Computer Aided Dispatch/Automated Vehicle Location Real Time Passenger Information System

Staff Report 20-201

Sandra Lewis-Williams

Senior Project Manager
Department of Innovation and Technology

July 22, 2020

AGENDA

1. Operational Overview

2. Requirements for Accurate Predictions

3. Other Considerations

4. Wayside Signs

Operational Overview

Vehicle location

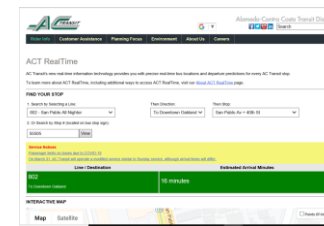every 15 seconds

BUSTIME@

Vehicle Location

ACT RealTime

ACT RealTime Website, Mobile App, Developers' APIs

GTFS-RT Feed

Predictions

511.Org, Google Maps, Developers' APIs, Third Party Transit Apps

Real Time Message Signs

Requirements for Accurate Predictions

1. The Vehicle Must Have the Current Schedule

2. All Equipment and the Infrastructure Must be in Good Working Order

3. The Vehicle Must be ON

4. The Operator Must Log On

5a. The Vehicle Activity Must Follow its Schedule …..or…..

5b. Operations Control Must Activate Disruption Management

1. The Vehicle Must Have the Current Schedule

- Four times a year a new schedule from HASTUS is downloaded to the fleet

- All vehicles must receive the current schedule by day 1 of the new signup

- **Without the updated schedule on a vehicle:**

  – Operators can not logon

  – Unpredicted vehicles will suddenly show up at a stop

- **This problem has decreased significantly:**
  – By monitoring the fleet's receipt of the new schedule the week prior to the signup

2. All Equipment and Infrastructure Must Function in Good Working Order

- **The vehicle determines it's location, then communicates it to BusTime through:**
  - Onboard Equipment
  - The Network and Infrastructure

- **Any failure of any onboard equipment, network, or services will result in the following:**
  - A predicating vehicle can suddenly disappear
  - An unpredicting vehicle can suddenly show up at a stop
  - No predictions at all

- **To mitigate this problem:**
  - Operation Control carefully monitors loss of communication messages
  - ACT initiated campaign to ensure vehicle leaves the yard with equipment in good order

3. The Vehicle Must Have its Power On

- **The vehicle must have its power ON to communicate its current location**

- **Generally, this a challenge with long layovers**

- **When the vehicle is turned off:**

  – The vehicle is not communicating its location to BusTime

  – Predictions for this vehicle will not appear

  – A previous prediction may disappear

- **To mitigate this problem:**

  – AC Transit adjusts power down configurations

4. The Operator Must Log On

- The operator Logon connects the vehicle to the schedule

- **A correct and timely logon or logoff must occur:**

  – Logon before pull-outs and start of reliefs

  – Logoff at road calls and end of shift

  – Logoff *after* reaching the last stop of the trip

- **If the Operator does not log on or log off correctly:**

  – An unpredicted vehicle will show up at a stop

  – A prediction can disappear

  – Operator will not be able to log on to a replacement vehicle

  – The vehicle's next trip will predict inaccurately

More About The Operator log on

- **A correct and timely logon will activate:**

– Head signs, interior signs, the farebox, next stop announcements, exterior route announcements, schedule adherence, Clipper Driver Console, Next Stop Announcements, correct arrival data for KPIs, Missed trip and OTP reports

- **The Most Important Reason the Operator should log on:**

  – The Operator logon identifies and provides protection for the Operator

- **To Enforce Operator Logon, Operations Control has:**

  – Activated Logon Campaign

  – Posted Operator Training Video

  – Beefed up Operations Controller Staff

5a. The Vehicle Movement Must Follow Its Schedule

- **If the vehicle leaves the garage too early or too late**

    – Predictions will be inaccurate

- **If a vehicle is too far behind schedule**

    – Predictions may get confused with the following trip

    – The vehicle prediction will appear as a no-show

- **If The vehicle goes off-route more than 500 feet**

    – BusTime will stop predicting for this vehicle

- **If the vehicle does not stop at the last stop on the trip**

    – BusTime will think the vehicle is delayed

    – Predictions for the next trip will be inaccurate

5b. Operations Control Must Activate Disruption Management When the Schedule or Operation Changes

- Disruption Management Communicates schedule interruptions to the entire system and to BusTime

  – Detours

  – Cancels

  – Express

  – Short Turns

- **If Disruption Management is not activated when a schedule is disrupted:**

  – Unpredicted Vehicles can suddenly appear at a stop

  – Vehicles predictions can disappear

  – Vehicle no-shows can occur

  – Vehicle predictions become inaccurate

Other Considerations

- **At Relief points:**
  - The Original operator should log off and the relief operator should logon before pulling out
- **At a Road Call:**
  - The Operator should completely log off of the roadcalled vehicle
- **When the Vehicle goes off route:**
  - Predictions will start when the bus goes back on-route
- **Avoid Bunching**
  - When vehicles bunch, predictions will appear on top of each other
- **Prediction Window:**
  - Note that BusTime begins to predict when the vehicle is 60 minutes away or less

Wayside Signs

- **AC Transit owns 113 Wayside Signs purchased through the NextBus Contract**
  - 87 Are Installed throughout the District
  - 16 Spares at CMF
  - 2 LCD signs are waiting deploy at Fruitvale BART

- **Clear Channel owns the Shelters that provide the Power to the signs**
  - 8 Signs are waiting for power either through the City of Oakland or PG&E
  - Planning and Schedules works with Clear Channel to resolve power and shelter issues

- **Clever Devices has completed installation of 46 new signs on BRT platforms**

- **The AC Transit Electronics Team is responsible for sign Maintenance**

Conclusion

- Equipment and infrastructure failures, operational deviations, or missed logons can cause prediction failures.

- The AC Transit team has activated and continues to implement several campaigns to monitor and modify operations resulting in improved prediction reliability for our customers:

  - OCC Logon Campaign

  - Alerts to OCC for Specific Loss of Communication

  - Disruption Management Activation

  - Configuration Adjustments

  - Fully training our Operators

  - Focus on Operational practices that affect predictions

  - Take Over Responsibility of wayside signs

Questions?