
This project will implement RT-TRACS at critical locations to improve safety and flow.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Support development of a physical architecture to define communications needs
Traffic Control Communication Study
This study will evaluate the communications capacity, and infrastructure requirements for meeting the needs of the Northern Virginia District's signal system. Additionally, this project will identify cost-effective communications infrastructure and architecture options to meet the requirements of the signal system.

System 3 – Freeway Management System

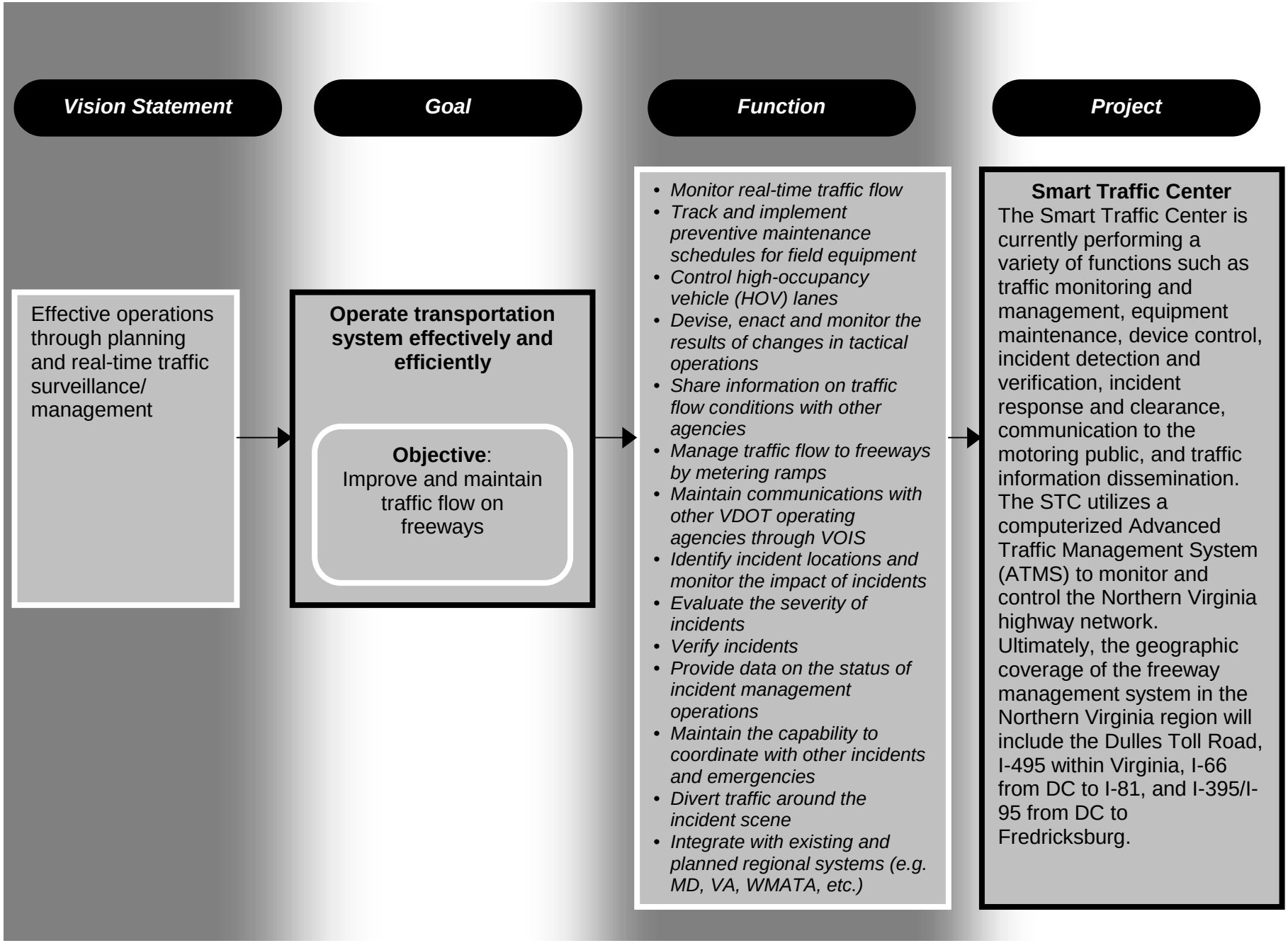
The freeway management system monitors and operates the freeway system at its optimal level. Effective freeway management will provide raw data to improve traveler information while allowing real-time operational adjustments as traffic conditions demand.

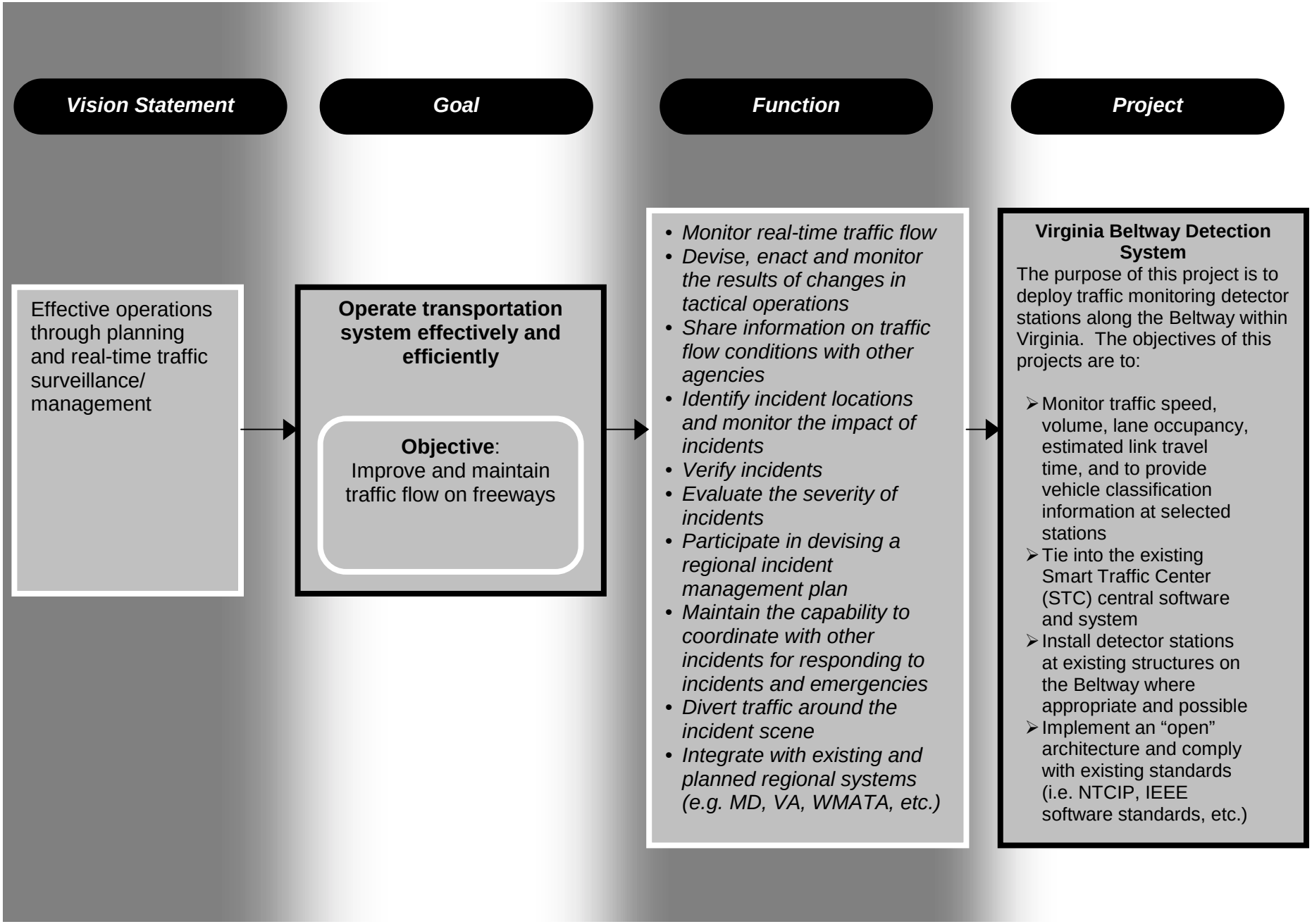
The following projects are included under the Freeway Management System:

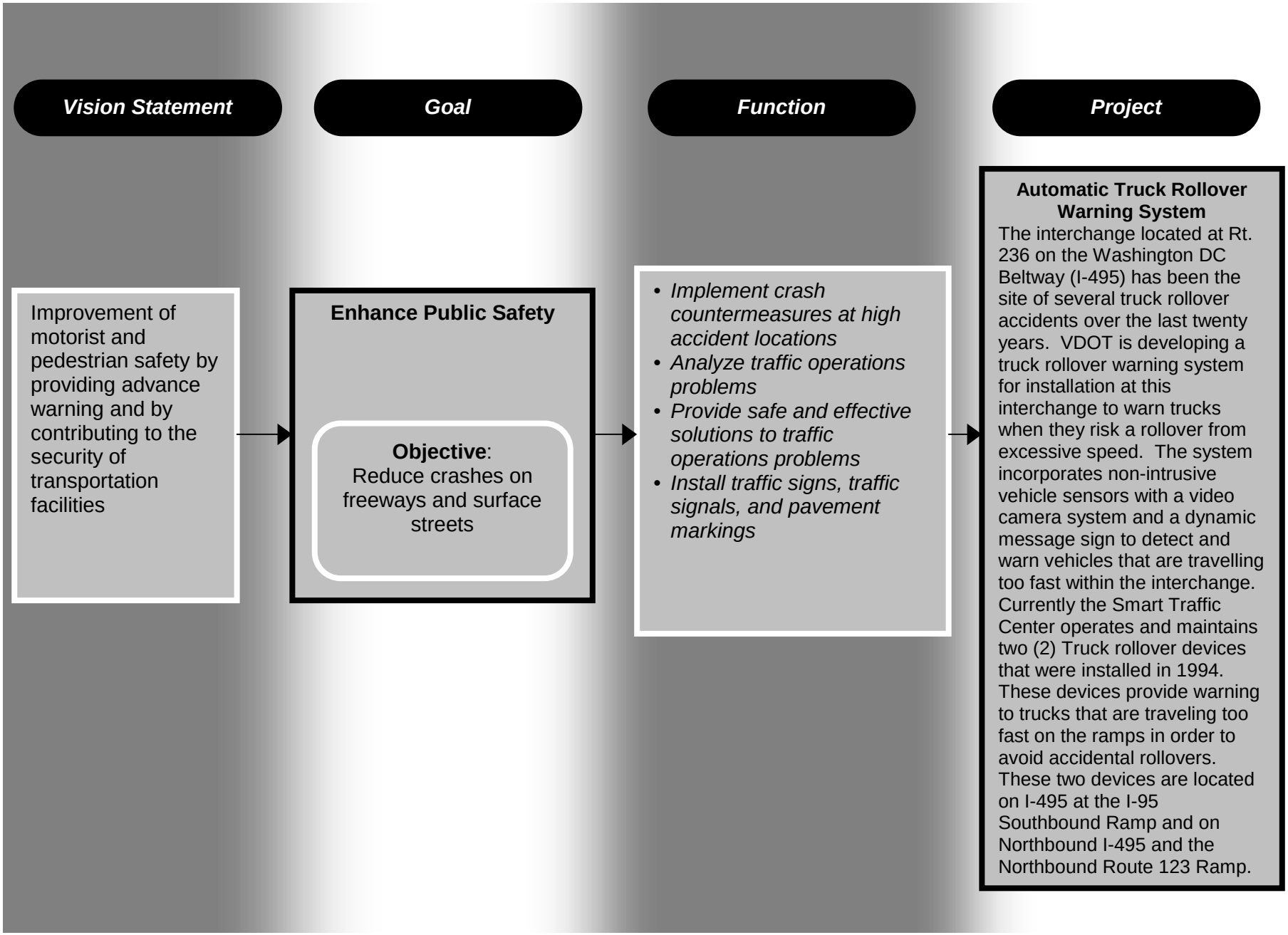
- *Smart Traffic Center*
- *Virginia Beltway Detection System*
- *Automatic Truck Roll-over Warning System*
- *Bridge Deck Anti-icing System*
- *Demonstration of Autonomous Mobile Call Sampling Leveraging Location Fingerprinting*
- Freeway Access Control System
- Integrated Traffic Management
- Integration of Signal, Freeway and Safety Service Patrol (SSP) Operations
- Analysis of Traffic Management Needs
- **Evaluation of Cellular Call Locating System**
- Transponders as Probes
- **Smart Traffic Center Software and Hardware Maintenance**
- Co-locate Smart Traffic Center, Smart Signal Control Center, and SSP Operations Control
- **Freeway Management System Evaluation**
- **Freeway System Completion Projects:**
  - **Integrate STC sub-systems for I-66 and I-395 inside the Capital Beltway to the new software system**
  - **STC sub-systems for I-495**
  - **I-66 from 17-mile away from the Beltway to I-81**
  - **Dulles Toll Road**
- Road and Highway Projects in the Regional Long range Plans
- **Interstate System completion Project Placeholder**

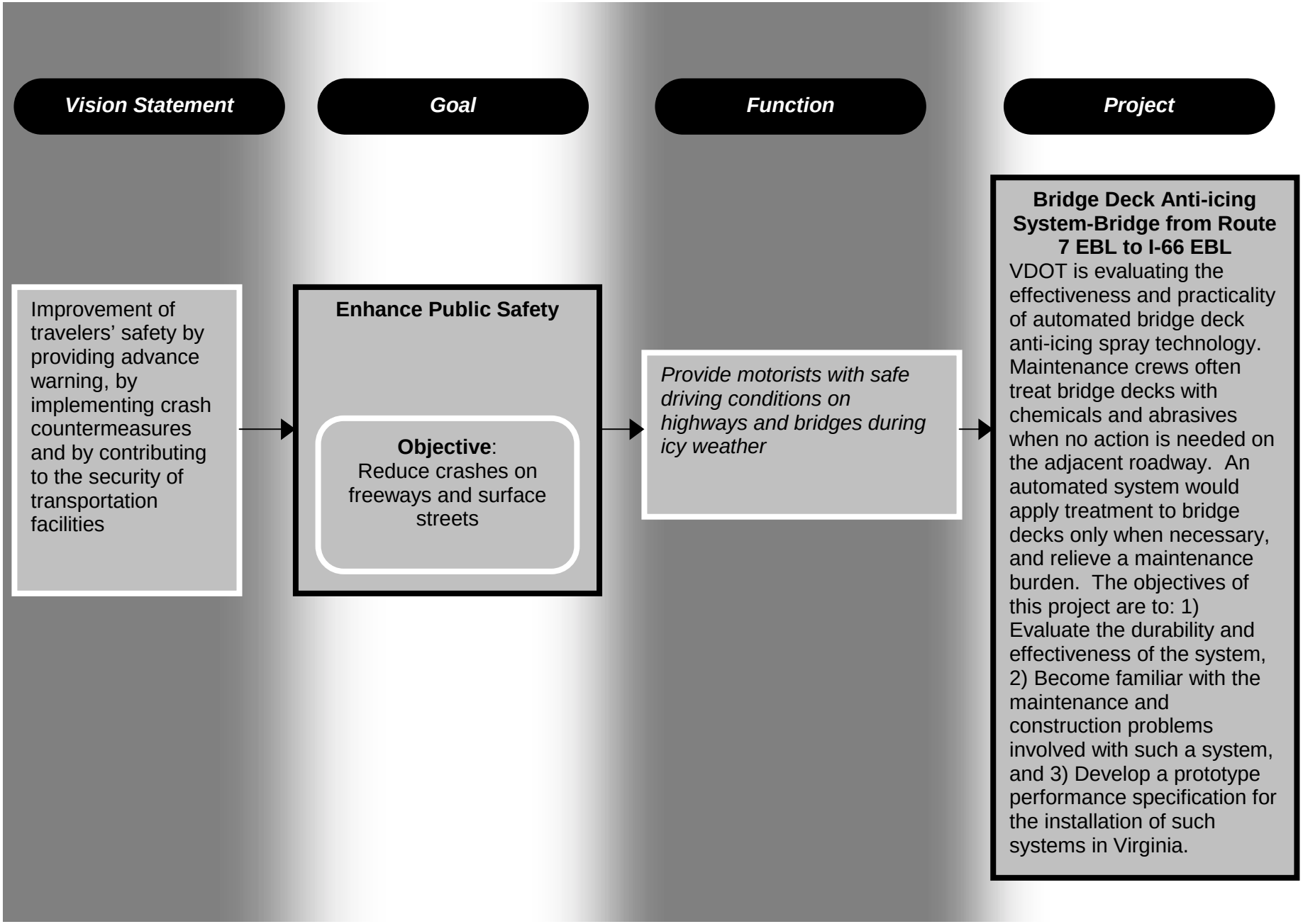
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

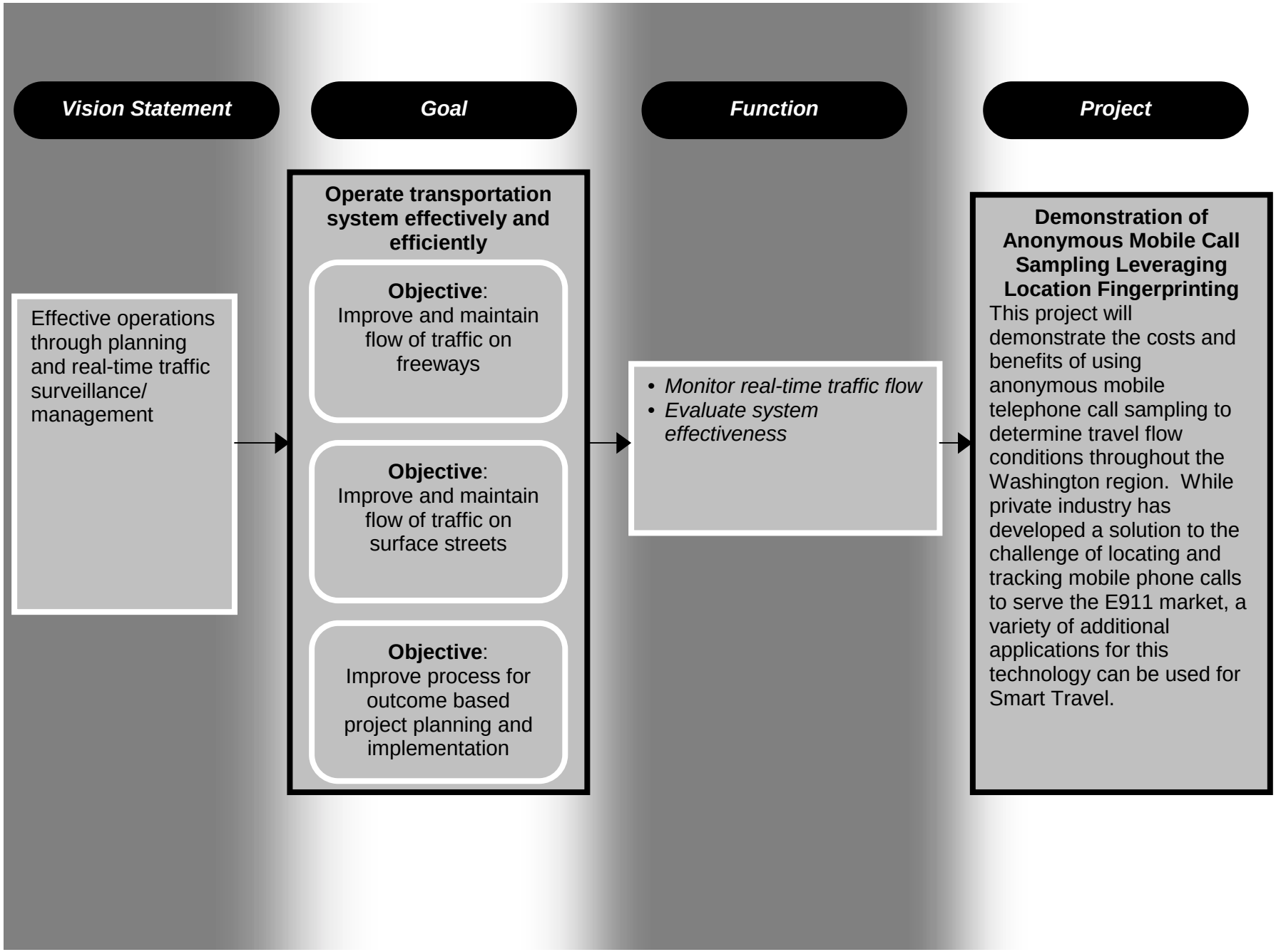
The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement. As *the Road and Highway Projects in the Regional Long range Plans* and *Interstate System completion Project Placeholder* are spot safety projects in nature, the mapping of these projects are not shown. Also, a mapping of the *Freeway Management System Evaluation* is not included, as this project will evaluate the effectiveness of freeway management that will be accomplished by various projects listed above.

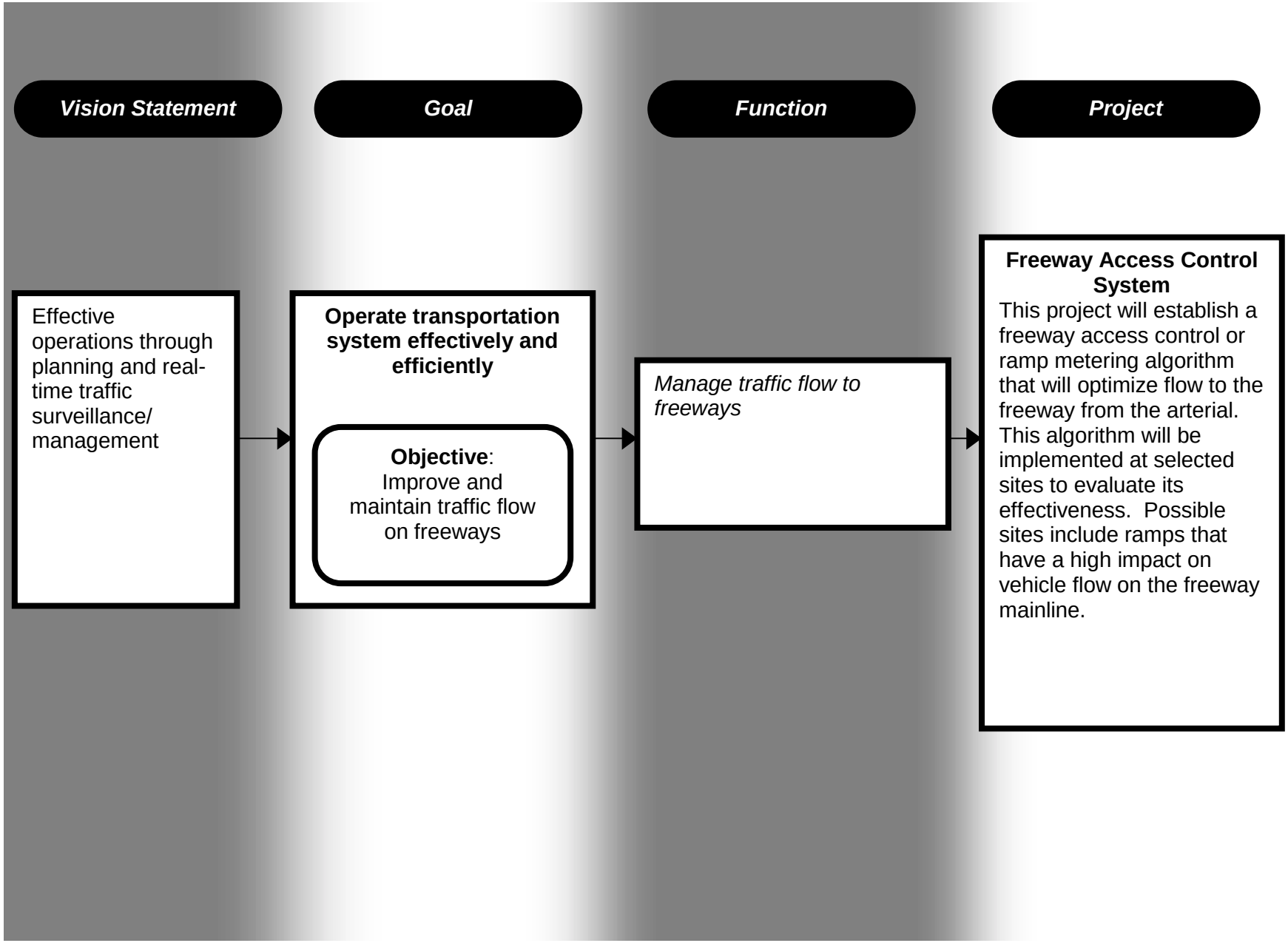

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain traffic flow on freeways
• Monitor real-time traffic flow
• Track and implement preventive maintenance schedules for field equipment
• Control high-occupancy vehicle (HOV) lanes
• Devise, enact and monitor the results of changes in tactical operations
• Share information on traffic flow conditions with other agencies
• Manage traffic flow to freeways by metering ramps
• Maintain communications with other VDOT operating agencies through VOIS
• Identify incident locations and monitor the impact of incidents
• Evaluate the severity of incidents
• Verify incidents
• Provide data on the status of incident management operations
• Maintain the capability to coordinate with other incidents and emergencies
• Divert traffic around the incident scene
• Integrate with existing and planned regional systems (e.g. MD, VA, WMATA, etc.)
Smart Traffic Center
The Smart Traffic Center is currently performing a variety of functions such as traffic monitoring and management, equipment maintenance, device control, incident detection and verification, incident response and clearance, communication to the motoring public, and traffic information dissemination. The STC utilizes a computerized Advanced Traffic Management System (ATMS) to monitor and control the Northern Virginia highway network. Ultimately, the geographic coverage of the freeway management system in the Northern Virginia region will include the Dulles Toll Road, I-495 within Virginia, I-66 from DC to I-81, and I-395/I-95 from DC to Fredricksburg.

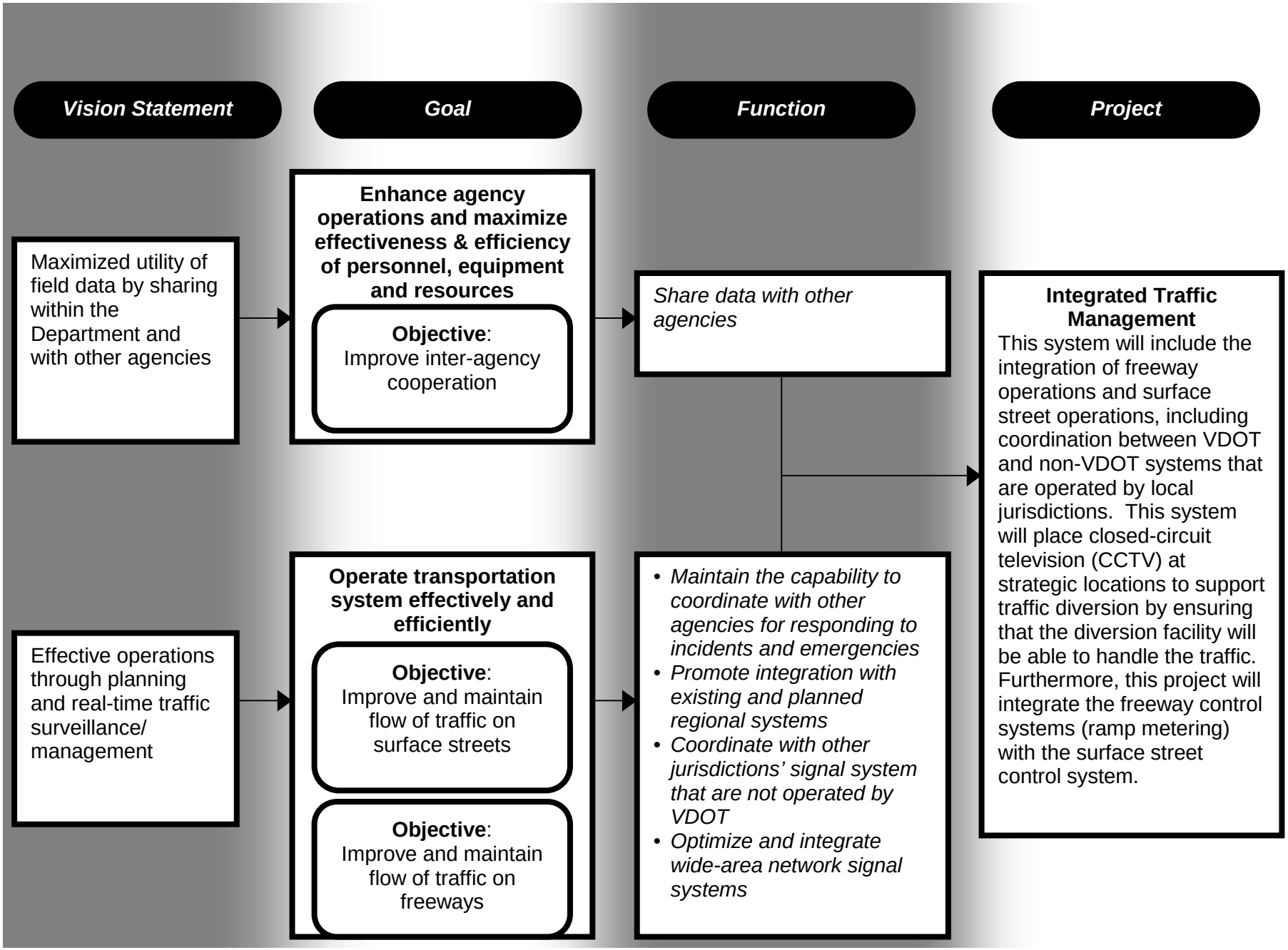

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain traffic flow on freeways
• Monitor real-time traffic flow
• Devise, enact and monitor the results of changes in tactical operations
• Share information on traffic flow conditions with other agencies
• Identify incident locations and monitor the impact of incidents
• Verify incidents
• Evaluate the severity of incidents
• Participate in devising a regional incident management plan
• Maintain the capability to coordinate with other incidents for responding to incidents and emergencies
• Divert traffic around the incident scene
• Integrate with existing and planned regional systems (e.g. MD, VA, WMATA, etc.)
Virginia Beltway Detection System
The purpose of this project is to deploy traffic monitoring detector stations along the Beltway within Virginia. The objectives of this projects are to:
➢ Monitor traffic speed, volume, lane occupancy, estimated link travel time, and to provide vehicle classification information at selected stations
➢ Tie into the existing Smart Traffic Center (STC) central software and system
➢ Install detector stations at existing structures on the Beltway where appropriate and possible
➢ Implement an "open" architecture and comply with existing standards (i.e. NTCIP, IEEE software standards, etc.)

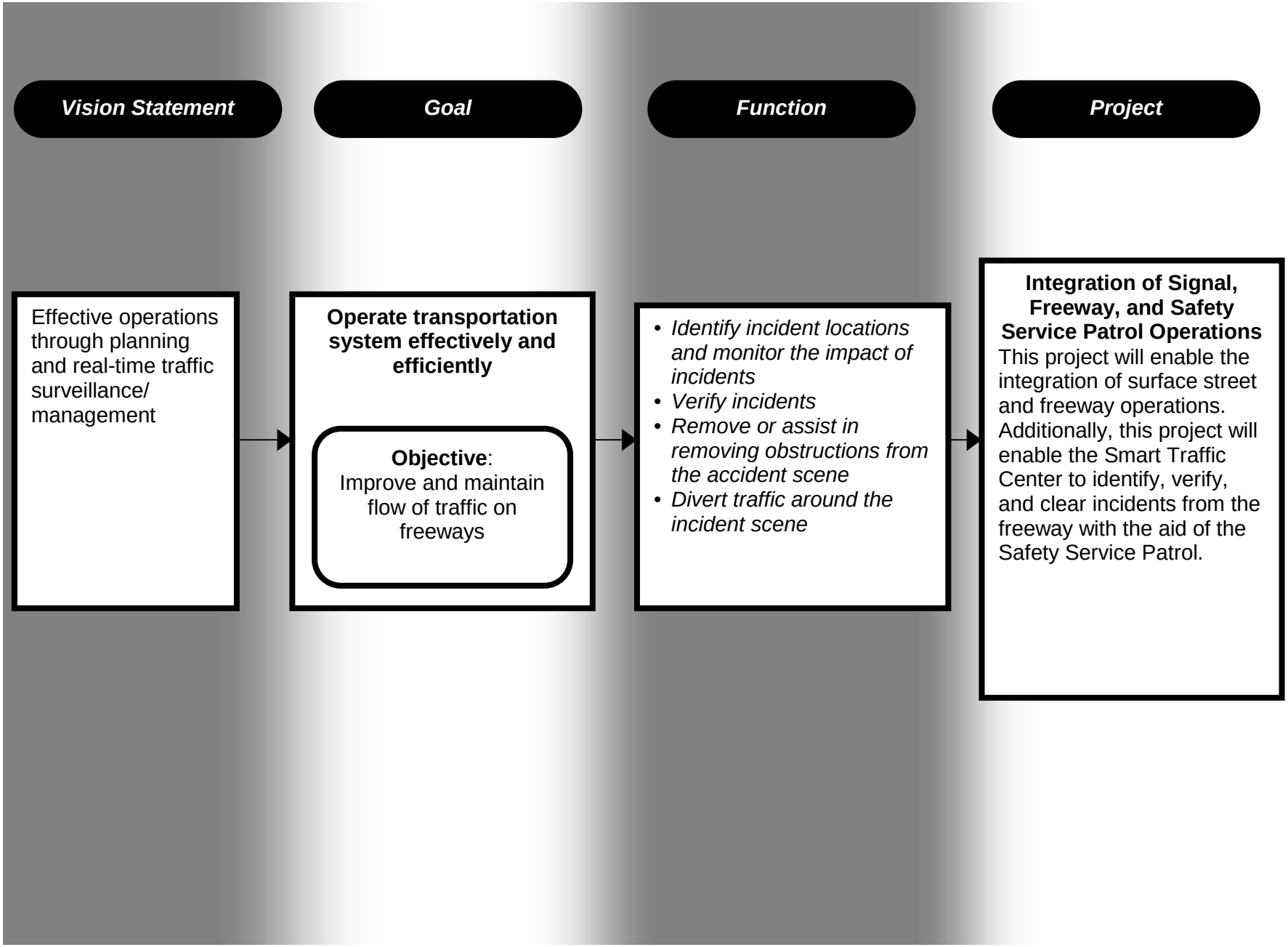

Vision Statement
Goal
Function
Project
Improvement of motorist and pedestrian safety by providing advance warning and by contributing to the security of transportation facilities
Enhance Public Safety
Objective: Reduce crashes on freeways and surface streets
• Implement crash countermeasures at high accident locations
• Analyze traffic operations problems
• Provide safe and effective solutions to traffic operations problems
• Install traffic signs, traffic signals, and pavement markings
Automatic Truck Rollover Warning System
The interchange located at Rt. 236 on the Washington DC Beltway (I-495) has been the site of several truck rollover accidents over the last twenty years. VDOT is developing a truck rollover warning system for installation at this interchange to warn trucks when they risk a rollover from excessive speed. The system incorporates non-intrusive vehicle sensors with a video camera system and a dynamic message sign to detect and warn vehicles that are travelling too fast within the interchange. Currently the Smart Traffic Center operates and maintains two (2) Truck rollover devices that were installed in 1994. These devices provide warning to trucks that are traveling too fast on the ramps in order to avoid accidental rollovers. These two devices are located on I-495 at the I-95 Southbound Ramp and on Northbound I-495 and the Northbound Route 123 Ramp.

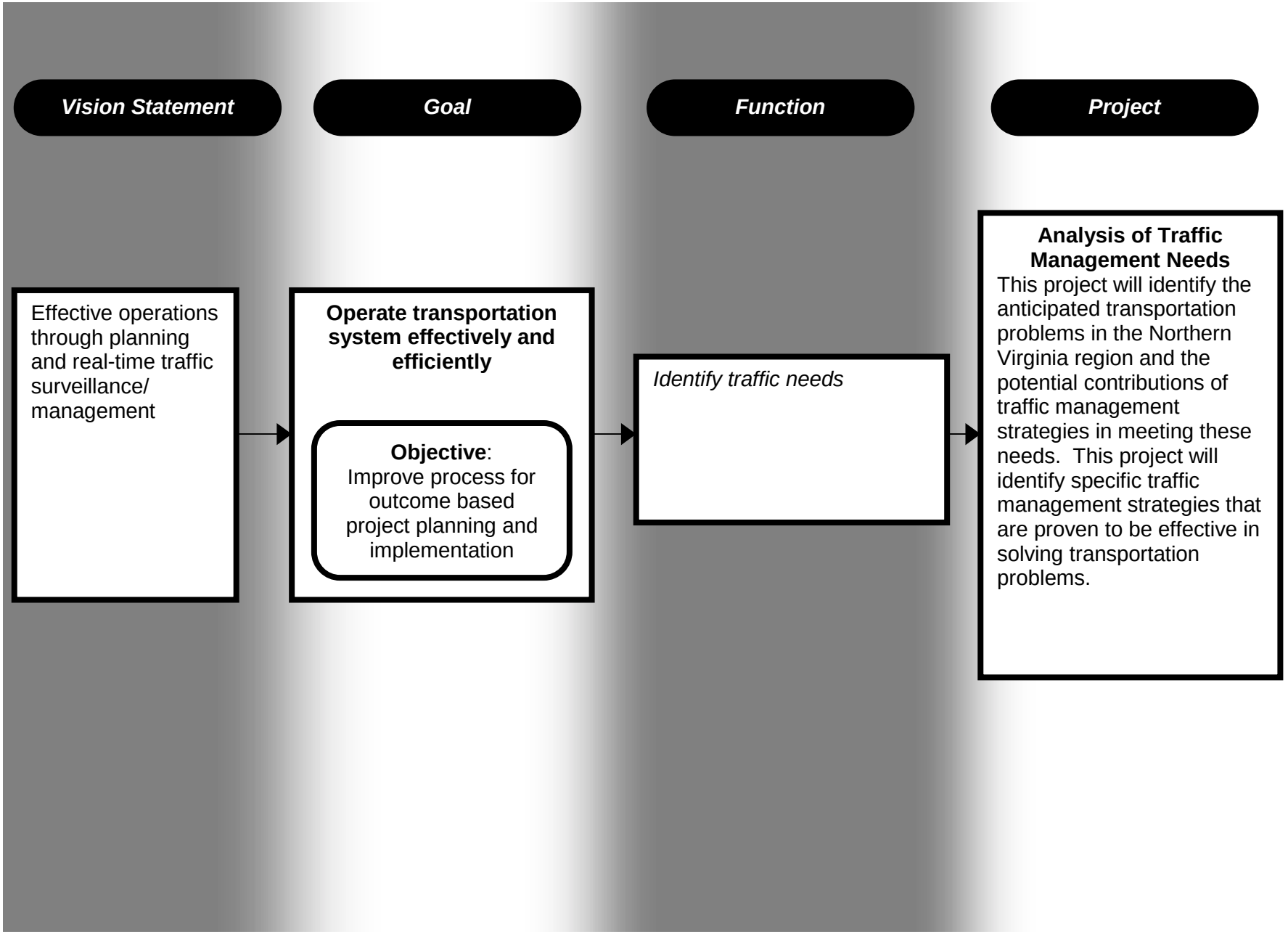

Vision Statement
Goal
Function
Project
Improvement of travelers' safety by providing advance warning, by implementing crash countermeasures and by contributing to the security of transportation facilities
Enhance Public Safety
Objective: Reduce crashes on freeways and surface streets
Provide motorists with safe driving conditions on highways and bridges during icy weather
Bridge Deck Anti-icing System-Bridge from Route 7 EBL to I-66 EBL
VDOT is evaluating the effectiveness and practicality of automated bridge deck anti-icing spray technology. Maintenance crews often treat bridge decks with chemicals and abrasives when no action is needed on the adjacent roadway. An automated system would apply treatment to bridge decks only when necessary, and relieve a maintenance burden. The objectives of this project are to: 1) Evaluate the durability and effectiveness of the system, 2) Become familiar with the maintenance and construction problems involved with such a system, and 3) Develop a prototype performance specification for the installation of such systems in Virginia.

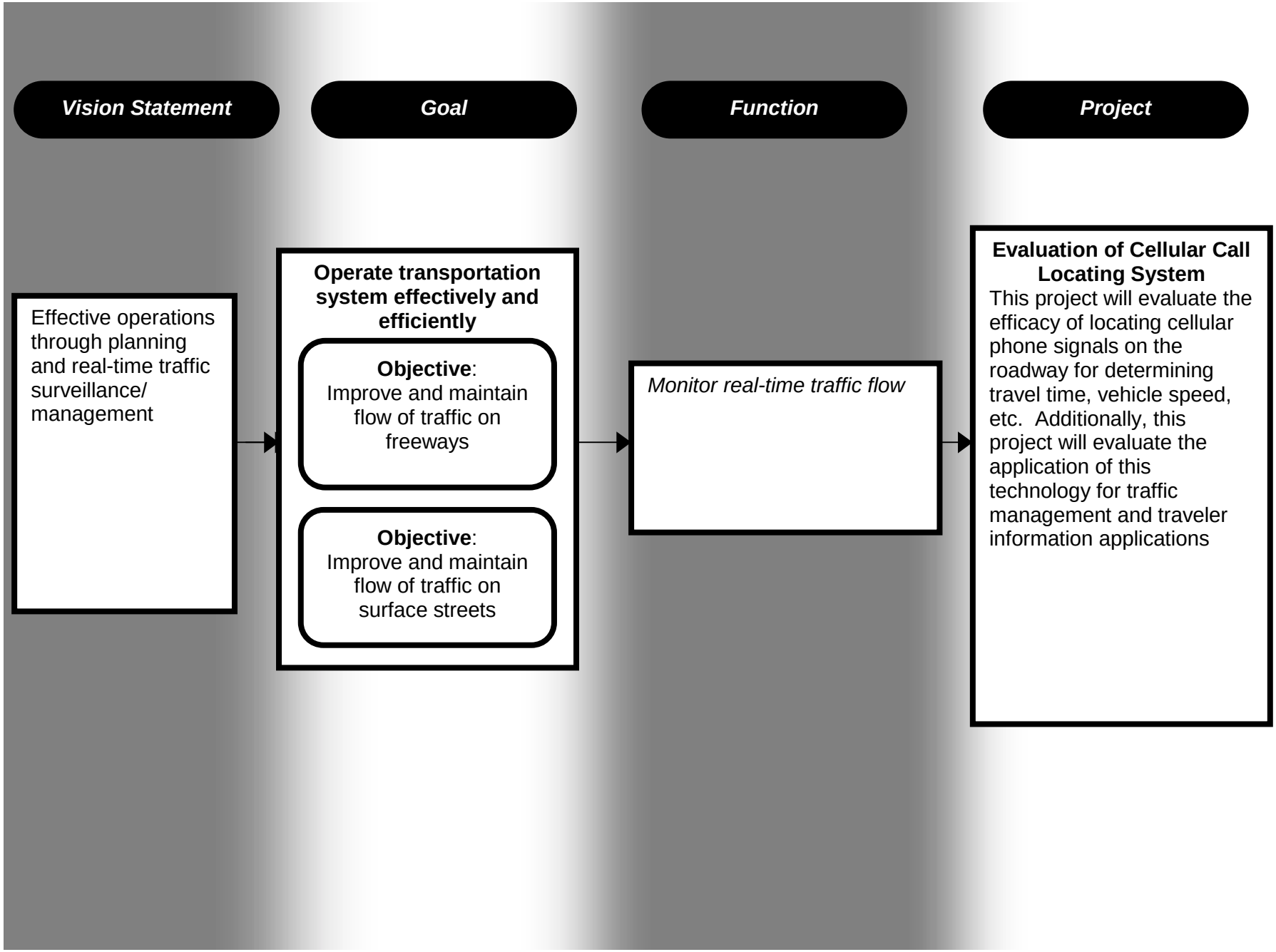

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
Objective: Improve and maintain flow of traffic on surface streets
Objective: Improve process for outcome based project planning and implementation
• Monitor real-time traffic flow
• Evaluate system effectiveness
Demonstration of Anonymous Mobile Call Sampling Leveraging Location Fingerprinting
This project will demonstrate the costs and benefits of using anonymous mobile telephone call sampling to determine travel flow conditions throughout the Washington region. While private industry has developed a solution to the challenge of locating and tracking mobile phone calls to serve the E911 market, a variety of additional applications for this technology can be used for Smart Travel.

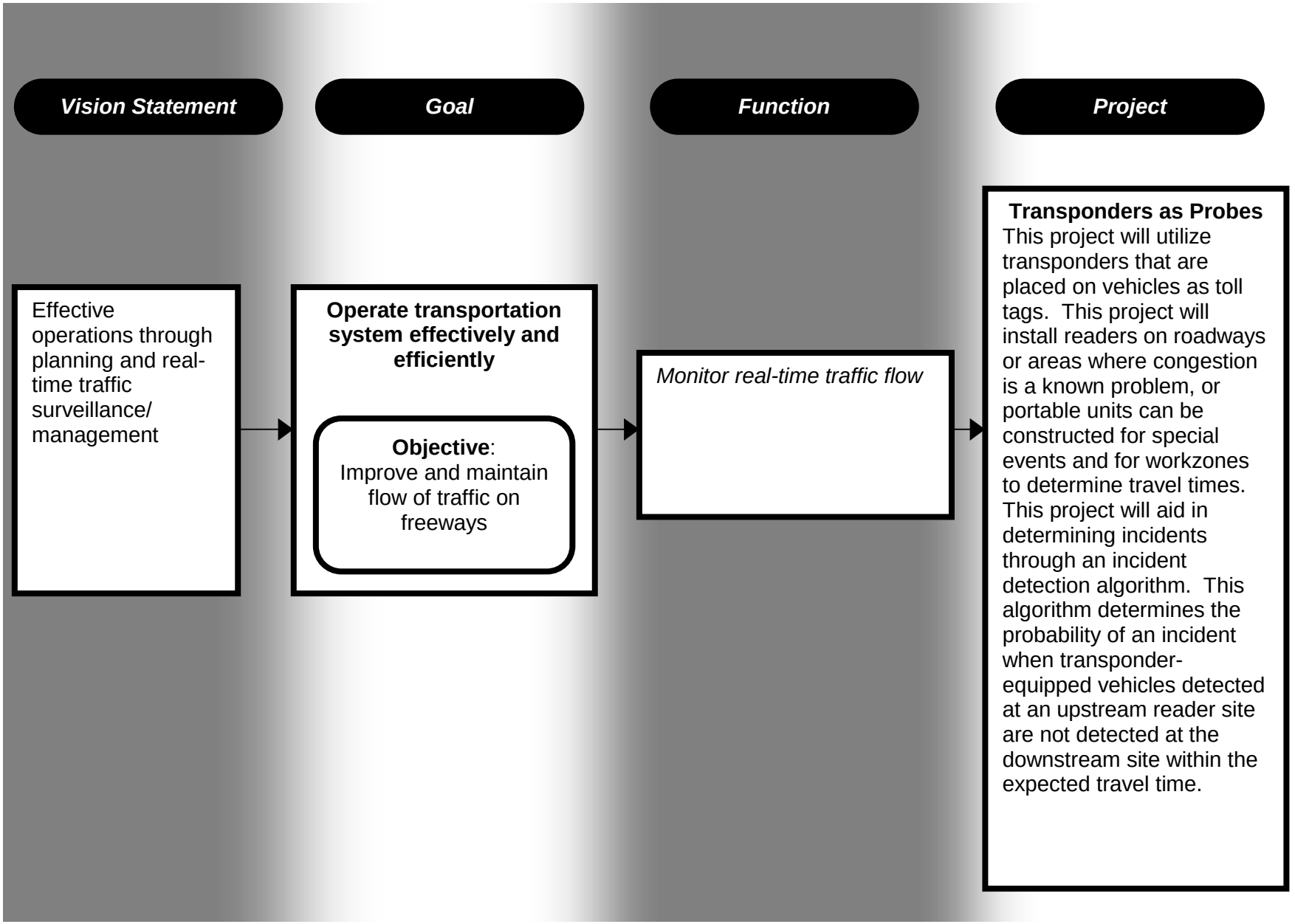

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain traffic flow on freeways
Manage traffic flow to freeways
Freeway Access Control System
This project will establish a freeway access control or ramp metering algorithm that will optimize flow to the freeway from the arterial. This algorithm will be implemented at selected sites to evaluate its effectiveness. Possible sites include ramps that have a high impact on vehicle flow on the freeway mainline.

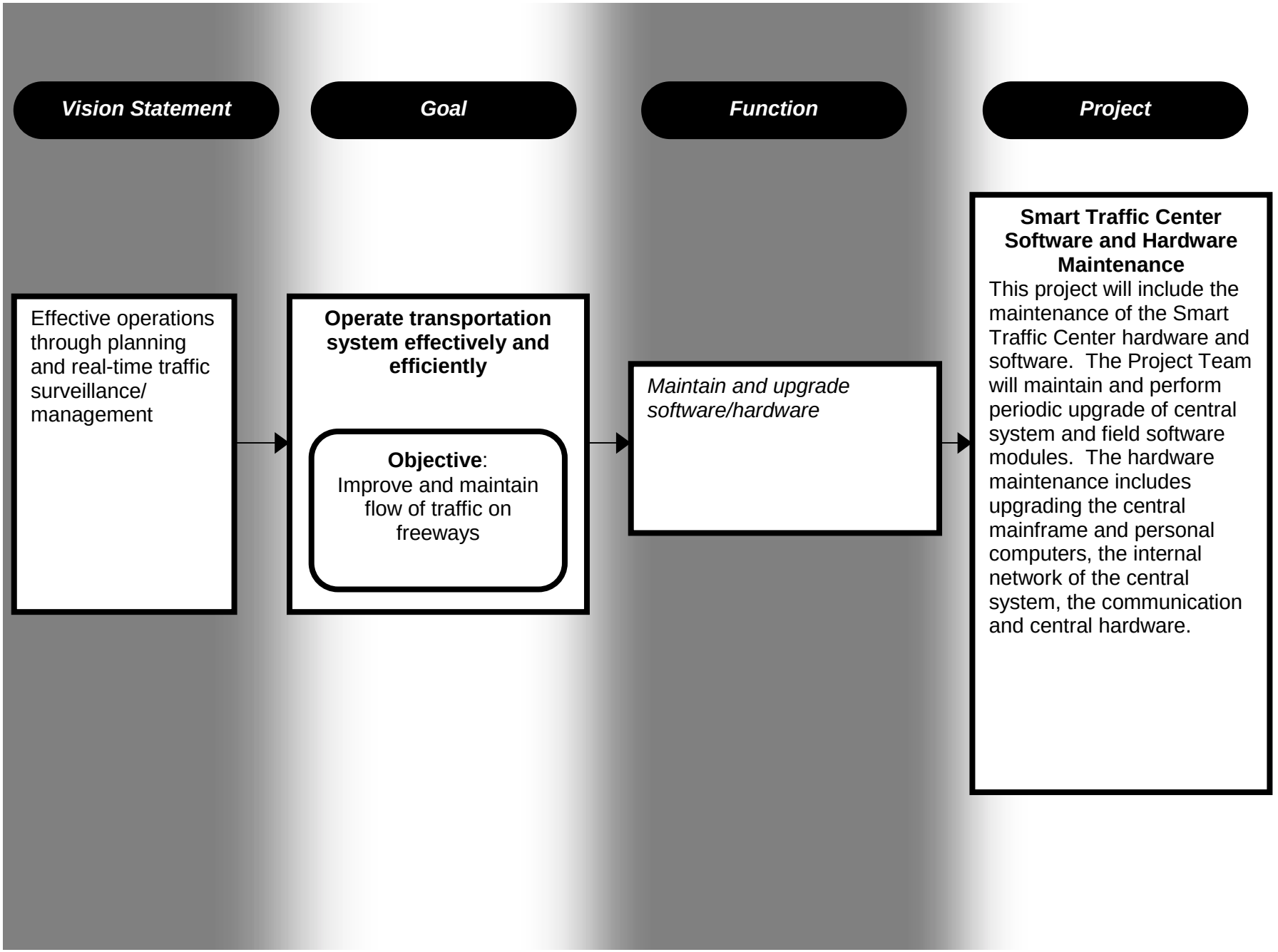

Vision Statement
Goal
Function
Project
Maximized utility of field data by sharing within the Department and with other agencies
Enhance agency operations and maximize effectiveness & efficiency of personnel, equipment and resources
Objective: Improve inter-agency cooperation
Share data with other agencies
Integrated Traffic Management
This system will include the integration of freeway operations and surface street operations, including coordination between VDOT and non-VDOT systems that are operated by local jurisdictions. This system will place closed-circuit television (CCTV) at strategic locations to support traffic diversion by ensuring that the diversion facility will be able to handle the traffic. Furthermore, this project will integrate the freeway control systems (ramp metering) with the surface street control system.
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
Objective: Improve and maintain flow of traffic on freeways
• Maintain the capability to coordinate with other agencies for responding to incidents and emergencies
• Promote integration with existing and planned regional systems
• Coordinate with other jurisdictions' signal system that are not operated by VDOT
• Optimize and integrate wide-area network signal systems

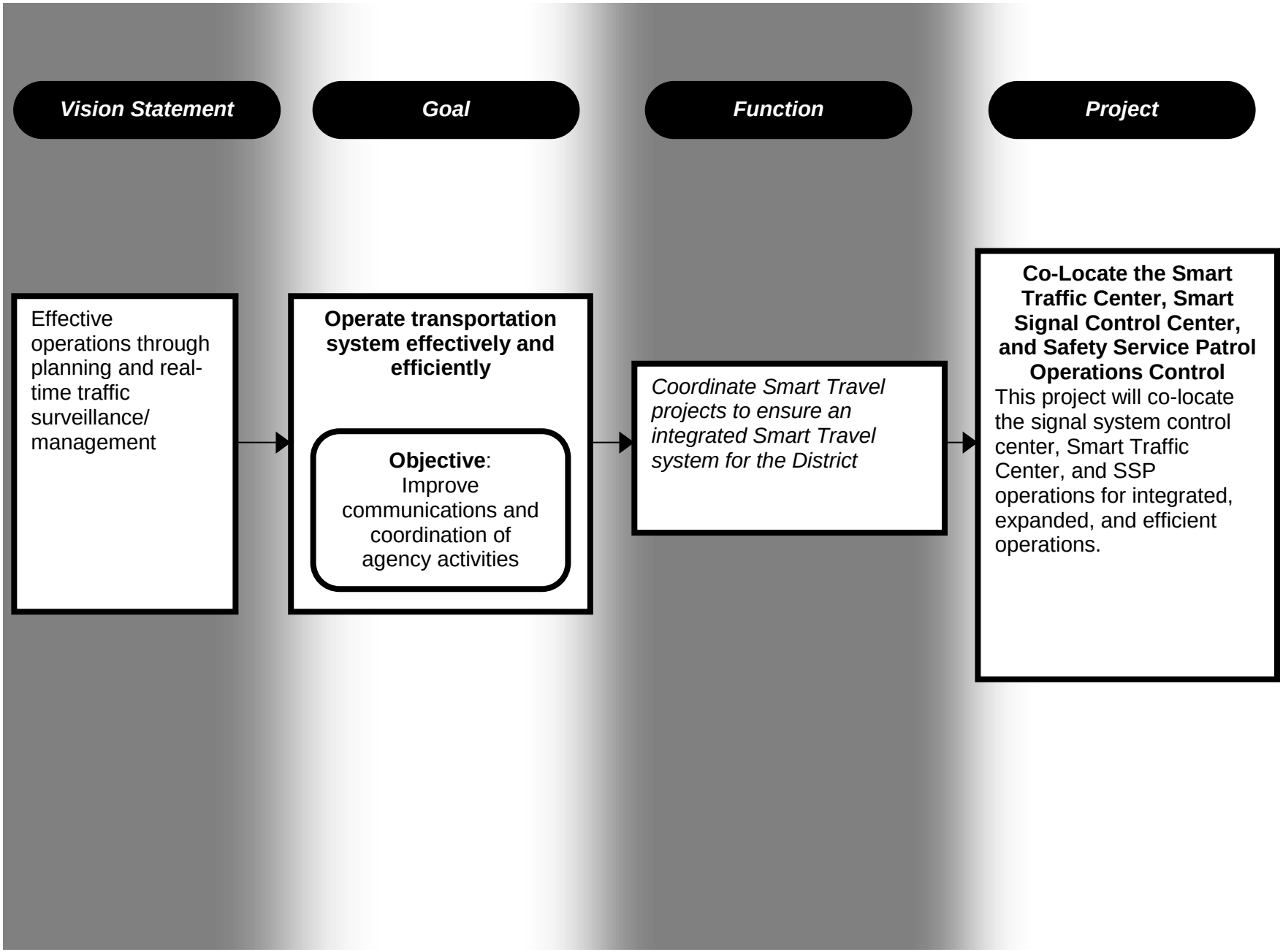

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
• Identify incident locations and monitor the impact of incidents
• Verify incidents
• Remove or assist in removing obstructions from the accident scene
• Divert traffic around the incident scene
Integration of Signal, Freeway, and Safety Service Patrol Operations
This project will enable the integration of surface street and freeway operations. Additionally, this project will enable the Smart Traffic Center to identify, verify, and clear incidents from the freeway with the aid of the Safety Service Patrol.

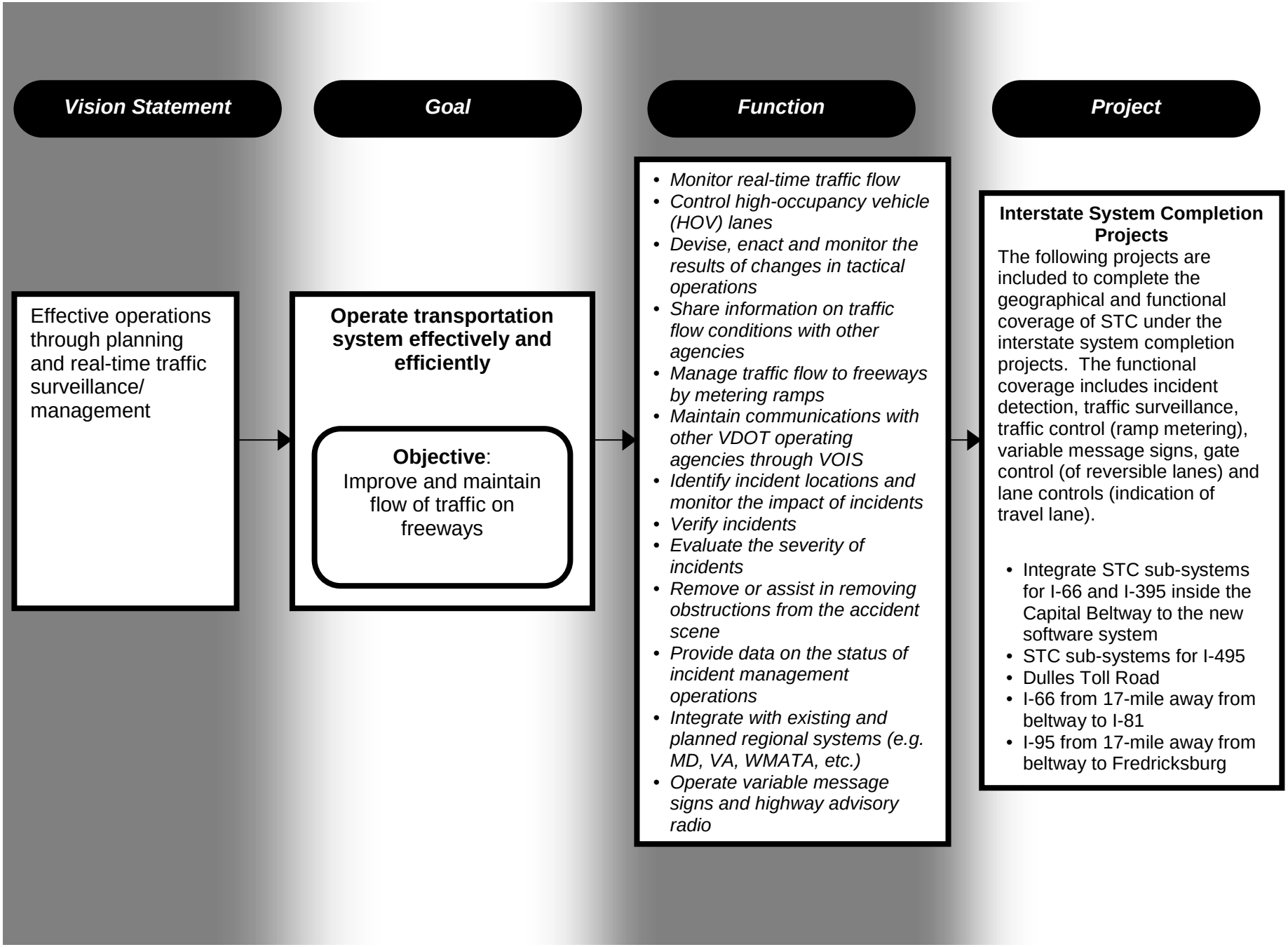

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Identify traffic needs
Analysis of Traffic Management Needs
This project will identify the anticipated transportation problems in the Northern Virginia region and the potential contributions of traffic management strategies in meeting these needs. This project will identify specific traffic management strategies that are proven to be effective in solving transportation problems.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
Objective: Improve and maintain flow of traffic on surface streets
Monitor real-time traffic flow
Evaluation of Cellular Call Locating System
This project will evaluate the efficacy of locating cellular phone signals on the roadway for determining travel time, vehicle speed, etc. Additionally, this project will evaluate the application of this technology for traffic management and traveler information applications


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
Monitor real-time traffic flow
Transponders as Probes
This project will utilize transponders that are placed on vehicles as toll tags. This project will install readers on roadways or areas where congestion is a known problem, or portable units can be constructed for special events and for workzones to determine travel times. This project will aid in determining incidents through an incident detection algorithm. This algorithm determines the probability of an incident when transponder-equipped vehicles detected at an upstream reader site are not detected at the downstream site within the expected travel time.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
Maintain and upgrade software/hardware
Smart Traffic Center Software and Hardware Maintenance
This project will include the maintenance of the Smart Traffic Center hardware and software. The Project Team will maintain and perform periodic upgrade of central system and field software modules. The hardware maintenance includes upgrading the central mainframe and personal computers, the internal network of the central system, the communication and central hardware.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve communications and coordination of agency activities
Coordinate Smart Travel projects to ensure an integrated Smart Travel system for the District
Co-Locate the Smart Traffic Center, Smart Signal Control Center, and Safety Service Patrol Operations Control
This project will co-locate the signal system control center, Smart Traffic Center, and SSP operations for integrated, expanded, and efficient operations.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
• Monitor real-time traffic flow
• Control high-occupancy vehicle (HOV) lanes
• Devise, enact and monitor the results of changes in tactical operations
• Share information on traffic flow conditions with other agencies
• Manage traffic flow to freeways by metering ramps
• Maintain communications with other VDOT operating agencies through VOIS
• Identify incident locations and monitor the impact of incidents
• Verify incidents
• Evaluate the severity of incidents
• Remove or assist in removing obstructions from the accident scene
• Provide data on the status of incident management operations
• Integrate with existing and planned regional systems (e.g. MD, VA, WMATA, etc.)
• Operate variable message signs and highway advisory radio
Interstate System Completion Projects
The following projects are included to complete the geographical and functional coverage of STC under the interstate system completion projects. The functional coverage includes incident detection, traffic surveillance, traffic control (ramp metering), variable message signs, gate control (of reversible lanes) and lane controls (indication of travel lane).
• Integrate STC sub-systems for I-66 and I-395 inside the Capital Beltway to the new software system
• STC sub-systems for I-495
• Dulles Toll Road
• I-66 from 17-mile away from beltway to I-81
• I-95 from 17-mile away from beltway to Fredricksburg

System 4 – Incident Management System

The incident management system enables VDOT to identify the occurrence and nature of roadway or roadside incidents, initiate an appropriate response, and clear the incident in a timely manner.

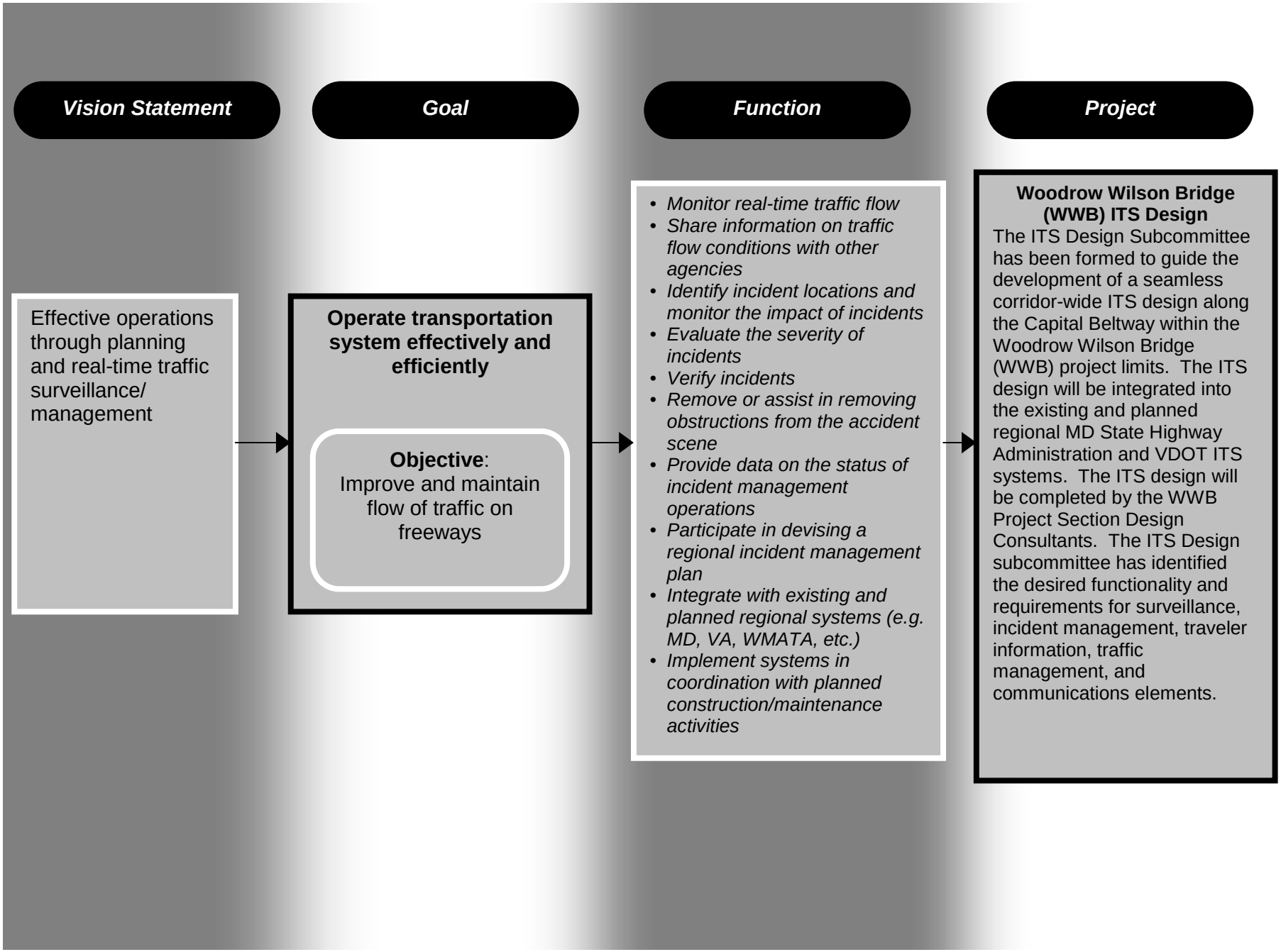
The following projects are included under the Incident Management System:

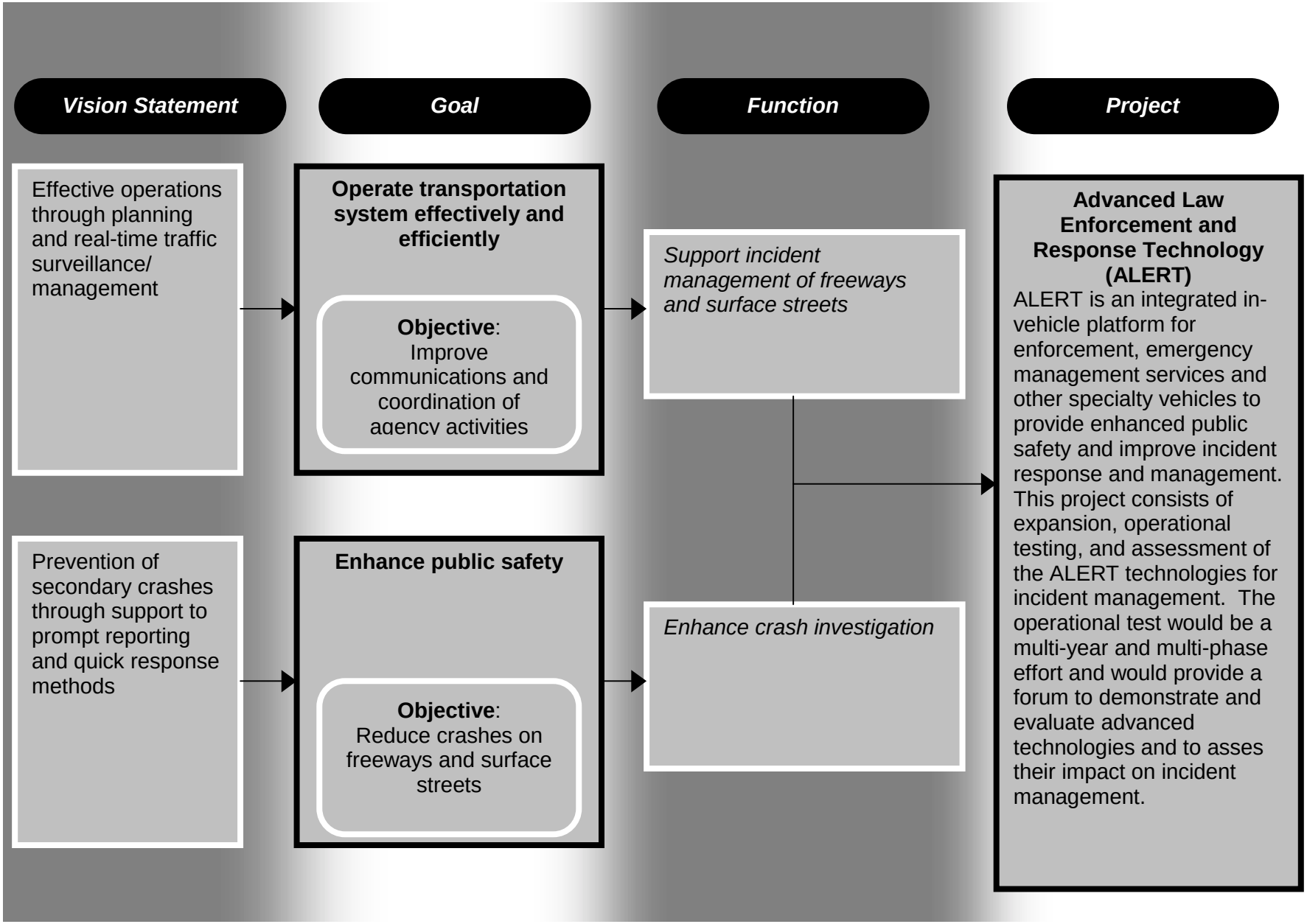
- *Woodrow Wilson Bridge ITS design*
- *Advanced Law Enforcement and Response Technology (ALERT)*
- *Springfield Interchange Congestion Management Program*
- *Enhanced Use of Video Images for Springfield Interchange*
- AVL for Safety Service Patrol
- Roadway Maintenance Operations Link to TCC
- **Workzone Safety System**
- Uniform Incident Response Protocol Implementation
- Low Cost Route Diversion Study

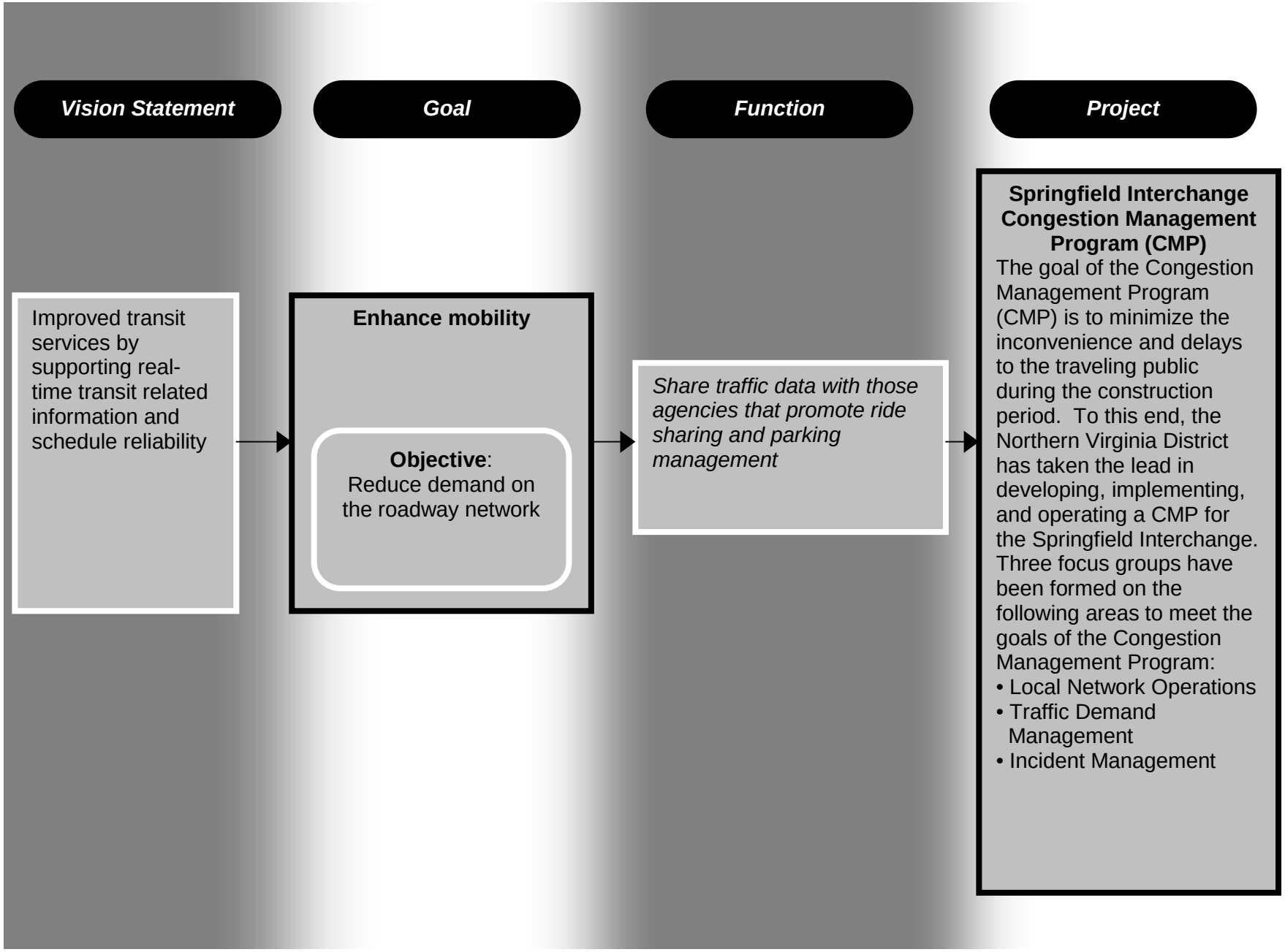
- Mayday System
  - Uniform Incident response and Dispatch Protocol Update
  - Lesson Learned: from Construction Impact Mitigation Strategies
  - **Springfield Interchange Smart Travel Implementation**
  - **Woodrow Wilson Bridge Smart Travel Implementation**

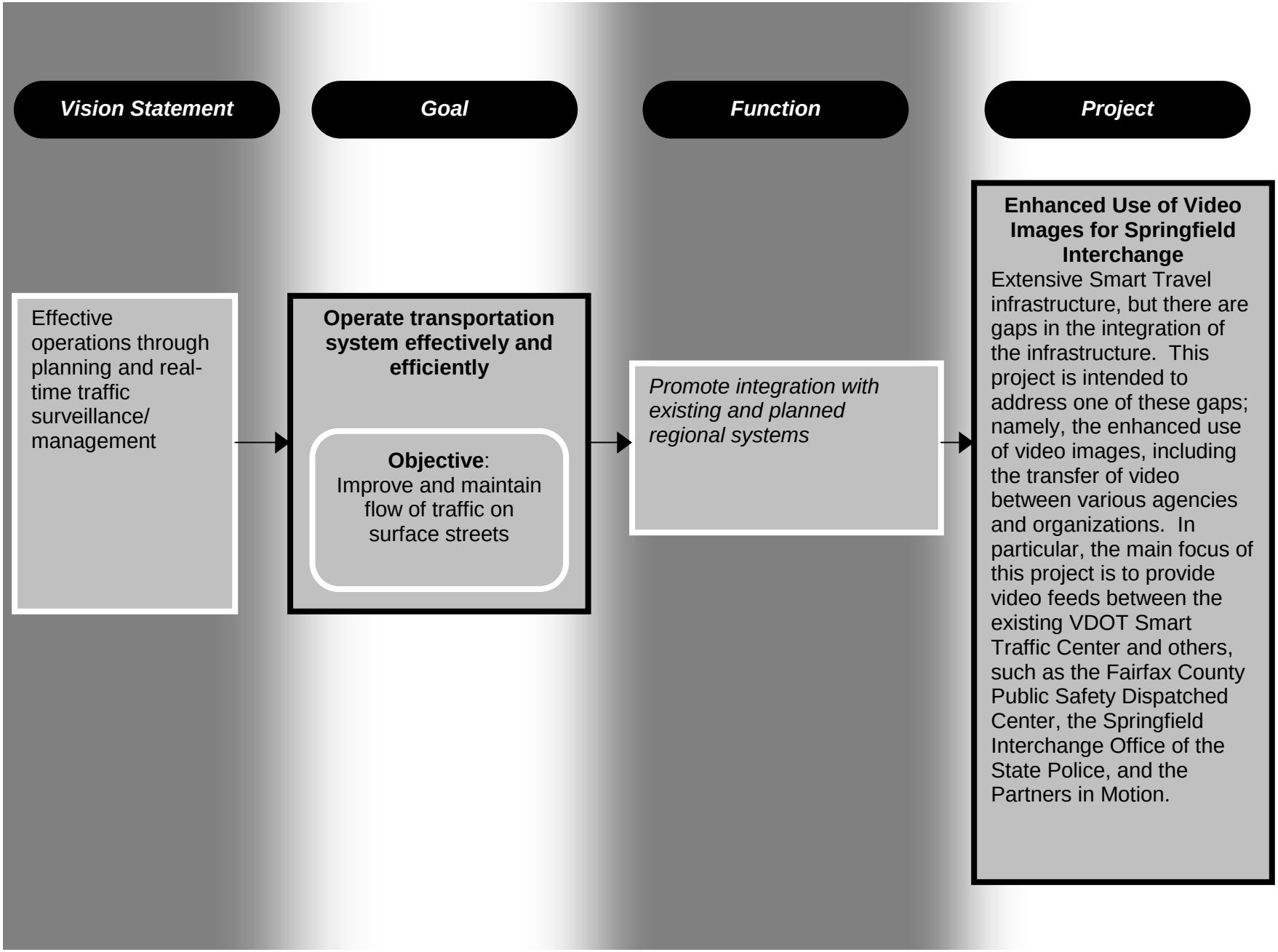
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

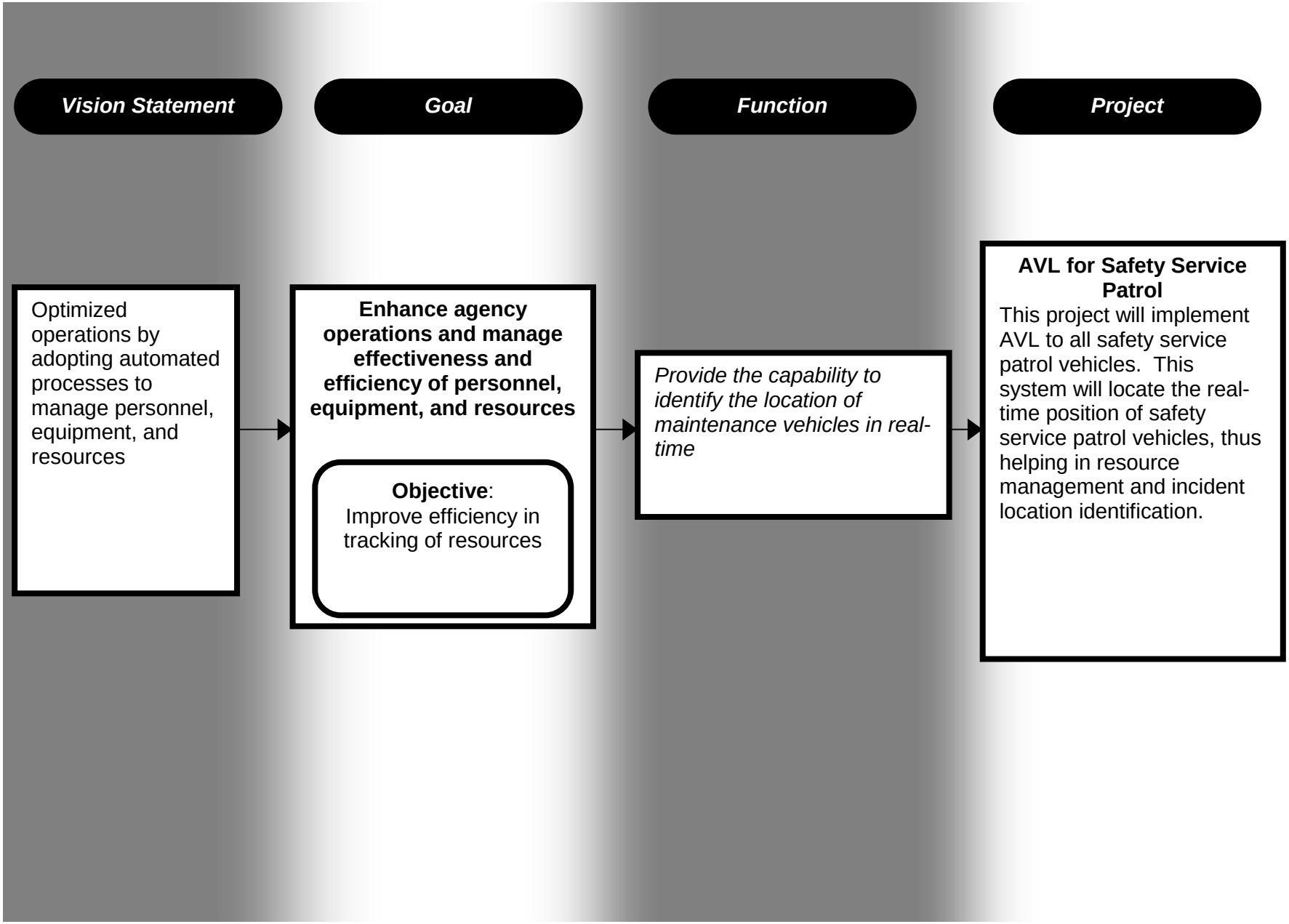
The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement. As the *Uniform Incident response and Dispatch Protocol Update* is an extension of the Uniform Incident Response Protocol Implementation project, the mapping of this project is not shown.

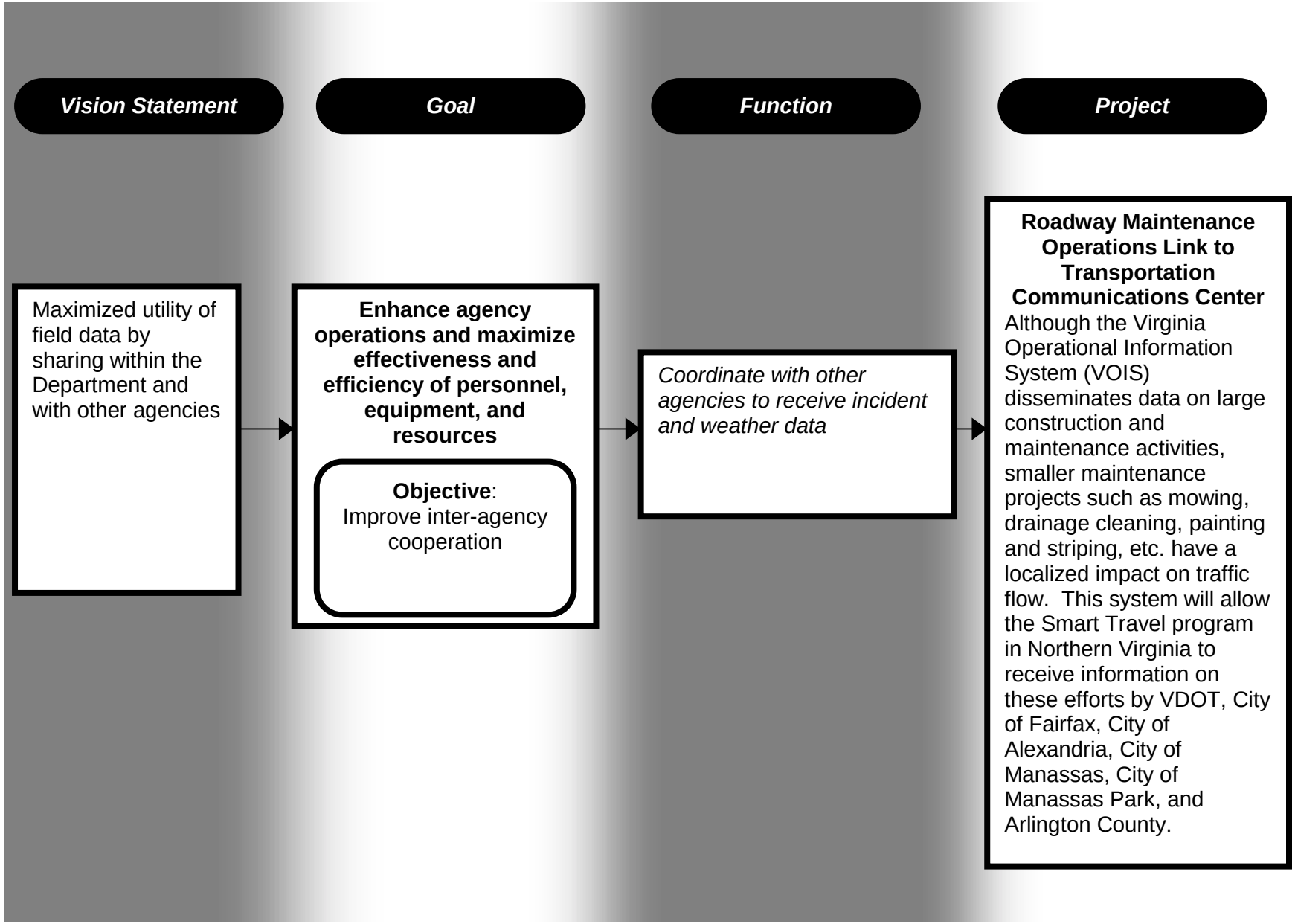

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
• Monitor real-time traffic flow
• Share information on traffic flow conditions with other agencies
• Identify incident locations and monitor the impact of incidents
• Evaluate the severity of incidents
• Verify incidents
• Remove or assist in removing obstructions from the accident scene
• Provide data on the status of incident management operations
• Participate in devising a regional incident management plan
• Integrate with existing and planned regional systems (e.g. MD, VA, WMATA, etc.)
• Implement systems in coordination with planned construction/maintenance activities
Woodrow Wilson Bridge (WWB) ITS Design
The ITS Design Subcommittee has been formed to guide the development of a seamless corridor-wide ITS design along the Capital Beltway within the Woodrow Wilson Bridge (WWB) project limits. The ITS design will be integrated into the existing and planned regional MD State Highway Administration and VDOT ITS systems. The ITS design will be completed by the WWB Project Section Design Consultants. The ITS Design subcommittee has identified the desired functionality and requirements for surveillance, incident management, traveler information, traffic management, and communications elements.

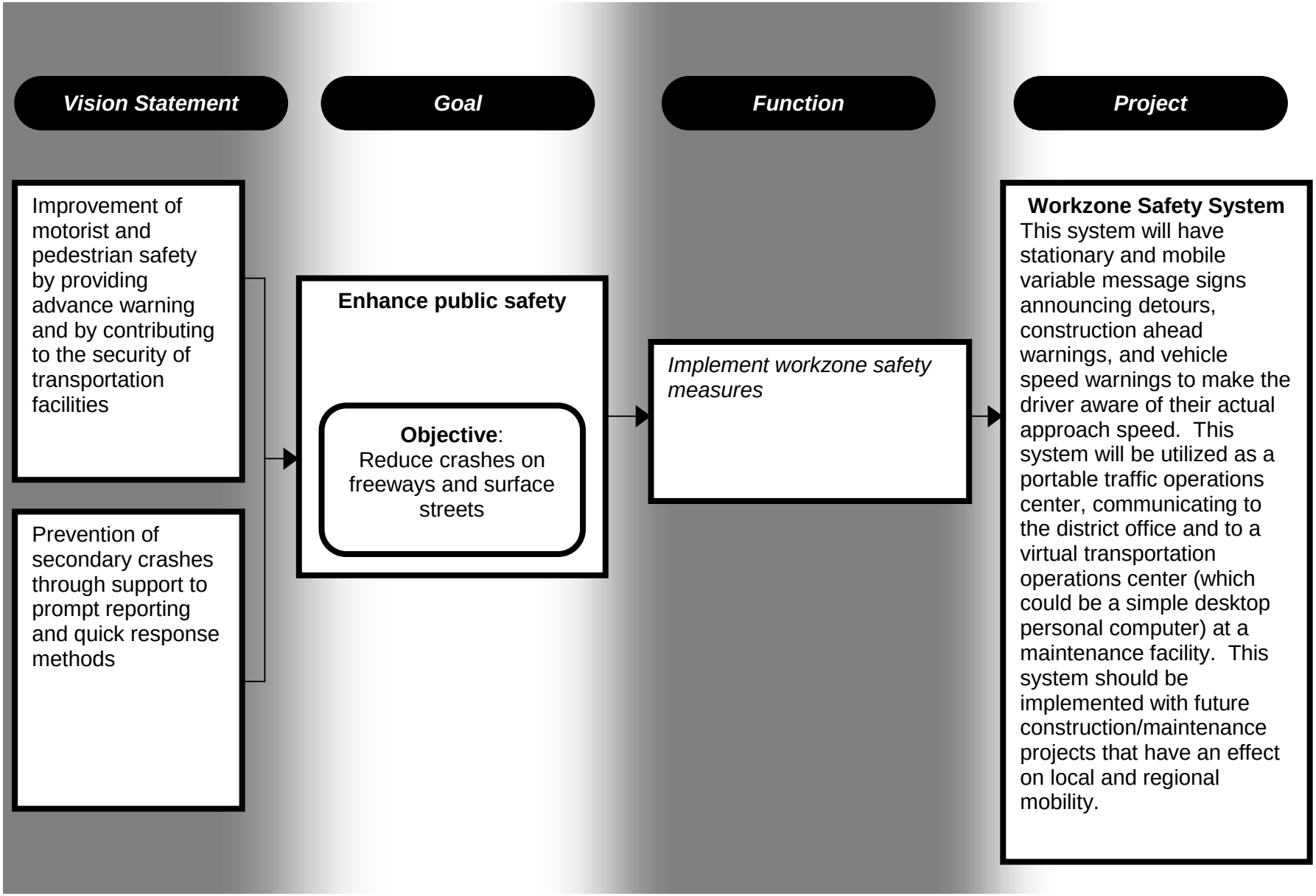

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve communications and coordination of agency activities
Support incident management of freeways and surface streets
Prevention of secondary crashes through support to prompt reporting and quick response methods
Enhance public safety
Objective: Reduce crashes on freeways and surface streets
Enhance crash investigation
Advanced Law Enforcement and Response Technology (ALERT)
ALERT is an integrated in-vehicle platform for enforcement, emergency management services and other specialty vehicles to provide enhanced public safety and improve incident response and management. This project consists of expansion, operational testing, and assessment of the ALERT technologies for incident management. The operational test would be a multi-year and multi-phase effort and would provide a forum to demonstrate and evaluate advanced technologies and to asses their impact on incident management.

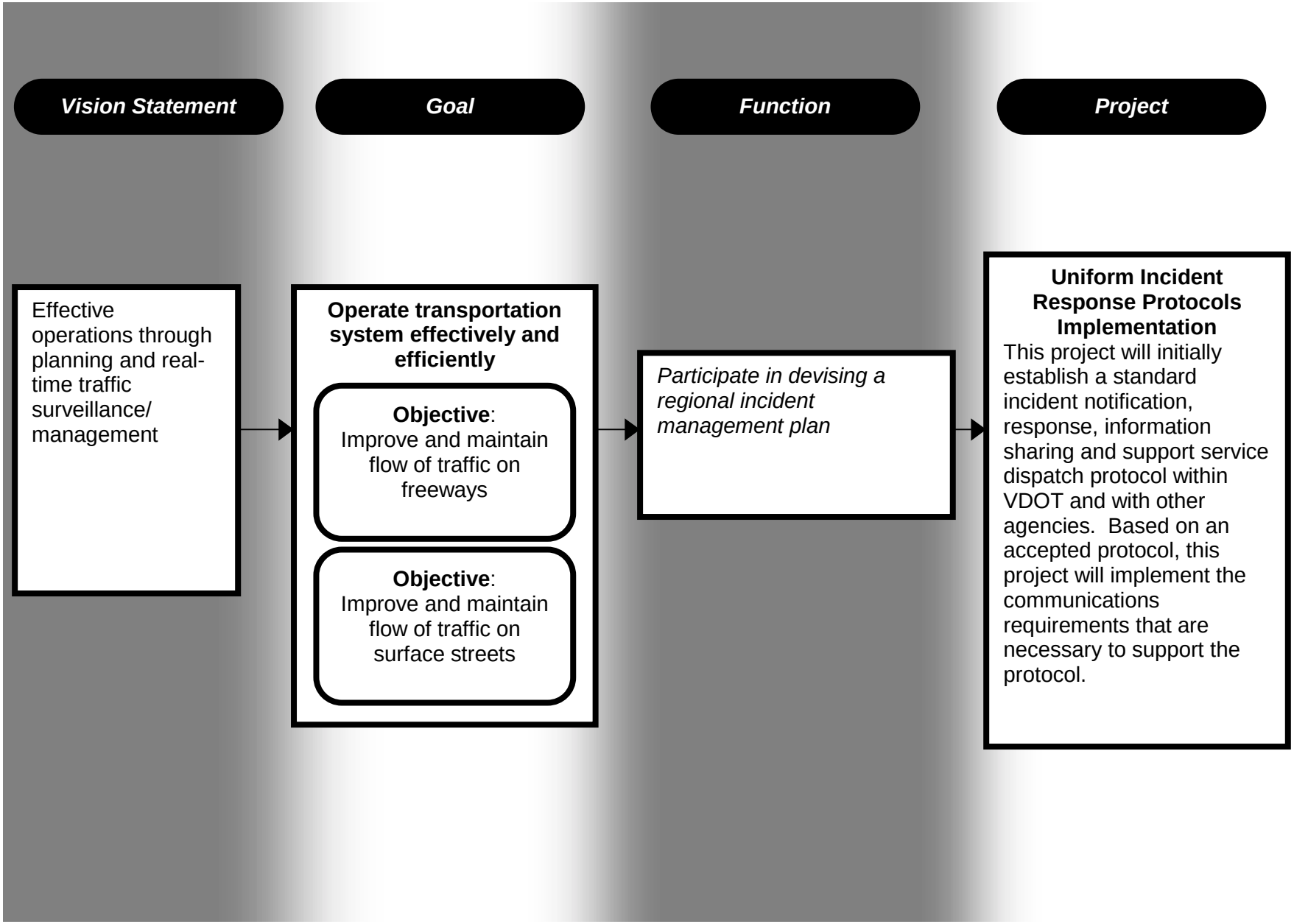

Vision Statement
Goal
Function
Project
Improved transit services by supporting real-time transit related information and schedule reliability
Enhance mobility
Objective: Reduce demand on the roadway network
Share traffic data with those agencies that promote ride sharing and parking management
Springfield Interchange Congestion Management Program (CMP)
The goal of the Congestion Management Program (CMP) is to minimize the inconvenience and delays to the traveling public during the construction period. To this end, the Northern Virginia District has taken the lead in developing, implementing, and operating a CMP for the Springfield Interchange. Three focus groups have been formed on the following areas to meet the goals of the Congestion Management Program:
• Local Network Operations
• Traffic Demand Management
• Incident Management

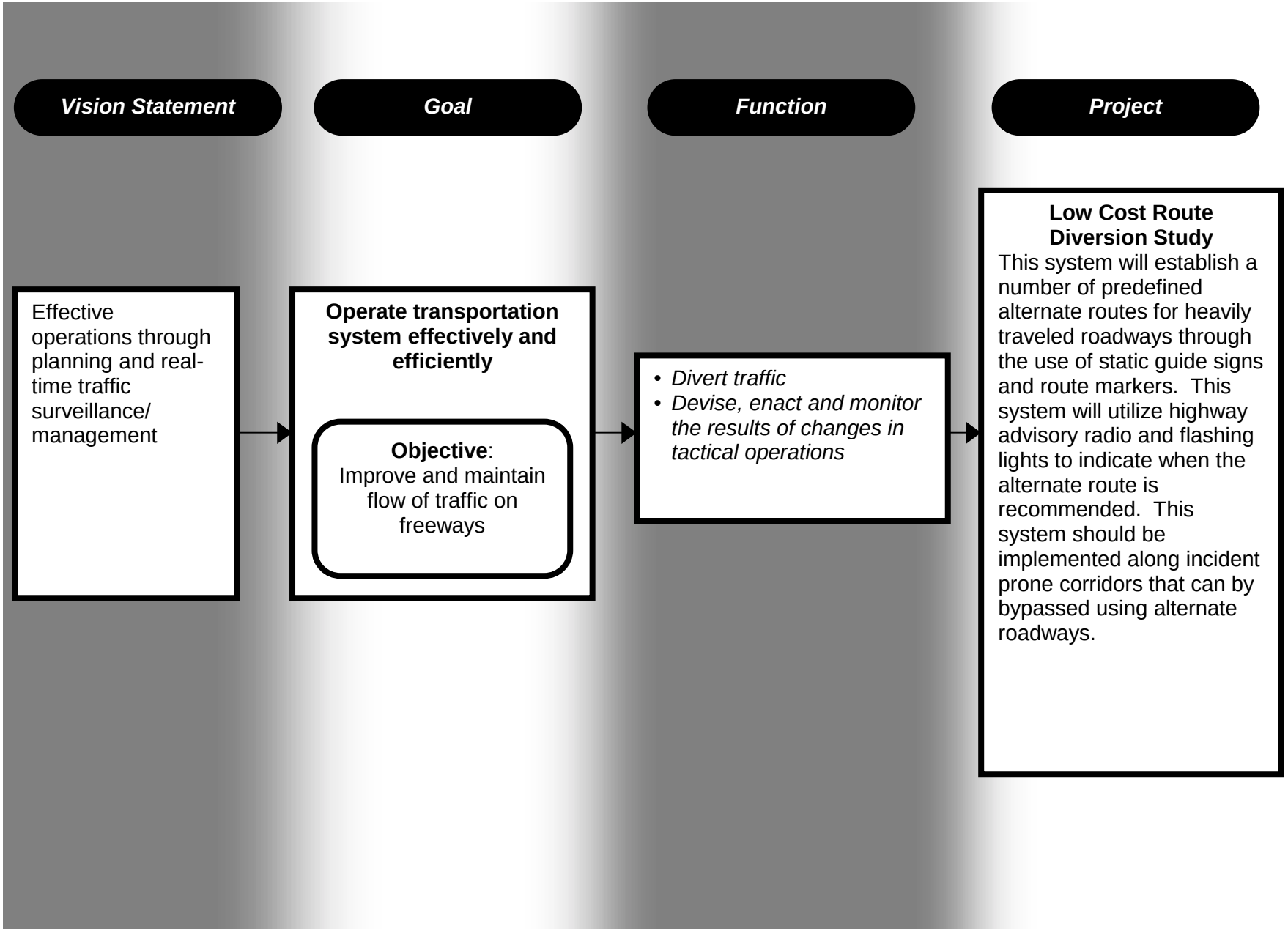

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
Promote integration with existing and planned regional systems
Enhanced Use of Video Images for Springfield Interchange
Extensive Smart Travel infrastructure, but there are gaps in the integration of the infrastructure. This project is intended to address one of these gaps; namely, the enhanced use of video images, including the transfer of video between various agencies and organizations. In particular, the main focus of this project is to provide video feeds between the existing VDOT Smart Traffic Center and others, such as the Fairfax County Public Safety Dispatched Center, the Springfield Interchange Office of the State Police, and the Partners in Motion.

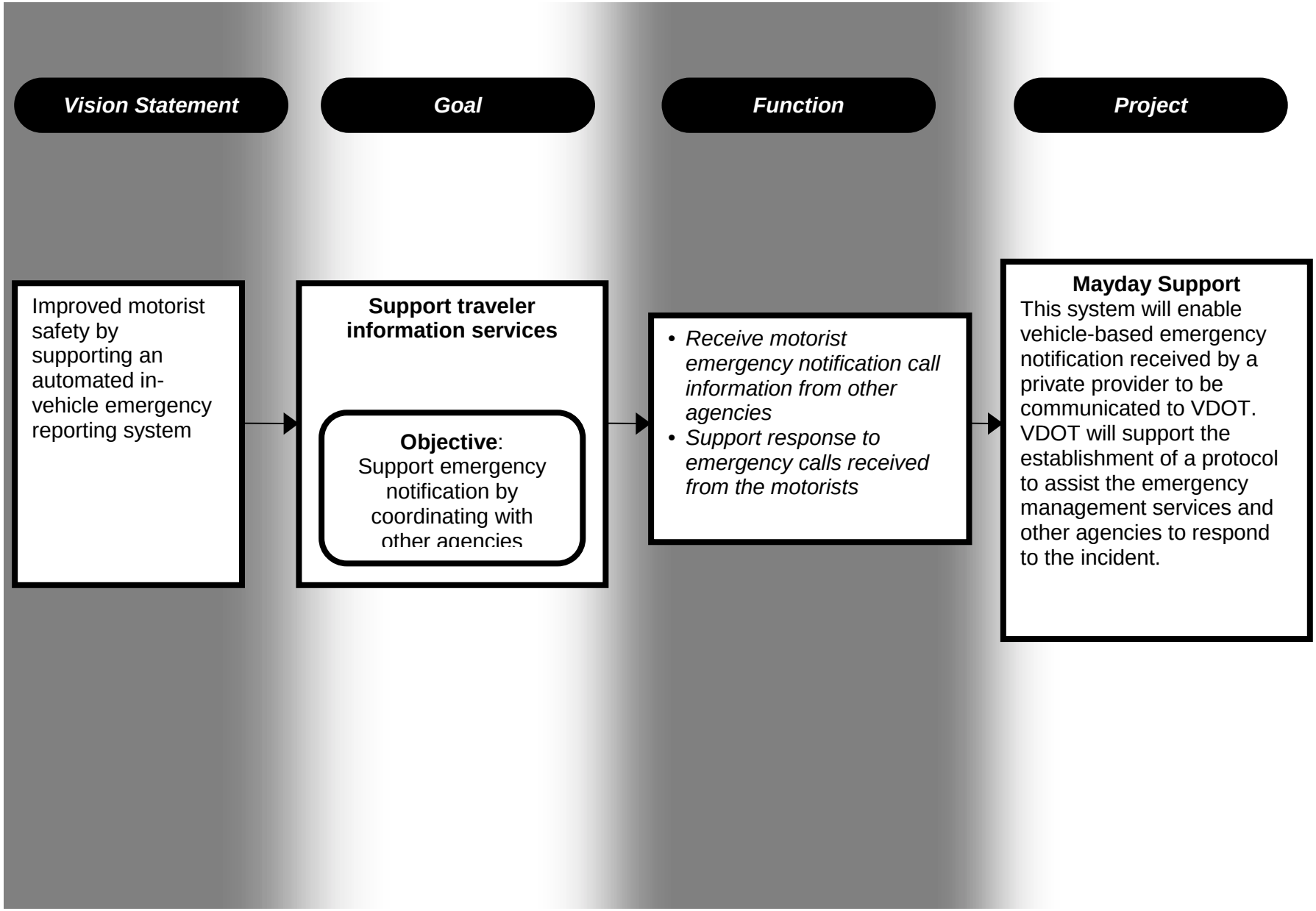

Vision Statement
Goal
Function
Project
Optimized operations by adopting automated processes to manage personnel, equipment, and resources
Enhance agency operations and manage effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve efficiency in tracking of resources
Provide the capability to identify the location of maintenance vehicles in real-time
AVL for Safety Service Patrol
This project will implement AVL to all safety service patrol vehicles. This system will locate the real-time position of safety service patrol vehicles, thus helping in resource management and incident location identification.

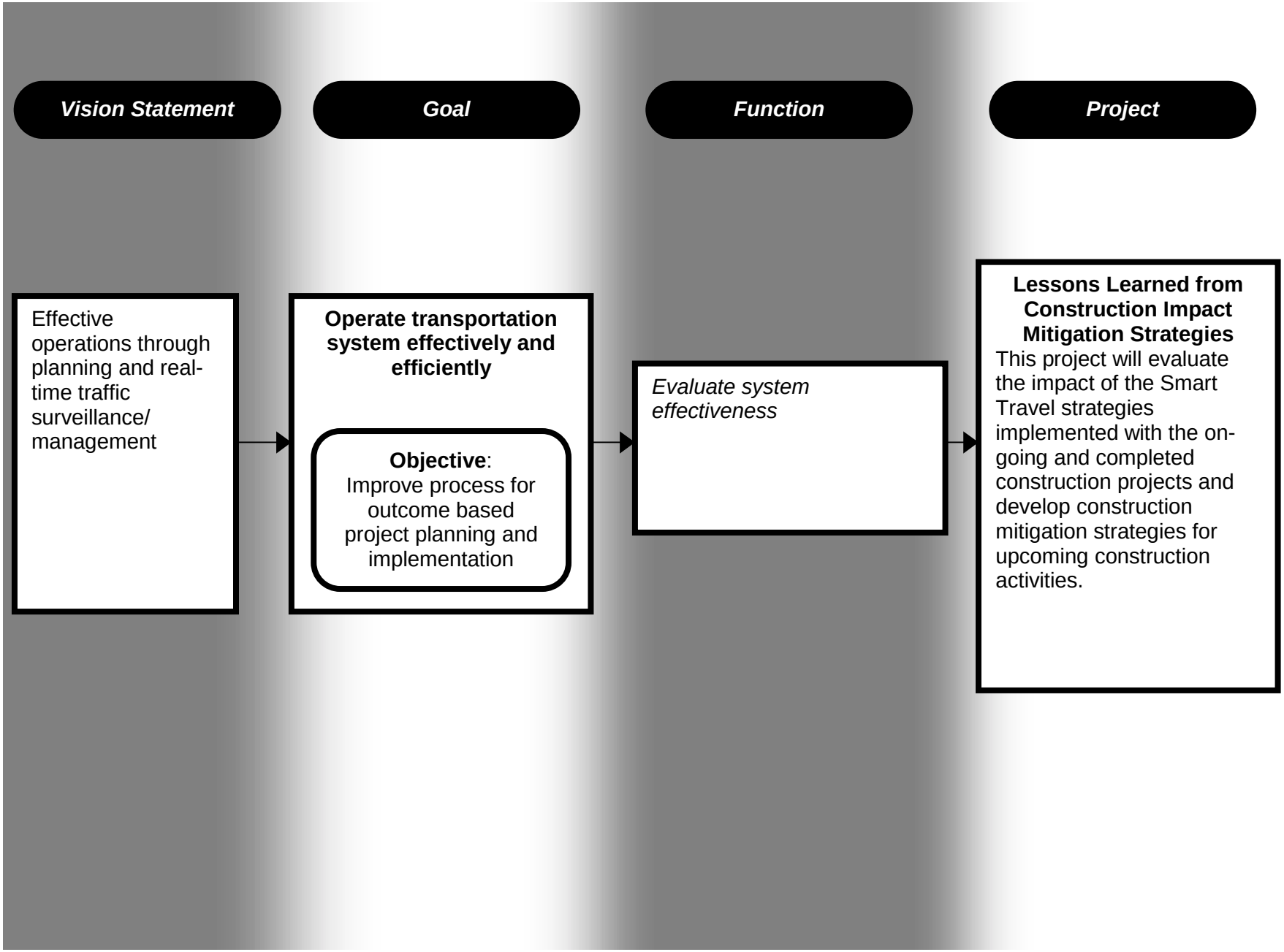

Vision Statement
Goal
Function
Project
Maximized utility of field data by sharing within the Department and with other agencies
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve inter-agency cooperation
Coordinate with other agencies to receive incident and weather data
Roadway Maintenance Operations Link to Transportation Communications Center
Although the Virginia Operational Information System (VOIS) disseminates data on large construction and maintenance activities, smaller maintenance projects such as mowing, drainage cleaning, painting and striping, etc. have a localized impact on traffic flow. This system will allow the Smart Travel program in Northern Virginia to receive information on these efforts by VDOT, City of Fairfax, City of Alexandria, City of Manassas, City of Manassas Park, and Arlington County.

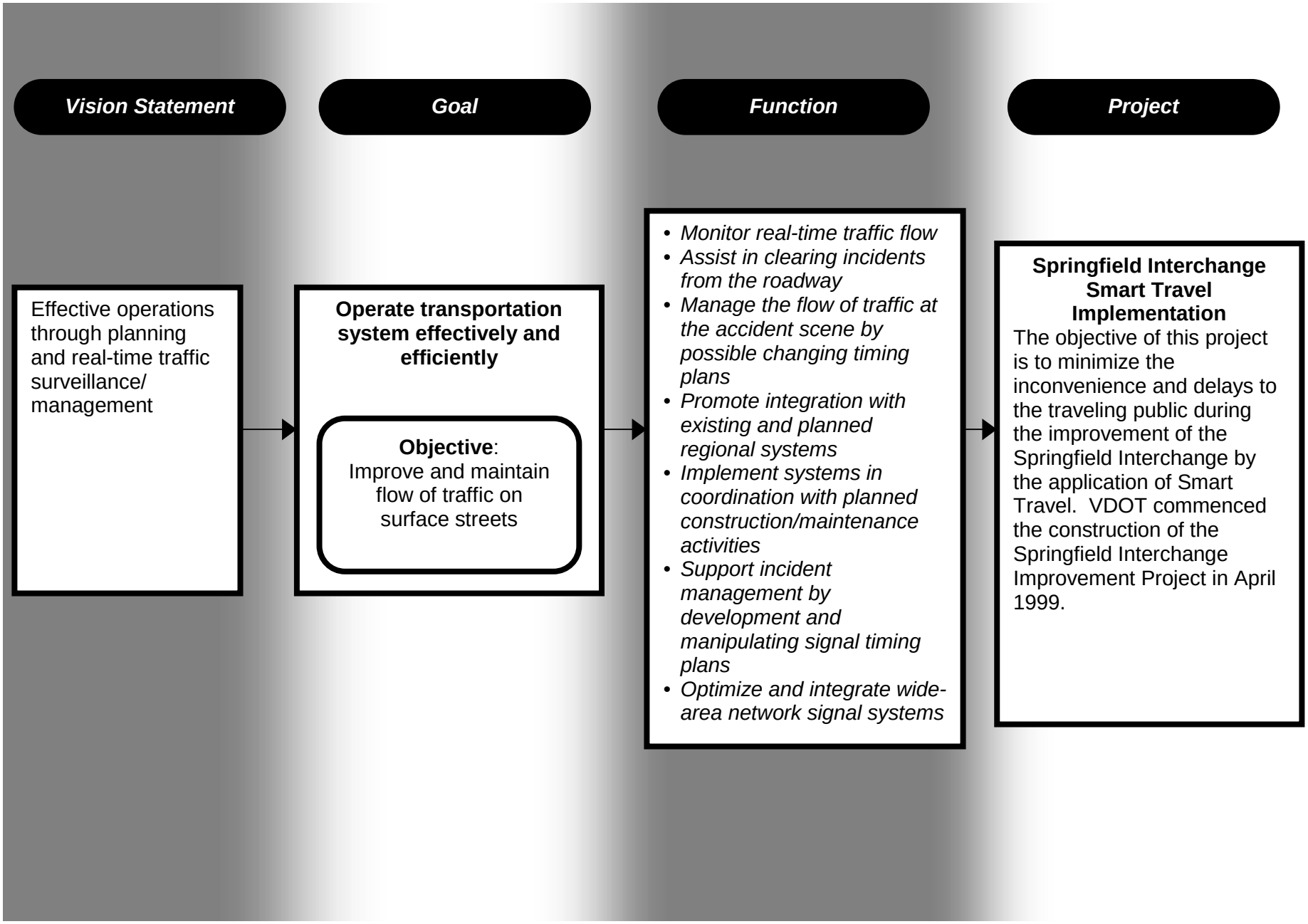

Vision Statement
Goal
Function
Project
Improvement of motorist and pedestrian safety by providing advance warning and by contributing to the security of transportation facilities
Prevention of secondary crashes through support to prompt reporting and quick response methods
Enhance public safety
Objective: Reduce crashes on freeways and surface streets
Implement workzone safety measures
Workzone Safety System
This system will have stationary and mobile variable message signs announcing detours, construction ahead warnings, and vehicle speed warnings to make the driver aware of their actual approach speed. This system will be utilized as a portable traffic operations center, communicating to the district office and to a virtual transportation operations center (which could be a simple desktop personal computer) at a maintenance facility. This system should be implemented with future construction/maintenance projects that have an effect on local and regional mobility.

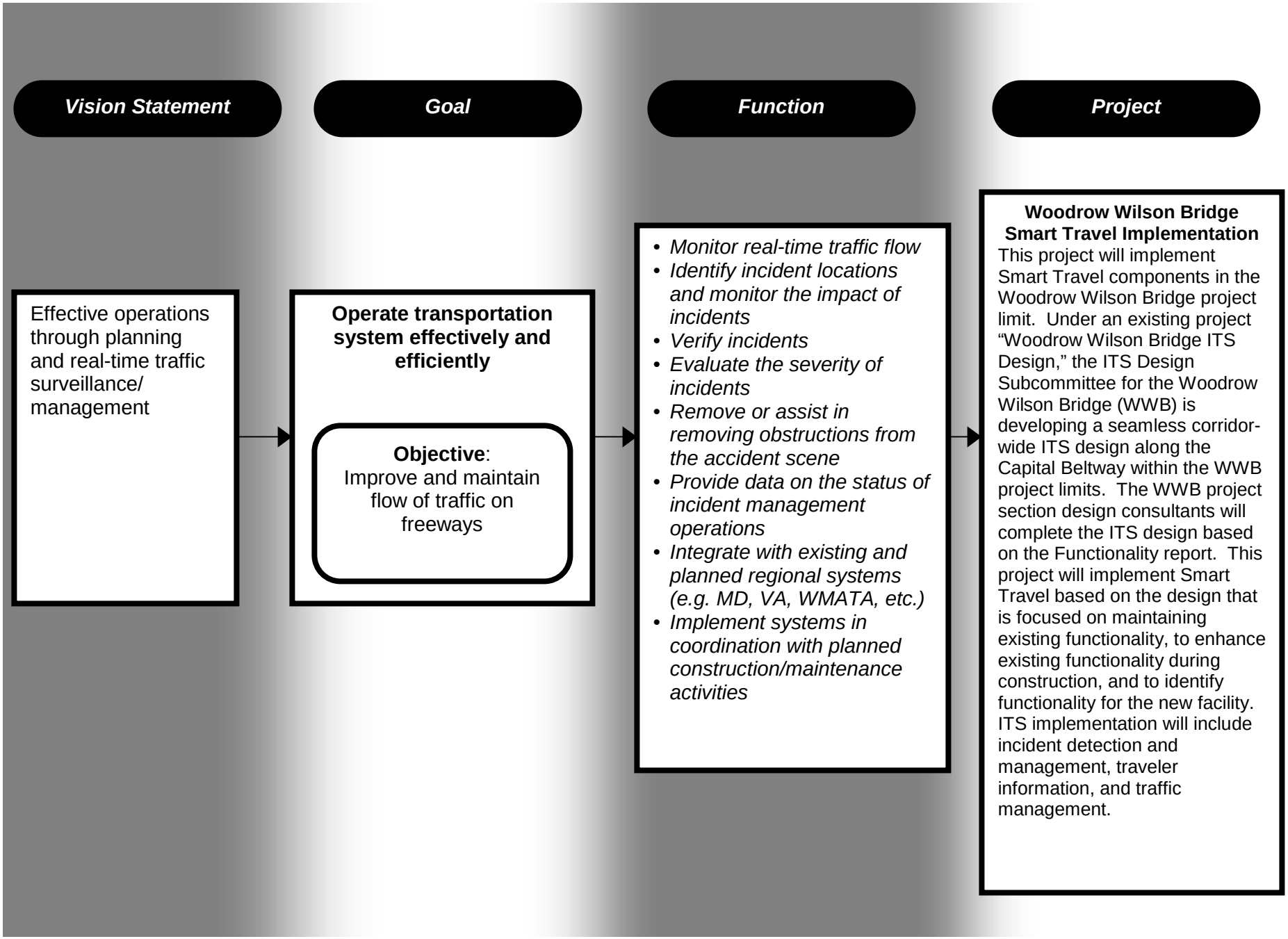

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
Objective: Improve and maintain flow of traffic on surface streets
Participate in devising a regional incident management plan
Uniform Incident Response Protocols Implementation
This project will initially establish a standard incident notification, response, information sharing and support service dispatch protocol within VDOT and with other agencies. Based on an accepted protocol, this project will implement the communications requirements that are necessary to support the protocol.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
• Divert traffic
• Devise, enact and monitor the results of changes in tactical operations
Low Cost Route Diversion Study
This system will establish a number of predefined alternate routes for heavily traveled roadways through the use of static guide signs and route markers. This system will utilize highway advisory radio and flashing lights to indicate when the alternate route is recommended. This system should be implemented along incident prone corridors that can by bypassed using alternate roadways.


Vision Statement
Goal
Function
Project
Improved motorist safety by supporting an automated in-vehicle emergency reporting system
Support traveler information services
Objective: Support emergency notification by coordinating with other agencies
• Receive motorist emergency notification call information from other agencies
• Support response to emergency calls received from the motorists
Mayday Support
This system will enable vehicle-based emergency notification received by a private provider to be communicated to VDOT. VDOT will support the establishment of a protocol to assist the emergency management services and other agencies to respond to the incident.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Evaluate system effectiveness
Lessons Learned from Construction Impact Mitigation Strategies
This project will evaluate the impact of the Smart Travel strategies implemented with the on-going and completed construction projects and develop construction mitigation strategies for upcoming construction activities.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
• Monitor real-time traffic flow
• Assist in clearing incidents from the roadway
• Manage the flow of traffic at the accident scene by possible changing timing plans
• Promote integration with existing and planned regional systems
• Implement systems in coordination with planned construction/maintenance activities
• Support incident management by development and manipulating signal timing plans
• Optimize and integrate wide-area network signal systems
Springfield Interchange Smart Travel Implementation
The objective of this project is to minimize the inconvenience and delays to the traveling public during the improvement of the Springfield Interchange by the application of Smart Travel. VDOT commenced the construction of the Springfield Interchange Improvement Project in April 1999.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
• Monitor real-time traffic flow
• Identify incident locations and monitor the impact of incidents
• Verify incidents
• Evaluate the severity of incidents
• Remove or assist in removing obstructions from the accident scene
• Provide data on the status of incident management operations
• Integrate with existing and planned regional systems (e.g. MD, VA, WMATA, etc.)
• Implement systems in coordination with planned construction/maintenance activities
Woodrow Wilson Bridge Smart Travel Implementation
This project will implement Smart Travel components in the Woodrow Wilson Bridge project limit. Under an existing project "Woodrow Wilson Bridge ITS Design," the ITS Design Subcommittee for the Woodrow Wilson Bridge (WWB) is developing a seamless corridor-wide ITS design along the Capital Beltway within the WWB project limits. The WWB project section design consultants will complete the ITS design based on the Functionality report. This project will implement Smart Travel based on the design that is focused on maintaining existing functionality, to enhance existing functionality during construction, and to identify functionality for the new facility. ITS implementation will include incident detection and management, traveler information, and traffic management.

System 5 – Multi-modal Support System

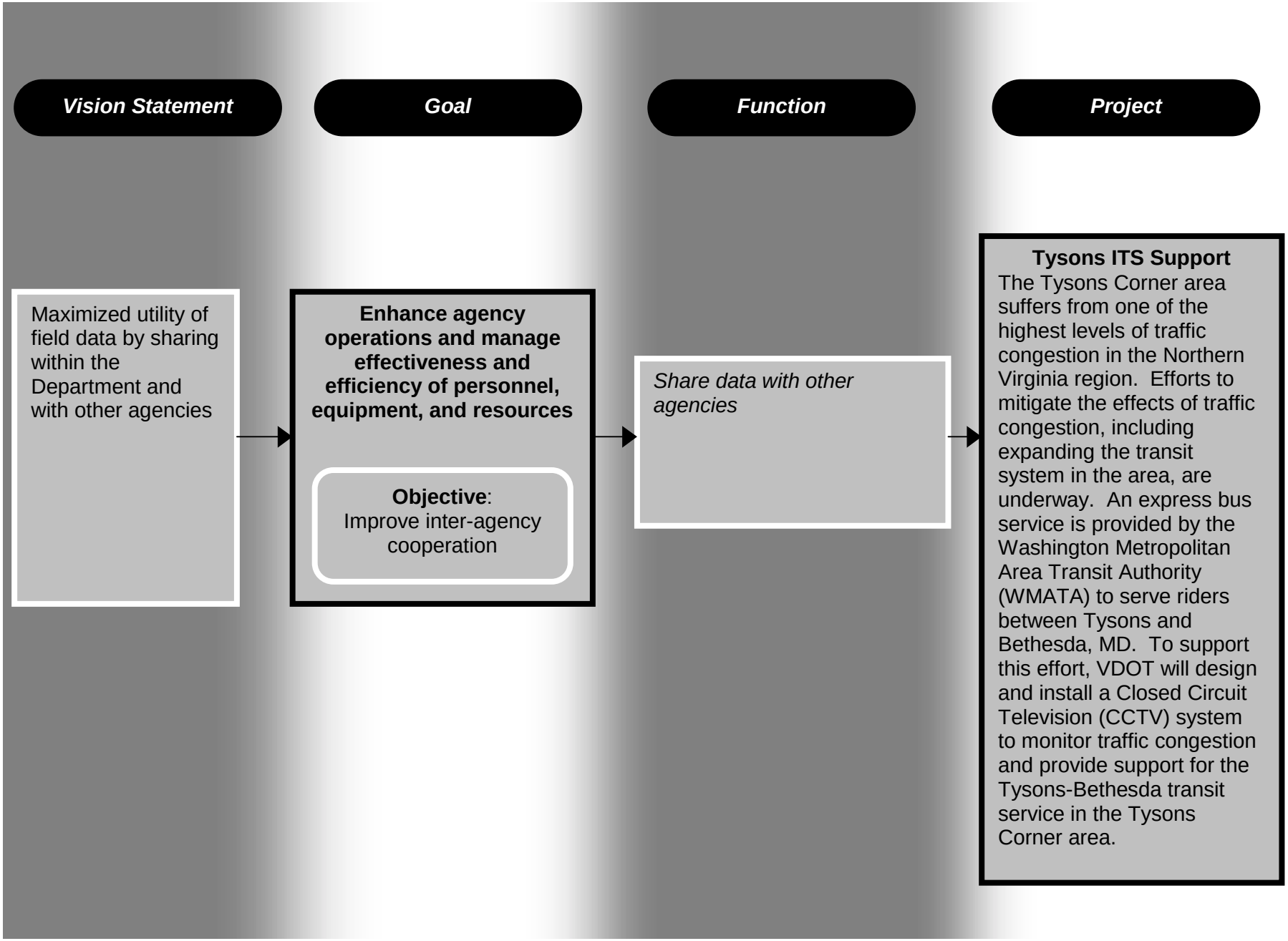
The Multi-modal Support System provides travelers with information on alternate modes of transportation. The intent of this system is to distribute a broad range of modal information, allowing travelers to choose the most appropriate mode available and decreasing travel demand on the highway system.

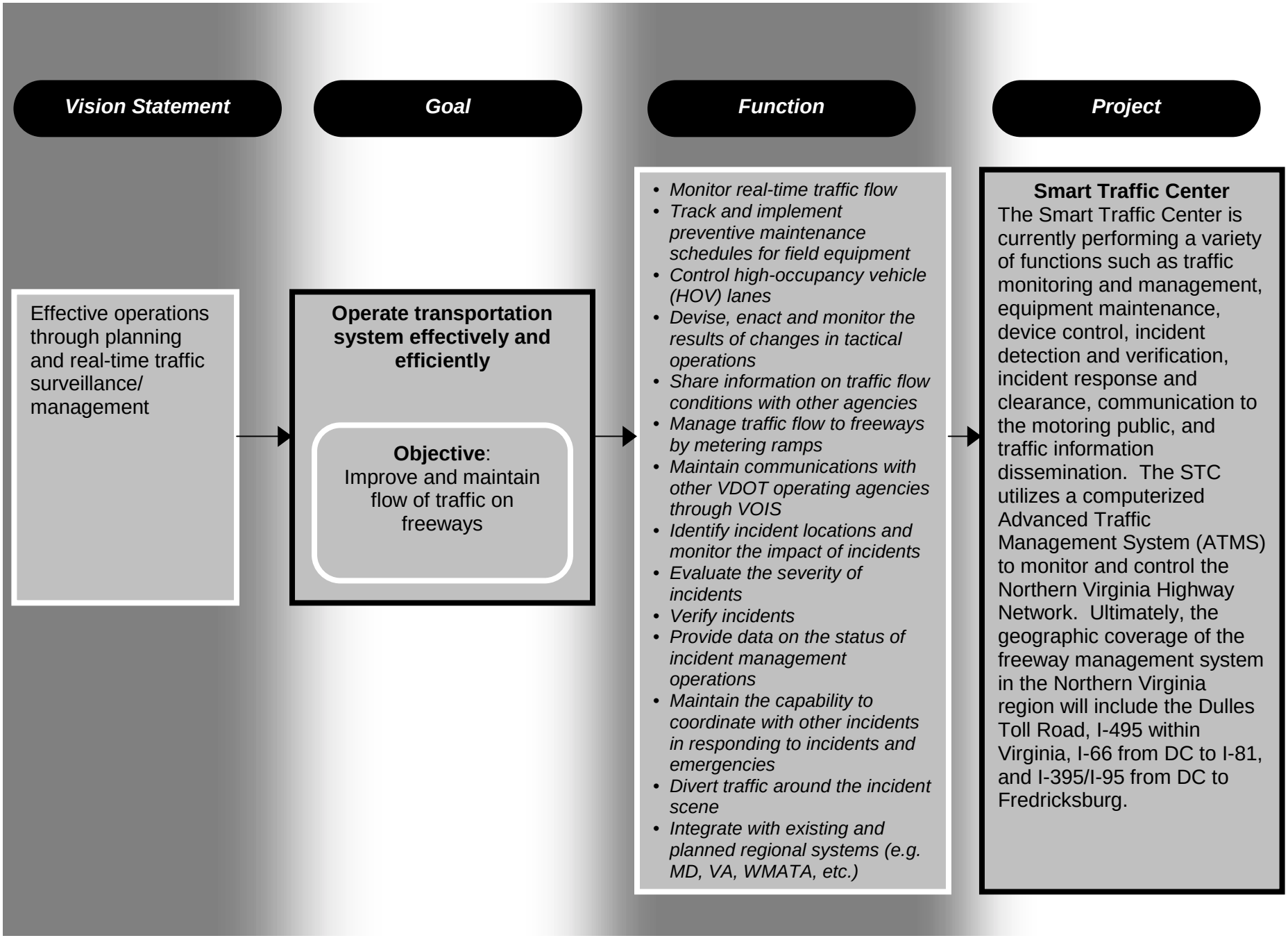
The following projects are included under the Multi-modal Support System:

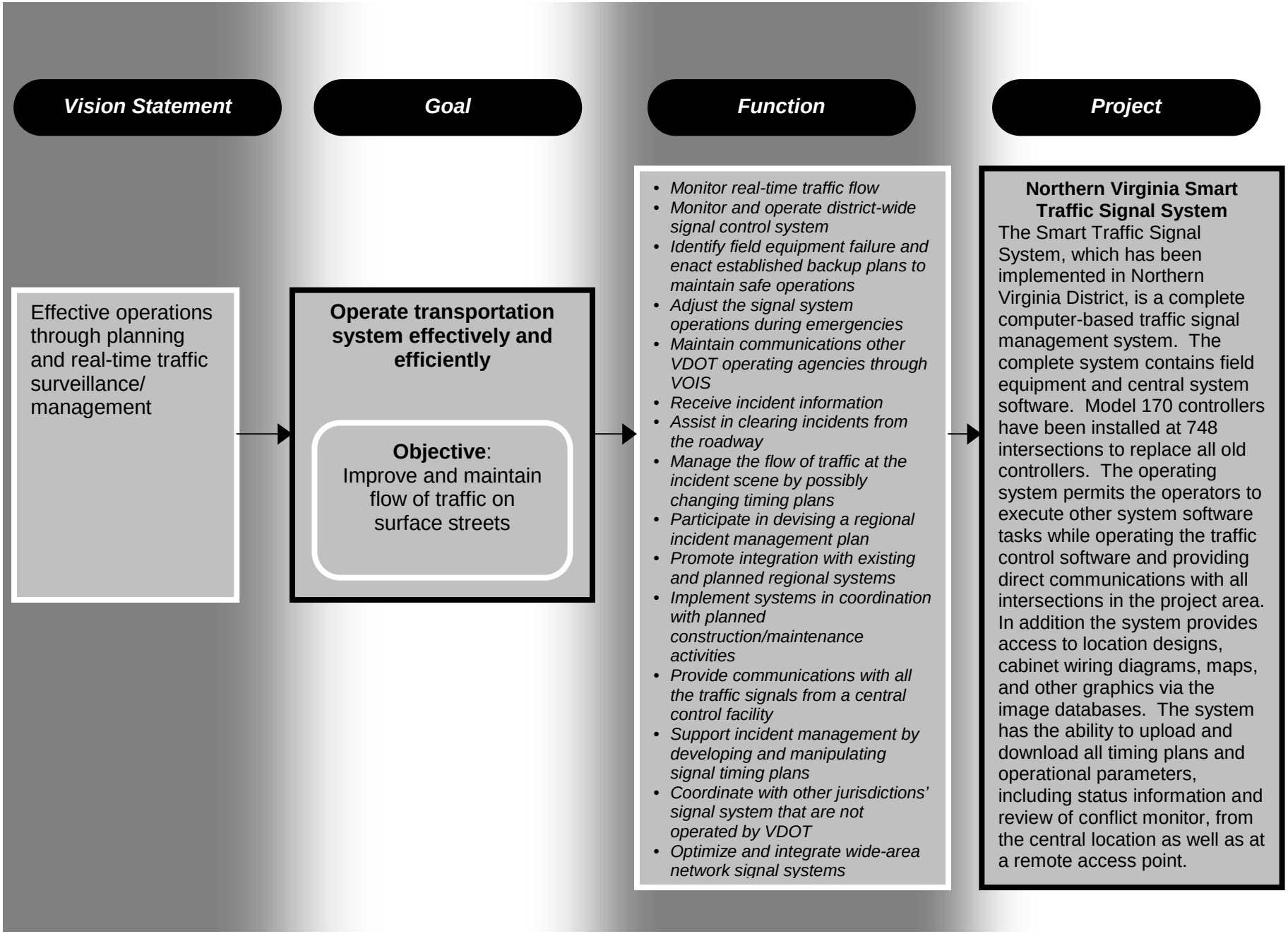
- *Tysons ITS Support*
- *Smart Traffic Center*
- *Northern Virginia Smart Signal System*
- *Dulles Corridor Technology Task Group*
- Transportation Demand Management Support
- **Evaluation of Support to Transit Operations**

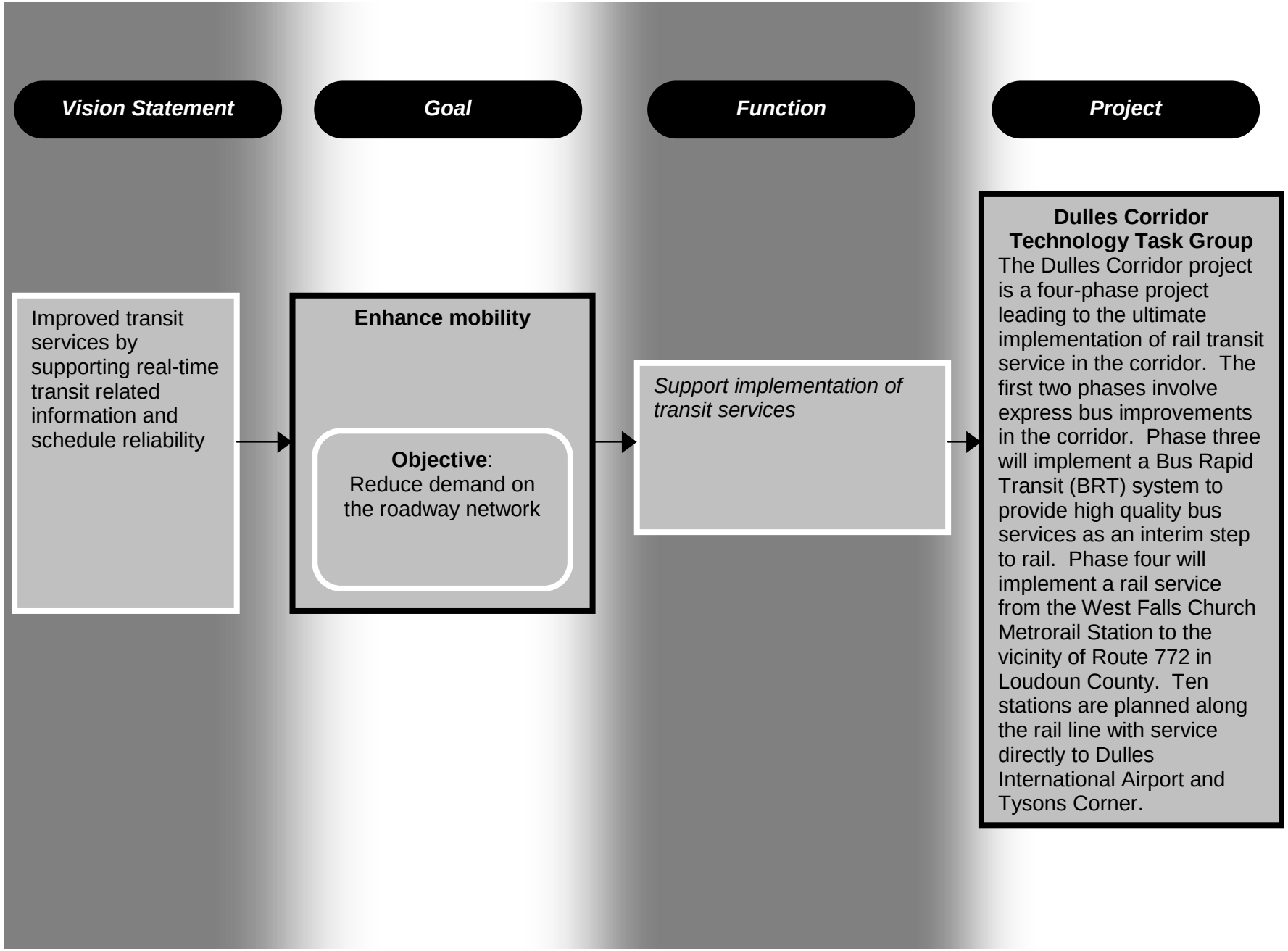
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

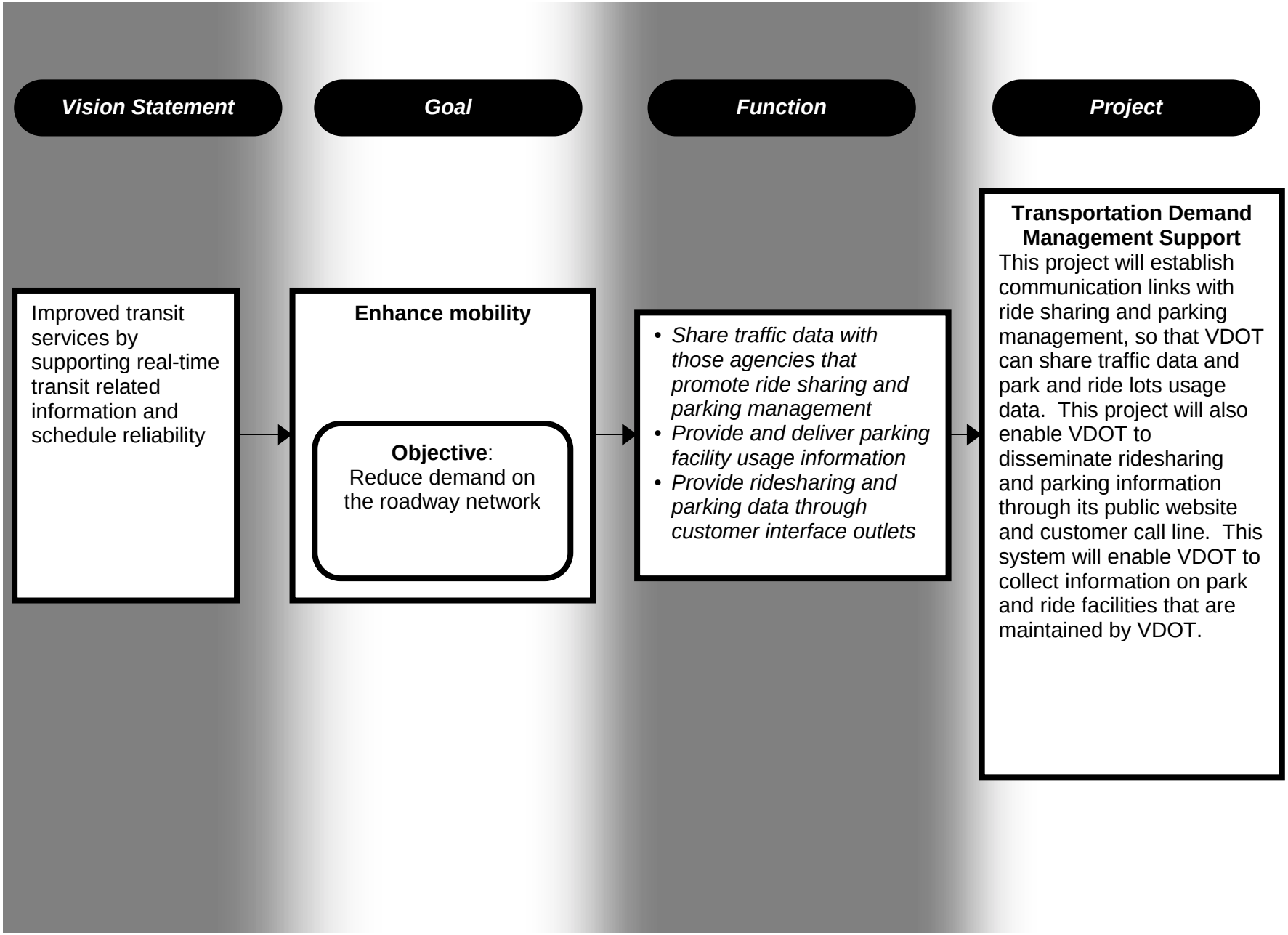
The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement.

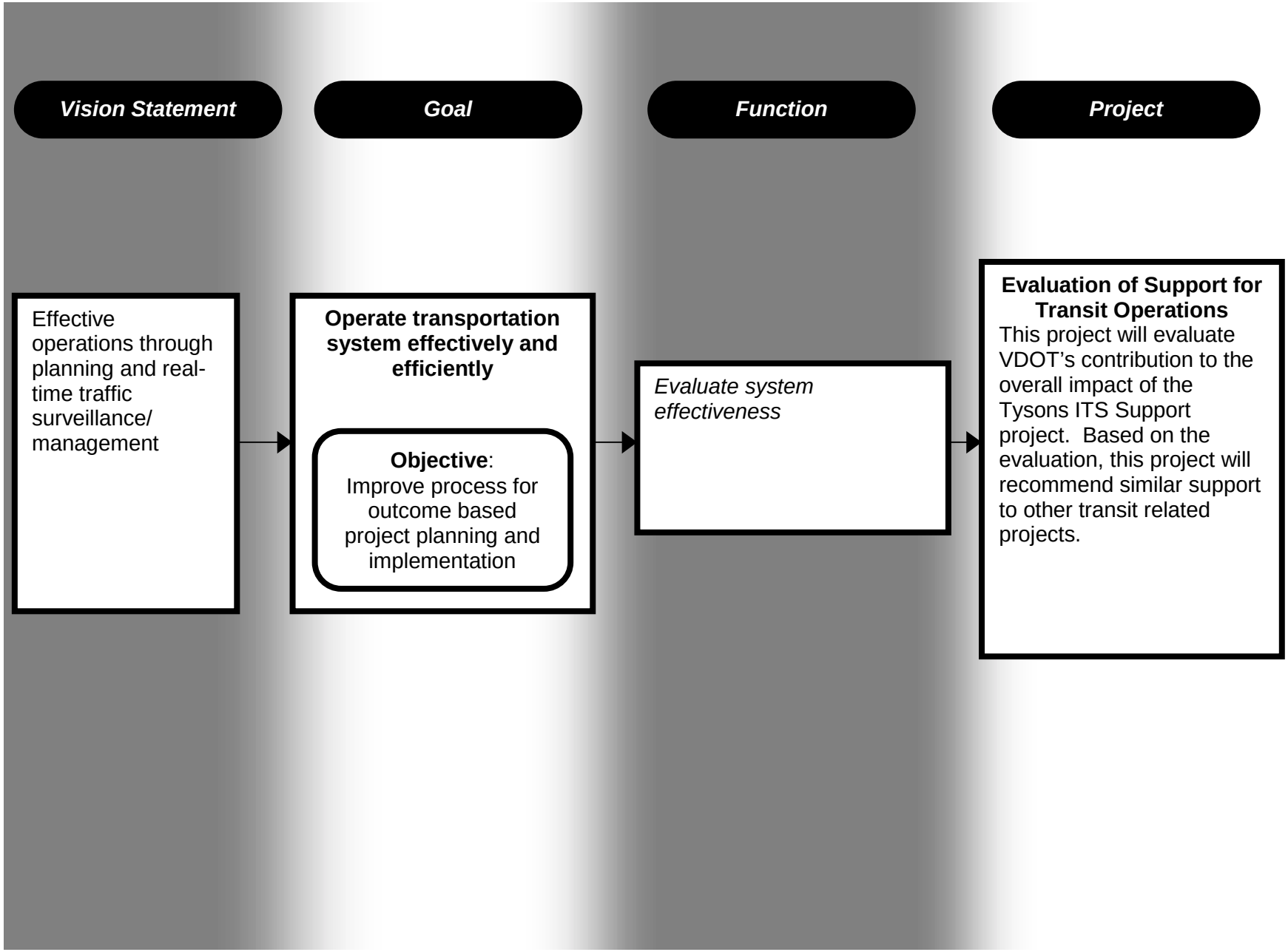

Vision Statement
Goal
Function
Project
Maximized utility of field data by sharing within the Department and with other agencies
Enhance agency operations and manage effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve inter-agency cooperation
Share data with other agencies
Tysons ITS Support
The Tysons Corner area suffers from one of the highest levels of traffic congestion in the Northern Virginia region. Efforts to mitigate the effects of traffic congestion, including expanding the transit system in the area, are underway. An express bus service is provided by the Washington Metropolitan Area Transit Authority (WMATA) to serve riders between Tysons and Bethesda, MD. To support this effort, VDOT will design and install a Closed Circuit Television (CCTV) system to monitor traffic congestion and provide support for the Tysons-Bethesda transit service in the Tysons Corner area.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
• Monitor real-time traffic flow
• Track and implement preventive maintenance schedules for field equipment
• Control high-occupancy vehicle (HOV) lanes
• Devise, enact and monitor the results of changes in tactical operations
• Share information on traffic flow conditions with other agencies
• Manage traffic flow to freeways by metering ramps
• Maintain communications with other VDOT operating agencies through VOIS
• Identify incident locations and monitor the impact of incidents
• Evaluate the severity of incidents
• Verify incidents
• Provide data on the status of incident management operations
• Maintain the capability to coordinate with other incidents in responding to incidents and emergencies
• Divert traffic around the incident scene
• Integrate with existing and planned regional systems (e.g. MD, VA, WMATA, etc.)
Smart Traffic Center
The Smart Traffic Center is currently performing a variety of functions such as traffic monitoring and management, equipment maintenance, device control, incident detection and verification, incident response and clearance, communication to the motoring public, and traffic information dissemination. The STC utilizes a computerized Advanced Traffic Management System (ATMS) to monitor and control the Northern Virginia Highway Network. Ultimately, the geographic coverage of the freeway management system in the Northern Virginia region will include the Dulles Toll Road, I-495 within Virginia, I-66 from DC to I-81, and I-395/I-95 from DC to Fredricksburg.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on surface streets
• Monitor real-time traffic flow
• Monitor and operate district-wide signal control system
• Identify field equipment failure and enact established backup plans to maintain safe operations
• Adjust the signal system operations during emergencies
• Maintain communications other VDOT operating agencies through VOIS
• Receive incident information
• Assist in clearing incidents from the roadway
• Manage the flow of traffic at the incident scene by possibly changing timing plans
• Participate in devising a regional incident management plan
• Promote integration with existing and planned regional systems
• Implement systems in coordination with planned construction/maintenance activities
• Provide communications with all the traffic signals from a central control facility
• Support incident management by developing and manipulating signal timing plans
• Coordinate with other jurisdictions' signal system that are not operated by VDOT
• Optimize and integrate wide-area network signal systems
Northern Virginia Smart Traffic Signal System
The Smart Traffic Signal System, which has been implemented in Northern Virginia District, is a complete computer-based traffic signal management system. The complete system contains field equipment and central system software. Model 170 controllers have been installed at 748 intersections to replace all old controllers. The operating system permits the operators to execute other system software tasks while operating the traffic control software and providing direct communications with all intersections in the project area. In addition the system provides access to location designs, cabinet wiring diagrams, maps, and other graphics via the image databases. The system has the ability to upload and download all timing plans and operational parameters, including status information and review of conflict monitor, from the central location as well as at a remote access point.


Vision Statement
Goal
Function
Project
Improved transit services by supporting real-time transit related information and schedule reliability
Enhance mobility
Objective: Reduce demand on the roadway network
Support implementation of transit services
Dulles Corridor Technology Task Group
The Dulles Corridor project is a four-phase project leading to the ultimate implementation of rail transit service in the corridor. The first two phases involve express bus improvements in the corridor. Phase three will implement a Bus Rapid Transit (BRT) system to provide high quality bus services as an interim step to rail. Phase four will implement a rail service from the West Falls Church Metrorail Station to the vicinity of Route 772 in Loudoun County. Ten stations are planned along the rail line with service directly to Dulles International Airport and Tysons Corner.


Vision Statement
Goal
Function
Project
Improved transit services by supporting real-time transit related information and schedule reliability
Enhance mobility
Objective: Reduce demand on the roadway network
• Share traffic data with those agencies that promote ride sharing and parking management
• Provide and deliver parking facility usage information
• Provide ridesharing and parking data through customer interface outlets
Transportation Demand Management Support
This project will establish communication links with ride sharing and parking management, so that VDOT can share traffic data and park and ride lots usage data. This project will also enable VDOT to disseminate ridesharing and parking information through its public website and customer call line. This system will enable VDOT to collect information on park and ride facilities that are maintained by VDOT.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Evaluate system effectiveness
Evaluation of Support for Transit Operations
This project will evaluate VDOT's contribution to the overall impact of the Tysons ITS Support project. Based on the evaluation, this project will recommend similar support to other transit related projects.

System 6 – Customer Service System

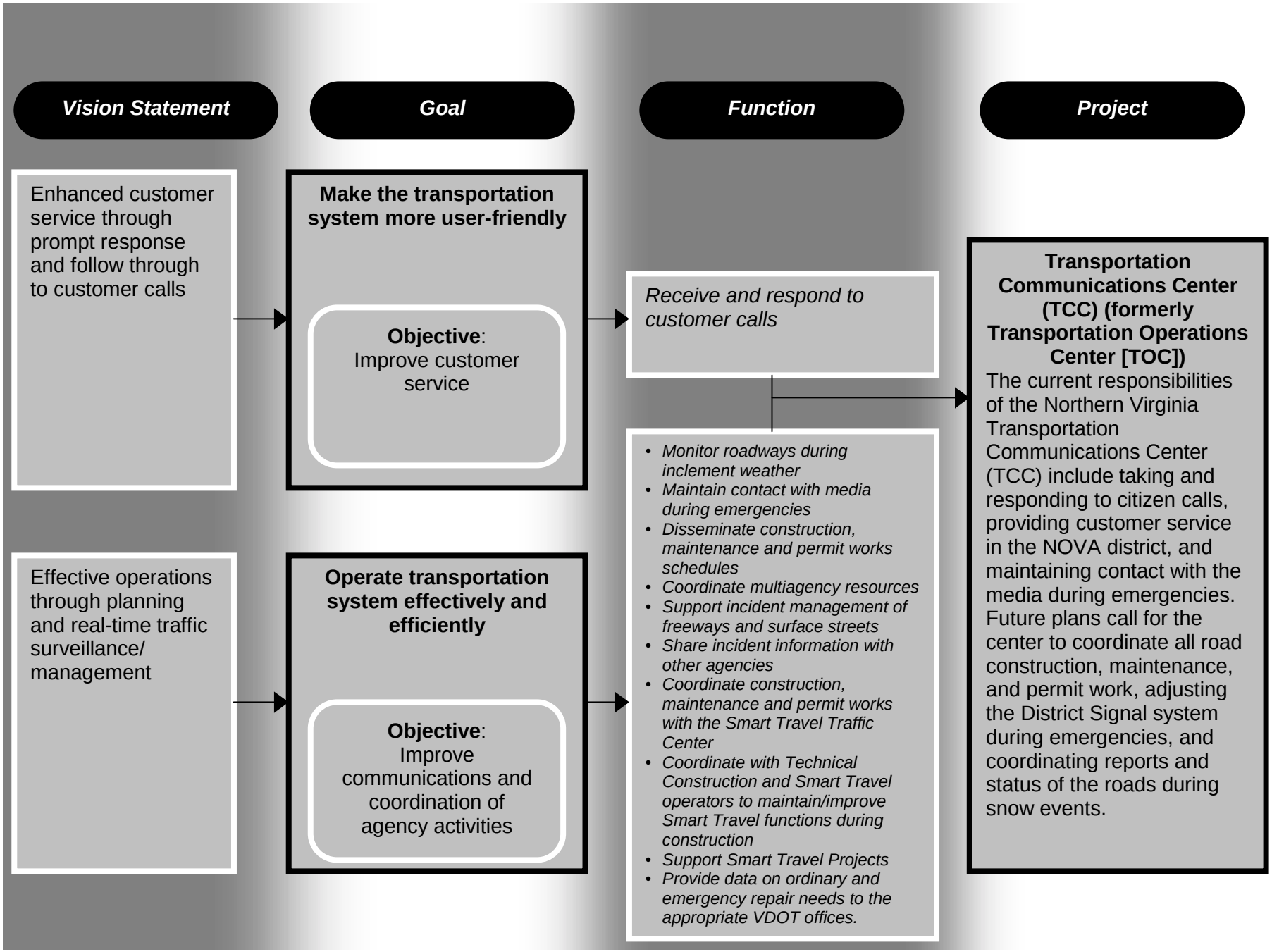
The customer service system provides a direct link between travelers and VDOT services. The system provides VDOT with feedback on customer satisfaction and allows management to target resources in response to customer demands.

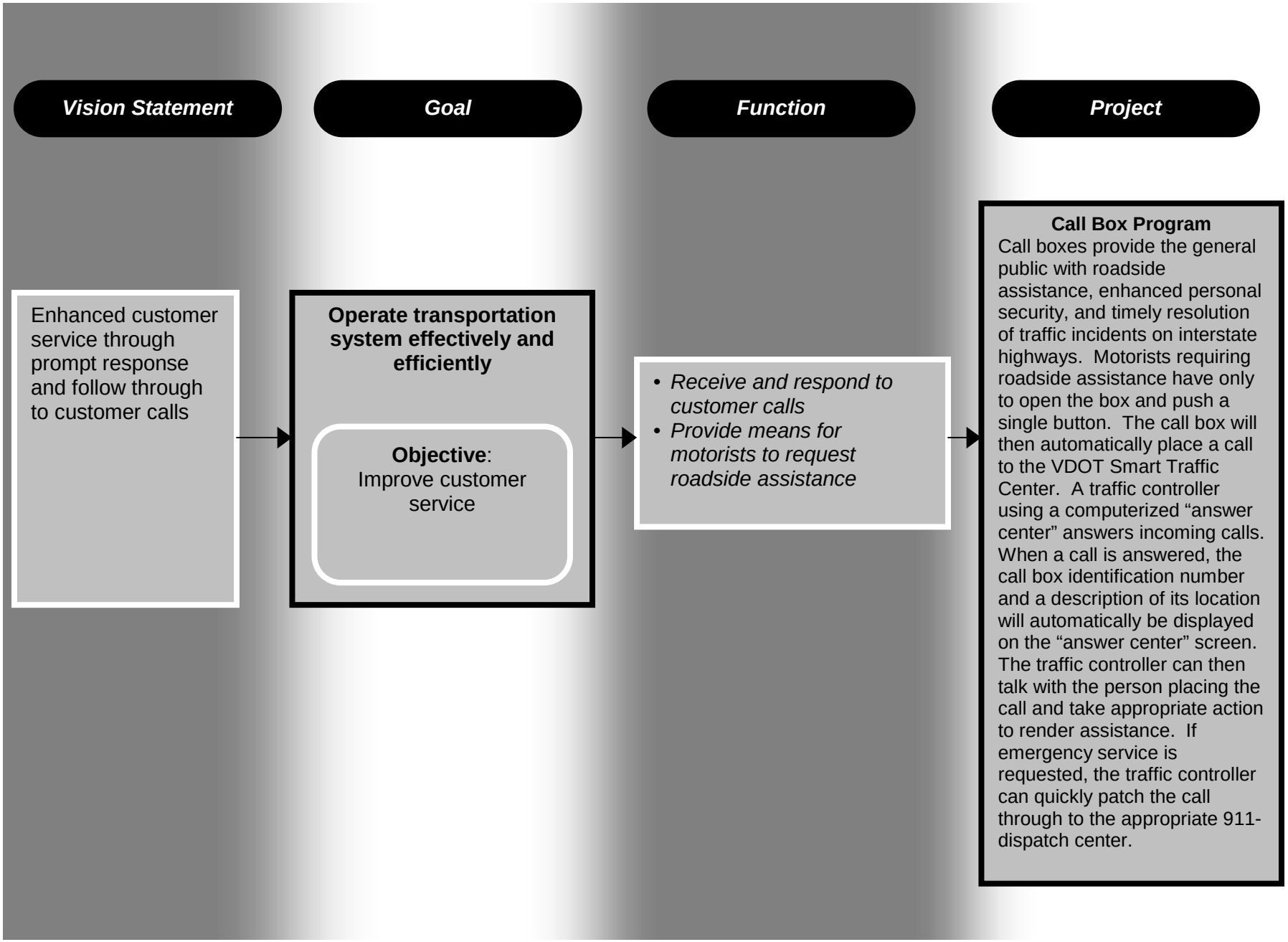
The following projects are included under the Customer Service System:

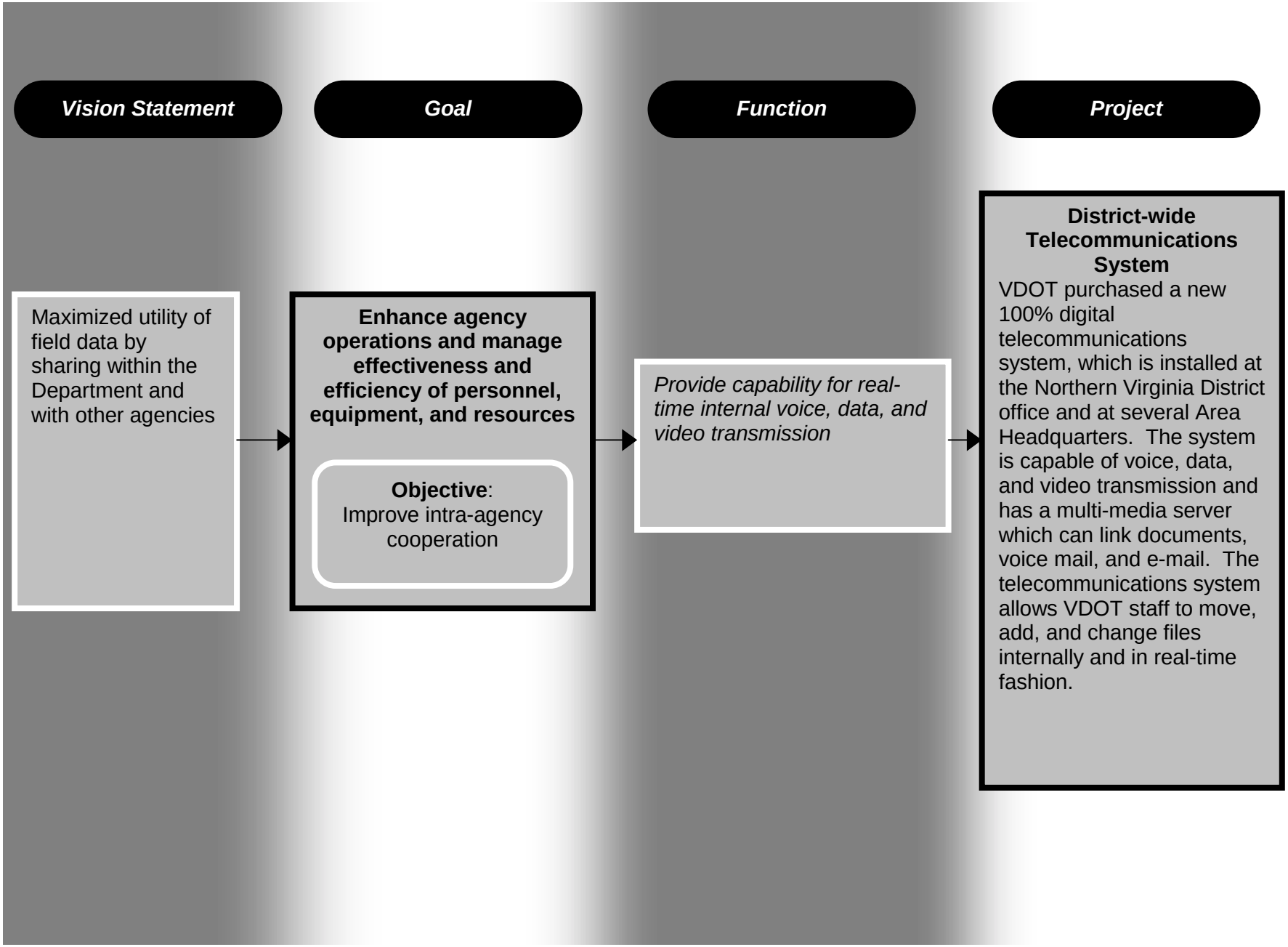
- *Transportation Communications Center*
- C*all Box Program*
- *Districtwide Tele-Communications System*
- Customer Service Enhancement
- Transportation Communications Center Operations Upgrade
- Emergency Call Services Upgrade
- **Customer Satisfaction Survey**

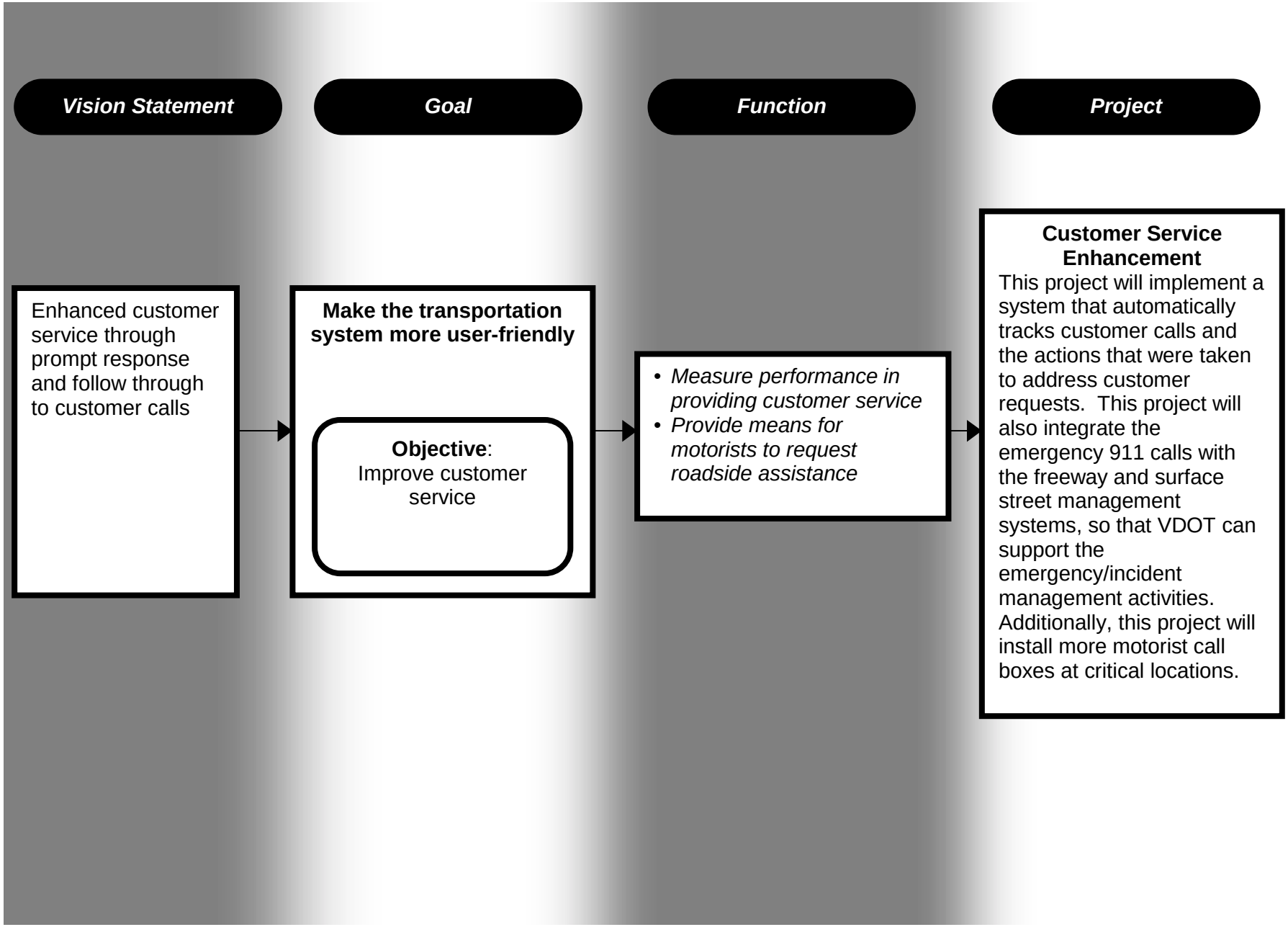
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

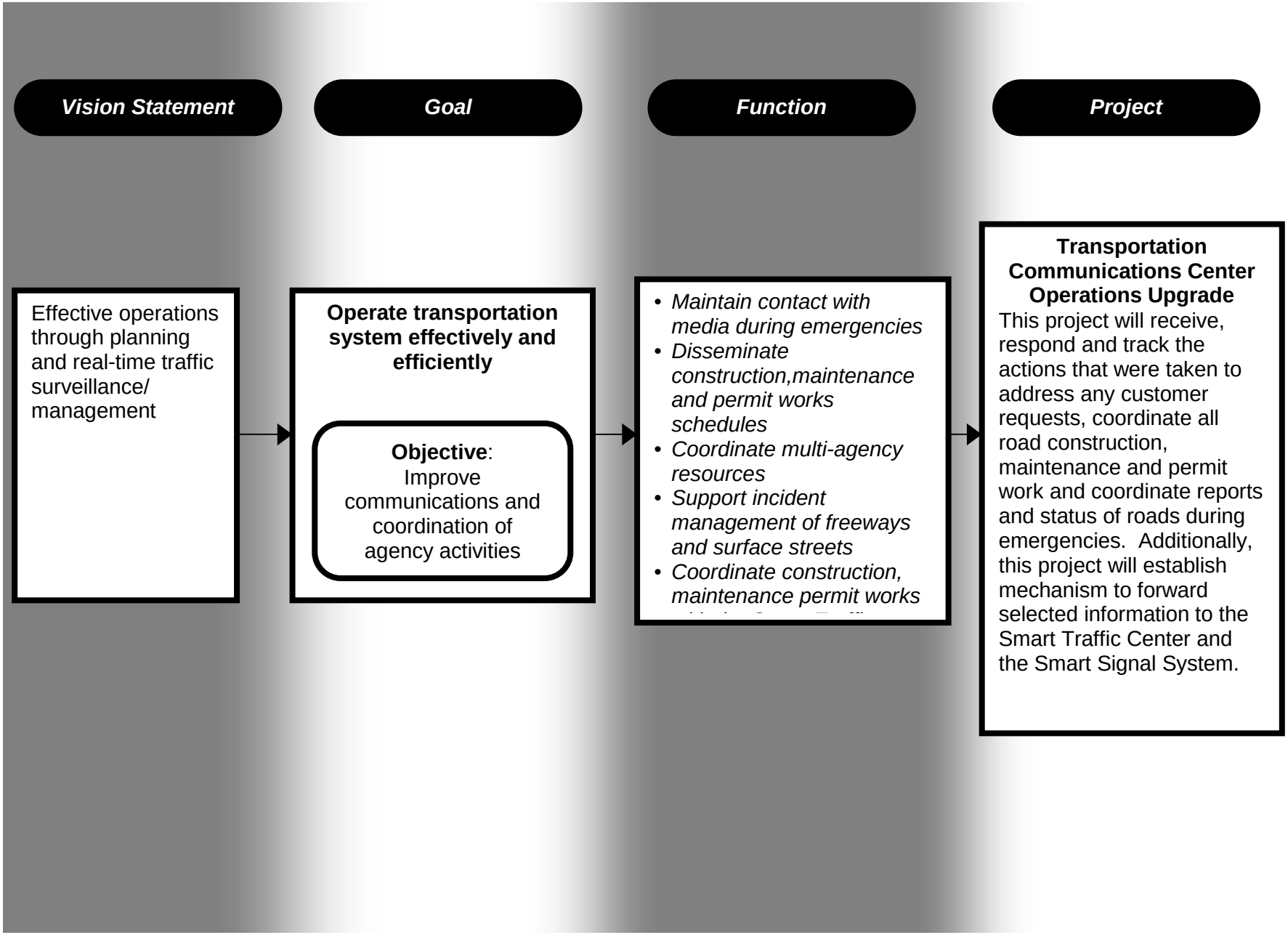
The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement

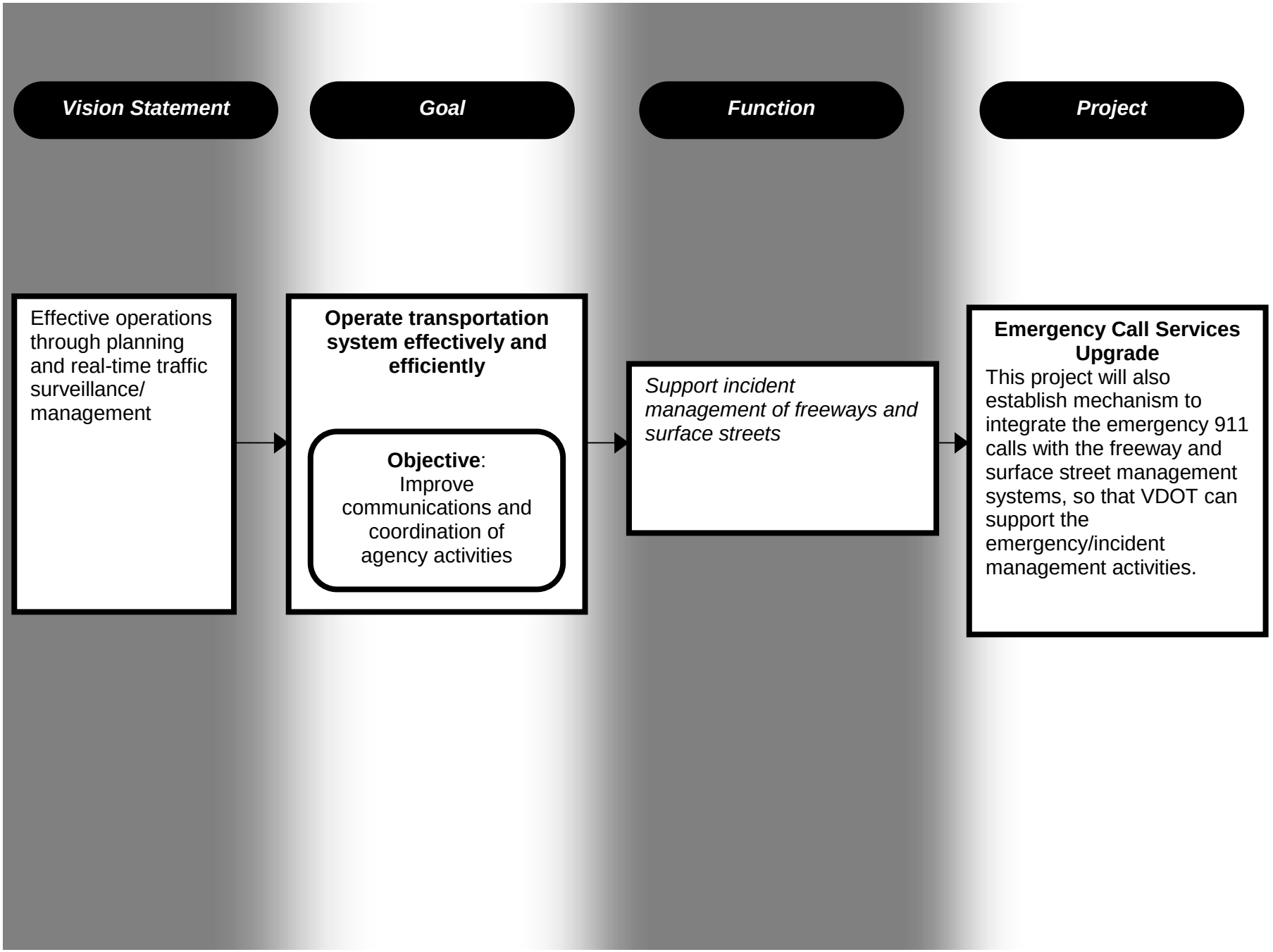

Vision Statement
Goal
Function
Project
Enhanced customer service through prompt response and follow through to customer calls
Make the transportation system more user-friendly
Objective: Improve customer service
Receive and respond to customer calls
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve communications and coordination of agency activities
• Monitor roadways during inclement weather
• Maintain contact with media during emergencies
• Disseminate construction, maintenance and permit works schedules
• Coordinate multiagency resources
• Support incident management of freeways and surface streets
• Share incident information with other agencies
• Coordinate construction, maintenance and permit works with the Smart Travel Traffic Center
• Coordinate with Technical Construction and Smart Travel operators to maintain/improve Smart Travel functions during construction
• Support Smart Travel Projects
• Provide data on ordinary and emergency repair needs to the appropriate VDOT offices.
Transportation Communications Center (TCC) (formerly Transportation Operations Center [TOC])
The current responsibilities of the Northern Virginia Transportation Communications Center (TCC) include taking and responding to citizen calls, providing customer service in the NOVA district, and maintaining contact with the media during emergencies. Future plans call for the center to coordinate all road construction, maintenance, and permit work, adjusting the District Signal system during emergencies, and coordinating reports and status of the roads during snow events.

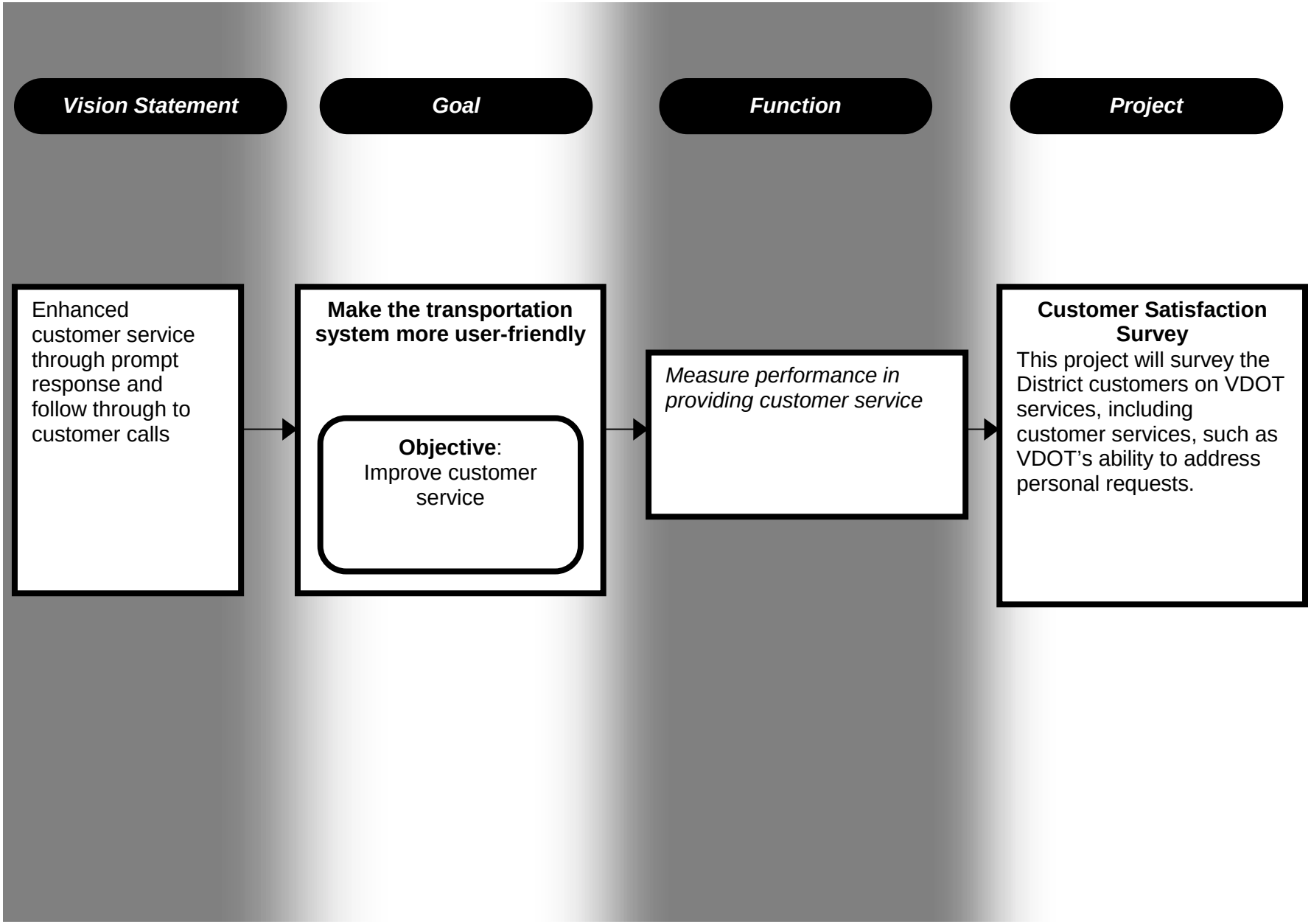

Vision Statement
Goal
Function
Project
Enhanced customer service through prompt response and follow through to customer calls
Operate transportation system effectively and efficiently
Objective: Improve customer service
• Receive and respond to customer calls
• Provide means for motorists to request roadside assistance
Call Box Program
Call boxes provide the general public with roadside assistance, enhanced personal security, and timely resolution of traffic incidents on interstate highways. Motorists requiring roadside assistance have only to open the box and push a single button. The call box will then automatically place a call to the VDOT Smart Traffic Center. A traffic controller using a computerized "answer center" answers incoming calls. When a call is answered, the call box identification number and a description of its location will automatically be displayed on the "answer center" screen. The traffic controller can then talk with the person placing the call and take appropriate action to render assistance. If emergency service is requested, the traffic controller can quickly patch the call through to the appropriate 911-dispatch center.


Vision Statement
Goal
Function
Project
Maximized utility of field data by sharing within the Department and with other agencies
Enhance agency operations and manage effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve intra-agency cooperation
Provide capability for real-time internal voice, data, and video transmission
District-wide Telecommunications System
VDOT purchased a new 100% digital telecommunications system, which is installed at the Northern Virginia District office and at several Area Headquarters. The system is capable of voice, data, and video transmission and has a multi-media server which can link documents, voice mail, and e-mail. The telecommunications system allows VDOT staff to move, add, and change files internally and in real-time fashion.


Vision Statement
Goal
Function
Project
Enhanced customer service through prompt response and follow through to customer calls
Make the transportation system more user-friendly
Objective: Improve customer service
• Measure performance in providing customer service
• Provide means for motorists to request roadside assistance
Customer Service Enhancement
This project will implement a system that automatically tracks customer calls and the actions that were taken to address customer requests. This project will also integrate the emergency 911 calls with the freeway and surface street management systems, so that VDOT can support the emergency/incident management activities. Additionally, this project will install more motorist call boxes at critical locations.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve communications and coordination of agency activities
• Maintain contact with media during emergencies
• Disseminate construction,maintenance and permit works schedules
• Coordinate multi-agency resources
• Support incident management of freeways and surface streets
• Coordinate construction, maintenance permit works
Transportation Communications Center Operations Upgrade
This project will receive, respond and track the actions that were taken to address any customer requests, coordinate all road construction, maintenance and permit work and coordinate reports and status of roads during emergencies. Additionally, this project will establish mechanism to forward selected information to the Smart Traffic Center and the Smart Signal System.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve communications and coordination of agency activities
Support incident management of freeways and surface streets
Emergency Call Services Upgrade
This project will also establish mechanism to integrate the emergency 911 calls with the freeway and surface street management systems, so that VDOT can support the emergency/incident management activities.


Vision Statement
Goal
Function
Project
Enhanced customer service through prompt response and follow through to customer calls
Make the transportation system more user-friendly
Objective: Improve customer service
Measure performance in providing customer service
Customer Satisfaction Survey
This project will survey the District customers on VDOT services, including customer services, such as VDOT's ability to address personal requests.

System 7 – Communications System

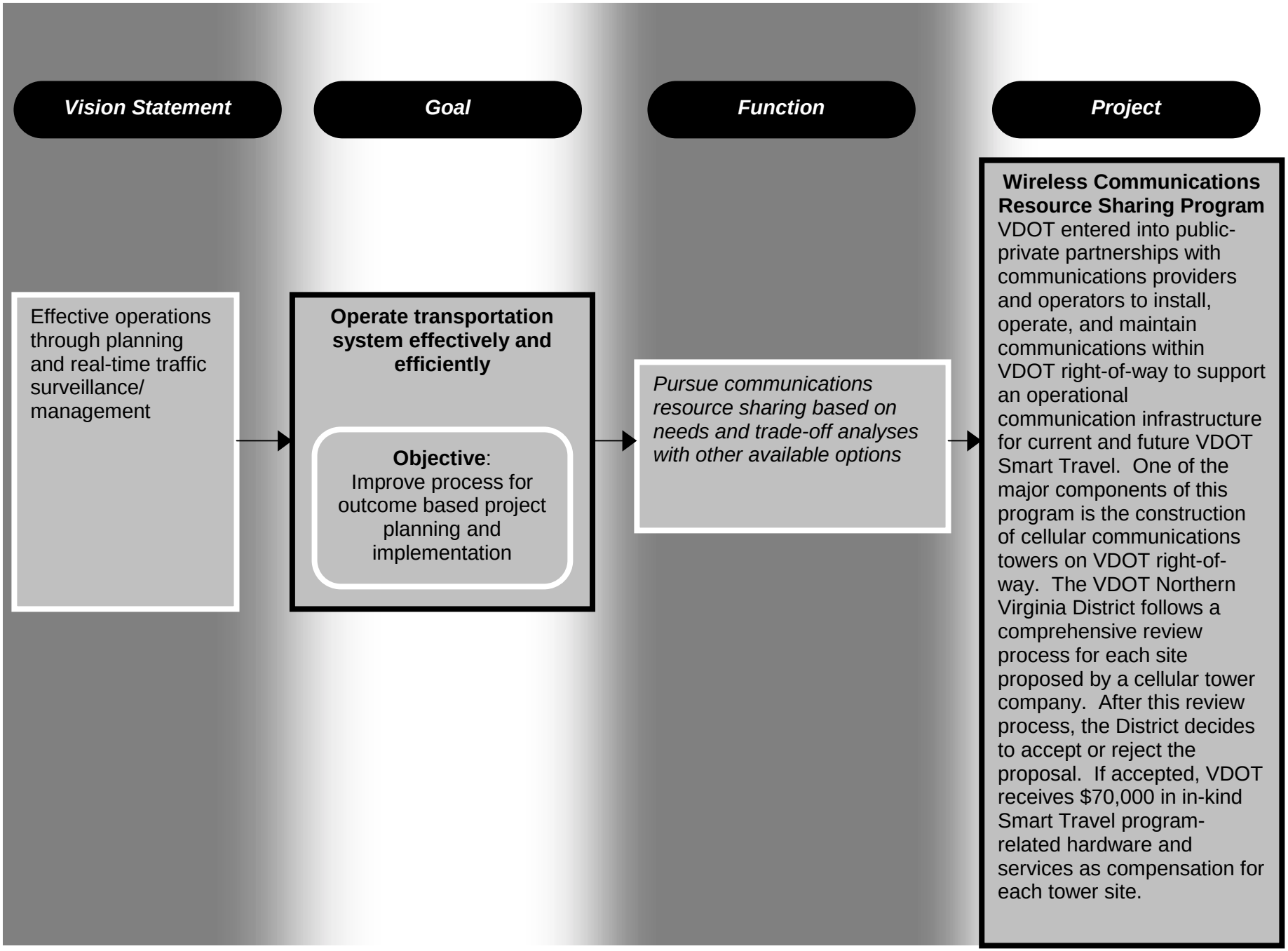
All Smart Travel systems that transfer information require wireline and/or wireless communication. This system establishes the required communications infrastructure that enables the other systems to inter-operate, taking into account service requirements and implications on cost, performance and user acceptance.

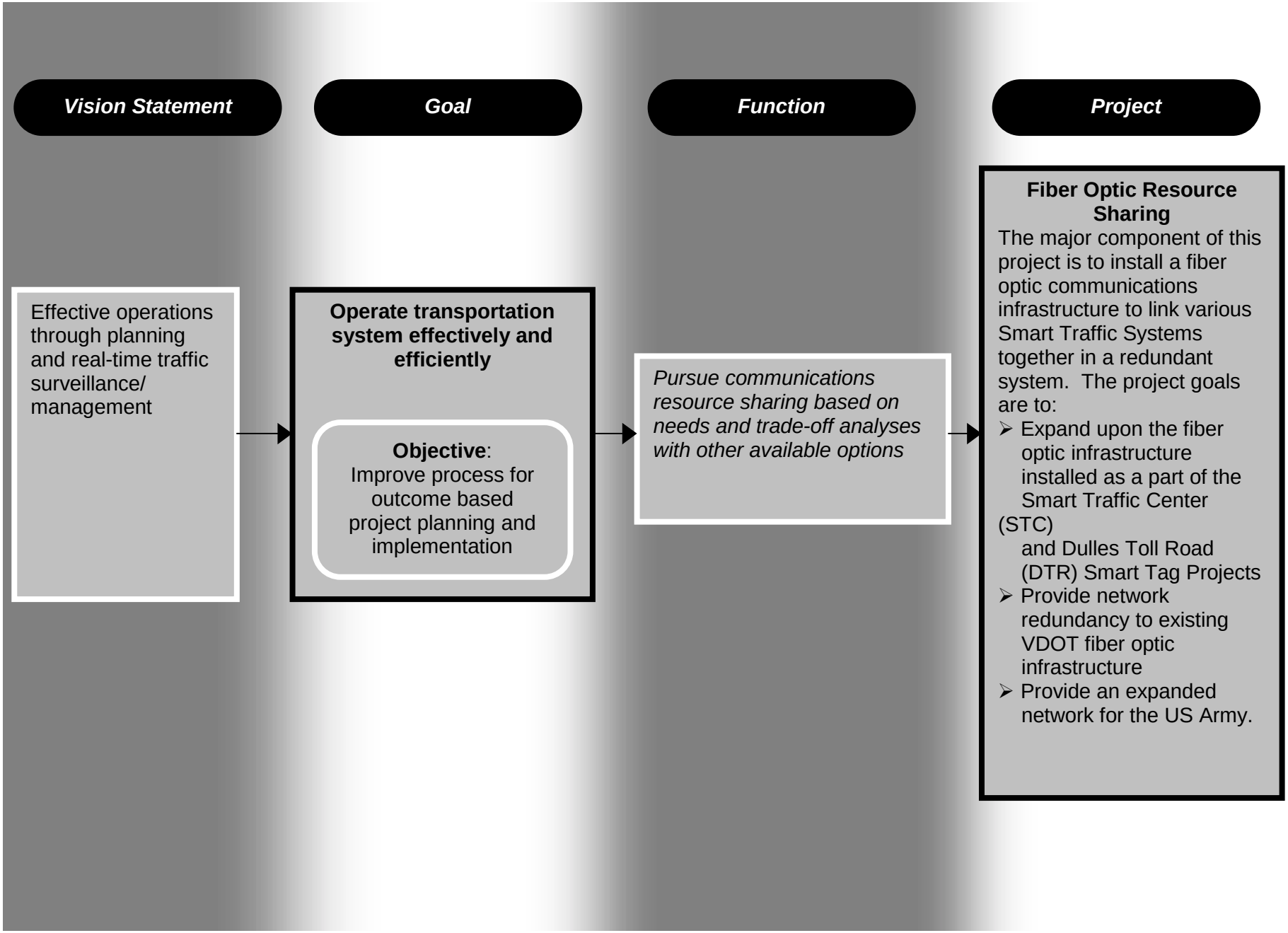
The following projects are included under the Communications System:

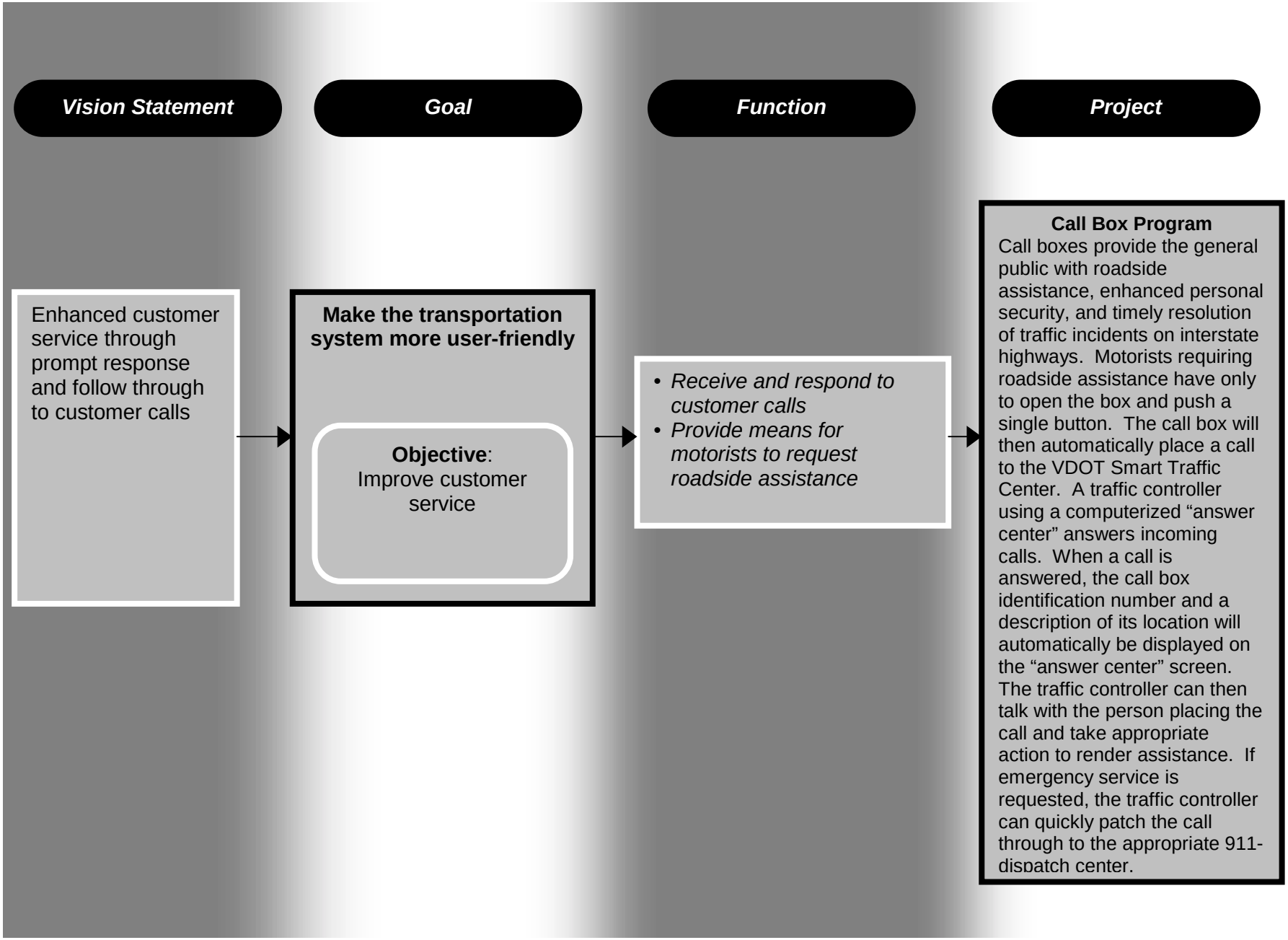
- *Wireless Communications Resource Sharing Program*
- *Fiber Optic Resource Sharing*
- *Call Box Program*
- *Highway Advisory Radio*
- **Inventory of Communications Infrastructure**
- Fiber-optic Link between I-66 and the Northern Virginia District Headquarters
- **Procedures for Maintaining the Communications Infrastructure**
- **District-wide Communications System Evaluation**

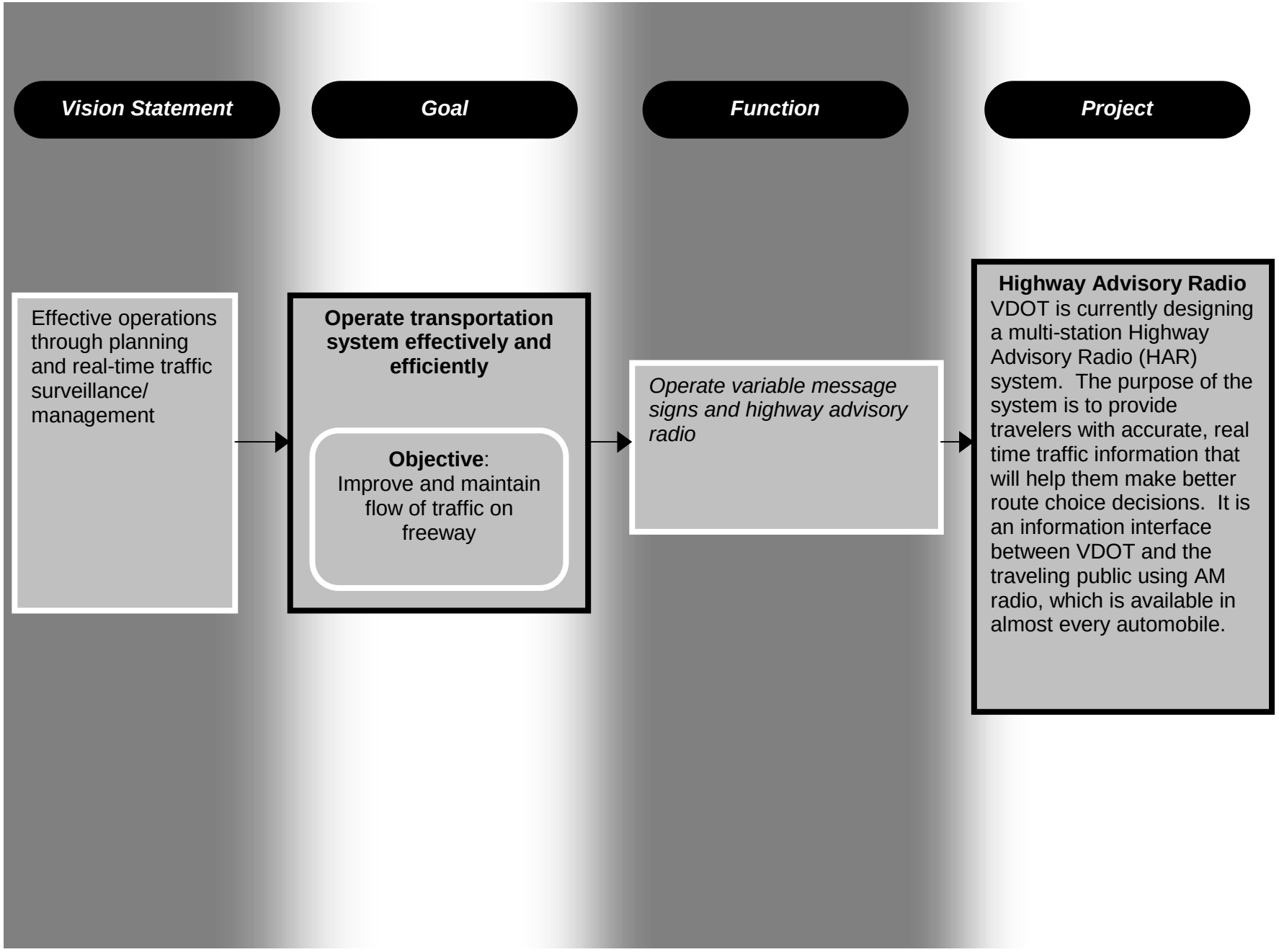
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

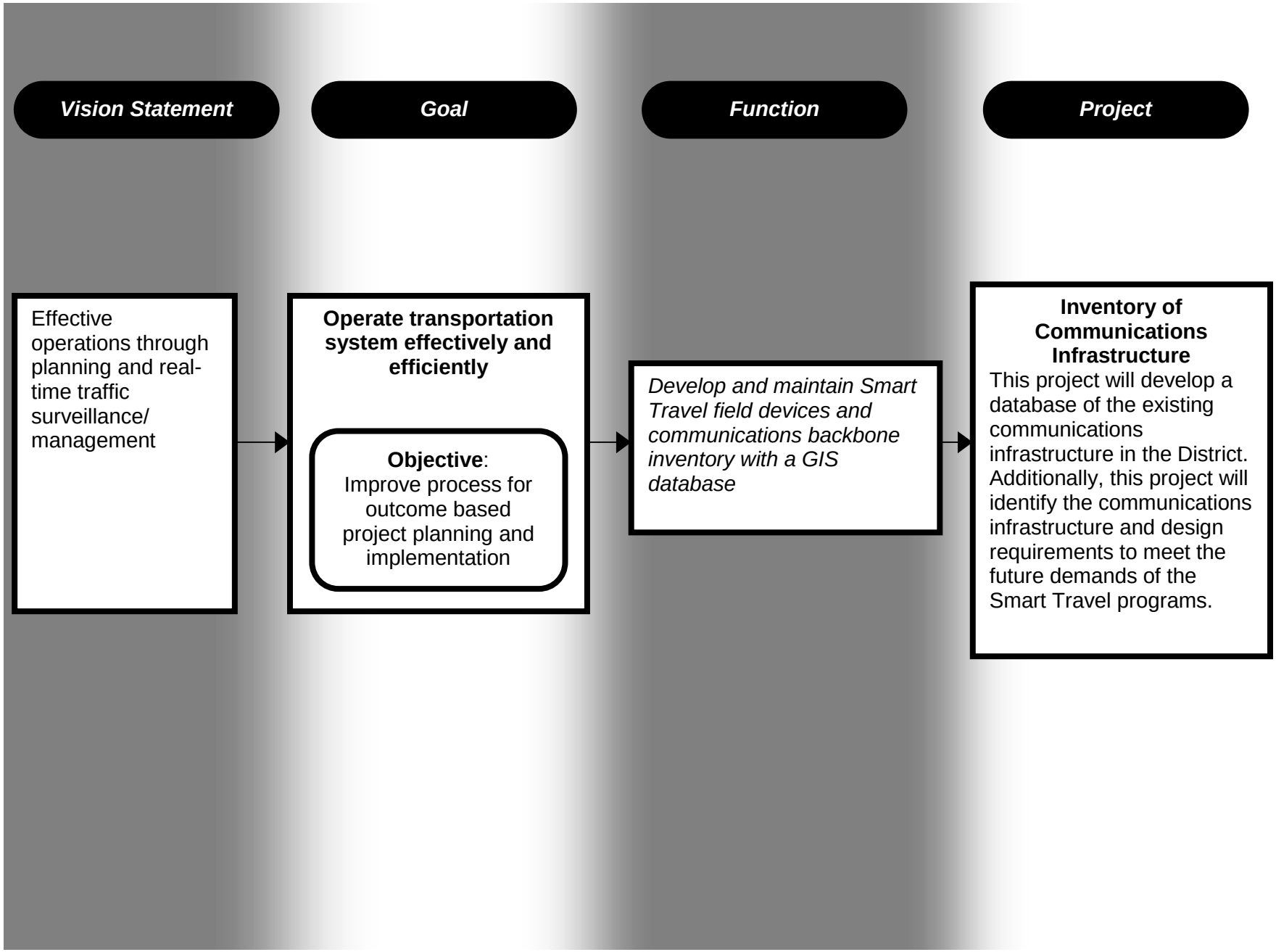
The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement.

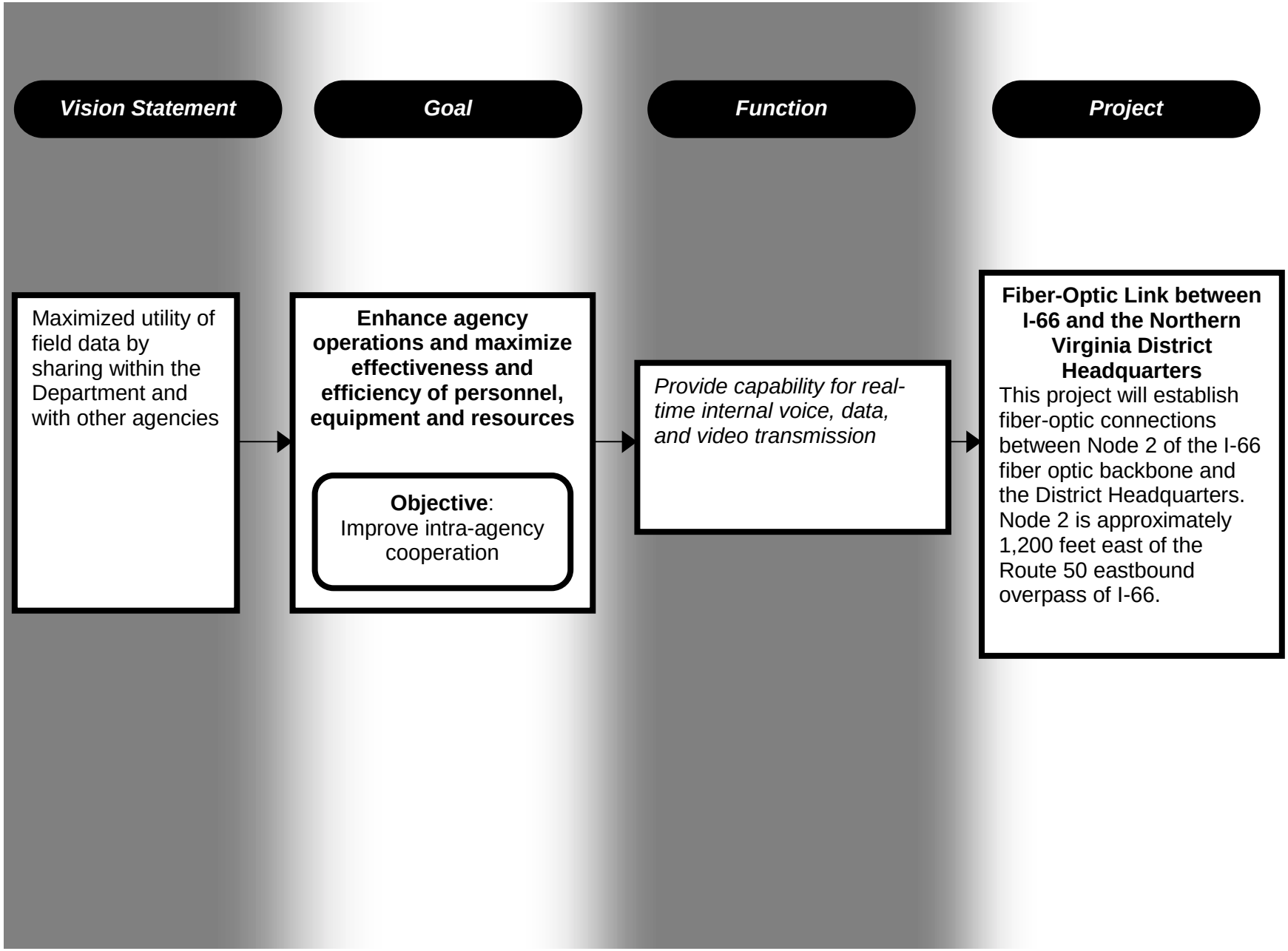

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Pursue communications resource sharing based on needs and trade-off analyses with other available options
Wireless Communications Resource Sharing Program
VDOT entered into public-private partnerships with communications providers and operators to install, operate, and maintain communications within VDOT right-of-way to support an operational communication infrastructure for current and future VDOT Smart Travel. One of the major components of this program is the construction of cellular communications towers on VDOT right-of-way. The VDOT Northern Virginia District follows a comprehensive review process for each site proposed by a cellular tower company. After this review process, the District decides to accept or reject the proposal. If accepted, VDOT receives $70,000 in in-kind Smart Travel program-related hardware and services as compensation for each tower site.

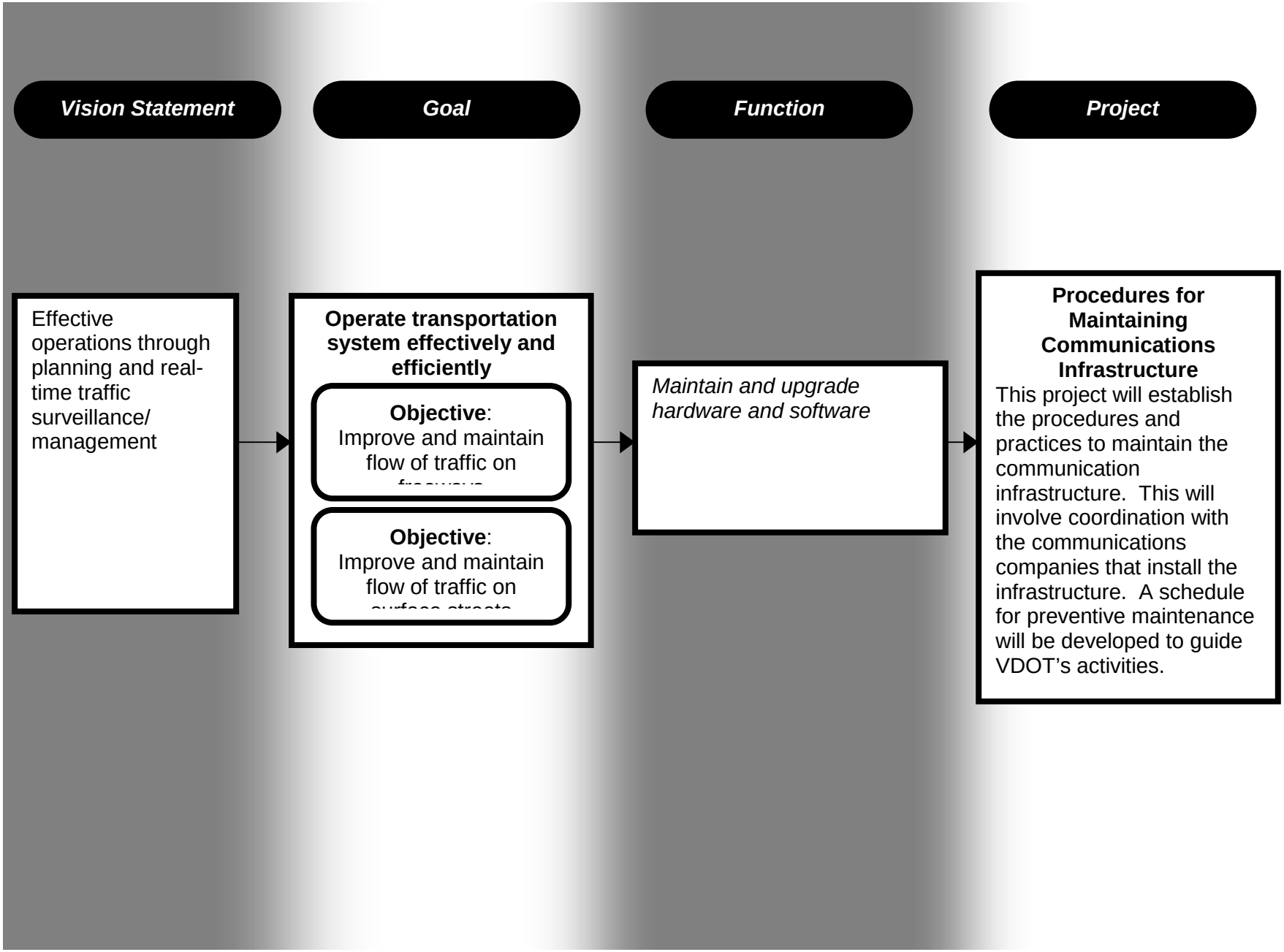

Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Pursue communications resource sharing based on needs and trade-off analyses with other available options
Fiber Optic Resource Sharing
The major component of this project is to install a fiber optic communications infrastructure to link various Smart Traffic Systems together in a redundant system. The project goals are to:
Expand upon the fiber optic infrastructure installed as a part of the Smart Traffic Center (STC) and Dulles Toll Road (DTR) Smart Tag Projects
Provide network redundancy to existing VDOT fiber optic infrastructure
Provide an expanded network for the US Army.

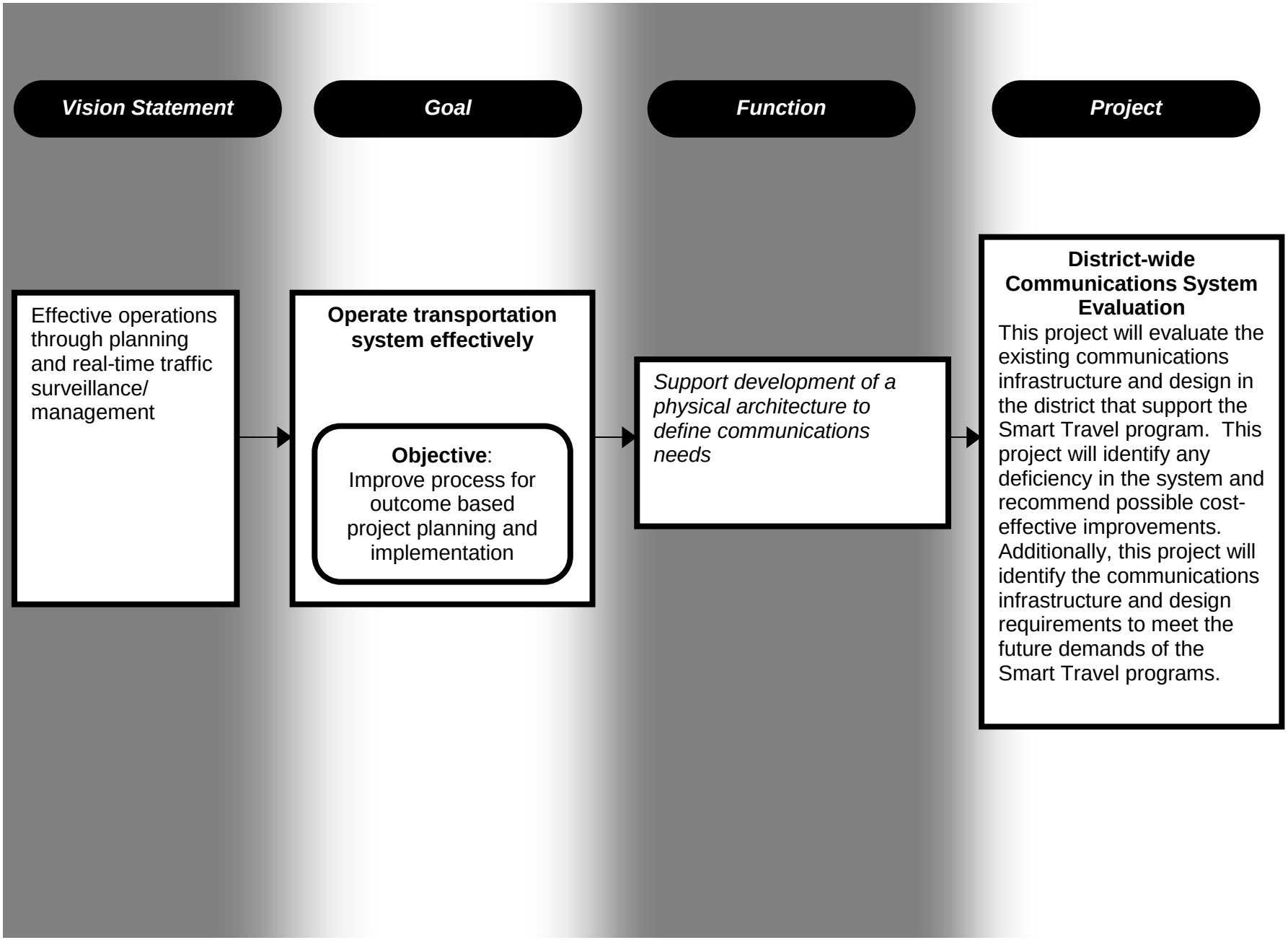

Vision Statement
Goal
Function
Project
Enhanced customer service through prompt response and follow through to customer calls
Make the transportation system more user-friendly
Objective: Improve customer service
• Receive and respond to customer calls
• Provide means for motorists to request roadside assistance
Call Box Program
Call boxes provide the general public with roadside assistance, enhanced personal security, and timely resolution of traffic incidents on interstate highways. Motorists requiring roadside assistance have only to open the box and push a single button. The call box will then automatically place a call to the VDOT Smart Traffic Center. A traffic controller using a computerized "answer center" answers incoming calls. When a call is answered, the call box identification number and a description of its location will automatically be displayed on the "answer center" screen. The traffic controller can then talk with the person placing the call and take appropriate action to render assistance. If emergency service is requested, the traffic controller can quickly patch the call through to the appropriate 911-dispatch center.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeway
Operate variable message signs and highway advisory radio
Highway Advisory Radio
VDOT is currently designing a multi-station Highway Advisory Radio (HAR) system. The purpose of the system is to provide travelers with accurate, real time traffic information that will help them make better route choice decisions. It is an information interface between VDOT and the traveling public using AM radio, which is available in almost every automobile.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve process for outcome based project planning and implementation
Develop and maintain Smart Travel field devices and communications backbone inventory with a GIS database
Inventory of Communications Infrastructure
This project will develop a database of the existing communications infrastructure in the District. Additionally, this project will identify the communications infrastructure and design requirements to meet the future demands of the Smart Travel programs.


Vision Statement
Goal
Function
Project
Maximized utility of field data by sharing within the Department and with other agencies
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment and resources
Objective: Improve intra-agency cooperation
Provide capability for real-time internal voice, data, and video transmission
Fiber-Optic Link between I-66 and the Northern Virginia District Headquarters
This project will establish fiber-optic connections between Node 2 of the I-66 fiber optic backbone and the District Headquarters. Node 2 is approximately 1,200 feet east of the Route 50 eastbound overpass of I-66.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve and maintain flow of traffic on freeways
Objective: Improve and maintain flow of traffic on surface streets
Maintain and upgrade hardware and software
Procedures for Maintaining Communications Infrastructure
This project will establish the procedures and practices to maintain the communication infrastructure. This will involve coordination with the communications companies that install the infrastructure. A schedule for preventive maintenance will be developed to guide VDOT's activities.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively
Objective: Improve process for outcome based project planning and implementation
Support development of a physical architecture to define communications needs
District-wide Communications System Evaluation
This project will evaluate the existing communications infrastructure and design in the district that support the Smart Travel program. This project will identify any deficiency in the system and recommend possible cost-effective improvements. Additionally, this project will identify the communications infrastructure and design requirements to meet the future demands of the Smart Travel programs.

System 8 – Traveler Information System

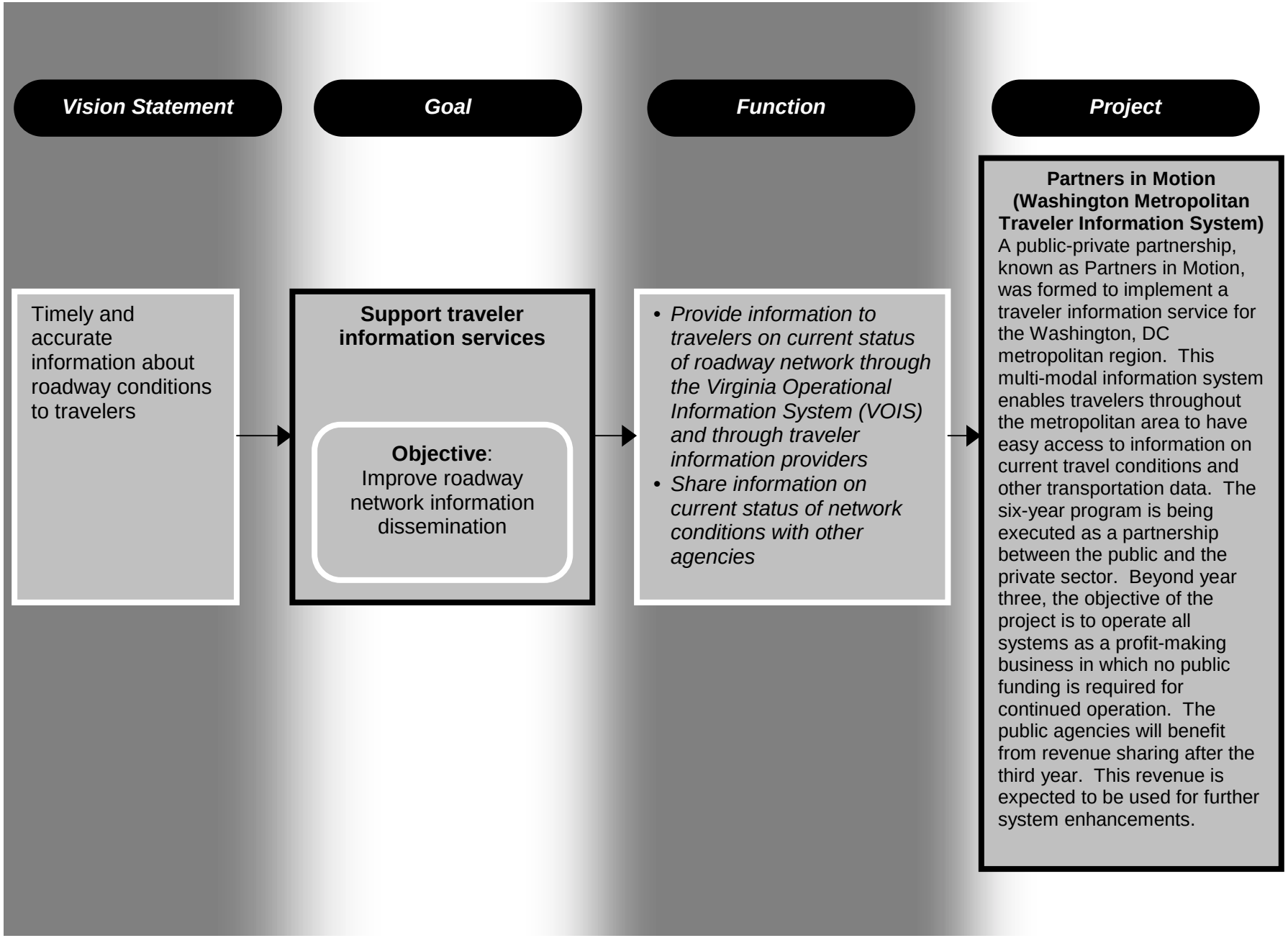
The traveler information system encompasses the broad range of services that provide traveler information to the public with the goal of improved travel choices, reduced delay, and improved customer satisfaction.

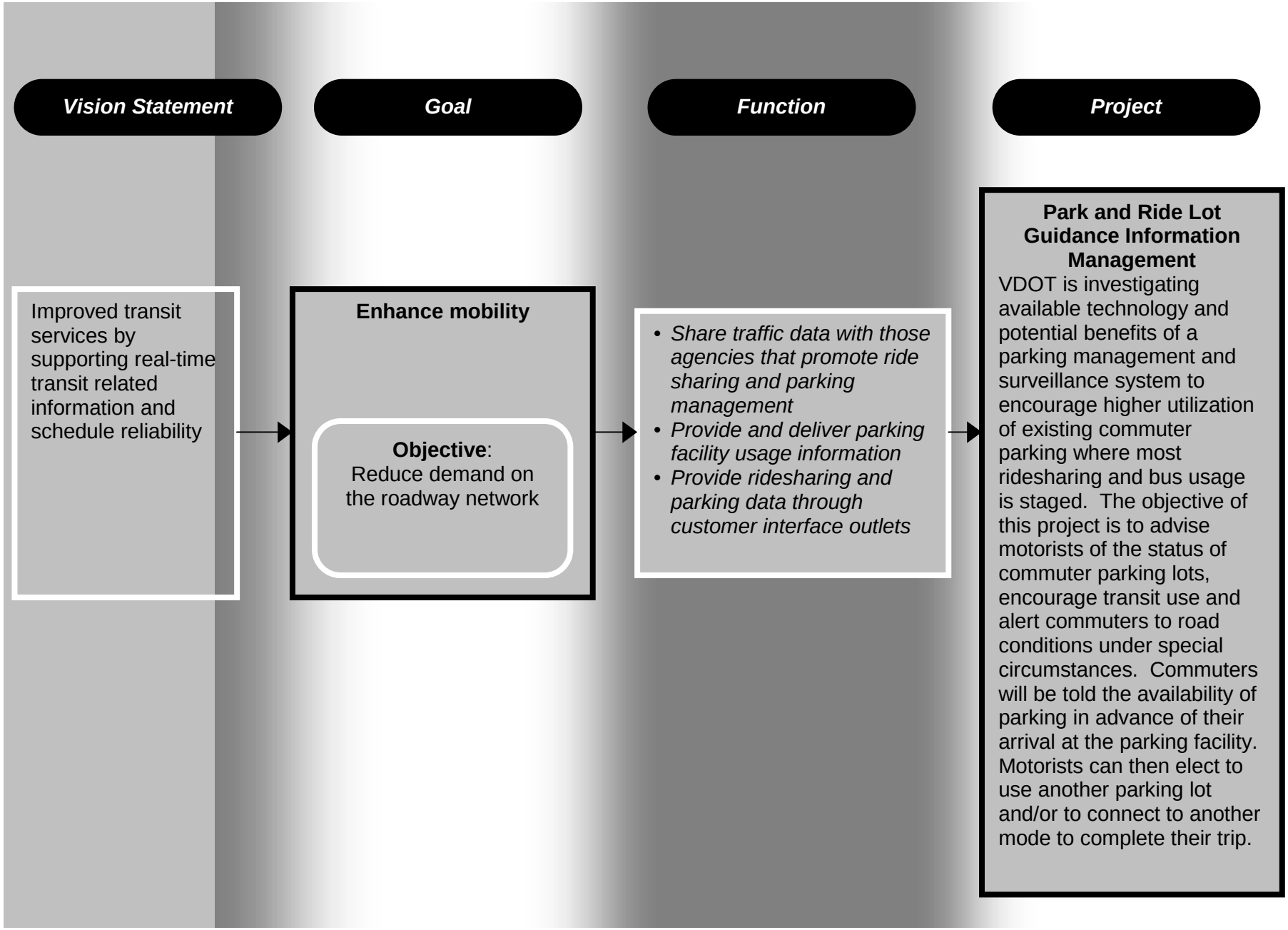
The following projects are included under the Traveler Information System:

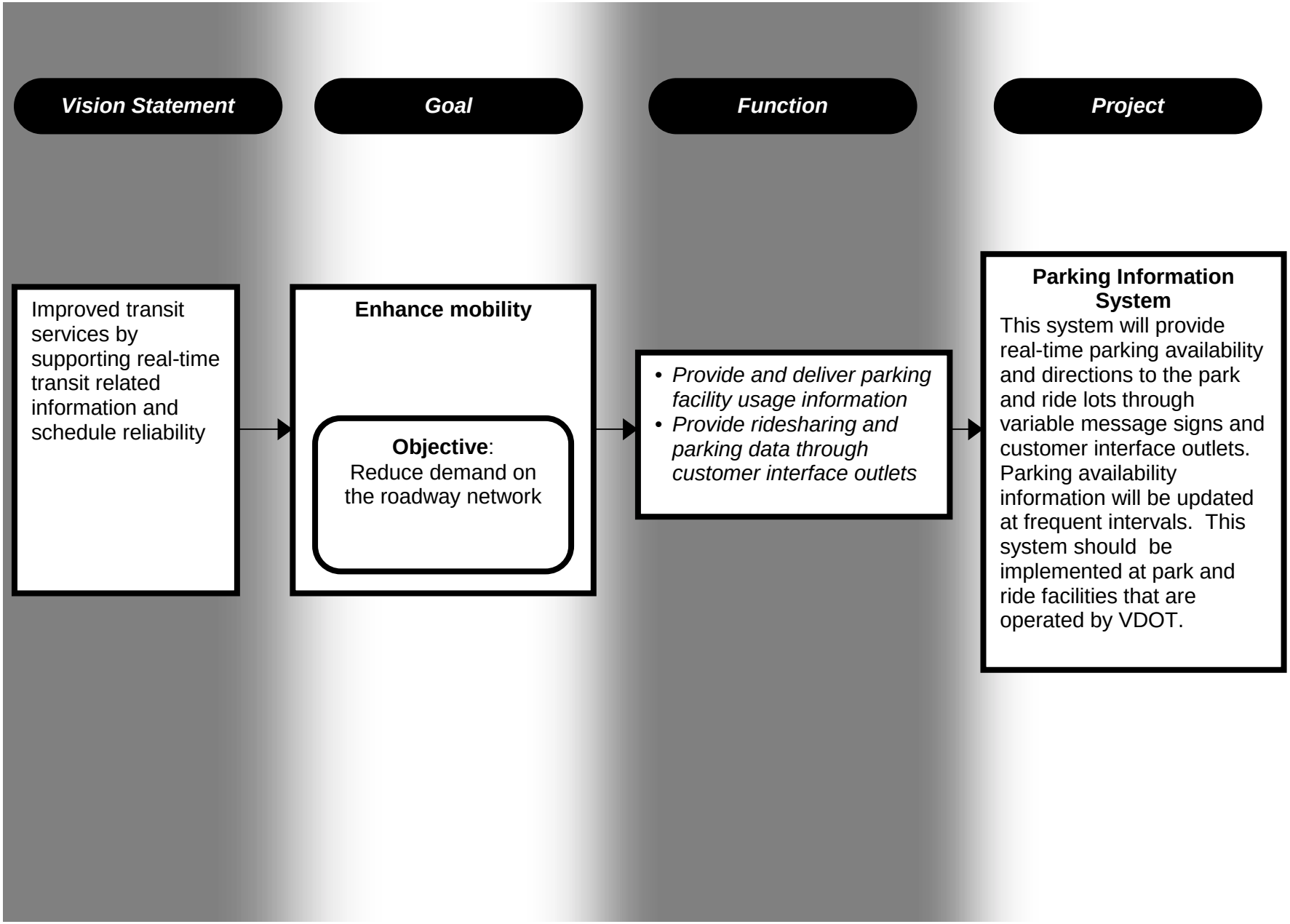
- *Partner in Motion*
- *Park and Ride Lot Guidance Information Management*
- Parking Information System
- Enhanced Traveler Information System
- Regional Traveler Information System Re-compete
- **Evaluation of the Regional Traveler Information System**

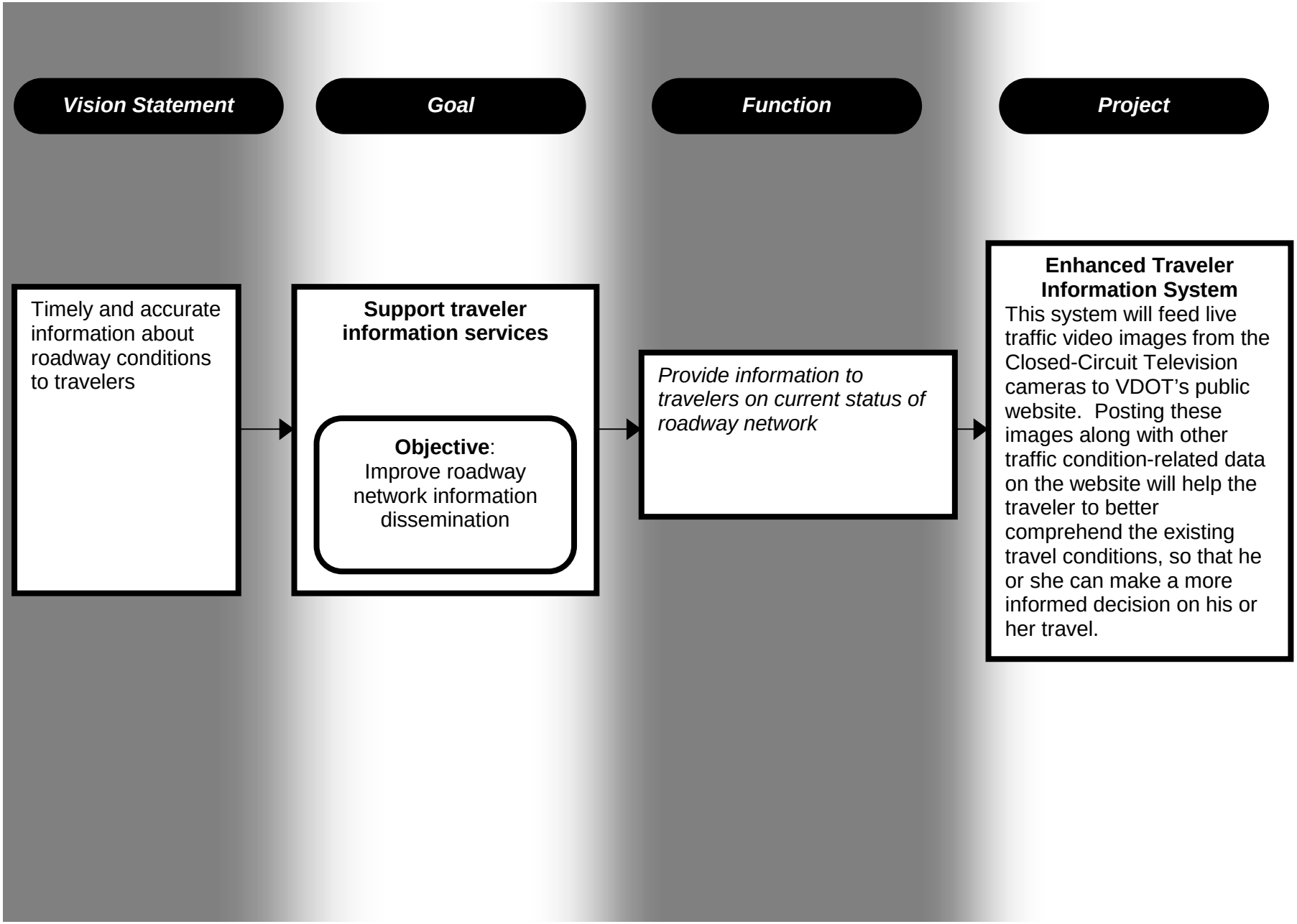
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement. As *the Regional Traveler Information System Re-compete* is an extension of the *Partner in Motion* project, the mapping of this project is not shown. Also, a mapping of the *Evaluation of the Regional Traveler Information System* is not included, as this project will evaluate the effectiveness of the *Regional Traveler Information System* that will be accomplished by various related projects listed above.


Vision Statement
Goal
Function
Project
Timely and accurate information about roadway conditions to travelers
Support traveler information services
Objective: Improve roadway network information dissemination
• Provide information to travelers on current status of roadway network through the Virginia Operational Information System (VOIS) and through traveler information providers
• Share information on current status of network conditions with other agencies
Partners in Motion (Washington Metropolitan Traveler Information System)
A public-private partnership, known as Partners in Motion, was formed to implement a traveler information service for the Washington, DC metropolitan region. This multi-modal information system enables travelers throughout the metropolitan area to have easy access to information on current travel conditions and other transportation data. The six-year program is being executed as a partnership between the public and the private sector. Beyond year three, the objective of the project is to operate all systems as a profit-making business in which no public funding is required for continued operation. The public agencies will benefit from revenue sharing after the third year. This revenue is expected to be used for further system enhancements.


Vision Statement
Goal
Function
Project
Improved transit services by supporting real-time transit related information and schedule reliability
Enhance mobility
Objective: Reduce demand on the roadway network
• Share traffic data with those agencies that promote ride sharing and parking management
• Provide and deliver parking facility usage information
• Provide ridesharing and parking data through customer interface outlets
Park and Ride Lot Guidance Information Management
VDOT is investigating available technology and potential benefits of a parking management and surveillance system to encourage higher utilization of existing commuter parking where most ridesharing and bus usage is staged. The objective of this project is to advise motorists of the status of commuter parking lots, encourage transit use and alert commuters to road conditions under special circumstances. Commuters will be told the availability of parking in advance of their arrival at the parking facility. Motorists can then elect to use another parking lot and/or to connect to another mode to complete their trip.


Vision Statement
Goal
Function
Project
Improved transit services by supporting real-time transit related information and schedule reliability
Enhance mobility
Objective: Reduce demand on the roadway network
• Provide and deliver parking facility usage information
• Provide ridesharing and parking data through customer interface outlets
Parking Information System
This system will provide real-time parking availability and directions to the park and ride lots through variable message signs and customer interface outlets. Parking availability information will be updated at frequent intervals. This system should be implemented at park and ride facilities that are operated by VDOT.


Vision Statement
Goal
Function
Project
Timely and accurate information about roadway conditions to travelers
Support traveler information services
Objective: Improve roadway network information dissemination
Provide information to travelers on current status of roadway network
Enhanced Traveler Information System
This system will feed live traffic video images from the Closed-Circuit Television cameras to VDOT's public website. Posting these images along with other traffic condition-related data on the website will help the traveler to better comprehend the existing travel conditions, so that he or she can make a more informed decision on his or her travel.

System 9 – Asset Management System

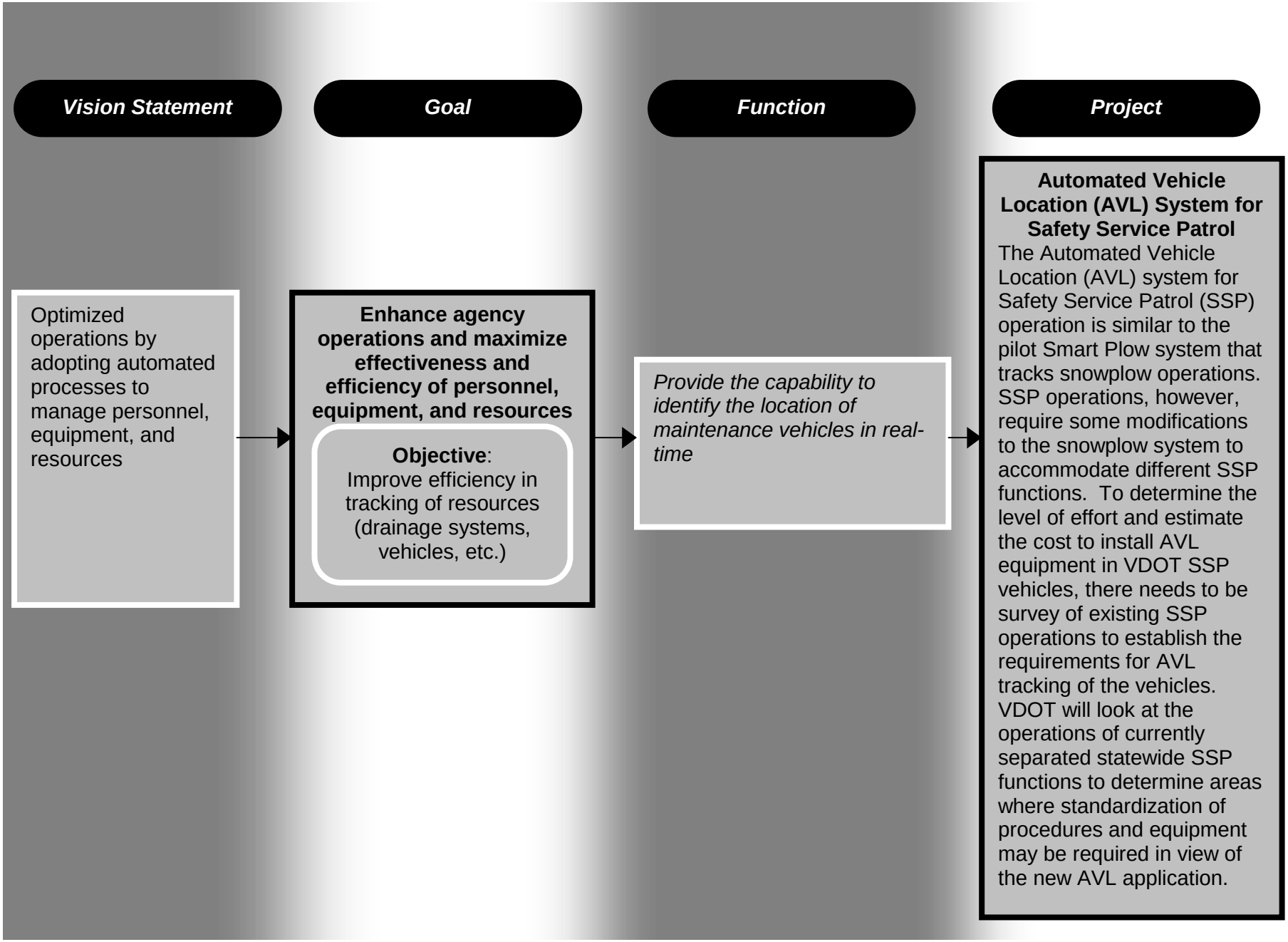
The asset management system coordinates routine VDOT maintenance and operations activities in a way that minimizes travel disruptions.

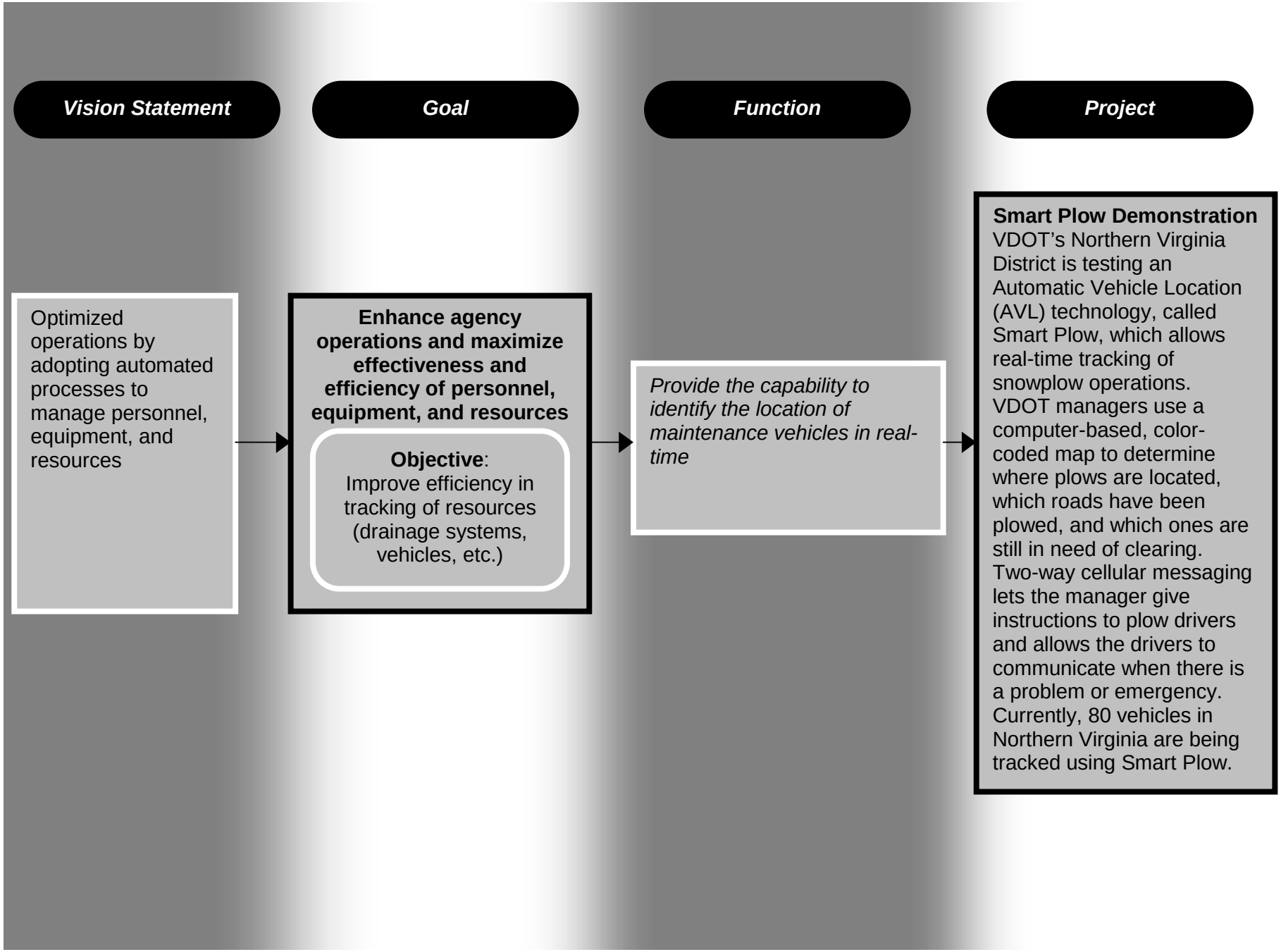
The following projects are included under the Asset Management System:

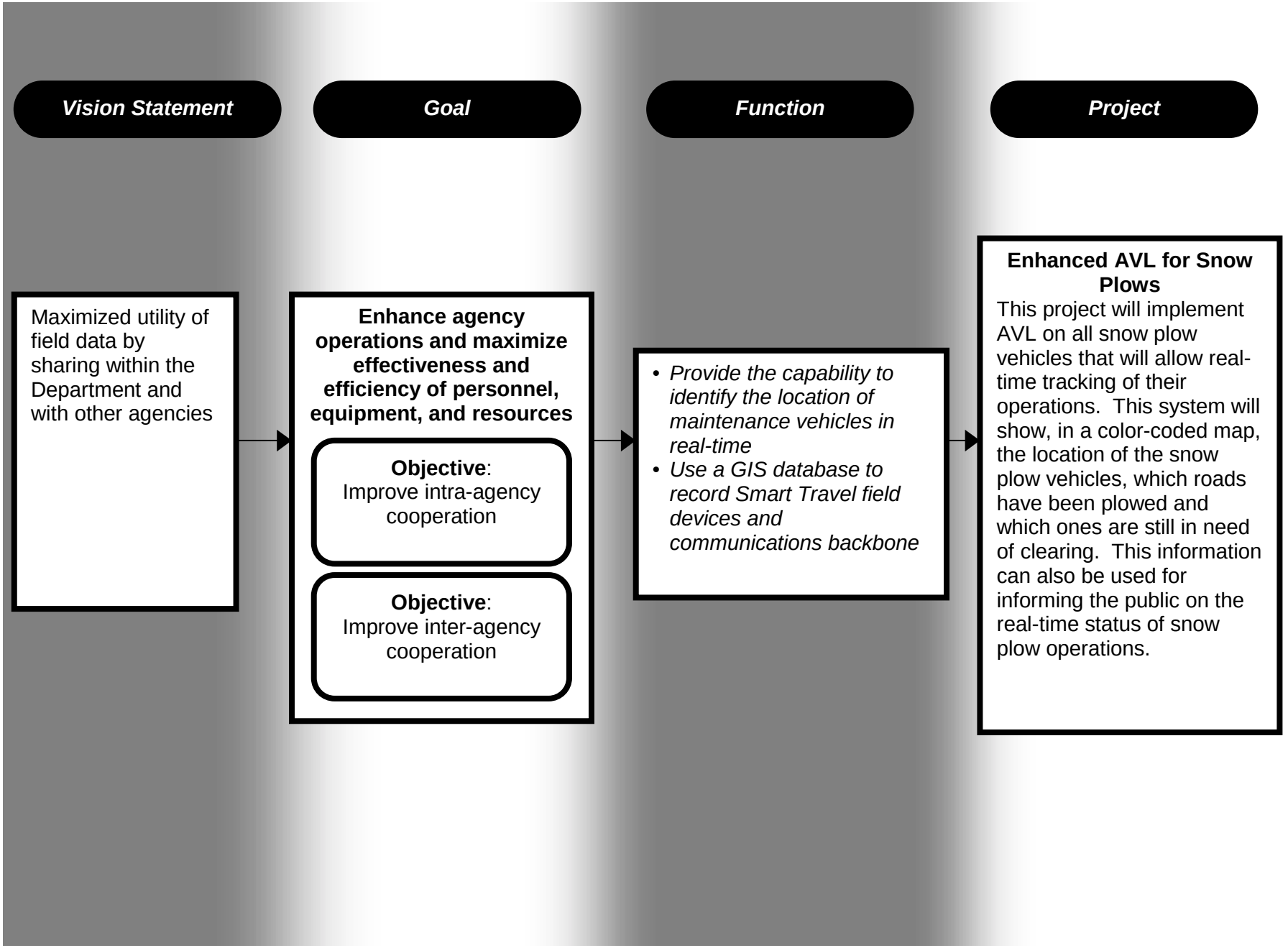
- *AVL System for Safety Service Patrol*
- *Smart Plow Demonstration*
- Enhanced AVL for Snow Plows
- Region-wide Coordination with Construction/Road Closures
- AVL for Fleet Management
- Evaluation of AVL for Fleet Management

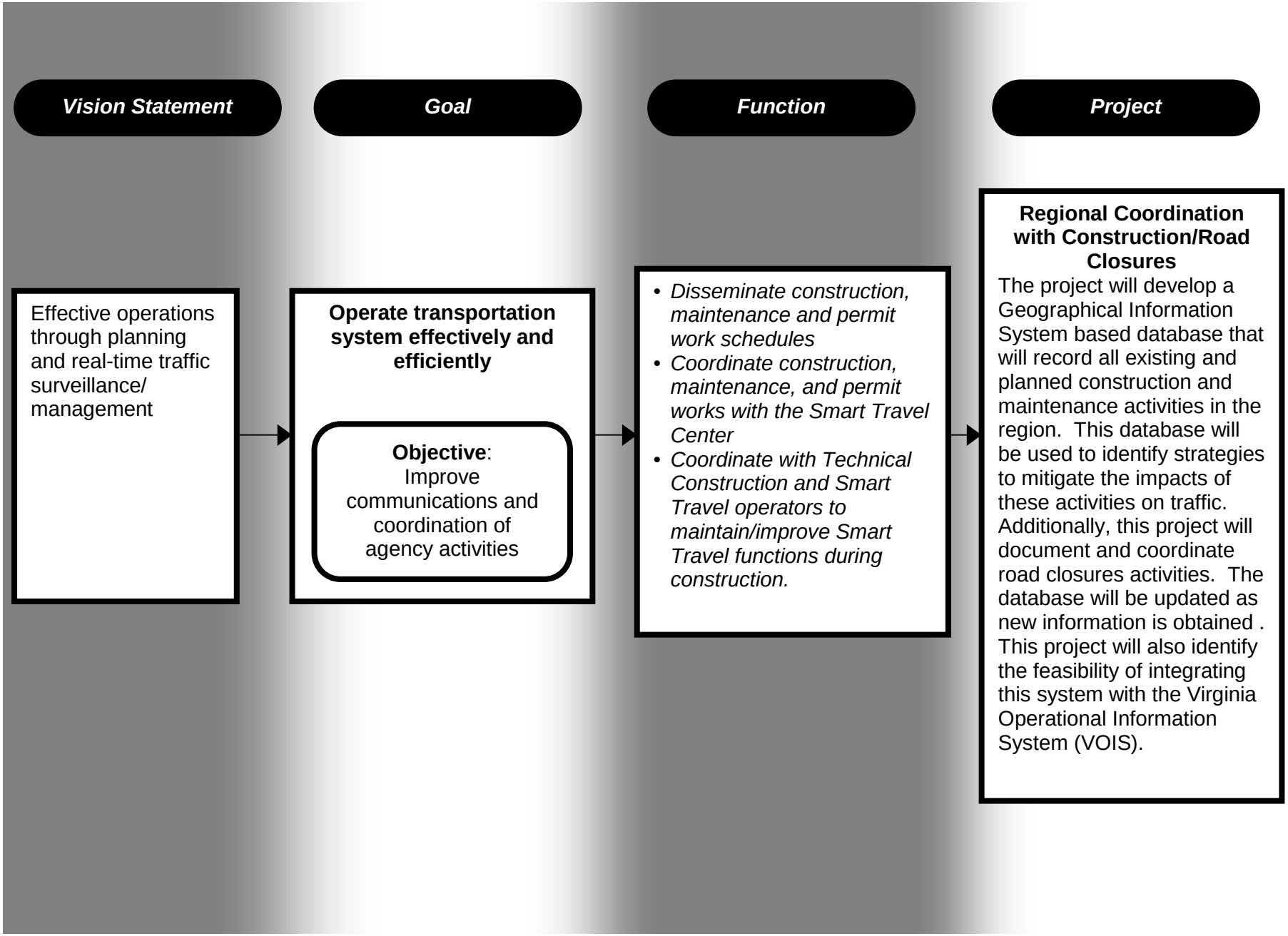
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

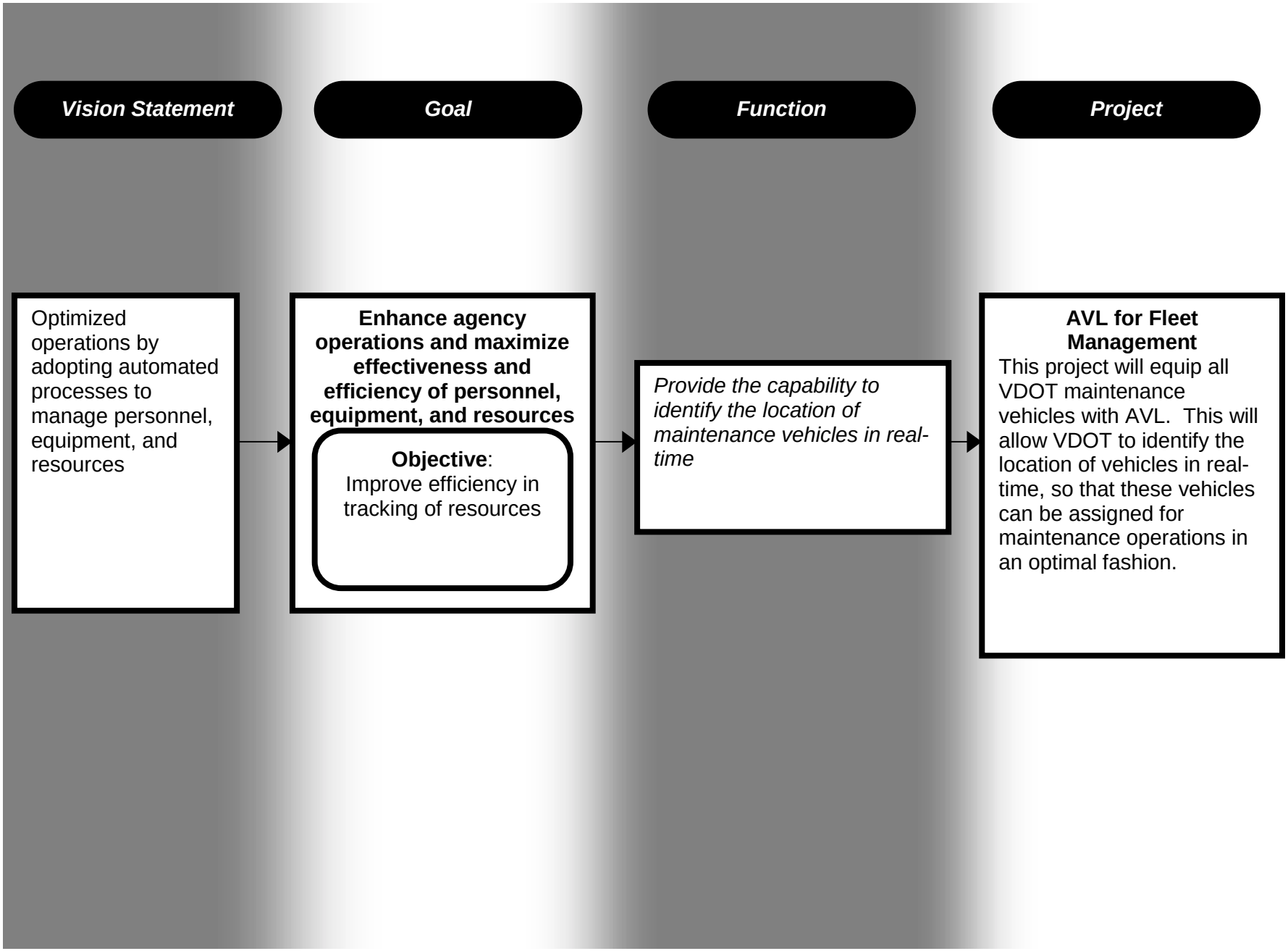
The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement.


Vision Statement
Goal
Function
Project
Optimized operations by adopting automated processes to manage personnel, equipment, and resources
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve efficiency in tracking of resources (drainage systems, vehicles, etc.)
Provide the capability to identify the location of maintenance vehicles in real-time
Automated Vehicle Location (AVL) System for Safety Service Patrol
The Automated Vehicle Location (AVL) system for Safety Service Patrol (SSP) operation is similar to the pilot Smart Plow system that tracks snowplow operations. SSP operations, however, require some modifications to the snowplow system to accommodate different SSP functions. To determine the level of effort and estimate the cost to install AVL equipment in VDOT SSP vehicles, there needs to be survey of existing SSP operations to establish the requirements for AVL tracking of the vehicles. VDOT will look at the operations of currently separated statewide SSP functions to determine areas where standardization of procedures and equipment may be required in view of the new AVL application.


Vision Statement
Goal
Function
Project
Optimized operations by adopting automated processes to manage personnel, equipment, and resources
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve efficiency in tracking of resources (drainage systems, vehicles, etc.)
Provide the capability to identify the location of maintenance vehicles in real-time
Smart Plow Demonstration
VDOT's Northern Virginia District is testing an Automatic Vehicle Location (AVL) technology, called Smart Plow, which allows real-time tracking of snowplow operations. VDOT managers use a computer-based, color-coded map to determine where plows are located, which roads have been plowed, and which ones are still in need of clearing. Two-way cellular messaging lets the manager give instructions to plow drivers and allows the drivers to communicate when there is a problem or emergency. Currently, 80 vehicles in Northern Virginia are being tracked using Smart Plow.


Vision Statement
Goal
Function
Project
Maximized utility of field data by sharing within the Department and with other agencies
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve intra-agency cooperation
Objective: Improve inter-agency cooperation
• Provide the capability to identify the location of maintenance vehicles in real-time
• Use a GIS database to record Smart Travel field devices and communications backbone
Enhanced AVL for Snow Plows
This project will implement AVL on all snow plow vehicles that will allow real-time tracking of their operations. This system will show, in a color-coded map, the location of the snow plow vehicles, which roads have been plowed and which ones are still in need of clearing. This information can also be used for informing the public on the real-time status of snow plow operations.


Vision Statement
Goal
Function
Project
Effective operations through planning and real-time traffic surveillance/ management
Operate transportation system effectively and efficiently
Objective: Improve communications and coordination of agency activities
• Disseminate construction, maintenance and permit work schedules
• Coordinate construction, maintenance, and permit works with the Smart Travel Center
• Coordinate with Technical Construction and Smart Travel operators to maintain/improve Smart Travel functions during construction.
Regional Coordination with Construction/Road Closures
The project will develop a Geographical Information System based database that will record all existing and planned construction and maintenance activities in the region. This database will be used to identify strategies to mitigate the impacts of these activities on traffic. Additionally, this project will document and coordinate road closures activities. The database will be updated as new information is obtained . This project will also identify the feasibility of integrating this system with the Virginia Operational Information System (VOIS).


Vision Statement
Goal
Function
Project
Optimized operations by adopting automated processes to manage personnel, equipment, and resources
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve efficiency in tracking of resources
Provide the capability to identify the location of maintenance vehicles in real-time
AVL for Fleet Management
This project will equip all VDOT maintenance vehicles with AVL. This will allow VDOT to identify the location of vehicles in real-time, so that these vehicles can be assigned for maintenance operations in an optimal fashion.

System 10 – Payment System

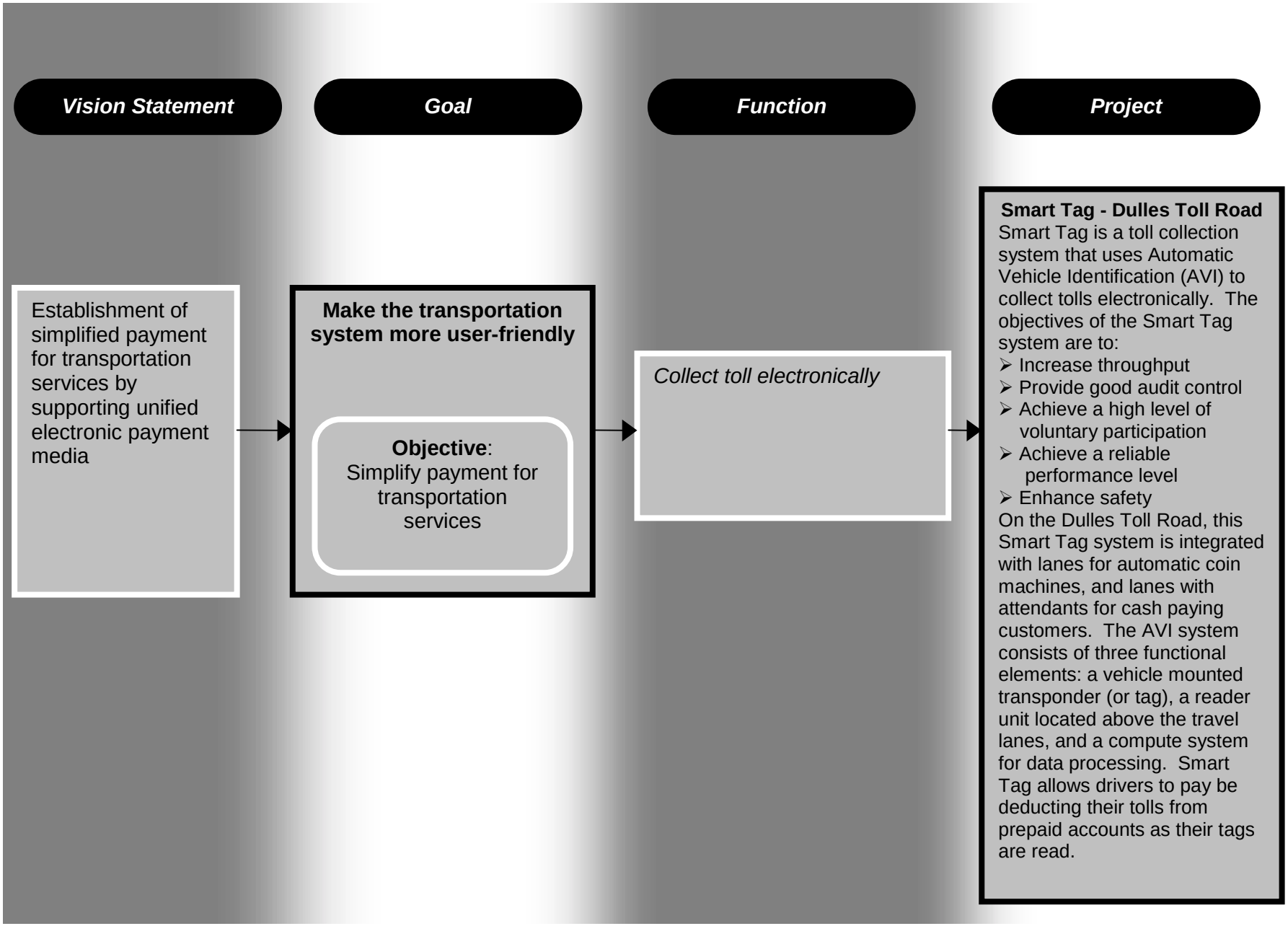
The payment system involves electronic toll collection, transaction confirmation, and payment violation. In addition, this system enables the integration of toll collection with other electronic payment systems in the region.

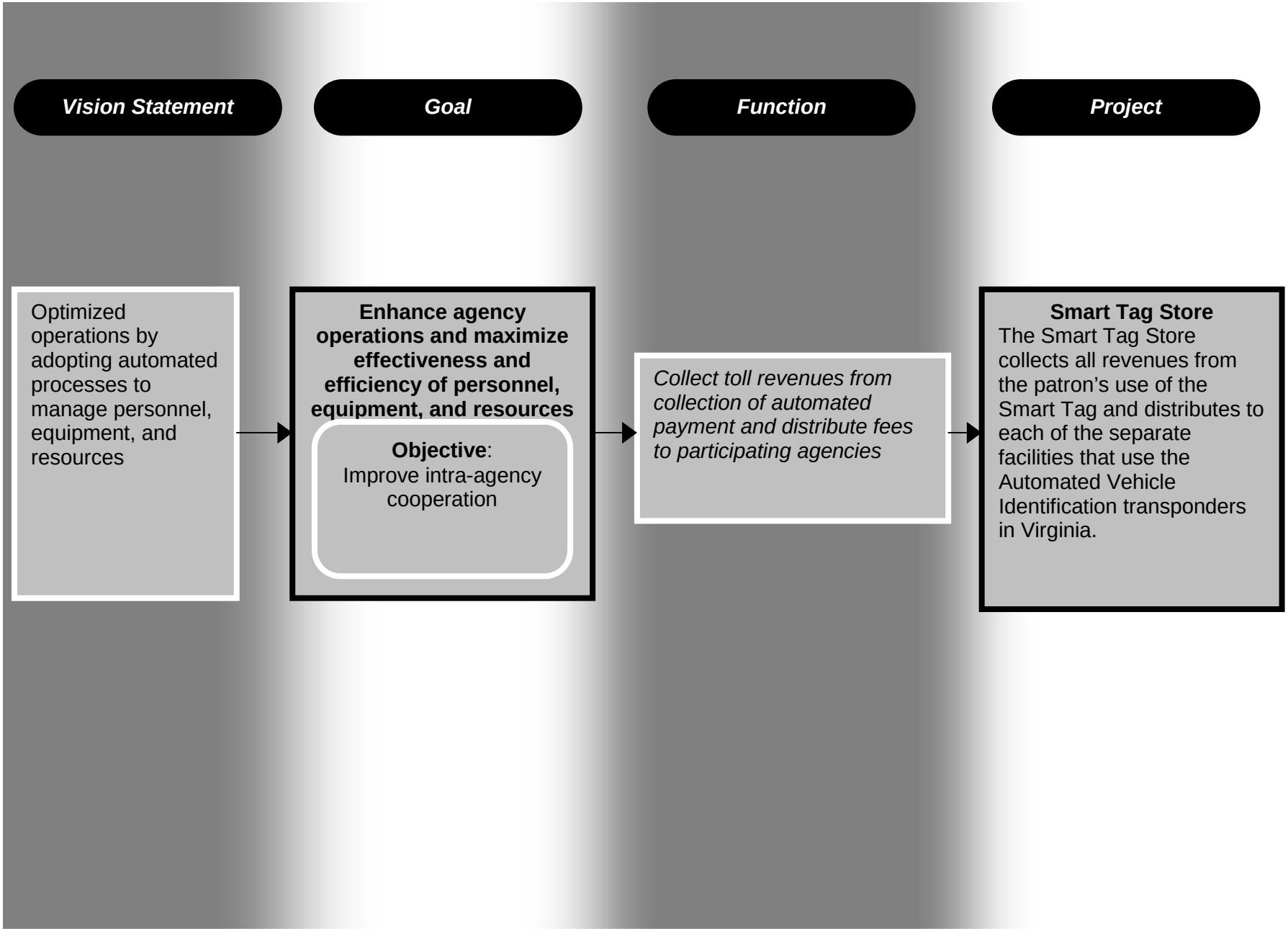
The following projects are included under the Payment System:

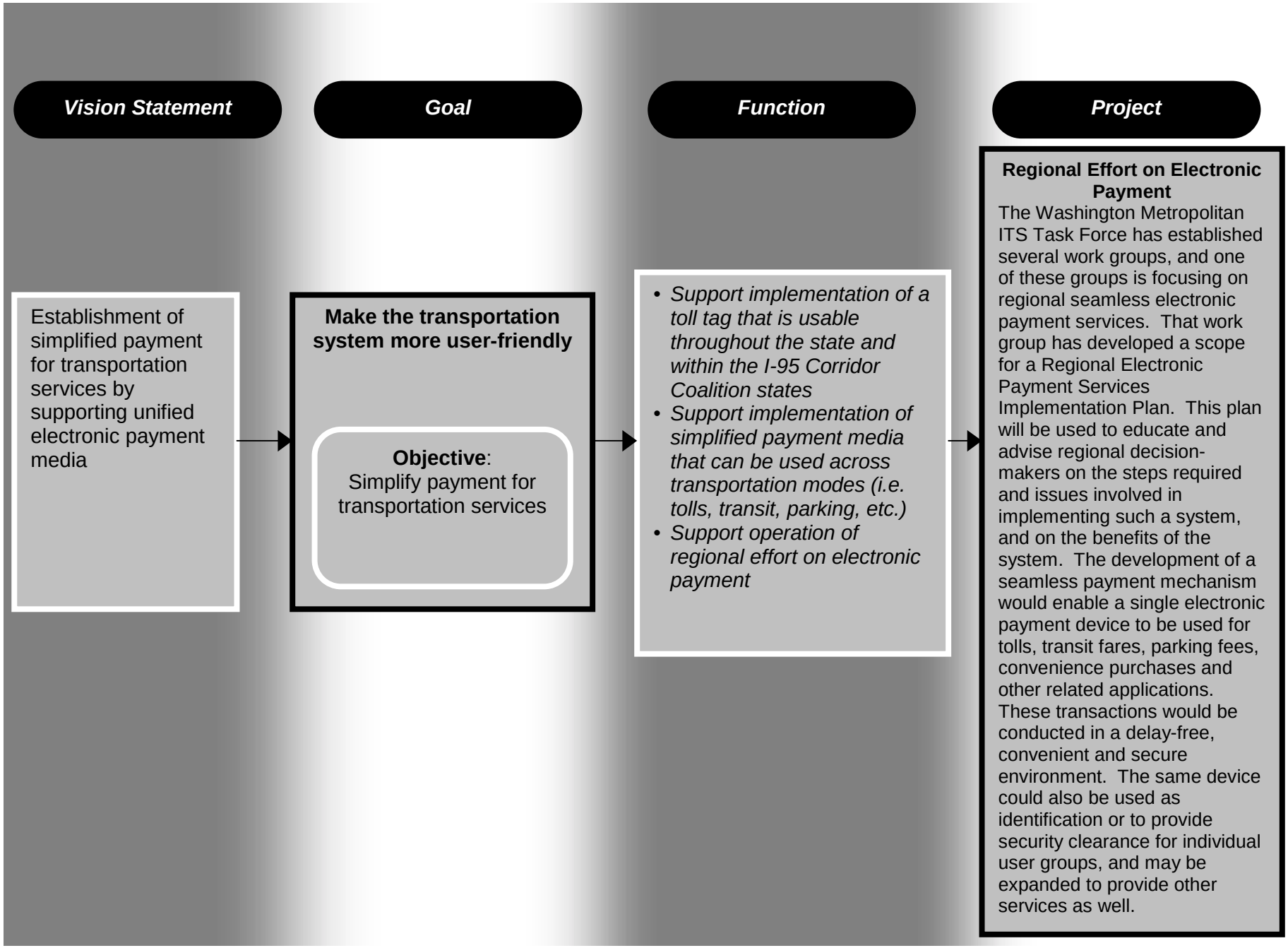
- *Smart Tag – Dulles Toll Road*
- *Smart Tag Store*
- *Regional Effort on Electronic Payment*
- **Integrated Payment System**
- Toll Operations Improvement
- **Evaluation of Integrated Payment System**

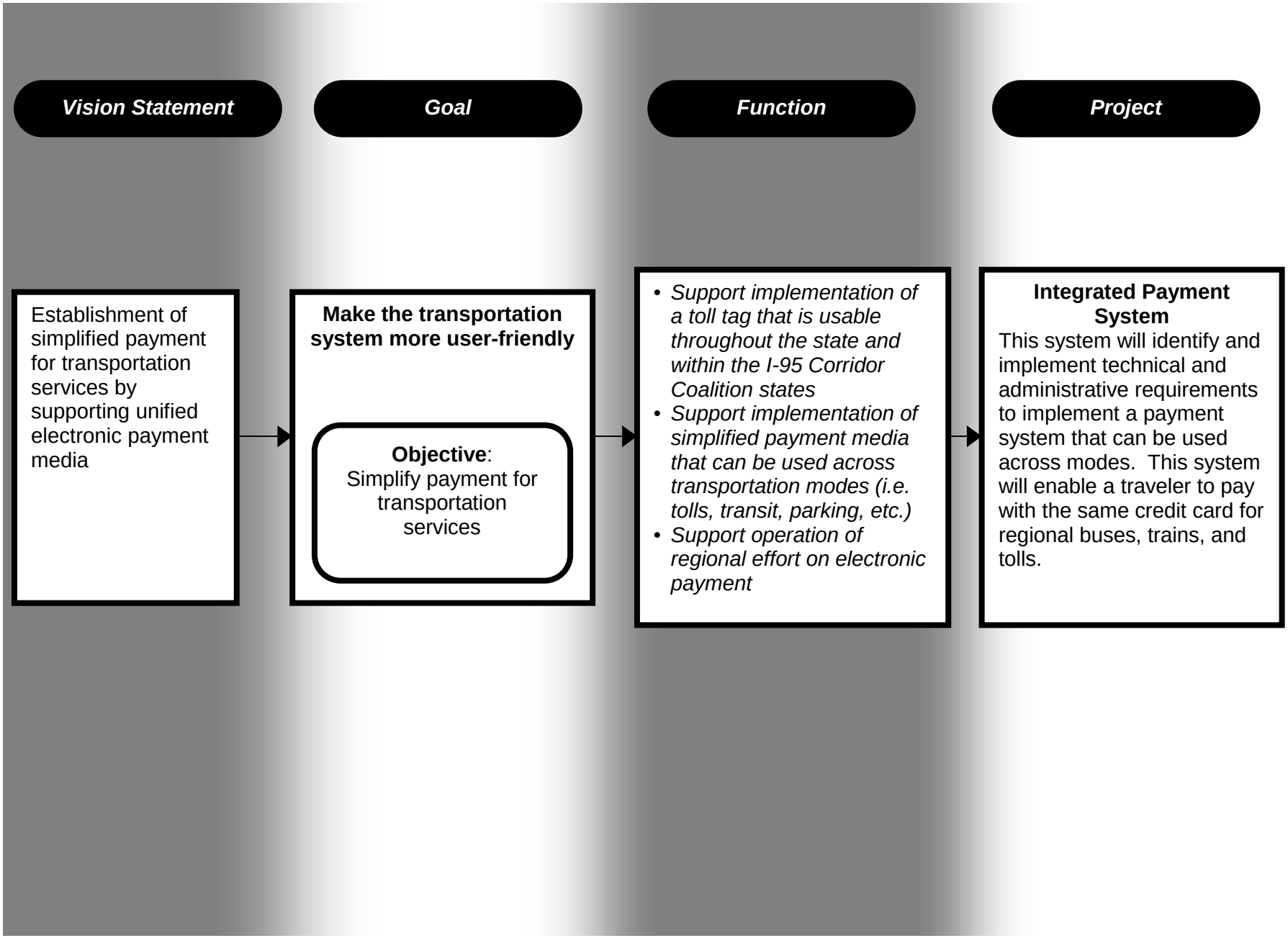
Italic type indicates that the project is existing or planned for this system.
Bold type indicates that the project is recommended for inclusion in the Short-Range plan.

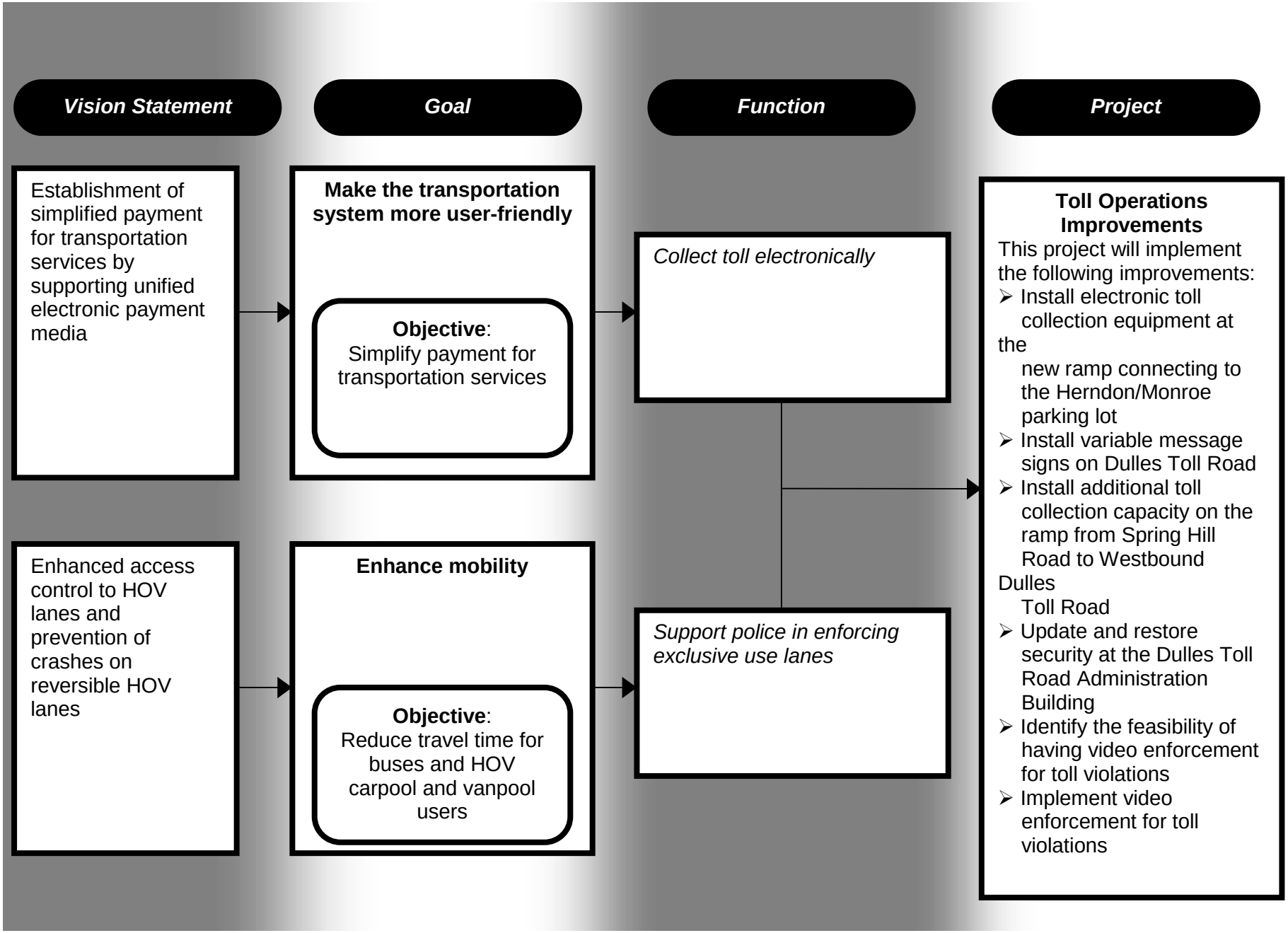
The following figures show the mapping of these projects to the Smart Travel to functions, objectives, goals and vision statement. A mapping of the *Evaluation of Integrated Payment System* is not included, as this project is an evaluation of the *Regional Effort on Electronic Payment* project.


Vision Statement
Goal
Function
Project
Establishment of simplified payment for transportation services by supporting unified electronic payment media
Make the transportation system more user-friendly
Objective: Simplify payment for transportation services
Collect toll electronically
Smart Tag - Dulles Toll Road
Smart Tag is a toll collection system that uses Automatic Vehicle Identification (AVI) to collect tolls electronically. The objectives of the Smart Tag system are to:
➢ Increase throughput
➢ Provide good audit control
➢ Achieve a high level of voluntary participation
➢ Achieve a reliable performance level
➢ Enhance safety
On the Dulles Toll Road, this Smart Tag system is integrated with lanes for automatic coin machines, and lanes with attendants for cash paying customers. The AVI system consists of three functional elements: a vehicle mounted transponder (or tag), a reader unit located above the travel lanes, and a compute system for data processing. Smart Tag allows drivers to pay be deducting their tolls from prepaid accounts as their tags are read.


Vision Statement
Goal
Function
Project
Optimized operations by adopting automated processes to manage personnel, equipment, and resources
Enhance agency operations and maximize effectiveness and efficiency of personnel, equipment, and resources
Objective: Improve intra-agency cooperation
Collect toll revenues from collection of automated payment and distribute fees to participating agencies
Smart Tag Store
The Smart Tag Store collects all revenues from the patron's use of the Smart Tag and distributes to each of the separate facilities that use the Automated Vehicle Identification transponders in Virginia.


Vision Statement
Goal
Function
Project
Establishment of simplified payment for transportation services by supporting unified electronic payment media
Make the transportation system more user-friendly
Objective: Simplify payment for transportation services
• Support implementation of a toll tag that is usable throughout the state and within the I-95 Corridor Coalition states
• Support implementation of simplified payment media that can be used across transportation modes (i.e. tolls, transit, parking, etc.)
• Support operation of regional effort on electronic payment
Regional Effort on Electronic Payment
The Washington Metropolitan ITS Task Force has established several work groups, and one of these groups is focusing on regional seamless electronic payment services. That work group has developed a scope for a Regional Electronic Payment Services Implementation Plan. This plan will be used to educate and advise regional decision-makers on the steps required and issues involved in implementing such a system, and on the benefits of the system. The development of a seamless payment mechanism would enable a single electronic payment device to be used for tolls, transit fares, parking fees, convenience purchases and other related applications. These transactions would be conducted in a delay-free, convenient and secure environment. The same device could also be used as identification or to provide security clearance for individual user groups, and may be expanded to provide other services as well.


Vision Statement
Goal
Function
Project
Establishment of simplified payment for transportation services by supporting unified electronic payment media
Make the transportation system more user-friendly
Objective: Simplify payment for transportation services
• Support implementation of a toll tag that is usable throughout the state and within the I-95 Corridor Coalition states
• Support implementation of simplified payment media that can be used across transportation modes (i.e. tolls, transit, parking, etc.)
• Support operation of regional effort on electronic payment
Integrated Payment System
This system will identify and implement technical and administrative requirements to implement a payment system that can be used across modes. This system will enable a traveler to pay with the same credit card for regional buses, trains, and tolls.


Vision Statement
Goal
Function
Project
Establishment of simplified payment for transportation services by supporting unified electronic payment media
Make the transportation system more user-friendly
Objective: Simplify payment for transportation services
Collect toll electronically
Enhanced access control to HOV lanes and prevention of crashes on reversible HOV lanes
Enhance mobility
Objective: Reduce travel time for buses and HOV carpool and vanpool users
Support police in enforcing exclusive use lanes
Toll Operations Improvements
This project will implement the following improvements:
Install electronic toll collection equipment at the new ramp connecting to the Herndon/Monroe parking lot
Install variable message signs on Dulles Toll Road
Install additional toll collection capacity on the ramp from Spring Hill Road to Westbound Dulles Toll Road
Update and restore security at the Dulles Toll Road Administration Building
Identify the feasibility of having video enforcement for toll violations
Implement video enforcement for toll violations