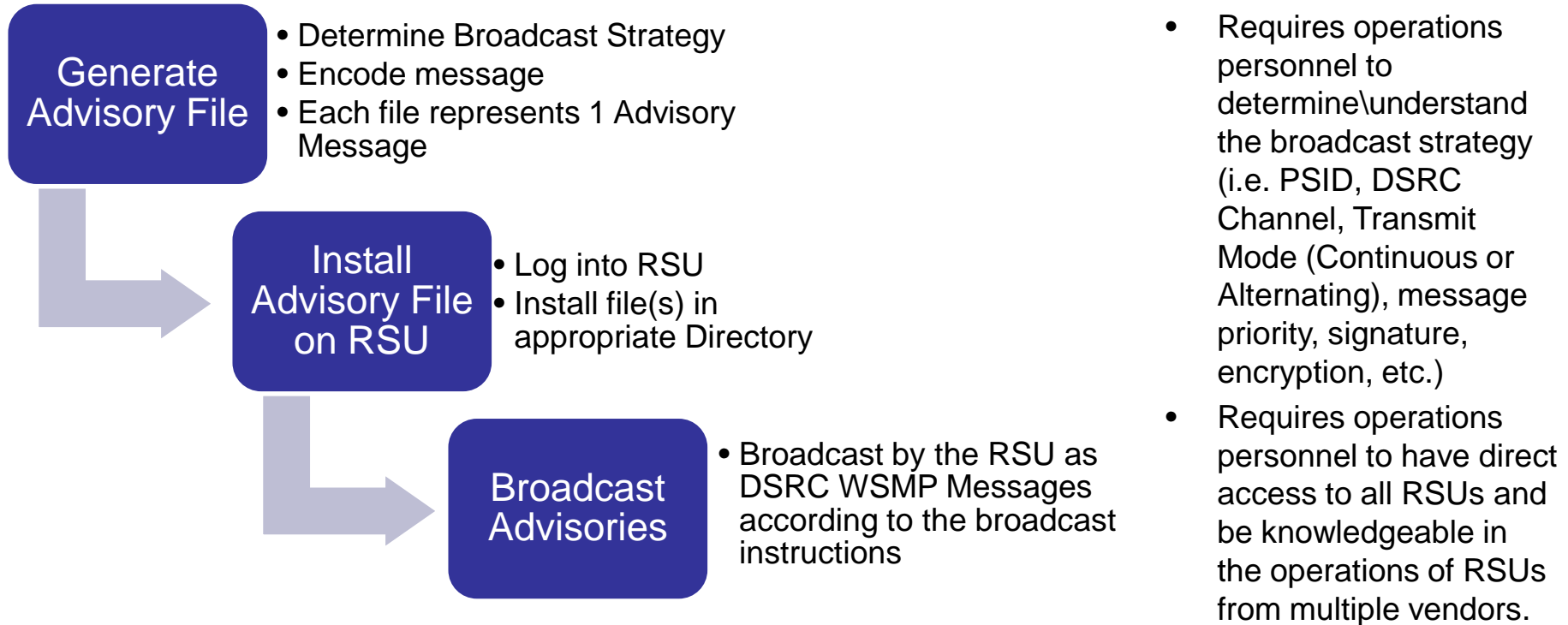

Getting to Something Big Tools and Support

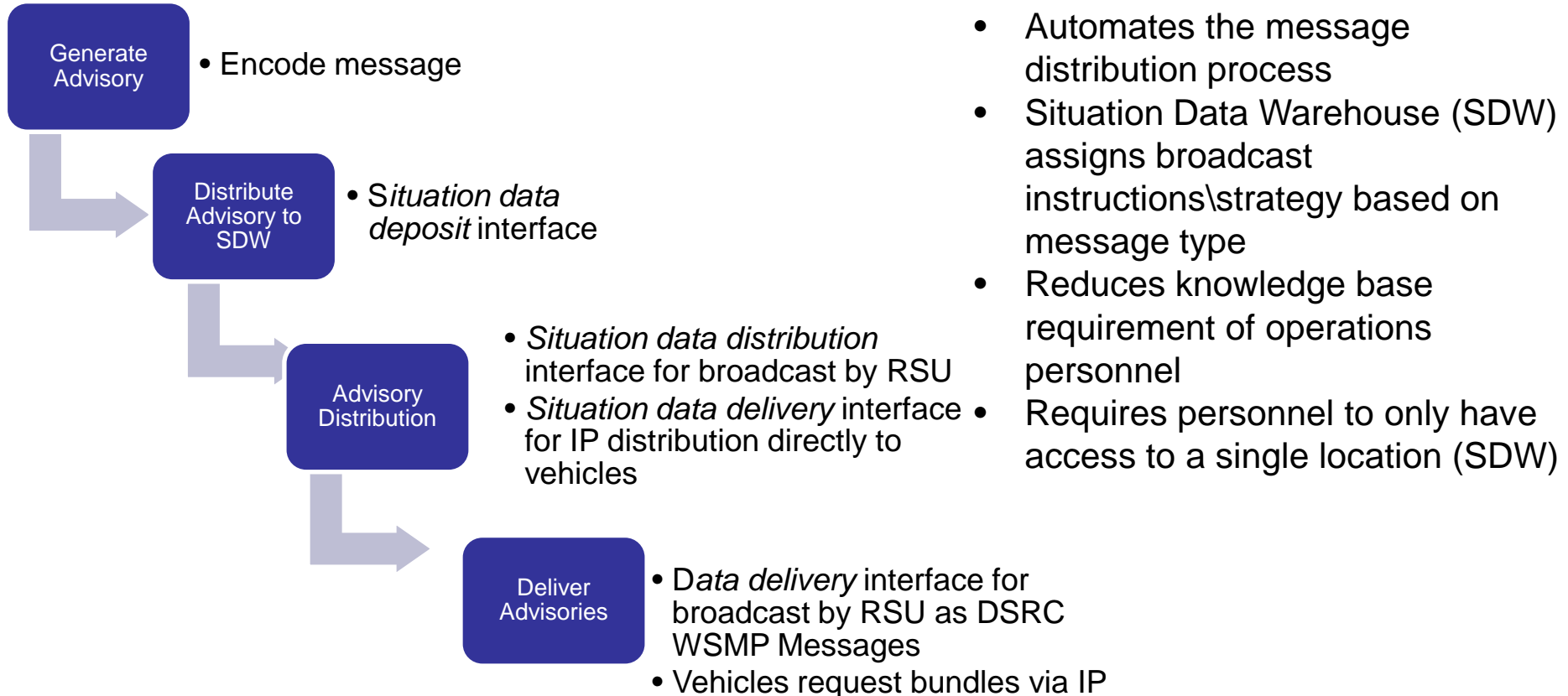
**Unified Implementation of the CVRIA – Regional Scale
Design Details, Tools to Assist Interoperable Implementations**



RSE 3.0



2014 Architecture



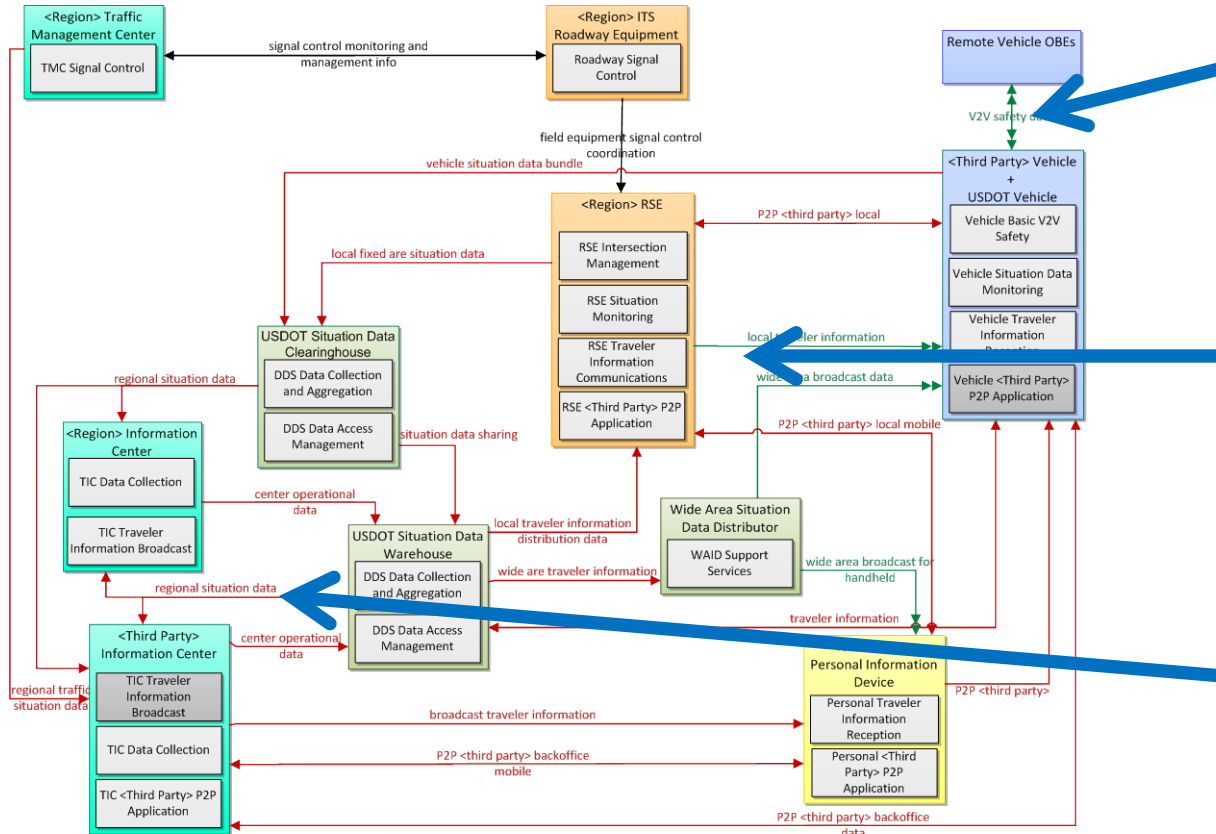
Focus on Key Interfaces

Promote Interoperability by forcing -

- All BSM's **meet performance requirements** (Vehicle Situation Data)
- All MAP's and SPaT's **created using the same interpretation** (Field Situation Data)
- All Traveler Situation Data **distributed using the USDOT Warehouse** (Travel Situation Data)



2014 Architecture



■ Vehicle Situation Data

■ Field Situation Data

■ Traveler Situation Data

1: Data Movements			
1	Physical View	Jan 23 2015	NAT



CPS – VO example

CPS-VO MY GROUPS MY ACCOUNT 100 3 Log out ? Search

CYBER PHYSICAL SYSTEMS
ACADEMIA INDUSTRY
GOVERNMENT
VIRTUAL ORGANIZATION

Unified Implementation of the CVRIA - Regional Scale

Connected Vehicles
Connected Vehicle Test Beds

Banner Image: U.S. DOT

CPS-VO » TRANSPORTATION » AUTOMOTIVE » UNIFIED IMPLEMENTATION OF THE CVRIA - REGIONAL SCALE » FILES

Files

Home

About

Search

Forums

Files →

EDIT GROUP TRACK TAXONOMY BROADCAST PANELS GROUP STATS

SE Michigan Projects	77.65 MB	115
Data Distribution	0 bytes	0
Overview Material	28.22 MB	18
Arch. Views	1.79 MB	7
ConOps	2.65 MB	2
Design	35.08 MB	83
Certification	9.91 MB	5
Affiliated Test Beds	13.32 MB	24



MAP Tool Example

The screenshot displays the 'Connected Vehicles' MAP Tool interface. The main window shows an aerial view of an urban intersection with a blue location pin and a red rectangle highlighting a specific area. A yellow line connects this area to a yellow dot on the road. On the left, a 'Builder' panel is open, showing two tabs: 'Intersection' and 'Lane'. The 'Lane' tab is selected, and it contains a grid of 12 lane configuration icons. Below the grid is a 'Draw Lanes' button. At the bottom of the interface, there is a toolbar with buttons for 'Approach', 'Lanes', 'Markers', and 'Delete'. On the right side, a 'Reference Point Configuration' panel is open, displaying the following information:

- Latitude:** 42.33765297679579
- Longitude:** -83.05129190674653
- Intersection:** Woodward Ave & E Elizabeth St
- Elevation:** 184


Buttons for 'Done' and 'Cancel' are located at the bottom of the Reference Point Configuration panel.

Traveler Situation Data Tool


New | Save | Preview | Rotate | Add | Delete | Move | Quit

Content


Advisory




Work Zone



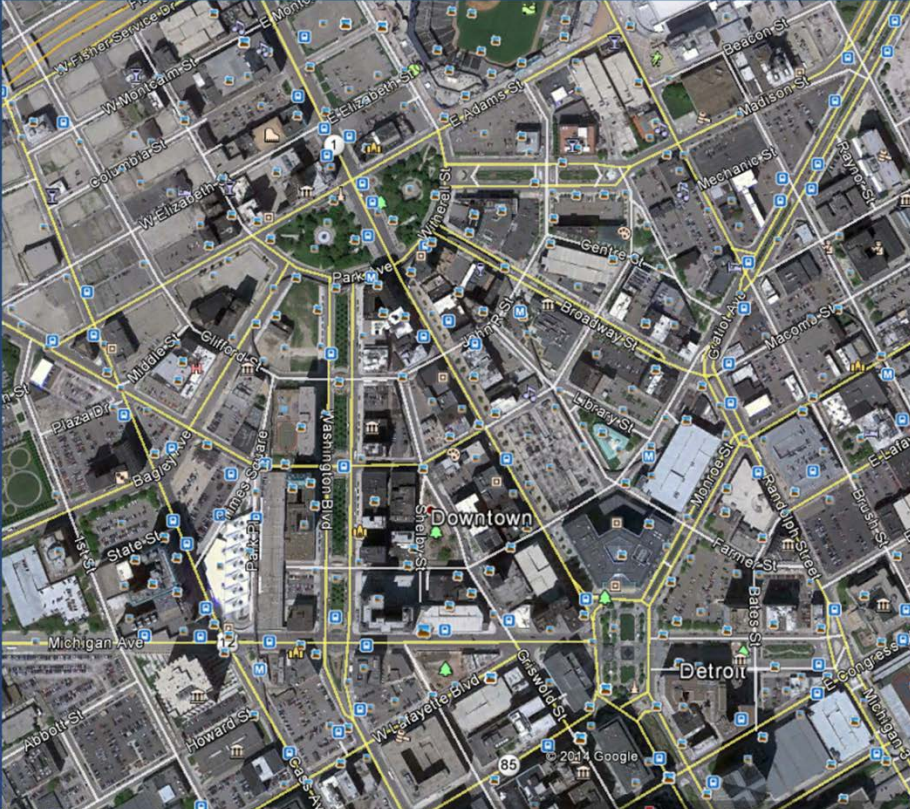

Generic



Speed Limit



Exit Service



- Objective
 - Provide less tedious and more user friendly way of creating Traveler Situation Data Messages (TIMs)
 - Common cases are easy and general case is possible
- Approach
 - Allow data entry via icon library drag and drop
 - Allow geo information to be provided from a map
 - Detect elevation from a geo point




Traveler Situation Data Tool, cont.


New | Save | Preview | Rotate | Add | Delete | Move | Quit

Content


Advisory




Work Zone




Generic



Speed Limit



Exit Service



Road Signage

Start Year

Start Time

Duration

Priority

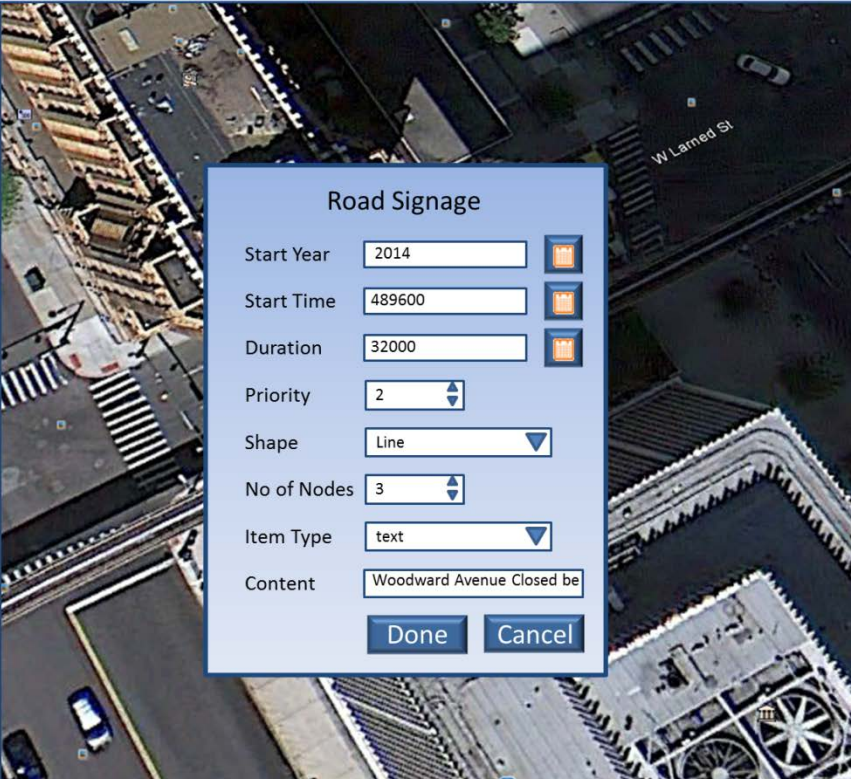
Shape

No of Nodes

Item Type

Content

Done Cancel



Preview

Hex String

```
3081CD80011081090000000000009021401A481B8308185800102A11BA119A0108004193AEAB68104CE8033DC820200B88102000C820102820207DE830307788084027D00850102A6108004193AEDB68104CE803AF2820200B78702016E880100A9213
```

Pretty print

```
value TravelerInformation ::=
{
  msgID travelerInformation,
  packetID '000000000009021401'H,
  dataFrames
  {
    {
      frameType roadSignage,
      msgID roadSignID :
      {
        position
        {
          lat 423291575,
          long -830458916,
          elevation '00B8'H
        },
        viewAngle '000C'H,
        mutcdCode warning
      },
      startTime 489600,
    }
  }
}
```

Save Close



Coming Soon

Organization to our efforts

- Architecture
- Tools
- Support
- Community



Coming Soon

Organization to our efforts to support

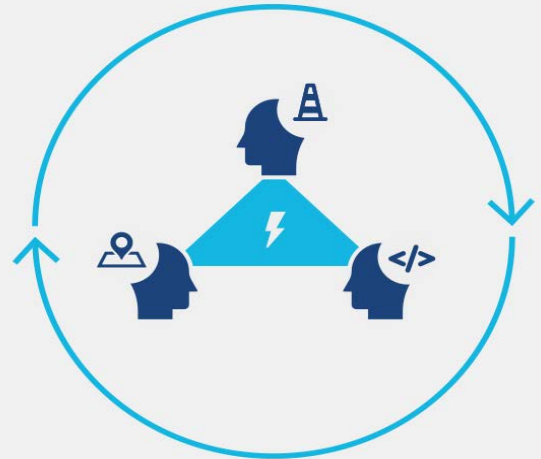
Platform

Tools

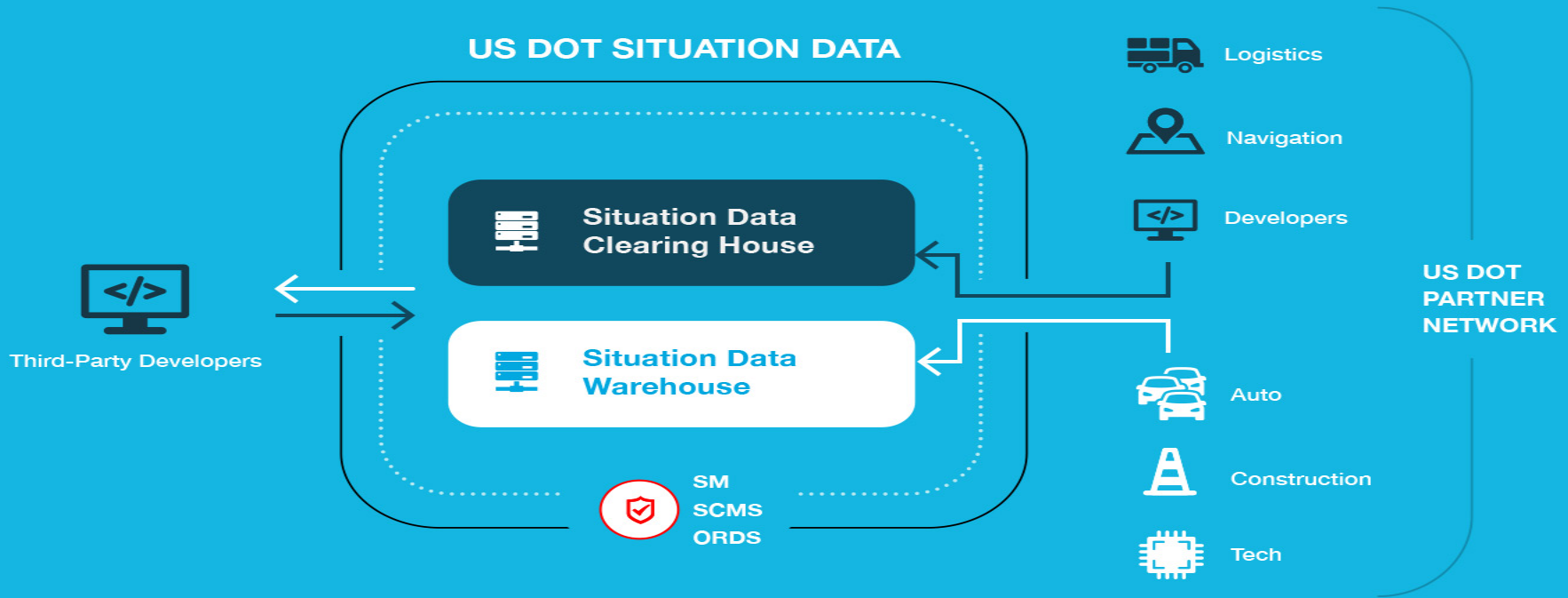
Community



U.S. DOT has established an open and evolving ecosystem for 3rd party developers to create new innovation.

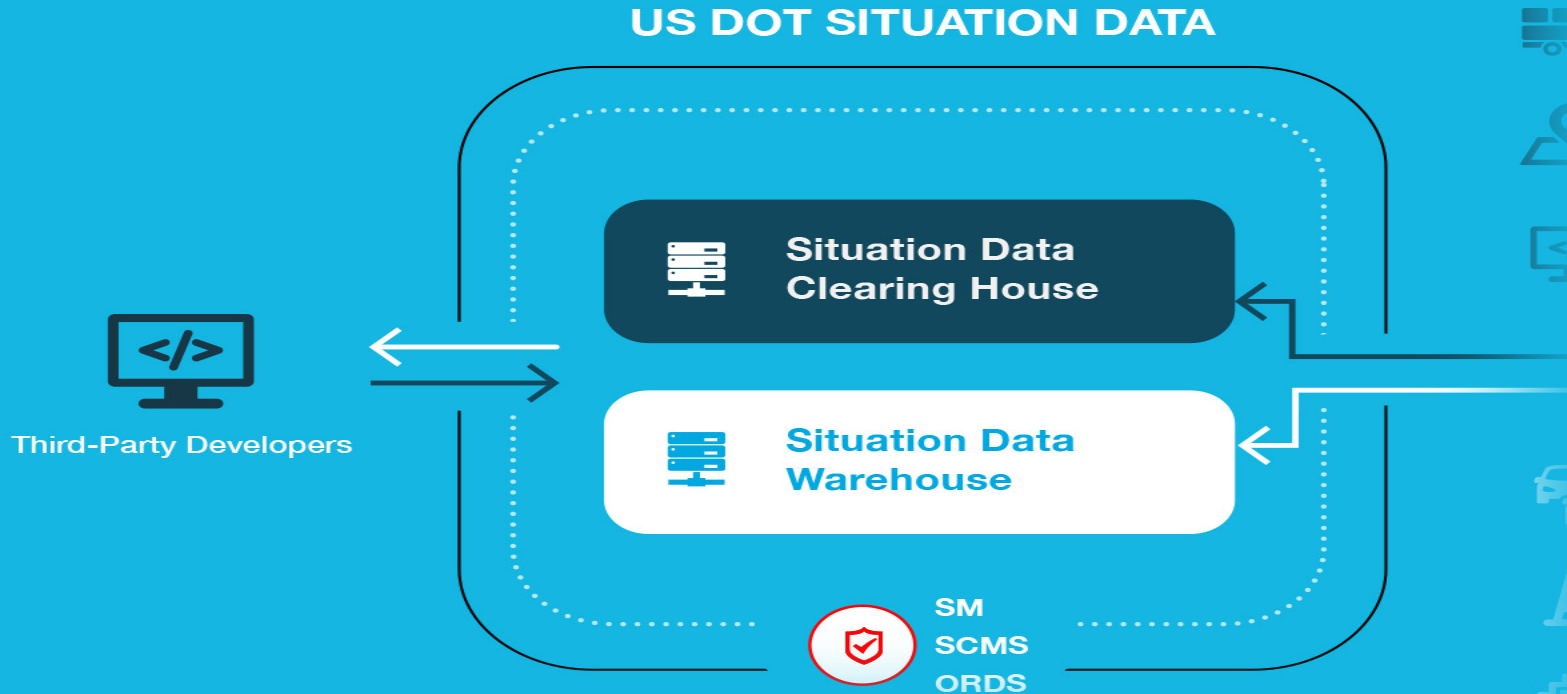


THE PLATFORM [Overview]



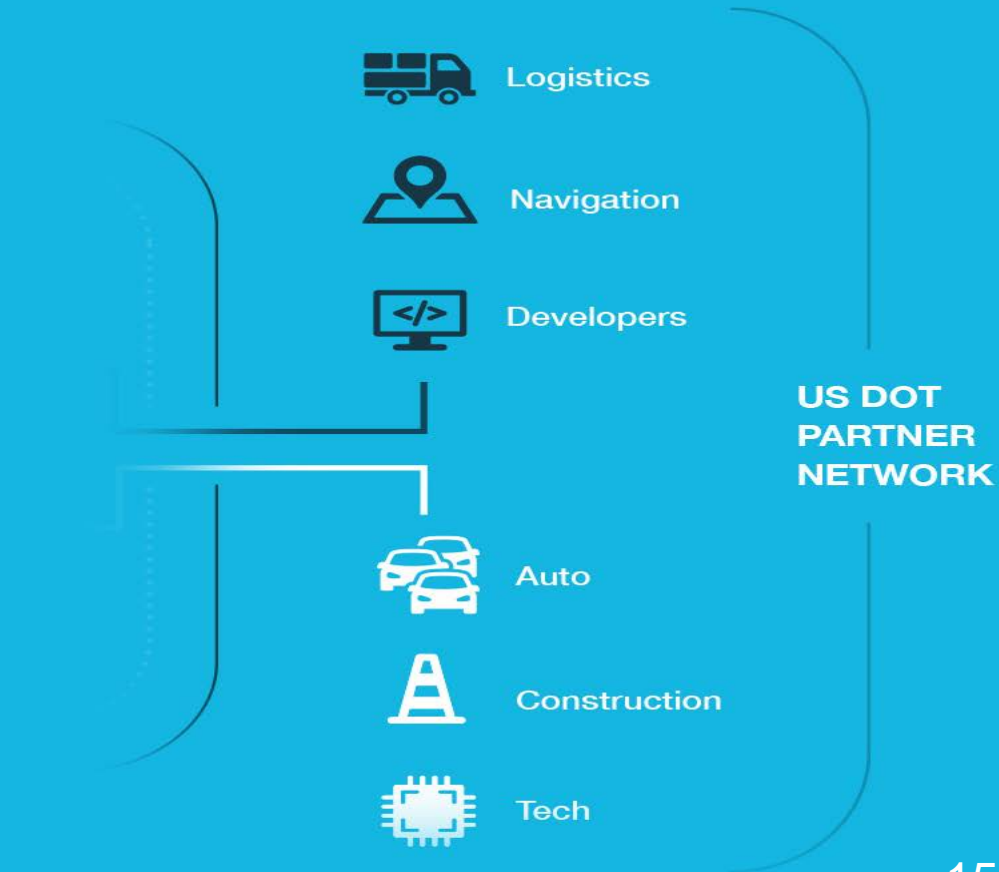
THE PLATFORM [Developers]

Focus on 3rd party developers



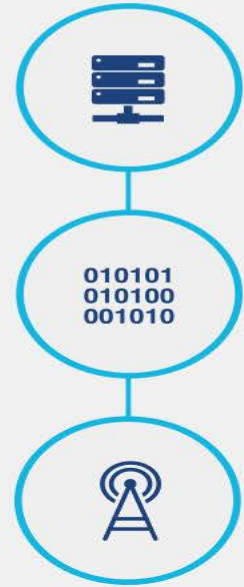
THE PLATFORM [Network]

Focus on partners



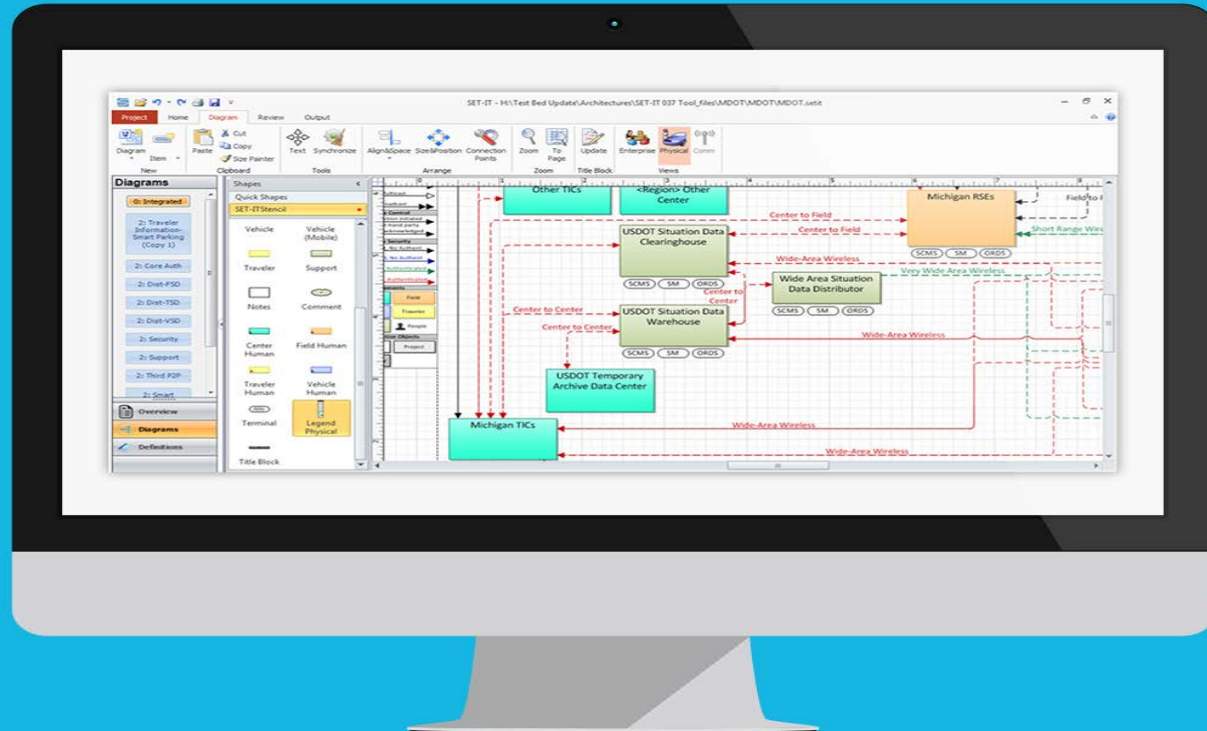
We have the tools...

We've been working hard to provide 3rd party developers everything they need to work efficiently, and effectively.



SET-IT

A network design tool, with guaranteed compliant designs to assist in development.

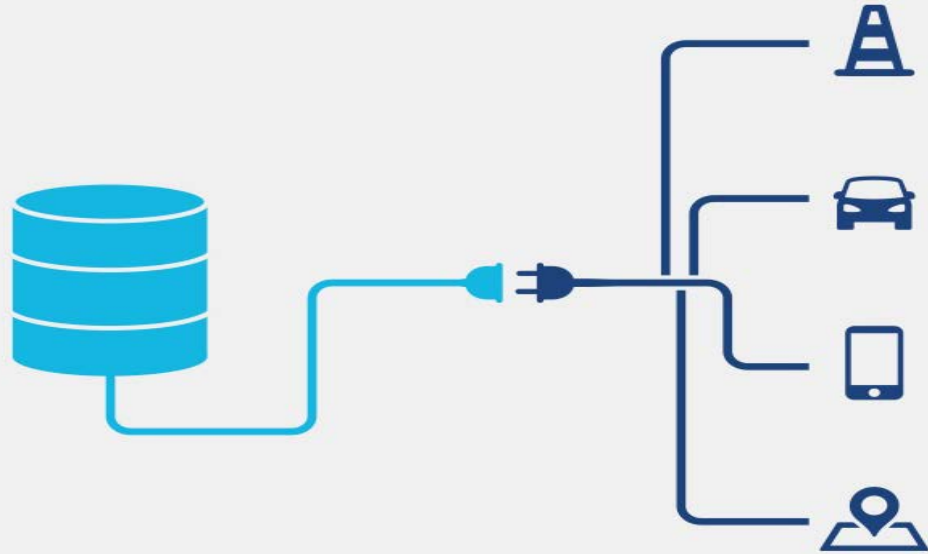


TEST HARNESS

A tool for 3rd party developers to functionally complete, test, and validate their code.



We have the APIs...



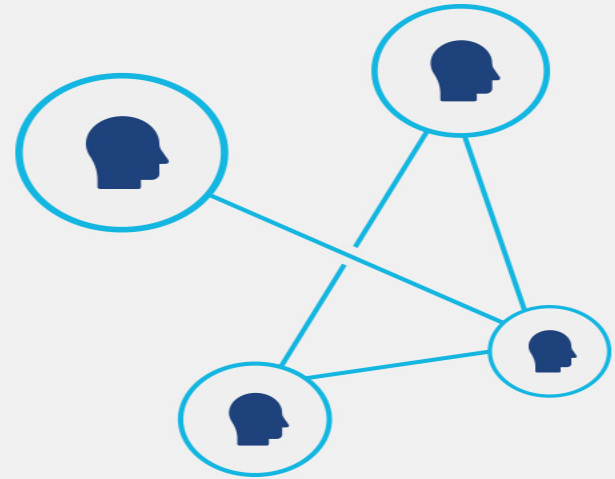
API – Live Data Exchange

- API - Live Data Exchange
- Proper subset implementation of J2735
- SDW - Data Warehouse
- SDC - Data Clearinghouse
- SCMS.v1 - Certificate Management/Security

```
DSRC-ASN.1  
-----  
23  
24  
25  
26  
27 SEMI DEFINITIONS AUTOMATIC TAGS ::= BEGIN  
28  
29 -----  
30 Common Trust Establishment Messages  
31 -----  
32  
33  
34 ServiceRequest ::= SEQUENCE {  
35   dialogID     SemiDialogID,           -- dependent on dialog  
36   seqID        SemiSequenceID,        -- 0x01 Service Request  
37   groupID      GroupID,               -- unique ID used to  
38   requestID    DSRC.TemporaryID,      -- random 4 byte ID ge  
39   destination  ConnectionPoint OPTIONAL -- the local IP and po  
40 }  
41  
42 ServiceResponse ::= SEQUENCE {  
43   dialogID     SemiDialogID,           -- dependent on dialog  
44   seqID        SemiSequenceID,        -- 0x02 Service Respon  
45   groupID      GroupID,               -- matches requestID in  
46   requestID    DSRC.TemporaryID,      -- matches requestID  
47   expiration   DSRC.ODateTime,        --  
48   serviceRegion GeoRegion OPTIONAL,   -- the region applicab  
49   hash          Sha256Hash            -- SHA-256 hash of Ser  
50 }  
51 -----  
52 Common Exchange Messages  
53 -----  
54  
55 {  
56   DataRequest ::= SEQUENCE {  
57     dialogID     SemiDialogID,           -- dependent on dialog  
58     seqID        SemiSequenceID,        -- 0x03 Data Request  
59     groupID      GroupID,               -- unique ID used to  
60     requestID    DSRC.TemporaryID,      -- random 4 byte ID ge  
61     serviceRegion GeoRegion,           -- region of interest  
62     timeBound    INTEGER (1..32767) OPTIONAL, -- maximum age in minu  
63     distType     DistributionType        -- distribution type  
64 }  
65 -----  
Line 61, Column 55
```



We have the community...



Our PlugFests are a place to solve problems and find new opportunities together.



We have the tools, APIs, and the people to build and test in the connected vehicle ecosystem.

The future should be built together.
Come and code with us.



GET STARTED TODAY

Design with SET-IT
Trial with Virtual Code
Live Support

Booth 912

Walton Fehr - walton.fehr@dot.gov
Greg Krueger- gregory.d.krueger@leidos.com
Test Beds: <http://www.its.dot.gov/testbed.htm>

