ALASKA IWAYS ARCHITECTURE UPDATE

ITS Alaska Conference 2022

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Purpose of the ITS Architecture

- Ensure effective and sustainable investments in ITS technologies
  - ITS purpose: efficient and safe roadway operations
  - Identify connections between systems that support ITS purpose
    - Ensure future systems can support data connections

Objectives

- ## Produce updated, user-friendly Alaska Iways ITS Architecture
  - Meets federal planning regulations
  - Consistent with National ITS Architecture
- ## Create user-friendly documents
- ## Outreach and train/educate stakeholders

Project Overview:
Process

1

Document Review

Identify content to be updated

Review ITS elements in planning documents

2

Workshops

Update and add concepts

Identify concepts no longer needed

3

Recommend updates & develop work plan

Project Team collaboration

4

Update architecture & documentations

Project Team collaboration

Convert to latest version of National architecture (ARC-IT)

Update Service Packages and Areas

5

Educational webinar

Presentation material

- Related collection of systems and data that deliver a "service"
  - e.g. Interactive Traveler Information or Broadcast Traveler Information, etc.

- Identifies:
  - Systems
  - Equipment
  - People
  - Data flows

…that, together, produce the service

- Related collection of service packages tailored to the State of Alaska
  - e.g. Traveler Information
- Identifies:
  - Systems
  - Equipment
  - People
  - Data flows

…that, together, fully describe the ITS elements in a functional area

Data Flow Diagrams by Service Area

1. Computer systems
- Subsystems
  - Functional Areas - aggregate various systems/subsystems

■ (blue)	Service Area Related Subsystem
▨ (green)	Subsystem from Another Service Area
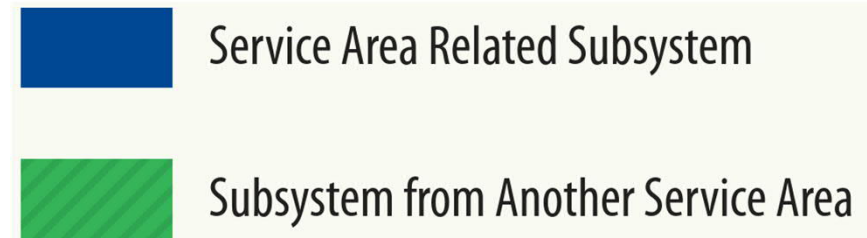
2. Data Flows
- Between systems

→	Existing Architecture Flow
---→	Planned Architecture Flow

3. Terminators
- Things that are outputs or inputs to the systems (people, detectors)

▭	Terminators

- Traffic Management
- Maintenance
- CVO & Freight
- Public Transportation
- Incident & Emergency Management
- Traveler Information
- Data Archive

Summary of Changes

- **Changes to National ITS Architecture**
  - Terminology changes
  - Architecture concept changes
- Changes based on stakeholder input
- Connected vehicle changes

TRAFFIC MANAGEMENT

Traveler Information Centers
- 511 (Phone & Web)
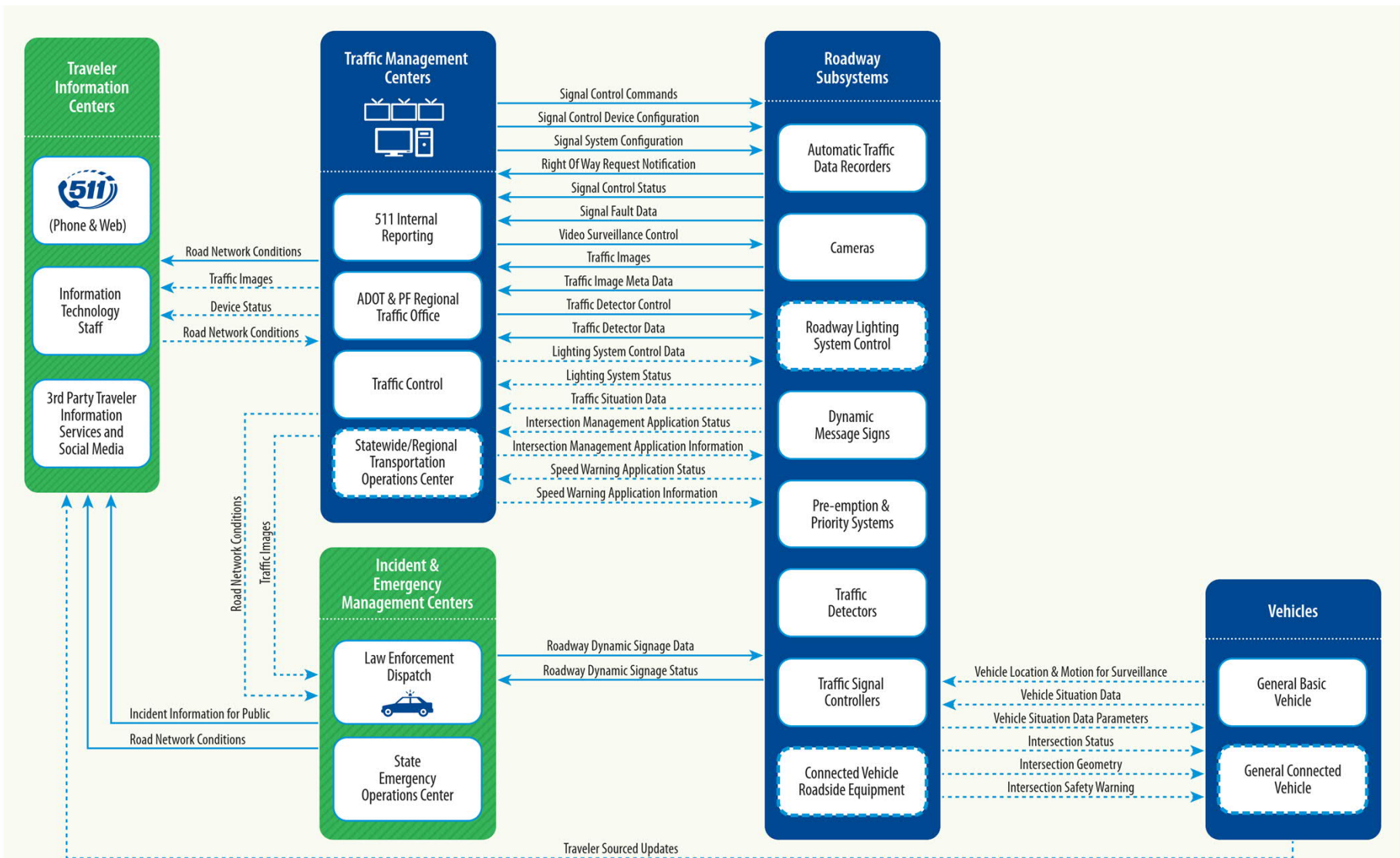- Information Technology Staff
- 3rd Party Traveler Information Services and Social Media

Traffic Management Centers
- 511 Internal Reporting
- ADOT & PF Regional Traffic Office
- Traffic Control
- Statewide/Regional Transportation Operations Center

Incident & Emergency Management Centers
- Law Enforcement Dispatch
- State Emergency Operations Center

Roadway Subsystems
- Automatic Traffic Data Recorders
- Cameras
- Roadway Lighting System Control
- Dynamic Message Signs
- Pre-emption & Priority Systems
- Traffic Detectors
- Traffic Signal Controllers
- Connected Vehicle Roadside Equipment

Vehicles
- General Basic Vehicle
- General Connected Vehicle

Flows between Traveler Information Centers and Traffic Management Centers:
- Road Network Conditions
- Traffic Images
- Device Status
- Road Network Conditions

Flows between Traffic Management Centers and Roadway Subsystems:
- Signal Control Commands
- Signal Control Device Configuration
- Signal System Configuration
- Right Of Way Request Notification
- Signal Control Status
- Signal Fault Data
- Video Surveillance Control
- Traffic Images
- Traffic Image Meta Data
- Traffic Detector Control
- Traffic Detector Data
- Lighting System Control Data
- Lighting System Status
- Traffic Situation Data
- Intersection Management Application Status
- Intersection Management Application Information
- Speed Warning Application Status
- Speed Warning Application Information

Other flows:
- Road Network Conditions
- Traffic Images
- Incident Information for Public
- Road Network Conditions
- Roadway Dynamic Signage Data
- Roadway Dynamic Signage Status
- Vehicle Location & Motion for Surveillance
- Vehicle Situation Data
- Vehicle Situation Data Parameters
- Intersection Status
- Intersection Geometry
- Intersection Safety Warning
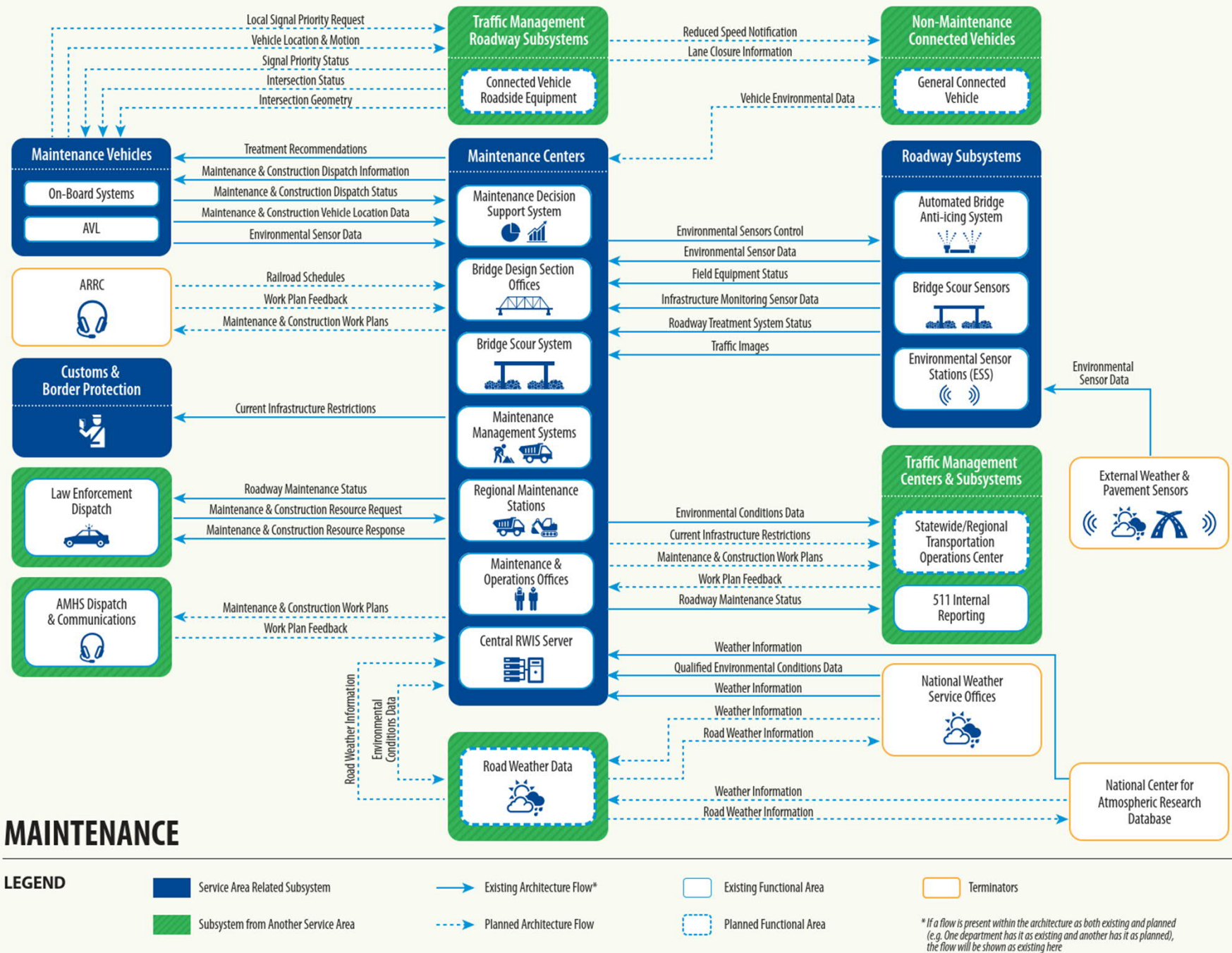- Traveler Sourced Updates

LEGEND

- Service Area Related Subsystem
- Subsystem from Another Service Area
- Existing Architecture Flow*
- Planned Architecture Flow
- Existing Functional Area
- Planned Functional Area
- Terminators

*If a flow is present within the architecture as both existing and planned (e.g. One department has it as existing and another has it as planned), the flow will be shown as existing here

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MAINTENANCE

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CVO & FREIGHT

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PUBLIC TRANSPORTATION

Public Transportation Centers & Subsystems

Public Transportation Service Information Subsystems
- AMHS Website
- Public Transit Agencies Websites

Traffic Management Centers & Subsystems
- Statewide/Regional Transportation Operations Centers
- Traffic Control

AMHS Dispatch & Communications
- Transit, Ferry, & Fare Schedules
- Transit & Ferry Incident Information
- Transit & Ferry Service Information

Transit, Ferry, & Fare Schedules
Incident Information
Traffic Images
Traffic Control Priority Request
Traffic Control Priority Status

Vessel Tracking System

Public Transportation Vehicles & Vessels
- Vessel On-Board Systems
- Vessel AVL
- Public Transit Vehicle On-Board Systems
- Public Transit Vehicle AVL

Traveler Information Subsystems
- 511 (Phone & Web)

Public Transit Agencies

Transit & Ferry Schedule Information
Transit Vehicle & Ferry Operator Information
Alarm Acknowledge
Alarm Notification
Transit Vehicle & Ferry Location Data
Transit Vehicle & Ferry Operator Authentication Information

Transit & Fare Schedule
Transit Incident Information
Transit Probe Data
Transit Schedule Adherence Information

Incident Response Status
Transit Emergency Data

Roadway Subsystem
- Cameras at AMHS Terminals

Alarm Acknowledge
Secure Area Surveillance Control
Alarm Notification
Secure Area Surveillance Data

Law Enforcement Dispatch

Traffic Management Roadway Subsystems
- Connected Vehicle Roadside Equipment

Local Signal Priority Request
Vehicle Location & Motion
Signal Priority Status
Intersection Status
Intersection Geometry

LEGEND

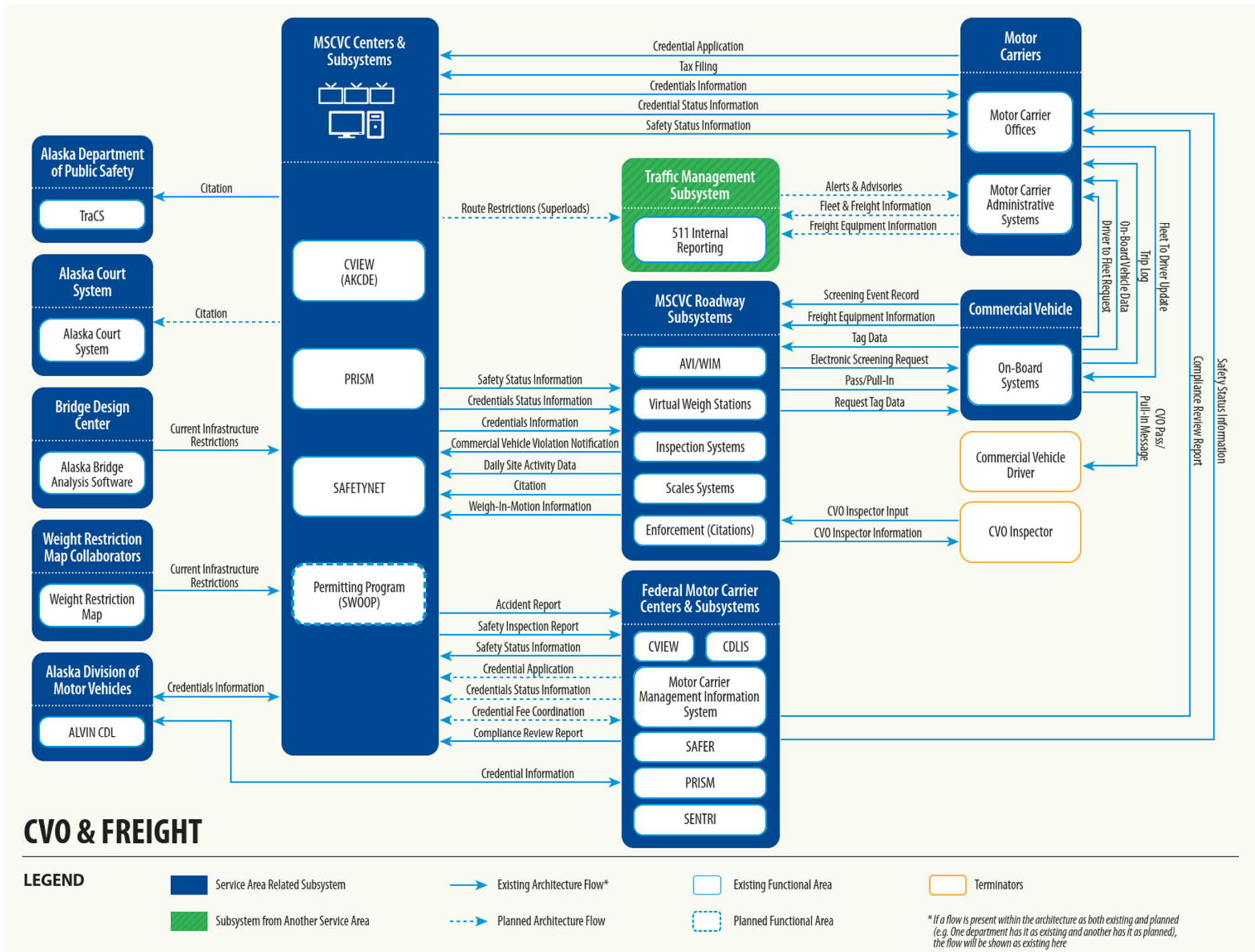- ■ Service Area Related Subsystem
- ▨ Subsystem from Another Service Area
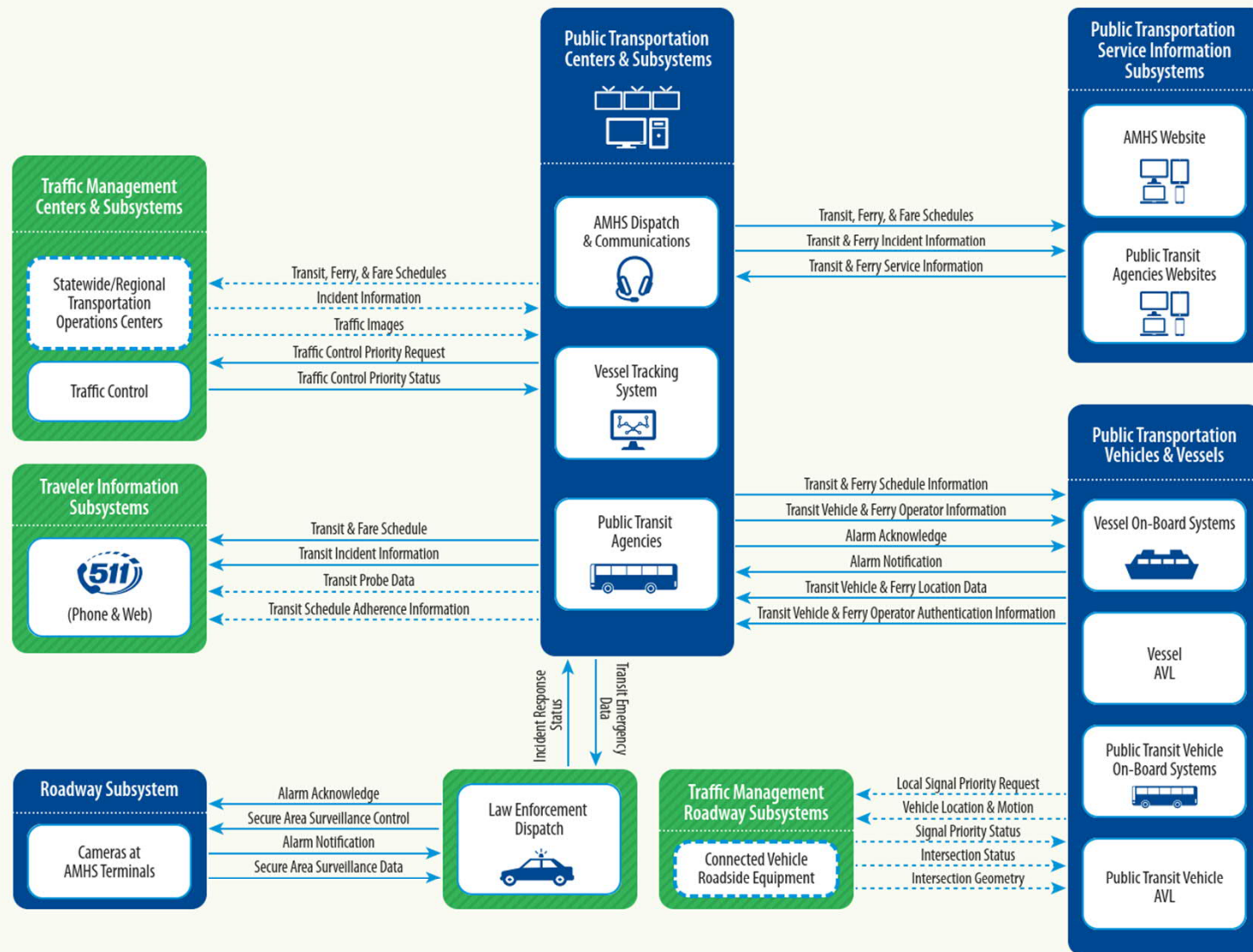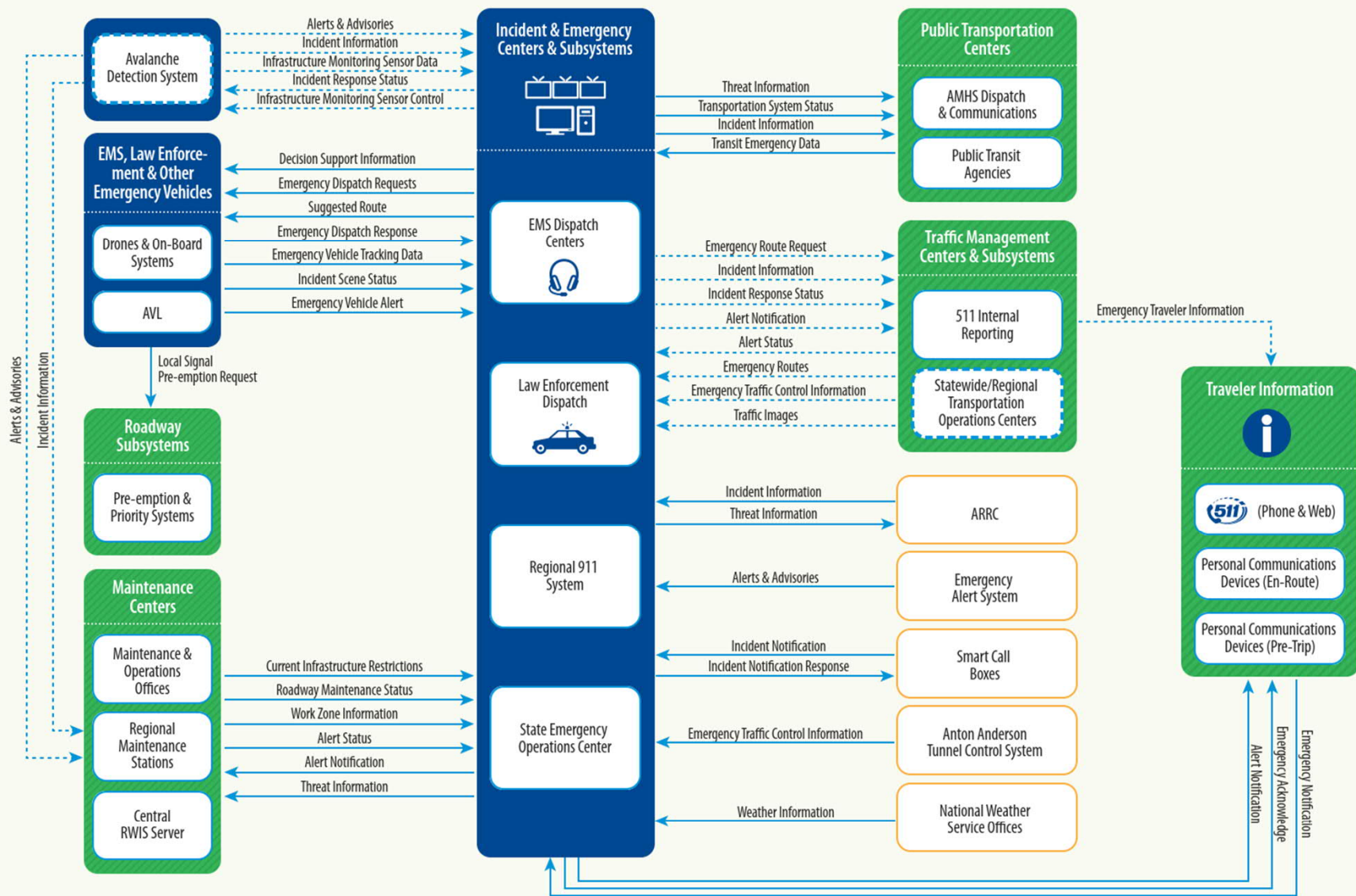- → Existing Architecture Flow*
- ⇢ Planned Architecture Flow
- ▢ Existing Functional Area
- ⬚ Planned Functional Area

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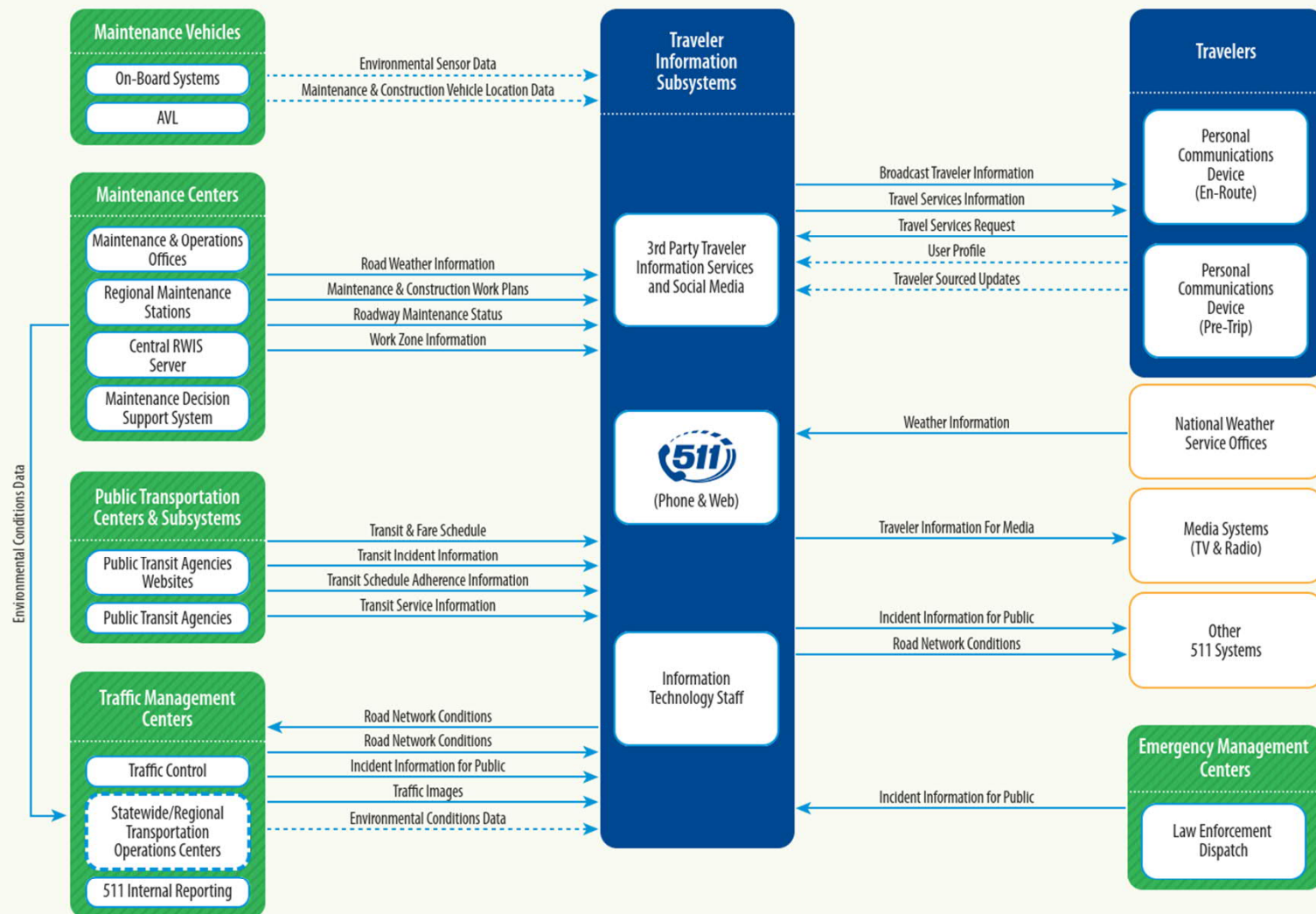
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INCIDENT & EMERGENCY MANAGEMENT

Incident & Emergency Centers & Subsystems
- EMS Dispatch Centers
- Law Enforcement Dispatch
- Regional 911 System
- State Emergency Operations Center

Avalanche Detection System
- Alerts & Advisories
- Incident Information
- Infrastructure Monitoring Sensor Data
- Incident Response Status
- Infrastructure Monitoring Sensor Control

EMS, Law Enforcement & Other Emergency Vehicles
- Drones & On-Board Systems
- AVL
- Decision Support Information
- Emergency Dispatch Requests
- Suggested Route
- Emergency Dispatch Response
- Emergency Vehicle Tracking Data
- Incident Scene Status
- Emergency Vehicle Alert
- Local Signal Pre-emption Request

Roadway Subsystems
- Pre-emption & Priority Systems

Maintenance Centers
- Maintenance & Operations Offices
- Regional Maintenance Stations
- Central RWIS Server
- Current Infrastructure Restrictions
- Roadway Maintenance Status
- Work Zone Information
- Alert Status
- Alert Notification
- Threat Information

Public Transportation Centers
- AMHS Dispatch & Communications
- Public Transit Agencies
- Threat Information
- Transportation System Status
- Incident Information
- Transit Emergency Data

Traffic Management Centers & Subsystems
- 511 Internal Reporting
- Statewide/Regional Transportation Operations Centers
- Emergency Route Request
- Incident Information
- Incident Response Status
- Alert Notification
- Alert Status
- Emergency Routes
- Emergency Traffic Control Information
- Traffic Images

Traveler Information
- 511 (Phone & Web)
- Personal Communications Devices (En-Route)
- Personal Communications Devices (Pre-Trip)
- Emergency Traveler Information

- ARRC — Incident Information, Threat Information
- Emergency Alert System — Alerts & Advisories
- Smart Call Boxes — Incident Notification, Incident Notification Response
- Anton Anderson Tunnel Control System — Emergency Traffic Control Information
- National Weather Service Offices — Weather Information

- Alert Notification
- Emergency Acknowledge
- Emergency Notification

TRAVELER INFORMATION

LEGEND

- ▮ (blue) Service Area Related Subsystem
- ▮ (green) Subsystem from Another Service Area
- → Existing Architecture Flow*
- --→ Planned Architecture Flow
- ▢ (blue outline) Existing Functional Area
- ▢ (blue dashed) Planned Functional Area
- ▢ (orange outline) Terminators

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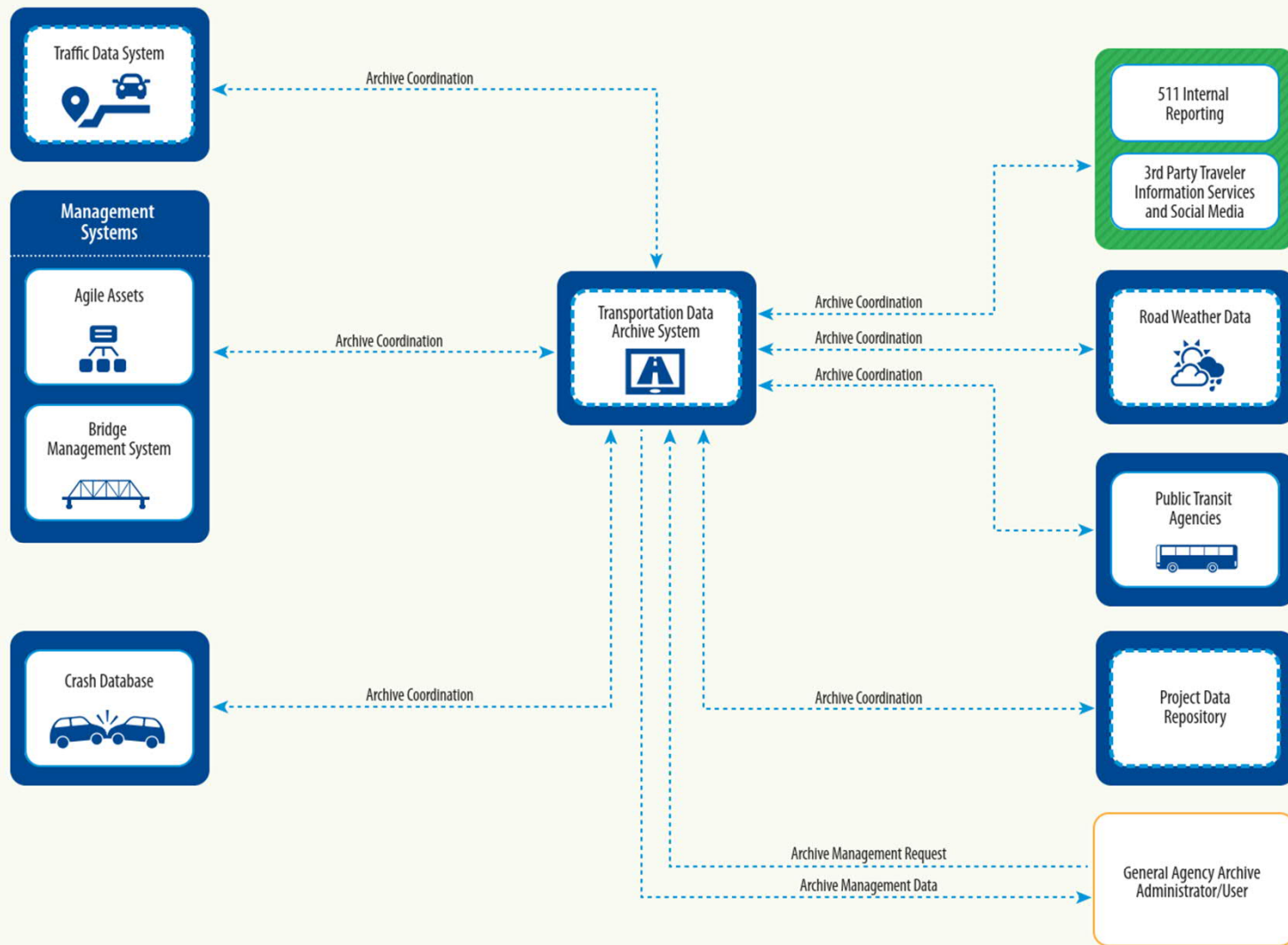
DATA ARCHIVE

LEGEND

■ Service Area Related Subsystem	→ Existing Architecture Flow*	▢ Existing Functional Area
▨ Subsystem from Another Service Area	⇢ Planned Architecture Flow	▢ Planned Functional Area

▢ Terminators

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Questions?

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