Pennsylvania Department of Transportation

- 39,700 miles of State maintained roads (5th in the nation)
- Over 25,000 State maintained bridges (3rd in the nation)
- Over $2.5 Billion in constructions lettings last year
- Over $1.5 Billion spent on maintenance activities last year
Automatic Vehicle Locator

Bureau of Maintenance and Operations – provides guidance and policy to district and county maintenance organizations by providing the tools (materials, equipment, training, data and reports) to monitor and improve operations.
Automatic Vehicle Locator

- AVL was attempted as an internal solution utilizing the GPS capabilities of the 800MHz radio
  - The Commonwealth’s topography made the system unreliable
  - Limited infrastructure caused errors in location
  - Limited to GPS location only
  - System maintenance had to compete with other technologies for limited IT resources
  - Enhancements were difficult
  - Cost
• 3 step process leads to AVL today
  - Step 1; Proof of Concept
    • Pilot was over 100 trucks during winter operations
    • Monitor GPS location within varying topographic areas
    • Monitor ground and air temperature
    • Receive spreader data
3 step process leads to AVL today

- Step 2; State-wide Assessment
  - Approximately 700 trucks mostly assigned to Interstates and limited access highways
  - Monitor GPS location
  - Monitor ground and air temperature
  - Receive spreader data
  - Provide location information to 511pa.com vendor for general public release on the Department’s website
• 3 step process leads to AVL today
  – Step 3; Full Implementation
    • Approximately 2,500 department force and rental trucks
    • Deploying 3 different types of units

ATS (full AVL)

WT10X (GPS only)

WT2250 (GPS only)
• Advanced Tracking System (ATS)
  - Full AVL was preferred equipment used if compatible with spreader control software
  • Transmits data over cellular signal
    - Utilizes Verizon 1G signal due to coverage availability before porting to AT&T Fleet Manager
    - Provide location information to 511pa.com vendor for general public release on the Department’s website
    - Internal storage in the event cellular signal is lost
    - Installed by department force mechanics
• Advanced Tracking System (ATS)
  - Enhanced attributes over direction and speed GPS only systems
    • Ground temperature
    • Air temperature
    • Mix (salt/anti-skid)
    • Pre-wet application
    • Spinner settings
    • Blast activation
• Advanced Tracking System (ATS)
  – Operational benefit over direction and speed GPS only systems
    • Situational awareness of conditions (mobile mini-RWIS)
    • Situational awareness of operator’s actions
    • Ability to compare in real-time; speed, conditions and treatment
    • When treating in the area of RWIS will have the treatment plan that lead to conditions reported by the RWIS site
• WT10X
  - Used when ATS is not compatible with spreader controller software or no controller is present (i.e. paint trucks and freeway service patrols)
    - Despite additional capabilities when installed with connections to the vehicle’s Canbus or OBD port, only utilizing GPS location at this time
    - Transmits data over cellular signal
      - Utilizes AT&T 3G signal
    - Provide location information to 511pa.com vendor for general public release on the Department’s website
    - NO internal storage in the event cellular signal is lost
Automatic Vehicle Locator

• WT2250
  – Used in seasonal rentals because of the quick nature of installation
    • Plug-and-play ease of operation
    • Transmits data over cellular signal
      – Utilizes AT&T 3G signal
      – Provide location information to 511pa.com vendor for general public release on the Department’s website
  • NO internal storage in the event cellular signal is lost
• Contract and program management
  - AT&T and Verizon
    • Both companies are on State Contract, but neither company could offer a solution that met our program goals of comprehensive cellular coverage area and a full service fleet manager program
    • Only choice was to work together to meet our program needs
• Contract and program management
  – AT&T was selected as the AVL Fleet Manager
    • AT&T and Verizon both provide cellular bandwidth.
      – Verizon ports the data to AT&T once it is “out of the field”
  – As the AVL Fleet Manager – PennDOT is contracted with AT&T to provide AVL services
    • At this time, AT&T utilizes WebTech to provide end-user interface
    • AT&T has established an Advanced Services Help Desk to manage all aspects of the AVL Fleet Manager
      – AT&T is responsible for identifying and taking steps to correct issues with WebTech
• Current status
  – Over 2,200 units installed by department force
  – Firmware updates available from Certified Power
  – Created a work order with 511pa vendor to add truck locations as a layer on the website
  – Developed tamper resistant marking material for terminal connections
  – Repositioned GPS antenna to reduce damage
• **Cost Savings**
  
  – Winter route optimization in real-time – no need to follow trucks with a stopwatch
  – Reduced paperwork
  – Foreman does not need to download material data after a storm on full AVL trucks – totals available for 6 months following an event
  – Real time material usage oversight
  – Winter metrics data
  – Route based metrics
  – Limiting tort liability (paint truck)
• **Future**
  - Increasing government transparency
    • Where are tax dollars making improvements today?
  - Safety
    • Alert motorists of slow moving traffic or work zones ahead
      - Message boards
      - 511 traveler information
      - Social media (i.e. Waze)
Automatic Vehicle Locator

• Contact information

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