



## CENTRAL FLORIDA TSM&O CONSORTIUM MEETING SUMMARY

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**Meeting Date:** October 1, 2020 (Thursday) **Time:** 10:00 AM – 12:00 PM

**Subject:** TSM&O Consortium Meeting

**Meeting Location:** Teleconference

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### I. OVERVIEW

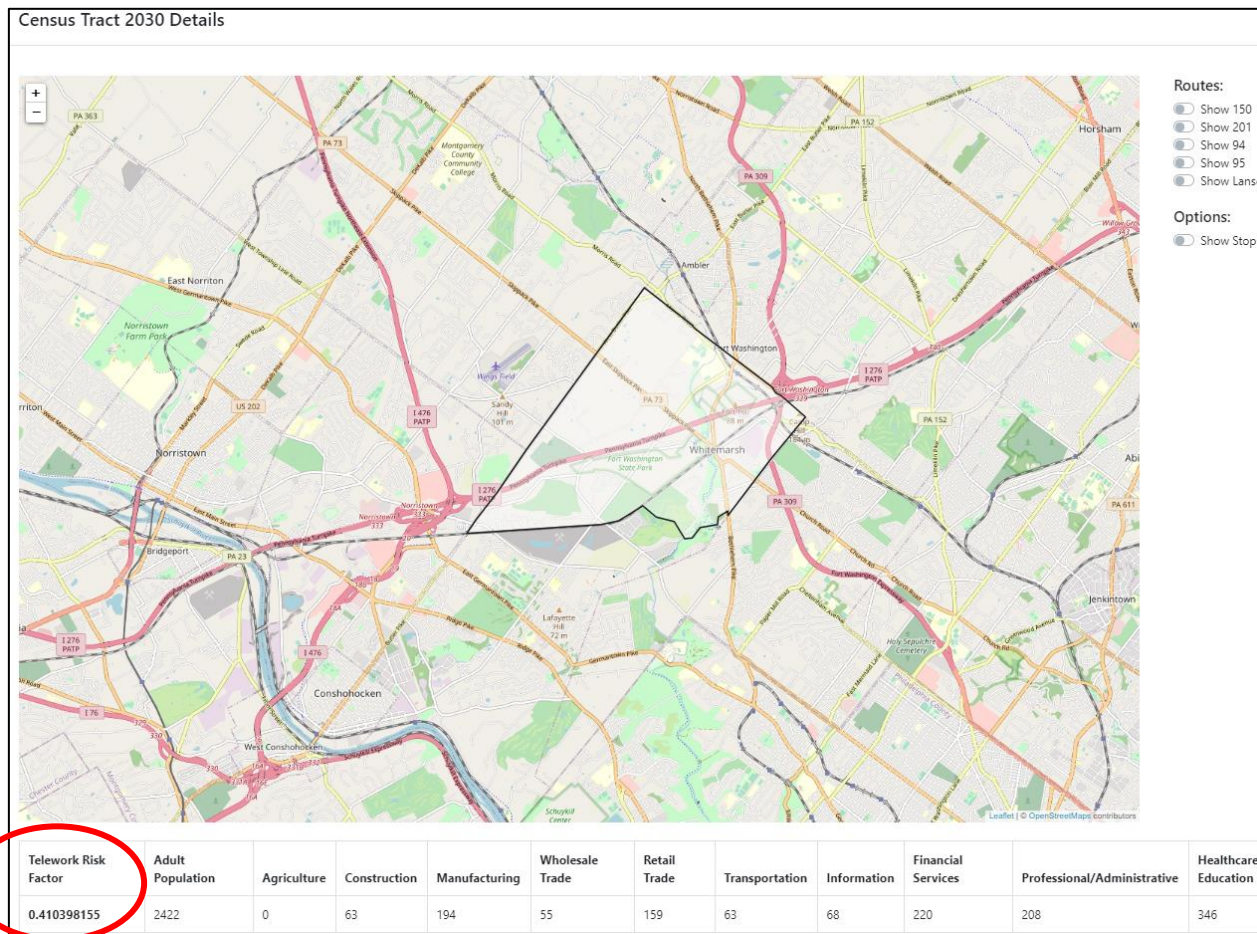
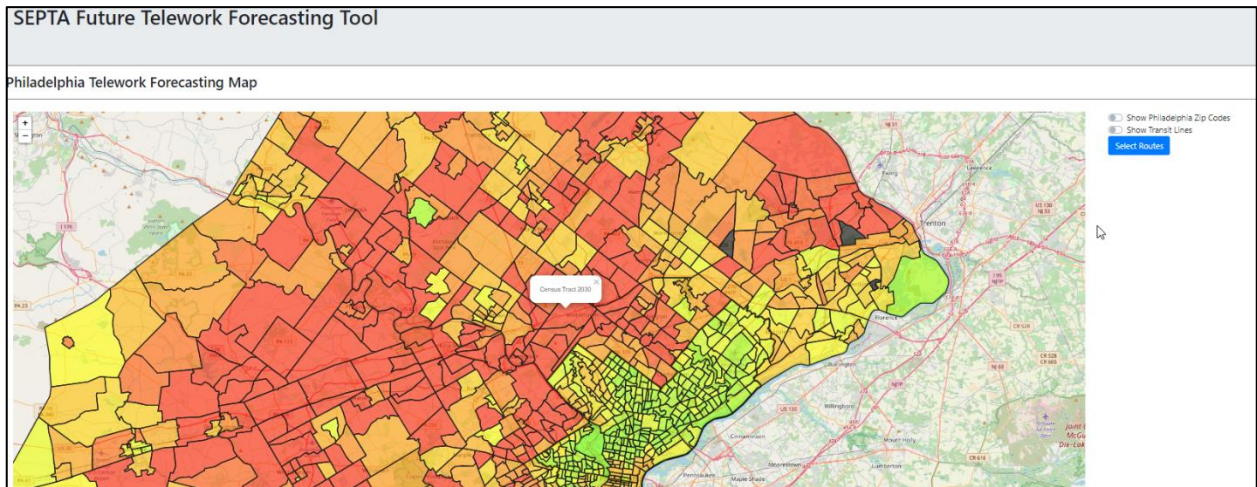
The purpose of this recurring meeting is to provide an opportunity for District Five FDOT staff and local/regional agency partners to collaborate on the state of the TSM&O Program and ongoing efforts in Central Florida. Jeremy Dilmore gave a short introduction and outlined the meeting agenda.

### II. TELEWORKING AND TRANSIT

David Williams presented on the Philadelphia Telework Forecasting Map developed by Penn State's Nittany AI Alliance in partnership with Southeastern Pennsylvania Transportation Authority (SEPTA).

- Background
  - Center City (Philadelphia's CBD) welcomes nearly 300,000 commuters daily
  - Nittany AI Alliance developed an AI algorithm that could estimate teleworking risk in community
    - Philadelphia's Smart City Director saw this as an opportunity to build relationship with Penn State
  - Then the pandemic hit, and the City had to redirect resources
  - City suggested Nittany AI Alliance partner with SEPTA to examine teleworking impact on ridership as a result of COVID-19
- Teleworking Risk – AI Algorithm
  - utilizes American Community Survey (ACS) census estimate data
  - historical ridership data
  - produces "telework risk" metric for each census tract that can be employed to create a heatmap
  - the heatmap developed for the Philadelphia region includes options to toggle on/off transit routes serving the region

- <http://septa.nittany-ai-associates.com/>



- Initial Findings
  - SEPTA Telework Forecasting Map
    - “The more affluent the area, the higher the teleworking”
  - University of Chicago Report, *How Many Jobs Can Be Done at Home?*
    - ~37% of jobs in US could plausibly be performed at home (this is likely an upper bound of possible outcomes, however)

- these jobs account for 46% of US wages
  - data was collected pre-COVID, but the findings and conclusions match current COVID-19 commuting trends
- NBER Report, *Which Workers Bear the Burden of Social Distancing Policies?*<sup>ii</sup>
  - Determined individuals in low-work-from-home jobs are the most likely to be affected by broad social distancing
  - These individuals are more likely to be economically vulnerable
- Telework Forecasting Map
  - algorithm and model are easily transferrable to other metro areas
  - algorithm is descriptive, not prescriptive
    - provides increased data for decision-making
  - data will support SEPTA in directing limited resources to communities that need transit the most
  - hope to estimate the magnitude of jobs converting to telework over the next 6 to 18 months

**Discussion:**

**Q:** What about our field – transportation planning, traffic ops, etc?

**Q:** How many agencies are still allowing working remotely?

**A:** Volusia County ends tomorrow; exception for health risk employees. City of Orlando allows remote working, although that may change soon as the Council will begin in-person meetings. MetroPlan Orlando is still allow employees to work remotely. We can go into the office as needed, as long as occupancy does not exceed 50%. Additional information is anticipated soon given in-person public meetings will start in November. Seminole County is still doing some remote working; the Traffic Ops department has several staff alternating one week at home, one week in the office. Orange County still has telework part-time for office staff and decentralized field staff. City of Ocala Public Works has been operating normally.

### III. TRENDS FROM RECENT CONSORTIUM MEETINGS

David Williams presented on previous TSM&O Consortium meetings, identifying key topics and trends over the past three years. Jeremy Dilmore led a discussion on next steps for the Consortium group, including conducting a Capability Maturity Model self-assessment (previously conducted in 2014 and 2017).

- Reviewed major topics and discussions 2017 to 2020
  - 22 meetings
  - [http://www.cflsmartroads.com/tsmo\\_consortium.html](http://www.cflsmartroads.com/tsmo_consortium.html)


### 2017 Topics

<p><b>FDOT and Partner Agencies</b></p> <ul style="list-style-type: none"> <li>• TSM&amp;O Planning Documentation</li> <li>• ITS/TSMO Master Plans</li> <li>• ATMS Plans</li> <li>• Roles &amp; Responsibilities</li> <li>• SunStore Development</li> <li>• “State of the System”</li> <li>• Signal Technician Training</li> <li>• Integrated Corridor Management System (ICMS)</li> <li>• ATCMTD</li> </ul>	<p><b>General Topics</b></p> <ul style="list-style-type: none"> <li>• Hard Shoulder Running</li> <li>• Express Bus / BRT (Miami)</li> <li>• CAV</li> <li>• GTFS and GTFS-RT</li> <li>• Future Proofing</li> </ul>
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### 2018 Topics

<p><b>FDOT and Partner Agencies</b></p> <ul style="list-style-type: none"> <li>• MPO Alliance and TSM&amp;O</li> <li>• Signal Technician Training</li> <li>• CV Readiness Study</li> <li>• SunStore</li> <li>• Local Agency Program (LAP) Process</li> <li>• Data Agreements</li> <li>• Near-Miss Collision Detection</li> <li>• Signal Clustering</li> <li>• Seminole County Lab Testing</li> <li>• CFAVP</li> <li>• RTMC</li> </ul>	<p><b>General Topics</b></p> <ul style="list-style-type: none"> <li>• Mobility as a Service (MaaS)</li> <li>• AVs (Benefits, Challenges, etc)</li> <li>• AVs and Local Planning</li> <li>• Planning for AVs &amp; Transit</li> <li>• Security Credential Management System (SCMS)</li> <li>• TransFuture                             <ul style="list-style-type: none"> <li>• Scenario Planning</li> </ul> </li> <li>• Federal Guidance on AVs</li> <li>• Gainesville <i>Autobus</i></li> <li>• Modeling ACES in Central FL</li> </ul>
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### 2019 Topics

<p><b>FDOT and Partner Agencies</b></p> <ul style="list-style-type: none"> <li>• TSM&amp;O Program Updates</li> <li>• Building the TSM&amp;O Business Case</li> <li>• SunStore / NOEMI / SIIA / ATSPM / RICMS</li> <li>• FDOT CAV Business Plan</li> <li>• ITS Funding Request List</li> <li>• ADS Grant</li> <li>• MPO Alliance – Prioritized Projects</li> <li>• Next Steps for Region</li> <li>• Regional Transit Study Final Report</li> <li>• UCF Data Visualization</li> <li>• Orange County Transportation Initiative</li> <li>• Signal ID Configuration</li> <li>• Mutualink</li> </ul>	<p><b>General Topics</b></p> <ul style="list-style-type: none"> <li>• Florida Legislation on AVs</li> <li>• DSRC / C-V2X / 5G</li> <li>• Future Proofing Infrastructure</li> <li>• Critical Issues in Transportation</li> <li>• Statewide SE Update</li> <li>• USDOT CV Pilot Sites</li> <li>• Data Management</li> <li>• Video-as-a-Sensor</li> <li>• What’s New in CAV?</li> </ul>
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**RTMC Operational**

**2020 Topics**

<p><b>FDOT and Partner Agencies</b></p> <ul style="list-style-type: none"> <li>• TSM&amp;O Workforce Development</li> <li>• TIM Program Update</li> <li>• FDOT CAV Readiness Study</li> <li>• Data Picker / ATSPM / NOEMI / SIIA</li> <li>• Orange County Transportation Technology Improvements</li> <li>• CAV Readiness Study</li> <li>• ITS4US and ATCMTD Grants</li> <li>• Technology Application Partnerships for Local Agencies (TAPs-LA)</li> </ul>	<p><b>General Topics</b></p> <ul style="list-style-type: none"> <li>• Federal AV Guidelines</li> <li>• New Policy on Grant Applications</li> <li>• Work Zone Data Exchange (WZDx)</li> <li>• AI for TSM&amp;O</li> <li>• DSRC / C-V2X / 5G</li> <li>• <i>Essential State Infrastructure Law</i></li> <li>• AV TEST</li> </ul>
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- Trends and Takeaways
  - Mainstreaming TSM&O within various agencies
  - Building the TSM&O business case
  - Workforce Development
  - Data (accessibility, dashboarding, management, security, sharing, storage)
  - Planning and Preparing for CAVs
  - Evolving CAV technologies, policies, regulations, laws
  - CAV Readiness Studies
  - CAV deployments
  - Finance, Funding, and Prioritization for local and regional TSM&O projects
  - TSM&O Best Practices and Lessons Learned
- Next Steps
  - Jeremy Dilmore
    - Mainstreaming has been a solid process; MPOs have shown understanding of TSM&O with their Master Plans
    - continuing to build business case
    - a lot of individual project successes
    - Workforce development
      - hasn't developed as strongly as would like
      - this is an area where we still need a lot of focus
    - **It is likely time to revisit our Capability Maturity<sup>iii</sup>**
      - expect *Organization & Workforce* to jump out as a priority
    - many successes, almost entirely because of the coordination and collaboration within the region
  - **At the next Consortium Meeting, we will hold a survey of public agency staff at the meeting to assess the region's progress in the Capability Maturity Model**
    - Business Practices
    - Organization & Workforce
    - Collaboration
    - Culture
    - Systems & Technology

- Performance Measurement

#### IV. SMART COLUMBUS MOBILITY ASSISTANCE FOR PEOPLE WITH COGNITIVE DISABILITIES PILOT

David Williams presented on the Smart Columbus Mobility Assistance for People with Cognitive Disabilities Pilot project, including lessons learned relating to its stakeholder outreach and support.

- Smart Columbus
  - Smart Columbus won the USDOT's *Smart City Challenge* - \$40 million awarded
  - Multiple projects planned for Smart Columbus
    - Smart Columbus Operating System (similar to FDOT's SunStore)
    - AV Shuttles
    - Multimodal Trip Planning and Common Payment System
    - Mobility Assistance for People with Cognitive Disabilities
    - EV Charging Infrastructure
    - EV Fleet Adoption
    - Event Parking Management
    - Smart Mobility Hubs
- Mobility Assistance for People with Cognitive Disabilities Pilot
  - using *WayFinder* phone app
  - Goal: connect individuals with limited cognitive abilities to the resources they need to better navigate Columbus using step-by-step visual and audio direction
    - caregivers enabled to develop instructions best suited for the individual user
  - Launched in April 2019
  - Primary Objectives in changing ridership patterns
    - enable individuals using paratransit services to switch to fixed-route bus services
    - enable individuals relying on caregiver transportation to switch to paratransit and/or fixed-route bus services
    - reduce Central Ohio Transit Authority (COTA) expenditures
      - Cost of Fixed-Route Trip = \$6.18
      - Cost of Paratransit Trip = \$35.86
  - Paratransit ridership largely unchanged year over year: 278,000 trips per year
  - Essential functions of Mobility Assistance app
    - System Access
    - Route creation via portal or app
    - Tracking
    - Accessibility
    - App features and settings
    - Alerts
    - User communication and caregiver support
  - Multiple tests were conducted to determine app functionality
  - O&M Plan established to ensure functionality beyond grant period
  - Data elements available
    - Starting/Completing a route

- Canceling a route before completion
- Pausing/Resuming a route
- GPS connection lost/reacquired
- Leaving/Reentering travel corridor of route
- Requests for assistance by user
- Downloading route with mode of travel used
- Caregiver updates and communications
- Lessons Learned
  - Focus group testing conducted to evaluate app's effectiveness with target users
  - **Successes:** increased feeling of access to community, worked well with users' personal skillsets, increased confidence through independent travel, and improved workforce development
  - **Challenges:** more hands-on training needed; more one-on-one training needed; additional safety features needed within app; participants would rather stick with the familiar; further research needed.
  - Documentation was critical to route testing
  - Diverse group of testers needed to explore app's functionality and interface completely
  - Switching engineering methodology presented challenges
    - Started in an Agile systems engineering (SE) process; ended in a V model SE process
      - switching back and forth led to development issues
  - Merchant rewards and gamification incentivize transit usage
  - Combining services under single umbrella improved usability leading to increased usage
  - <https://smart.columbus.gov/>

## V. DISTRICT FIVE ITS MASTER PLAN – IT STANDARDS

Jeremy Dilmore briefly provided an update on the District Five ITS Master Plan IT Standards.

- Communication
  - Land on FDOT Master Hub versus Core Switch
  - BGP between agencies
  - Physically redundant routes with ring break protocols on individual protocols
  - Re-IP
  - We're seeing that we're still sharing multicast; working on pursuing a single meet-up point
  - The region has made really good progress on the communication front
- Security
  - Land on Firewall at each end
    - security on both sides protects each agency
    - now have an interconnected system; when it affects your security, it affects ours
  - Use of Active Directory / Domain
    - moved over to SARS

- RADIUS or TACACS+ for supported devices
  - looking to have individual conversations with agencies on how to move forward; may move over to RADIUS or TACACS+
- Moving away from #2 key
  - other agencies have moved to different types of Cyberlocks or different # keys
  - as long as its not a #2, its much less likely that a bad actor will have access to it
- Will send out a survey to see where everyone is on these security issues
  - where there's a desire to do something but not an ability, jumpstarting the discussion will be good
- Data
  - Share to SunStore
    - SunStore offers ability to make data available in variety of different formats
  - Make JSON / XML data externally available
- Other
  - NTP / Common Clock
    - Jeremy sent out email earlier this week on comments/concerns
      - loss of network connectivity would affect signal timing across jurisdictions; seen a variety of options that seemed workable
      - please talk with your agency's IT folks about the NTP/Common Clock
      - Abram Little is the point of contact for this effort on FDOT's side
        - [Abram.Little@dot.state.fl.us](mailto:Abram.Little@dot.state.fl.us)
  - Standard ITS Testing
  - Software Licensing / Access
  - Asset Maintenance
    - MIMS is available, some agencies have adopted it into their processes; other agencies have their own asset management system
      - next step is identifying how to integrate MIMS with other asset management platforms that agencies have adopted
  - Contract Access
    - Maintenance
    - AAM / ICM
    - contact access is not where we want it to be
    - we are tracking contracts via spreadsheet
      - not currently available to the group; still working on this

**Discussion:**

- **Q:** Does the District have any preference on locking system?
  - Jeremy – we want to make sure local agencies have autonomy on decisions; if a recommendation is requested, FDOT can provide as needed
  - Tushar – the survey should help with identifying a preferred security method



## VI. SIIA CONTRACT LANGUAGE

Jeremy Dilmore briefly discussed the status of the SIIA contract language.

- SIIA – Signal Intersection Inventory Application
  - pulls in geometric information and other components of the intersection to help operate the system more efficiently and track assets in the field
  - big lift to gather this information
  - SIIA is not tied to state roads only
    - how can we make it more seamless to integrate into contracts?
- we have sample language
- recently put together a TSM&O CEI contract that added language allowing for data collection
- Is there a common set of specifications that agencies use?
- What does everyone use for specifications for local agency let?
  - if you aren't using FDOT specs, please send Jeremy an email and he will coordinate with you

## VII. R-ICMS AGREEMENT

Jeremy Dilmore presented on the R-ICMS Agreement and discussed its progress.

- Regional Integrated Corridor Management Software (R-ICMS)
  - you should have a copy of the R-ICMS agreement now
  - we're hoping it can go to Boards following election
    - Charles Wetzel – will be presented to the Seminole County Board on October 27
    - Cade Braud – currently in legal; doesn't anticipate any issues
  - we've heard that some folks want to see the software prior to signing the agreement; that's fine, we just wanted to make sure the language was available to folks
- David will send out copy to the Consortium group
  - FDOT initially sent it out to MetroPlan Orlando jurisdictions first as we're trying to get them up first

## VIII. CURRENT INITIATIVES

Jeremy Dilmore gave an update on current initiatives in District Five.

- ASCT Volusia County – able to work with folks at Rhythm regarding work efforts
- I-4 Express Lanes – starting to integrate with folks at FTE in their back office
  - should be able to make that connection within next couple of months
- Ramp Metering
  - will be an upcoming effort; Public Involvement group will be working on this
    - first ramp metering signal (completely shut off and bagged) at the beginning of 2021
    - public information blitz will be forthcoming
    - targeted discussion with first responders and with LYNX regarding their signal priority

- both identified as key stakeholders in initial ramp metering study 3 years ago
    - will be watching the John Young Parkway interchange like a hawk
- Wrong-Way Driving
  - thanks to CFX for all of their work efforts on WWD and sharing that data with the Department
  - will be turning on first WWD project at Lake Mary Blvd/SR 46 shortly
  - trying to address strongest demand first (I-4), but WWD is a strong emphasis for the District moving forward
- CV
  - technology has been improving
  - next big effort will be data gathering from CV equipment
- R-ICMS
  - working out schedule details
  - final acceptance of R-ICMS will be into CY 2021
    - but final install/test will be completed prior to end of 2020
- Automated Shuttle at UCF
  - startup date likely November 2020
  - COAST Autonomous has been great and worked with FDOT and UCF
- Freight Signal Priority
  - hoping they'll both be complete within 2 months
- New Tasks with UCF
  - Computer Vision Technology – what makes sense
    - CO put together a near-miss project
  - Measuring Post Encroachment Time (PET) and Post Collision Time (PCT)
- Cloud ATSPM
  - ITERIS will be new Cloud provider
  - Handoff will take place within the month; if you have a login to the ATSPM system, you will receive information on creating a new login for the new system
- PedSafe install
  - moving along nicely; expected completion in February 2021
  - a lot of ATCMTD/ATTAIN work should be completed by February 2021
- TMDD
  - up and running with Seminole County (has been a big help)
  - Osceola – has not been deployed yet; Clay was working on testing final deliverables
  - Orange – FDOT will be standing up own TMDD instance
- ATSPM
  - Connected to new Cobalt controller with Osceola County
    - instead of .dat file, they have .datz; should be able to figure out decoding this file type within the week
  - Now that we know how the system works, it will just be a matter of doing the work
- ATCMTD
  - GreenWay
    - a lot of Gridsmart units are starting to be deployed and connected to ITSQA

- Volusia County went first
  - expect this to move forward with individual agencies
- TAPs-LA
  - Central Office programmed the project proposed by Osceola County
- Questions
  - Keith DeLuca – has the SunGuide WWD module been tested for false calls?
    - Jeremy – hoping to run it through BlinkLink and SunGuide to see differences; want to make sure a smaller system is tested first
      - we were first District to ask how to install into system, so we'll likely be the first to implement and test and obtain lessons learned
    - Has MetroPlan heard back on ITS4US?
      - not yet
  - Jon Cheney – Can you send a copy of the latest preemption (Phases 2 and 3) intersection locations? In Volusia, some of the local agencies and 1 hospital are installing Opticom GPS units.
    - Jeremy to follow up

#### **IX. NEXT MEETING**

- December 10, 2020

#### **X. ATTACHMENTS**

- A – Presentation Slides
- B – Meeting agenda

#### **END OF SUMMARY**

*This summary was prepared by Amanda Johnson and David Williams and is provided as a summary (not verbatim) for use by the Consortium Members. The comments do not reflect FDOT's concurrence. Please review and send comments via e-mail to [dwilliams@vhb.com](mailto:dwilliams@vhb.com) so they can be finalized for the files.*

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<sup>i</sup> [https://bfi.uchicago.edu/wp-content/uploads/BFI\\_White-Paper\\_Dingel\\_Neiman\\_3.2020.pdf](https://bfi.uchicago.edu/wp-content/uploads/BFI_White-Paper_Dingel_Neiman_3.2020.pdf)

<sup>ii</sup> <https://www.nber.org/papers/w27085>

<sup>iii</sup> Capability Maturity Framework for TSM&O Program Areas (FHWA).  
<https://ops.fhwa.dot.gov/publications/fhwahop16031/index.htm>

# Welcome to the TSM&O Consortium Meeting October 1, 2020



# Meeting Agenda

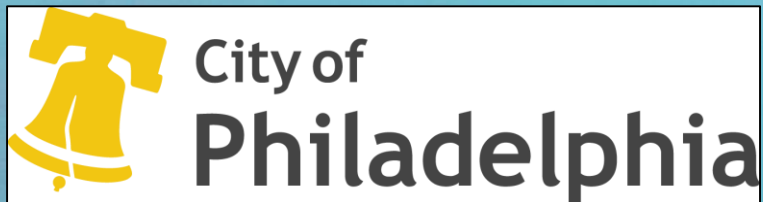
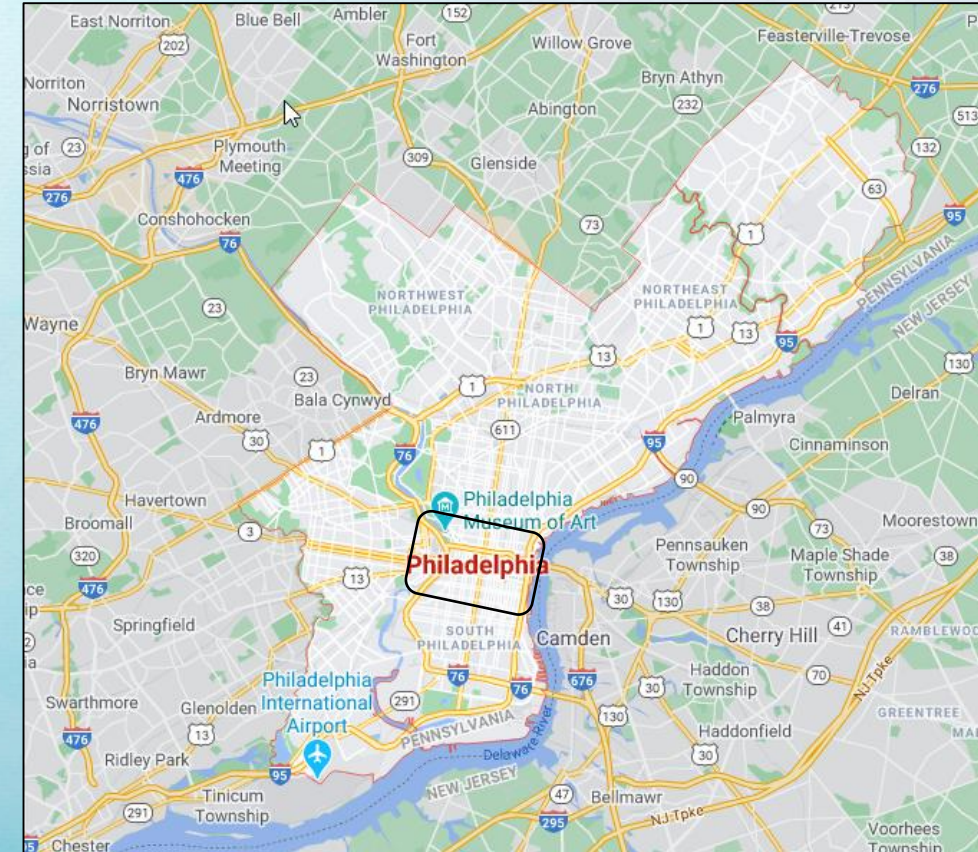
1. Welcome
2. Teleworking and Transit
3. Trends of Previous TSM&O Consortium Meetings
4. Smart Columbus – Mobility Assistance for People with Cognitive Disabilities Pilot
5. District Five ITS Master Plan – IT Standards
6. SIIA Contract Language
7. R-ICMS Agreement
8. Current Initiatives

# Teleworking Impacts on Transit in Philadelphia

David Williams, VHB

# Philadelphia Telework Forecasting Map

- Philadelphia's *Center City* district – nearly 300,000 commuters per day
- Penn State's Nittany AI Alliance developed an AI algorithm that could estimate a community's "teleworking risk"
- Smart City Director saw this as a chance to build relationship with Penn State
- Then the pandemic hit
- City passed along to SEPTA to examine impact on ridership



# Philadelphia Telework Forecasting Map

- The AI algorithm examines:
  - American Community Survey data
  - Historical ridership data
- The AI algorithm produces:
  - “Teleworking Risk” metric for each census tract that can be employed to create a heatmap
- Heatmap includes option to toggle on/off transit routes serving the Philadelphia region
  - <http://septa.nittany-ai-associates.com/>
  - <https://www.smartcitiesdive.com/news/psu-philadelphias-smart-city-transit-telework/584762/>



# Initial Findings

- “The more affluent the area, the higher the teleworking”
- **How Many Jobs Can Be Done at Home?\*** finds similar results
  - ~37% of jobs in US can plausibly be performed entirely at home
    - This is an upper bound, and has not been true in recent years
  - These job categories account for 46% of all US wages
    - Assumes same number of hours worked
  - Data was collected/interpreted pre-COVID, but matches current trends
  - Correlation between a country’s level of economic development and share of teleworking jobs

\*Jonathan I. Dingel and Brent Neiman. University of Chicago, Booth School of Business (June 2020).

[https://bfi.uchicago.edu/wp-content/uploads/BFI\\_White-Paper\\_Dingel\\_Neiman\\_3.2020.pdf](https://bfi.uchicago.edu/wp-content/uploads/BFI_White-Paper_Dingel_Neiman_3.2020.pdf)

# Findings



Figure 1: Jobs that can be done at home typically earn higher wages

# Findings

- A separate paper\* determined individuals in low-work-from-home jobs are the most likely to be affected by broad social distancing
- They are also more likely to be economically vulnerable
  - Generally less educated, of lower income, have fewer liquid assets relative to income, less stable employment, and are renters.
  - Experienced the greatest declines in employment during pandemic

Table 1: Share of jobs that can be done at home, by occupation's major group

Occupation	O*NET-derived baseline	Manual assignment
15 Computer and Mathematical Occupations	1.00	1.00
25 Education, Training, and Library Occupations	0.98	0.85
23 Legal Occupations	0.97	0.84
13 Business and Financial Operations Occupations	0.88	0.92
11 Management Occupations	0.87	0.84
27 Arts, Design, Entertainment, Sports, and Media Occupations	0.76	0.57
43 Office and Administrative Support Occupations	0.65	0.51
17 Architecture and Engineering Occupations	0.61	0.88
19 Life, Physical, and Social Science Occupations	0.54	0.36
21 Community and Social Service Occupations	0.37	0.50
41 Sales and Related Occupations	0.28	0.21
39 Personal Care and Service Occupations	0.26	0.00
33 Protective Service Occupations	0.06	0.00
29 Healthcare Practitioners and Technical Occupations	0.05	0.06
53 Transportation and Material Moving Occupations	0.03	0.00
31 Healthcare Support Occupations	0.02	0.00
45 Farming, Fishing, and Forestry Occupations	0.01	0.00
51 Production Occupations	0.01	0.00
49 Installation, Maintenance, and Repair Occupations	0.01	0.00
47 Construction and Extraction Occupations	0.00	0.00
35 Food Preparation and Serving Related Occupations	0.00	0.00
37 Building and Grounds Cleaning and Maintenance Occupations	0.00	0.00

\*Simon Mongey, Laura Pilossoph, and Alex Weinberg. *Which Workers Bear the Burden of Social Distancing Policies?* NBER Working Paper No. 27085 (May 2020).

# Philadelphia Telework Forecasting Map

- The algorithm and model are easily transferrable to other metro areas
- The algorithm is descriptive, not prescriptive
- Increased data available for decision-making
- Data will support SEPTA in directing limited resources to communities that need transit the most
- Understanding the changing travel patterns of the region will inform SEPTA in creating a viable business plan
- Hope to estimate the magnitude of jobs converting to telework over the next 6-18 months

# Questions?

# Trends from Recent Consortium Meetings

David Williams, VHB

# Topics and Trends in TSM&O Consortium Meetings

- Reviewed major topics and discussions since 2017
  - 22 meetings

- And you can too!

[http://www.cflsmartroads.com/tsmo\\_consortium.html](http://www.cflsmartroads.com/tsmo_consortium.html)



# 2017 Topics

## FDOT and Partner Agencies

- TSM&O Planning Documentation
- ITS/TSMO Master Plans
- ATMS Plans
- Roles & Responsibilities
- SunStore Development
- “State of the System”
- Signal Technician Training
- Integrated Corridor Management System (ICMS)
- ATCMTD

## General Topics

- Hard Shoulder Running
- Express Bus / BRT (Miami)
- CAV
- GTFS and GTFS-RT
- Future Proofing

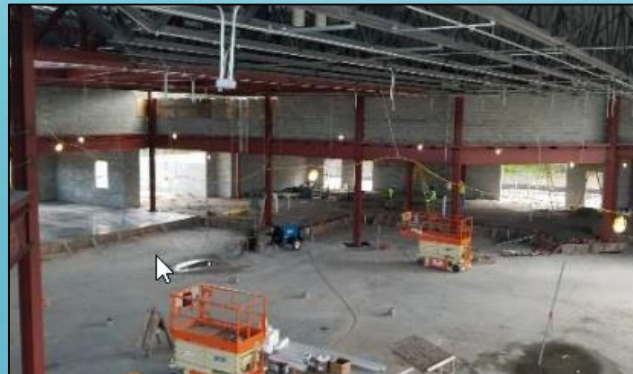




# 2018 Topics

## FDOT and Partner Agencies

- MPO Alliance and TSM&O
- Signal Technician Training
- CV Readiness Study
- SunStore
- Local Agency Program (LAP) Process
- Data Agreements
- Near-Miss Collision Detection
- Signal Clustering
- Seminole County Lab Testing
- CFAVP
- RTMC



## General Topics

- Mobility as a Service (MaaS)
- AVs (Benefits, Challenges, etc)
- AVs and Local Planning
- Planning for AVs & Transit
- Security Credential Management System (SCMS)
- TransFuture
  - Scenario Planning
- Federal Guidance on AVs
- Gainesville *Autobus*
- Modeling *ACES* in Central FL

# 2019 Topics

## FDOT and Partner Agencies

- TSM&O Program Updates
- Building the TSM&O Business Case
- SunStore / NOEMI / SIIA / ATSPM / RICMS
- FDOT CAV Business Plan
- ITS Funding Request List
- ADS Grant
- MPO Alliance – Prioritized Projects
- Next Steps for Region
- Regional Transit Study Final Report
- UCF Data Visualization
- Orange County Transportation Initiative
- Signal ID Configuration
- Mutualink

## General Topics

- Florida Legislation on AVs
- DSRC / C-V2X / 5G
- Future Proofing Infrastructure
- Critical Issues in Transportation
- Statewide SE Update
- USDOT CV Pilot Sites
- Data Management
- Video-as-a-Sensor
- What's New in CAV?



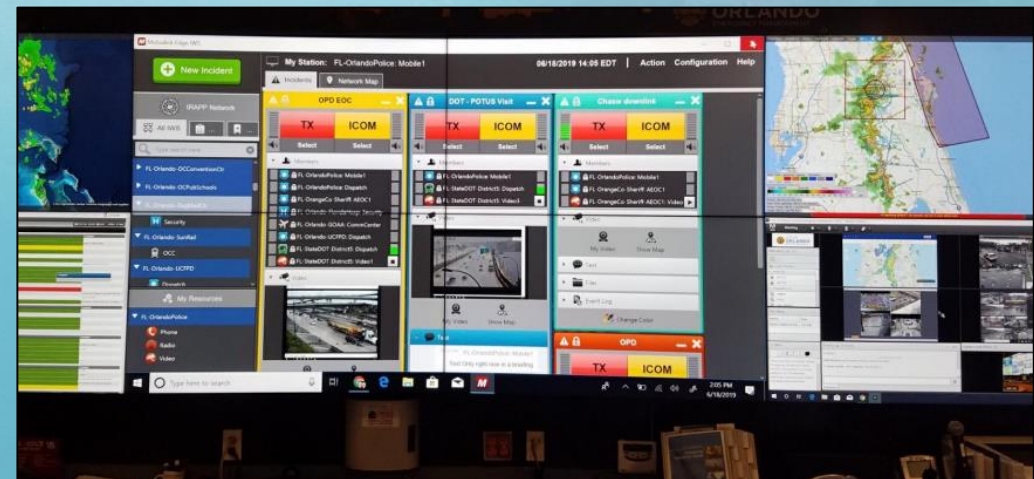
# 2020 Topics

## FDOT and Partner Agencies

- TSM&O Workforce Development
- TIM Program Update
- FDOT CAV Readiness Study
- Data Picker / ATSPM / NOEMI / SIIA
- Orange County Transportation Technology Improvements
- CAV Readiness Study
- ITS4US and ATCMTD Grants
- Technology Application Partnerships for Local Agencies (TAPs-LA)

## General Topics

- Federal AV Guidelines
- New Policy on Grant Applications
- Work Zone Data Exchange (WZDx)
- AI for TSM&O
- DSRC / C-V2X / 5G
- *Essential State Infrastructure Law*
- AV TEST



# Trends and Takeaways

- Mainstreaming TSM&O within agencies
- Building business case for TSM&O in the Central Florida region
- Workforce Development
- Data
- Preparing and (Scenario) Planning for CAV
- Evolving CAV technologies, policies, regulations, laws
- CAV Readiness Studies
- CAV Deployments
- Finance, Funding, and Prioritization
- TSM&O Best Practices and Lessons Learned – Florida, USA, International
- *Current Initiatives*

# Smart Columbus Mobility Assistance for People with Cognitive Disabilities Pilot

David Williams, VHB

# Smart Columbus

- Winner of the USDOT *Smart City Challenge*
  - \$40 million awarded
- Multiple projects planned/ongoing:
  - Smart Columbus Operating System
  - AV Shuttles
  - Multimodal Trip Planning and Common Payment System
  - Mobility Assistance for People with Cognitive Disabilities
  - EV Charging Infrastructure
  - EV Fleet Adoption
  - Event Parking Management
  - Smart Mobility Hubs

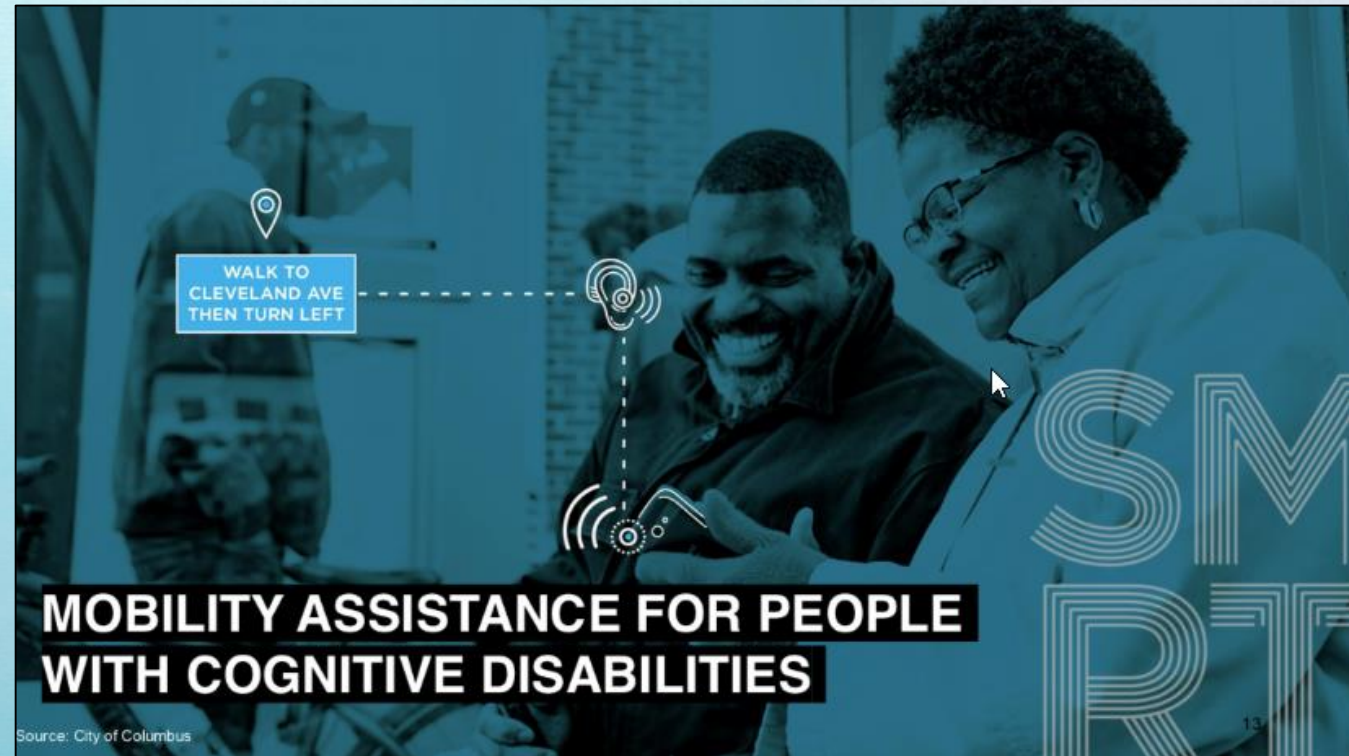
# Mobility Assistance for People with Cognitive Disabilities

- Pilot Project conducted by Smart Columbus
- Product: *WayFinder* phone app
- Goal: Connect individuals with limited cognitive abilities to the resources they need to better navigate Columbus using **step-by-step visual and audio direction**
  - Caregivers can develop instructions best suited to the user
  - App aims to make bus travel safe for older adults and people with cognitive disabilities
- Launched in April 2019



# Mobility Assistance for People with Cognitive Disabilities

- Cognitive Disabilities include:
  - Autism
  - Down Syndrome
  - Traumatic Brain Injury
  - Dementia
  - Attention Deficit Disorder
  - Dyslexia
  - Dyscalculia
  - Learning Disabilities





# Mobility Assistance for People with Cognitive Disabilities

- Main objectives in changing ridership patterns:
  1. Move people from using paratransit services to fixed-route bus services
  2. Move people from relying on being transported by a caregiver in a privately owned vehicle to paratransit and fixed-route bus services
  3. Reduce Central Ohio Transit Authority (COTA) expenditures
- Potential to decrease cost of paratransit service
- Improve mobility and independence of people with cognitive disabilities

# Mobility Assistance for People with Cognitive Disabilities

- COTA fixed-route trip cost = \$6.18
- COTA paratransit trip cost = \$35.86
- Paratransit ridership largely unchanged at 278,000 trips per year
- 5% shift → \$412k reduction
- 10% shift → \$825k reduction



# Mobility Assistance for People with Cognitive Disabilities

- COTA fixed-route trip cost = \$6.18
- COTA paratransit trip cost = \$35.86
- Paratransit ridership largely unchanged at 278,000 trips per year

**5% Shift**

\$412,552 cost savings

**10% Shift**

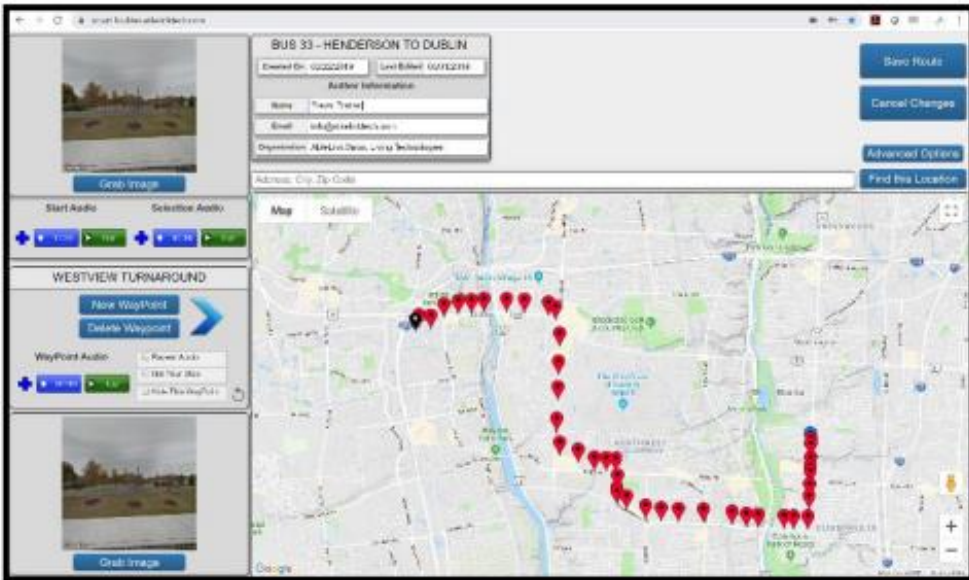
\$825,104 cost savings



# Mobility Assistance for People with Cognitive Disabilities



SMART Route Builder  
& App Route Builder

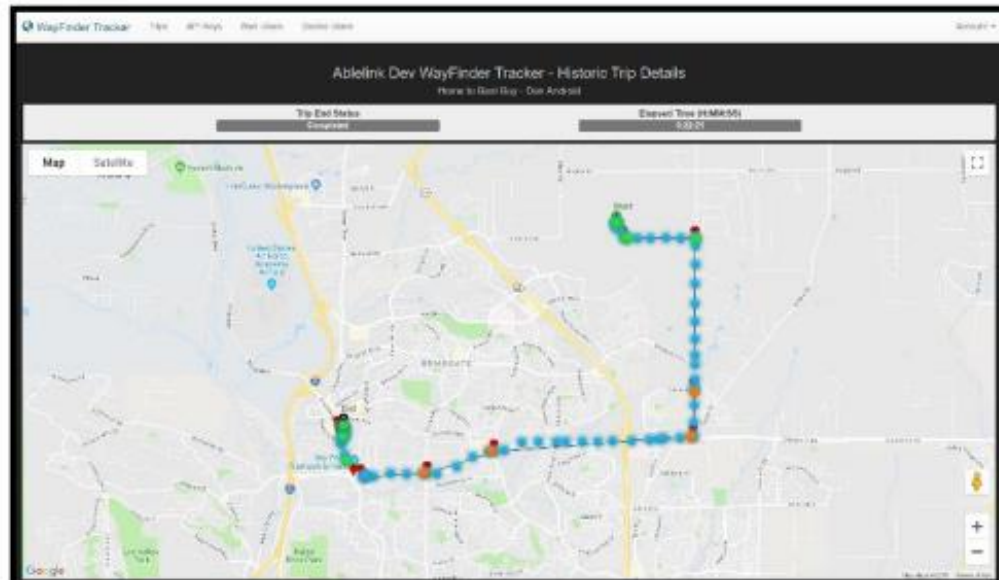


Public

SMART  
Route Library

Cloud-based  
library with no  
stage limitations

WayFinder  
Travel App



Agency

# WayFinder App Development

- WayFinder app developed by AbleLink Services
- Essential Functions
  - System Access
  - Route creation via portal
  - Route creation via app
  - Tracking
  - Accessibility
  - App features and settings
  - Alerts
  - User communication and caregiver support

# WayFinder App Development

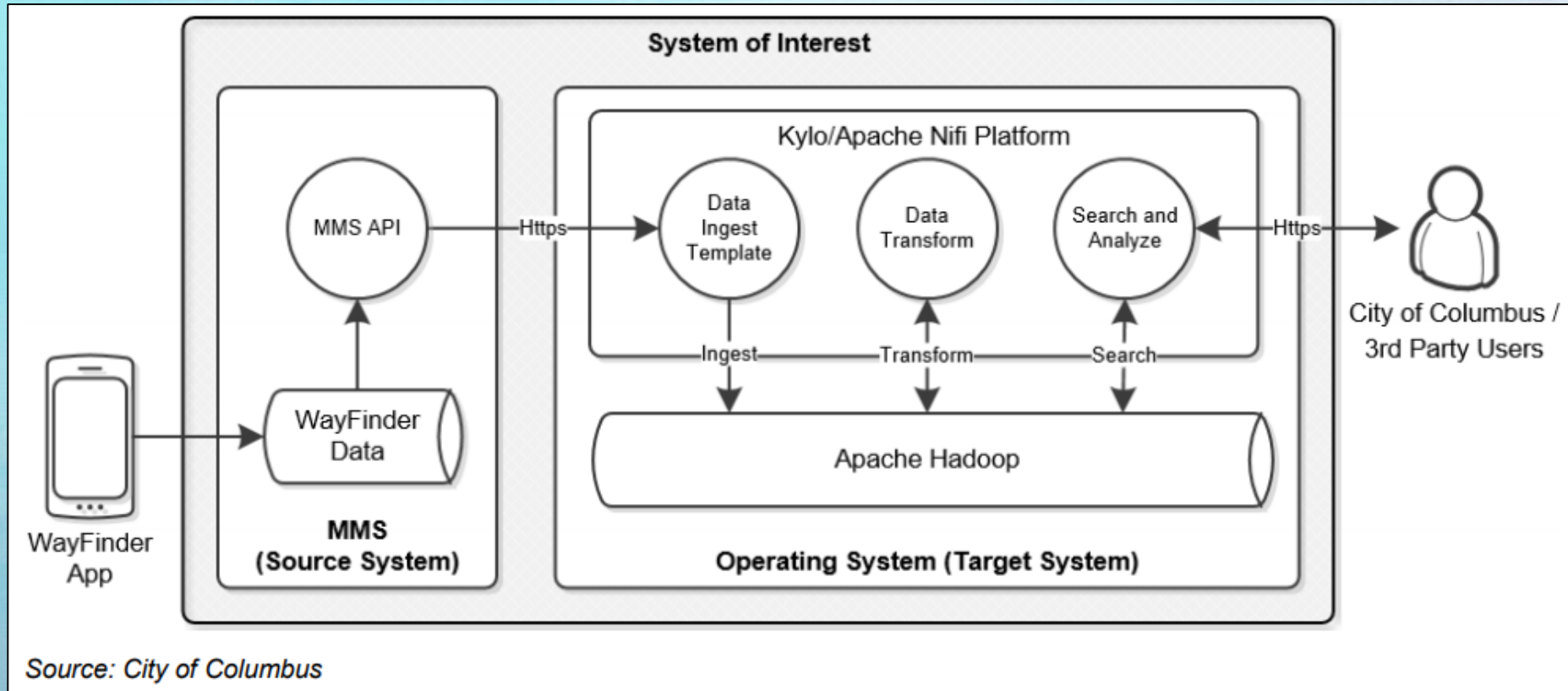
- Multiple tests conducted to determine app functionality:
  - Route Creation & Testing:
    - Walking only, transit only, and multimodal
    - In app and through web portal
    - Through open spaces and through spaces with GPS obstructions
  - Route Testing only:
    - App behavior when user leaves planned route
    - App response to user error
    - Evaluate accessibility considerations of route

# WayFinder App Development

- Test Results:
  - App functions well
  - Only outstanding issue was route preview functionality, but this was not considered a desired feature for the target users
- Operations & Maintenance Plan developed to ensure functionality even after the Smart Columbus grant period ends.



# Data Collection



City of Columbus can gather anonymized data through the WayFinder app for analysis.





# Data Collection

- Available Data Elements:
  - Starting a particular route
  - Completing a route
  - Canceling a route before completion
  - Pausing a route
  - Resuming a route
  - Loss of GPS connection
  - Reacquisition of GPS connection
  - Leaving the travel corridor for the route
  - Reentering the travel corridor for the route
  - Requests for assistance by the traveler
  - Downloading a route with mode of travel used
  - Caregiver updates and communications

# Lessons Learned

- Focus Group testing conducted to determine the app's effectiveness with its target users
- What worked for stakeholders:
  - The app increased the feeling of access to the community
  - The app worked with users' personal skillsets
  - Increase in confidence with independent travel
  - Increase intern skillset regarding technology, mobility, and safety

# Lessons Learned

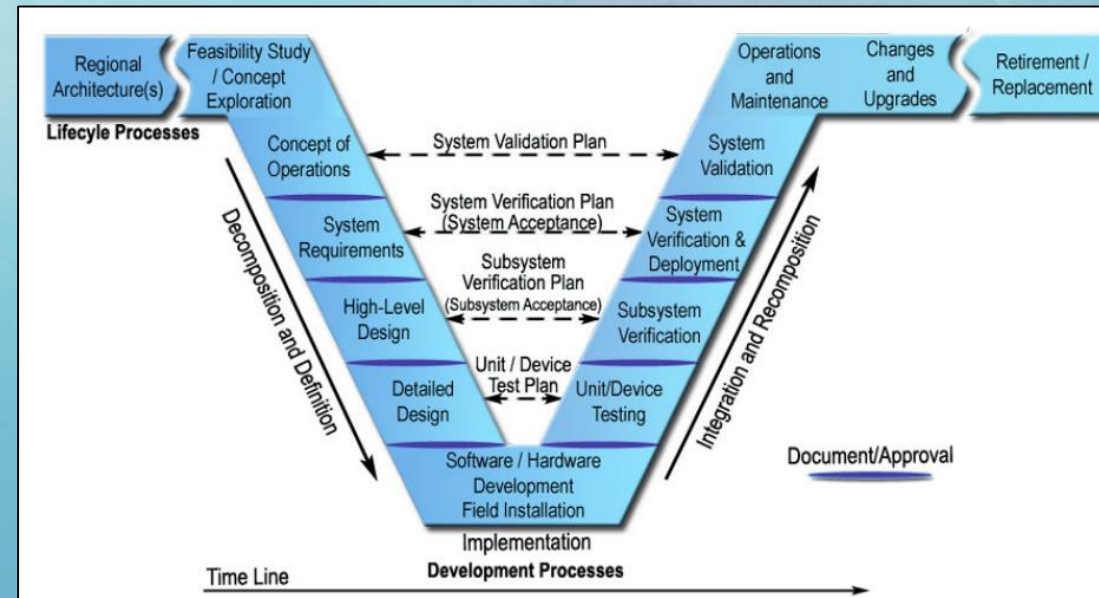
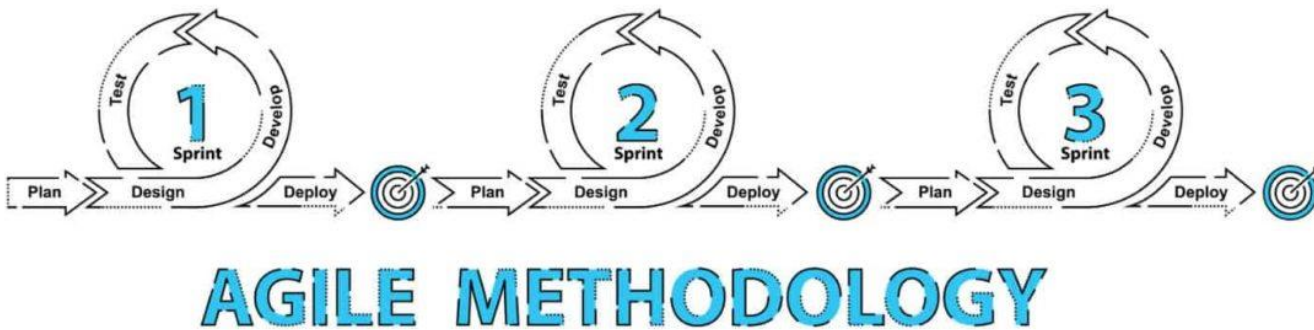
- Challenges in introducing the app to new users:
  - More hands-on training time
  - One-on-one training preferred
  - More safety features needed within an app
  - Participants would rather keep doing what's familiar instead of something new
  - Further research needed on the specific skills to use this type of technology for independent wayfinding

# Lessons Learned

- Documentation – critical to route testing
  - Need to develop clear instruction and procedures for users
  - Document routes in detail so that developers can easily recreate them and use them as templates for creating new standard routes
  
- Get diverse testers
  - Had testers from Smart Columbus, OSU faculty, OSU students
  - Wide ranging testers helped in improving user interface and experience

# Lessons Learned

- Switching engineering methodology presents challenges
  - Project began with an **Agile** systems engineering process; through trade study AbleLink was chosen and made software modifications to their pre-existing commercially available app.
  - Project then switched to **V Model** systems engineering approach with development of test pilot
  - Switching back and forth between the systems presented challenges



# Lessons Learned

- Anonymized data collection is valuable for continuing to develop creative solutions in the future
- Combining services under a single umbrella facilitates access and thereby increases usage
- Incentivize transit usage through merchant rewards, “gamification” of app/payment system, etc.

# Questions?

For more information, visit:

<https://smart.columbus.gov/>

# District Five ITS Master Plan IT Standards

Jeremy Dilmore, FDOT District Five



# Communication

- Land on FDOT Master Hub versus Core Switch
- BGP between agencies
- Physically redundant routes with ring break protocols
- Re-IP

# Security

- Land on Firewall at each end
- Use of Active Directory / Domain
- RADIUS or TACACS+ for supported devices
- Anything other than #2 Key

# Data

- Share to SunStore
- Make JSON / XML data externally available

# Other

- NTP / Common Clock
- Standard ITS Testing
- Software Licensing / Access
- Asset Maintenance
- Contract Access
  - Maintenance
  - AAM / ICM

# Questions?

# SIIA Contract Language

Jeremy Dilmore, District Five TSM&O

# SIIA Contract Language

- We have sample language
- Is there a common set of specifications that agencies use?
- What does everyone use for specifications for local agency let?

# Questions?



# R-ICMS Agreement

Jeremy Dilmore, District Five TSM&O

# Current Initiatives

Jeremy Dilmore, District Five TSM&O

# THANK YOU!

Next Consortium – December 3, 2020



# TSM&O Consortium Meeting

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## **MEETING AGENDA**

Teleconference

*October 1, 2020*

*10:00 AM-12:00 PM*

### **1) WELCOME**

### **2) TELEWORKING AND TRANSIT**

- David Williams, VHB

### **3) PREVIOUS TSM&O CONSORTIUM MEETINGS – TOPICS AND TRENDS**

- David Williams, VHB

### **4) SMART COLUMBUS – MOBILITY ASSISTANCE FOR PEOPLE WITH COGNITIVE DISABILITIES PILOT**

- David Williams, VHB

### **5) SIIA CONTRACT LANGUAGE**

- Jeremy Dilmore, District Five TSM&O

### **6) R-ICMS AGREEMENT**

- Jeremy Dilmore, District Five TSM&O

### **7) CURRENT INITIATIVES**

- Jeremy Dilmore, District Five TSM&O