Mobility Management: Bus Technologies

Community Relations Committee
February 7, 2018
Agenda Item 7

Bus Technologies

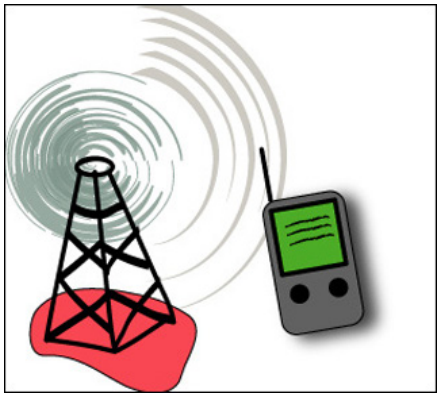
- **Essential onboard technologies and systems innovations that improve performance, reliability, safety, and data mining of SamTrans bus transportation services.**
  - **The innovations that assist SamTrans to manage its bus transportation services**

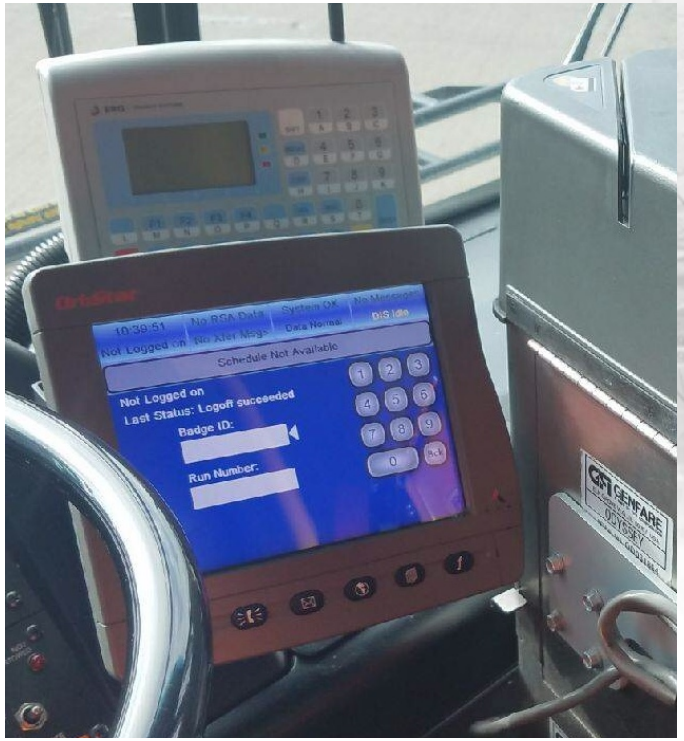
Onboard Technologies

- **Farebox – Processes cash, tokens, and change-cards (magnetic)**
- **Clipper Card Readers – Processes electronic (encoded) fare media**

Onboard Technologies

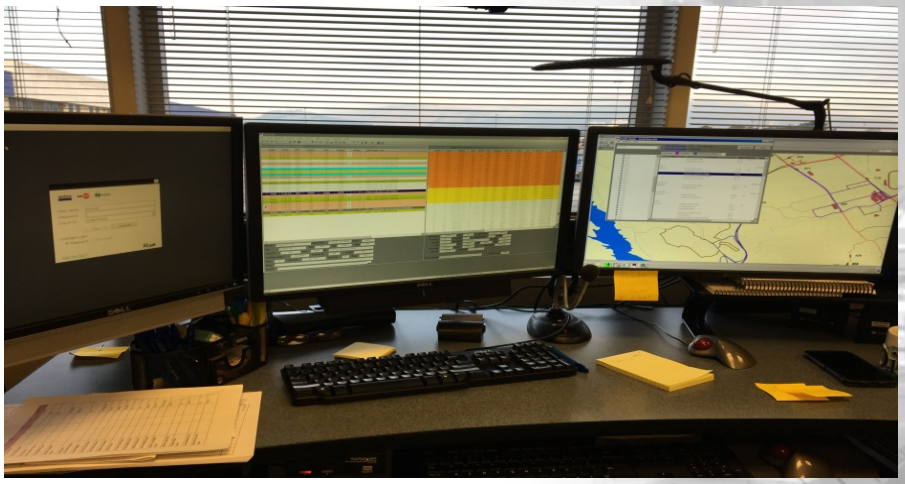
- **MDT – Mobile Data Terminal interfaces with the Advanced Communication System (ACS)**
  - **Downloads schedule/trip data, canned messages, and maps for the Bus Operator**





Onboard Technologies

- **Computer Aided Dispatch and Automatic Vehicle Locater (CAD/AVL) – Monitors the geo-position of revenue vehicles.**
  - Enhances safety features such as a silent alarm for the Bus Operator to report problems
  - Real time communication to respond to accidents, road closures, schedule deviation, onboard incidents or difficult passengers

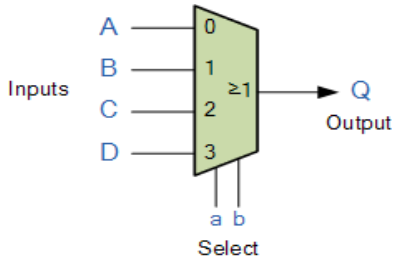


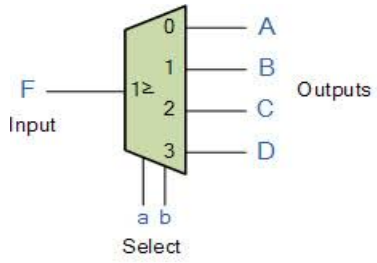
Onboard Technologies

- **Automatic Passenger Counting (APC) – Tracks passengers entering and exiting the bus. APC data is used for the following activities:**
  - **Planning and scheduling**
  - **Validation of ridership (number of trips)**
  - **Inform service changes**

Onboard Technologies

- **Multi-Plex System**
  - Input/Output (I/O) control system
  - Replaces mechanical relays and miles of electrical wires in the electrical circuits
    - Enables faster and more comprehensive information processing, i.e. door controls, lighting, engine controls, etc.
    - Provides for visual and computer-based diagnostics, and troubleshooting





Onboard Technologies

- **Multi-Plex System (continued)**
  - Reduces the number of components
  - Improves reliability of electrical systems
  - Provides the ability to combine system and sub-system functions, such as in the All-in-one Controller
    - Controls doors, bus kneeler, and the wheelchair ramp

Onboard Technologies

- **Safety and Security System**
  - **Digital Cameras**
    - **Interior cameras – Multiple interior cameras with high definition**
    - **Exterior cameras – Street side and curbside**
    - **Forward facing camera**
    - **Larger hard drives for enhanced digital storage**

Onboard Technologies

- Other bus systems with computers or electronic controls
  - Engine
  - Transmission
  - HVAC
  - Emission Controls
  - Engine Cooling System
  - Hybrid Drive
  - Door Controls
  - Destination Signs
  - Lighting

Onboard Technologies

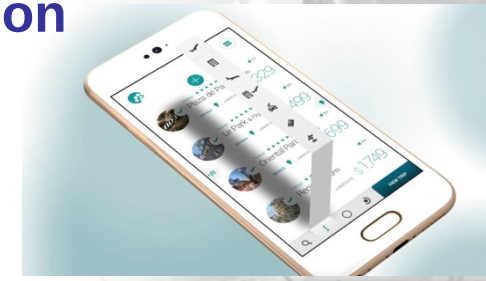
- **Emission Reductions**

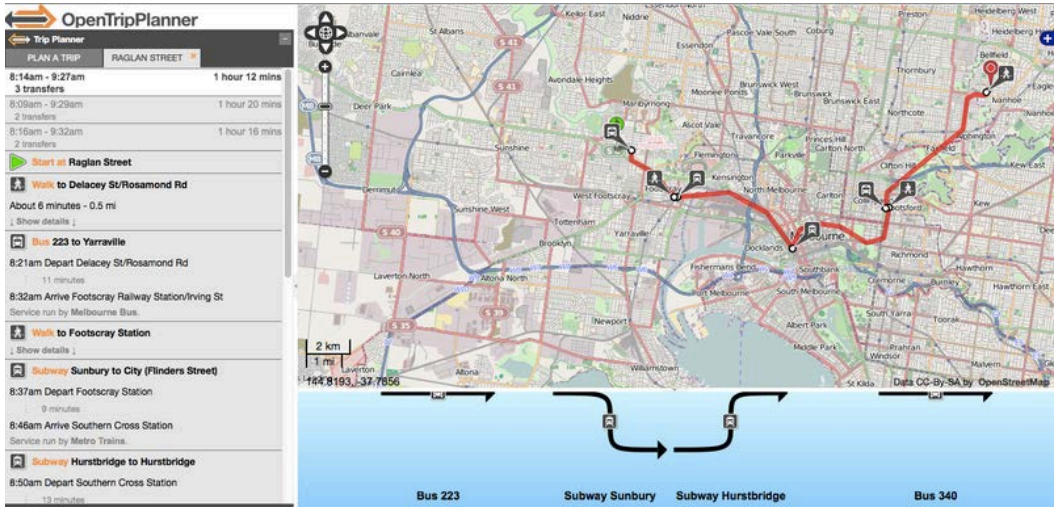
	Baseline 2002 g/bhp-hr	2019 g/bhp-hr	% reduced
NOx	1,691	224.4	87%
PM	57	3.0	95%

- **Strategic alternate fuel collaborations**
  - VTA 2004 – 3 Hydrogen fuel cell buses
  - AC Transit 2007 – 12 Hydrogen hybrid fuel cell buses
- **Battery Electric Buses (BEB) – zero emissions**

Onboard Technologies

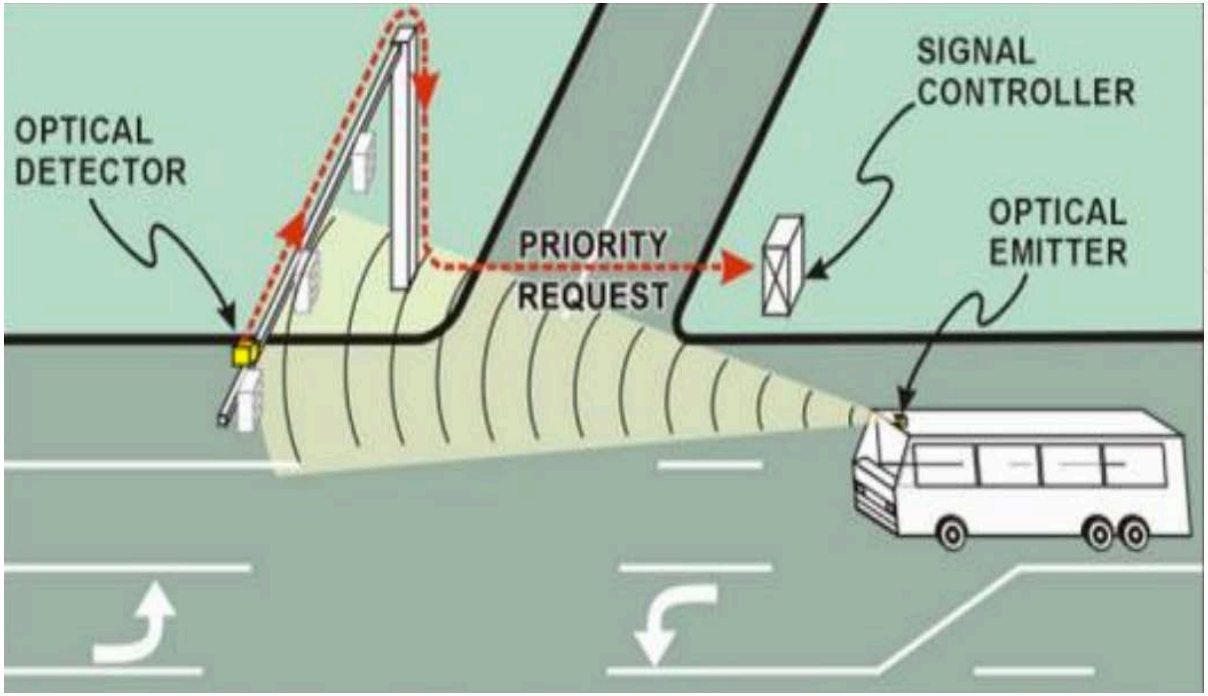
- **Mobile Application**
  - Trip planning, first and last mile connections
  - Next bus (predictive arrival)
  - Local and regional connectivity with transportation provider
  - Mobile ticketing
  - Detailed origin and destination data





Onboard Technologies

- **Signal Prioritization**
  - **Improve travel time on ECR (El Camino Real)**
  - **Assist OTP along the ECR corridor**



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