October 17, 2024

H-GAC ITS Architecture and Website Update

Greater Houston Freight Committee Briefing

What is an ITS Architecture

A plan for the **deployment**, **integration**, and **operation** of Intelligent Transportation Systems in a state or region

The plan includes **traffic**, **transit**, **tolling**, **public safety**, and **emergency management** agencies

The plan should be in developed in **coordination** with other **regional planning efforts** including the TxDOT Houston TSMO Program Plan, local ITS plans, and the H-GAC Regional Transportation Plan

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Why an ITS Architecture is Important?

All transportation projects that incorporate ITS elements and are funded through the Highway Trust Fund must conform with an ITS Architecture

An ITS Architectures can also…

- Help scope projects appropriately

- Ensure regional interoperability

- Support long-range planning

- Improve chances for future grant funding in the Region

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Project Goals

H-GAC ITS ARCHITECTURE AND WEBSITE UPDATE

1. Update the **existing H-GAC Regional ITS Architecture** to the current National ITS Architecture (Version 9.2)

2. Develop an ITS inventory software analysis tool that will **assist in transportation project prioritization**, benefit cost analysis, and economic impact analysis

3. Update and advance the existing Transportation Systems Management and Operations (TSMO) website

4. Create a **Geographic Information System (GIS) database of all ITS and signal fiber in the eight-county MPO**

5. Develop a standard method for collecting inventories and implementation plans from each stakeholder agency

6. Meet with all **eight counties and in the region (and cities)** to verify existing inventory and obtain plans for new ITS, signals, TMCs, and other deployments to be implemented over the next seven years

7. Meet with the **TxDOT Houston and Beaumont Districts** to inventory all existing ITS, signal, and tolling facilities and document their implementation plans for the next seven to 10 years

8. Determine which **cities will potentially surpass 50,000 residents** in the 2030 Census **and meet with them** to document their existing ITS and signal inventories and implementation plans leading up to 2030

9. Meet with all **Toll Authorities** in the MPO to inventory all existing ITS, signal, and tolling facilities and document the implementation plans for each for the next seven to 10 years

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Stakeholder Agencies

H-GAC Counties	H-GAC Cities	Regional Agencies
Brazoria *(Includes Toll Road Authority)* Chambers Fort Bend *(Includes Toll Road Authority and Transit)* Galveston Harris *(Includes Toll Road Authority)* Liberty Montgomery *(Includes Toll Road Authority)* Waller	Baytown Conroe Galveston Houston League City Missouri City Pasadena Pearland Sugar Land Texas City	Brazos Transit District Harris County Regional Transit Authority Houston Metro Port of Freeport Port of Houston TxDOT Beaumont District TxDOT Houston District Uptown TIRZ The Woodlands Regional Transit Authority

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H-GAC ITS Architecture History

First Developed in 2003

Updated in 2010

Updated in 2017

Current Update for 2024

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Key Tasks and Timeline

Task 1: Project Management

Task 2: Regional ITS Architecture Review

Task 3: Outreach and Data Collection

Task 4: Communications Scan

Task 5: Architecture Revision

Stakeholder Workshops
In-Person – December 5, 2024
Virtual – December 10, 2024

○ *Stakeholder Workshops*

Task 6: Architecture Website

| Feb 24 | Mar 24 | Apr 24 | May 24 | Jun 24 | Jul 24 | Aug 24 | Sep 24 | Oct 24 | Nov 24 | Dec 24 | Jan 25 | Feb 25 | Mar 25 |

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H-GAC Regional ITS Architecture

Inventory

Traffic Management

Closed Circuit Television Cameras

Dynamic Message Signs (Standard and Color)

Emergency Vehicle Preemption (GPS Based)

Freeway Safety Service Patrol

Ramp Metering

Smart Work Zones

Toll Lanes

Traffic Management Centers

Traffic Signal Operations

Truck Parking Availability Systems

Wrong-Way Driving Detection and Warning

Transit

AVL Systems

CCTV Security Cameras

Mobile Ticketing Application

Transit Signal Priority

Data/Information Mgmt

ConnectSmart

WAZE Integration

Claris Video Sharing

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Regional Needs

| COMMON REGIONAL NEEDS |
|:---:|
| **Commercial Vehicle Operations** |
| **Deploy freight signal priority**
Provide truck drivers with parking information and availability |
| **Parking Management** |
| Provide parking availability information for vehicles |
| **Public Transportation** |
| Install transit signal priority
Develop a regional transit fare application |
| **Public safety** |
| Expand emergency vehicle preemption |
| **Data and Information Management** |
| Develop data sharing agreements and expand data sharing capabilities
Improve utilization of data through dashboards, notification, and automation
Develop CCTV camera sharing network to share live video feeds
Expand fiber communications network
Share fiber network where appropriate |
| **Traffic Management** |
| **Improve traffic signal timing and coordination between jurisdictions**
Expand the CCTV camera network
Expand the DMS network (Including color and arterial DMS)
Deploy railroad monitoring system that provides notification of blockages
Deploy wrong-way driving detection and alert systems
Improve traffic incident management |
| **Weather** |
| Deploy road weather information systems (RWIS) for flood monitoring |

ITS Service Package Areas

ITS Service Package Areas from the National ITS Architecture

- Commercial Vehicle Operations
  - **Commercial Vehicle Parking**
  - **Freight Signal Priority**
- Data Management
- Maintenance and Construction
- Parking Management
- Public Safety
- Public Transportation

- Sustainable Travel
- Traffic Management
- Traveler Information and Personal Mobility
- Vehicle Safety
- Weather

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Potential ITS Focus Areas within the Region
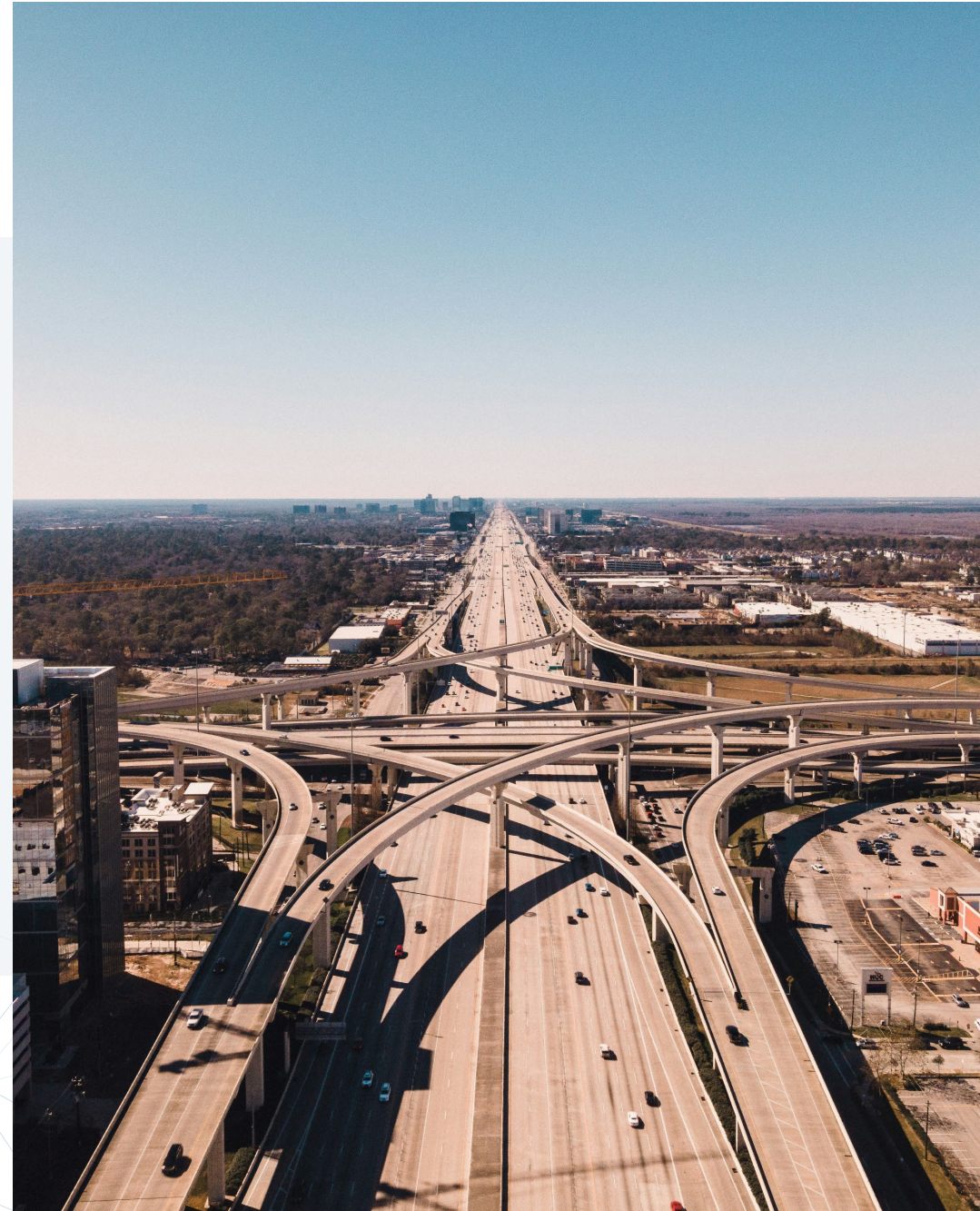
Potential ITS Focus Areas

Operations and Staffing

Improve Signal Timing on Arterials and Across Jurisdictional Boundaries

Automate Operational Capabilities (Includes Data Sharing)

Increase Staffing for ITS

Project Deployments

Expand CCTV Camera and DMS Coverage on Freeways and Arterials

Develop Regional CCTV Camera Video Sharing System

Deploy Railroad Crossing Detection and Notification Systems

Develop Regional Transit Rider Application

Expand Fiber Optic Communication Network

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Signal Timing and Coordination

Improve signal timing on arterials and coordination across jurisdictional boundaries.

League City | Missouri City | Pearland
Port Freeport | Port Houston
Houston METRO
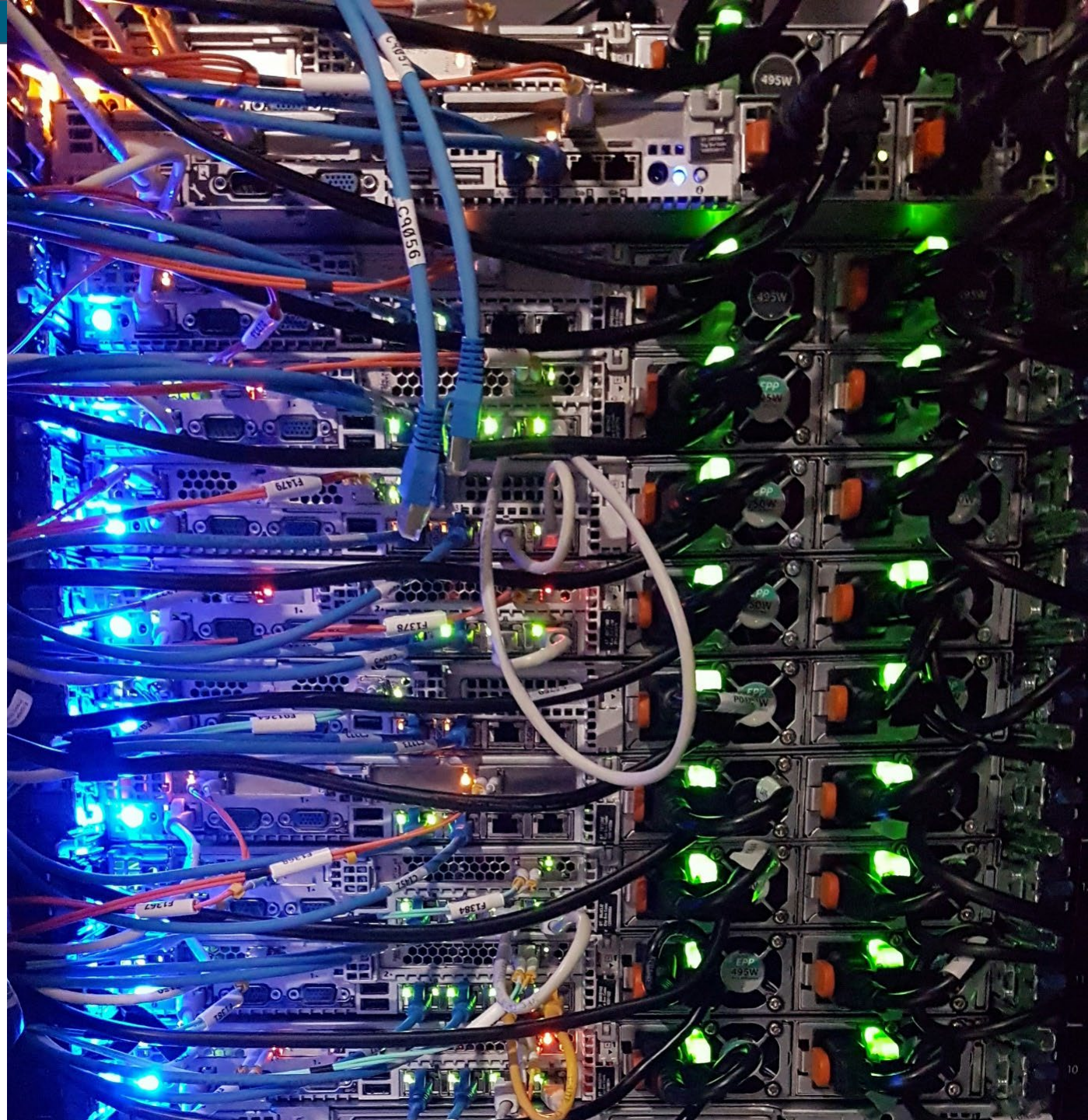
Operations and Staffing

Automate Operational Capabilities

Expand use of data dashboards, automation, data sharing, and AI to more actively manage transportation network.

Missouri City | Sugarland
Chambers County
Port Freeport
TxDOT Beaumont

Operations and Staffing

CCTV Camera and DMS Coverage on Freeways and Arterials

Expand CCTV camera and DMS coverage on freeways and arterials. Provide advanced information on traffic conditions prior to freeways. Use full color DMS.

Baytown | Galveston | Houston
Chambers County | Harris County
Port Freeport
TxDOT Beaumont

Project Deployment

CCTV Camera Video Sharing System

Develop regional system to share full-motion high resolution video between all transportation agencies in the region.

League City | Houston METRO
Brazoria County | Chambers County
Harris County Transit|
TxDOT Beaumont | TxDOT Houston

Project Deployment

Railroad Crossing Detection and Notification System

Improve rail detection systems and provide capability to notify drivers and emergency personnel of blockages cause by rail.

Houston | Missouri City
Pearland | Sugarland
Fort Bend County
Port Houston | Port Freeport

Project Deployment

Next Steps

- Continue Update to the Regional ITS Architecture

- Conduct Stakeholder Workshop (December 2024)

- Develop Training Classes for the Regional ITS Architecture

Contacts

H-GAC
Stephen Keen
stephen.keen@h-gac.com

Kimley-Horn (Project Consultant)
Tom Fowler
thomas.fowler@kimley-horn.com

Mark Conway
Mark.Conway@kimley-horn.com

Emma Brockman
Emma.Brockman@kimley-horn.com

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Thank You

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