Big Bus + ____?

VTA's Innovation in Mobility

SPUR Presentation

July 25, 2017

Santa Clara Valley
Transportation
Authority

Solutions that move you

VTA Innovation Program

- Test new technology and business models to solve mobility challenges
- Collaborative partnerships to tap creativity/technical expertise
- Increase mobility options beyond "big bus" transit
- Improve the public transit travel experience

Initiate the trip

Customer experience
and reaction

First Mile

Last Mile

At the station /
purchase fare

Arrival at station

Ride VTA
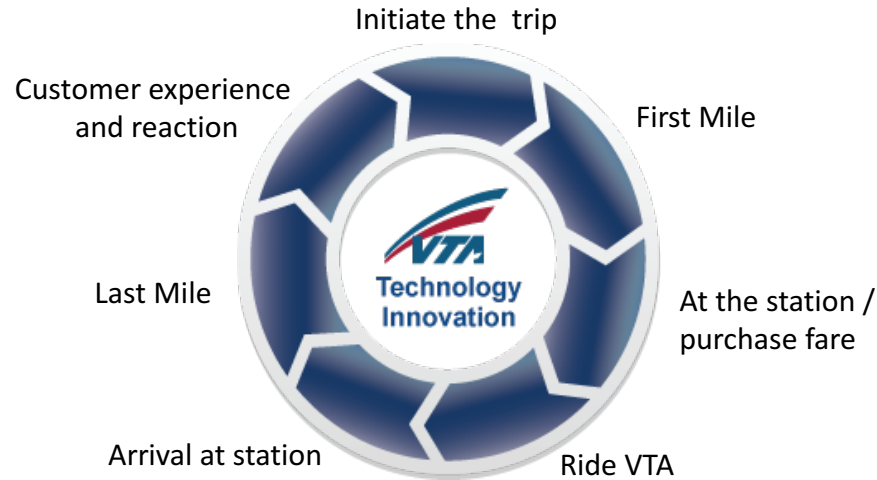
Solutions that move you

VTA Innovation Process

- Proposals funnel
  - Unsolicited proposals
  - Request for proposals
  - Actively seek out innovation partners

- Assessment / Evaluation
  - Value to VTA and scope of work for provider and VTA
  - Does this fit into our Innovation Strategy and Goals?
  - Pilot funding
  - Internal VTA sponsor identified

Proposals

Assessment

Evaluation

Review

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Some of Our Innovation Partners

- **Non-Profit Organizations/Companies**
  - Prospect Silicon Valley – Non-Profit supporting Start up companies
  - NREL – National Renewable Energy Laboratory
- **Universities**
  - Santa Clara University
  - San Jose State University and UC Santa Cruz
  - Mineta Institute of Transportation MTI
- **Vendors**
  - Allied Telesis
  - SwiftMile
  - Mobileye / ROSCO
- **Municipalities/Government**
  - City of San Jose
  - City of Santa Clara
  - VA Hospital

Solutions that move you

Improve Transit Travel Experience

Pilot Projects

- First/Last Mile
  - FLEX on-demand shuttle – Ridecell
  - Solar charging electric bike share – Swiftmile
- Communications
  - Passenger Information Monitor System (PIMs)
  - Mobile Apps
  - Smart Stops/interactive kiosks/real time information
- Mobile fare payment – Moovel
- Electric buses – Clever Devices & Proterra (electric bus management software)
- Collision avoidance – ROSCO & Mobileye

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Example: Digital Bus Stop (Road Map)

Partnered with CHK America

Solar panel

LED Light

Next Bus Arrival

10" or 13" Display

Notification Light

Digital Bus Stop

- **Option 1 - Base Unit**
  - Replacement to paper routes and paper schedules
  - Route Map
  - Route Schedules
  - Notifications
- **Option 2 - Base unit upgraded CPU and Solar power**
  - Add RTI information
  - Stop Request
  - Bus status when available (Bike, Wheelchair, load)
- **Smart Stop - Interactive**
  - Next Bus Arrival
  - Trip planning
 - Ride Request
  - Stop Request
  - Other features

Solutions that move you

Interactive Customer Messaging

Partnered with Comart and Intersection

COMART
Innovative ODM reliable partner

Interactive Customer Messaging Board (iCMB),

- A solution for non-smart phone customer
- 47 inch interactive touch screen at <u>major transit centers</u>
- Real time bus / train arrivals / transfers
- Trip planning
- Bus schedule, route maps,
- Emergency notifications
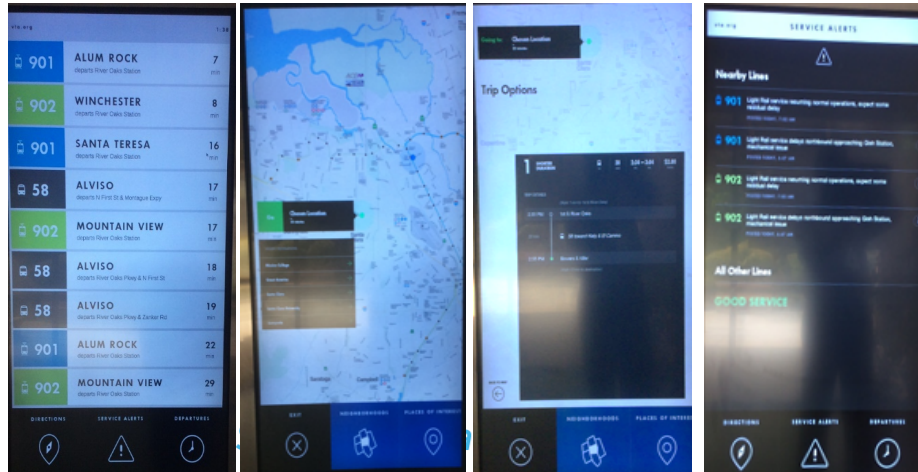- Local attraction, businesses & shopping
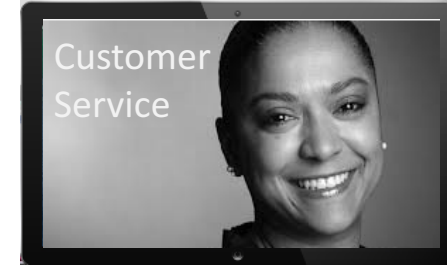
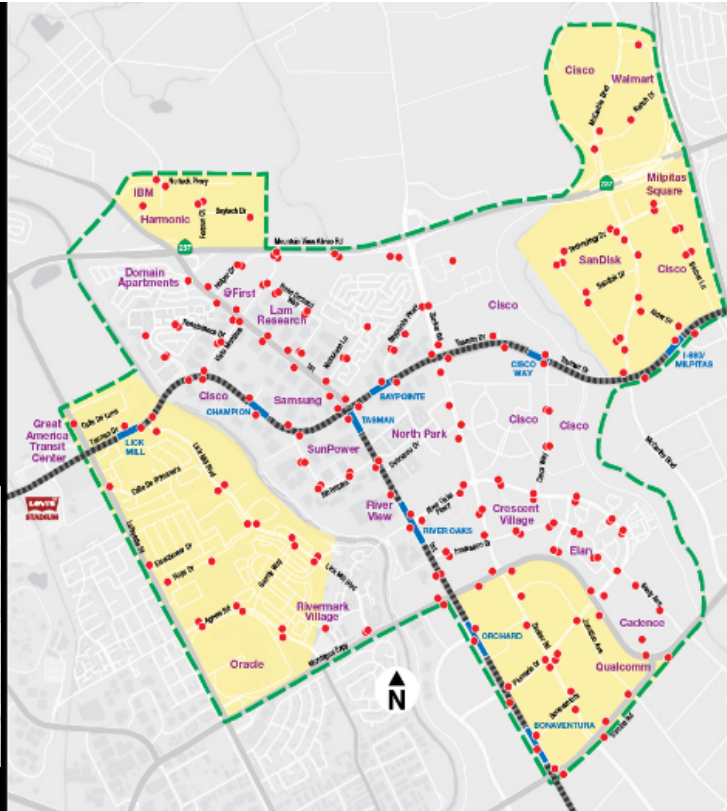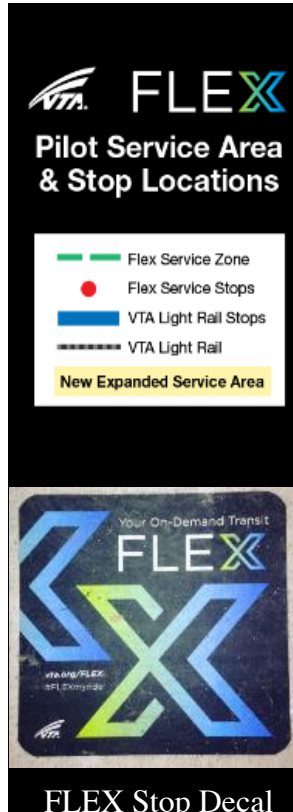Virtual Customer Service

Deployment locations

- Mineta International Airport
- San Jose City Hall
- Santa Clara County Building
- Mountain View Transit Center
- Diridon Transit Center
- Eastridge Transit Center
- VTA's Downtown Center
- Santa Clara Convention Center

New Business/Service Models

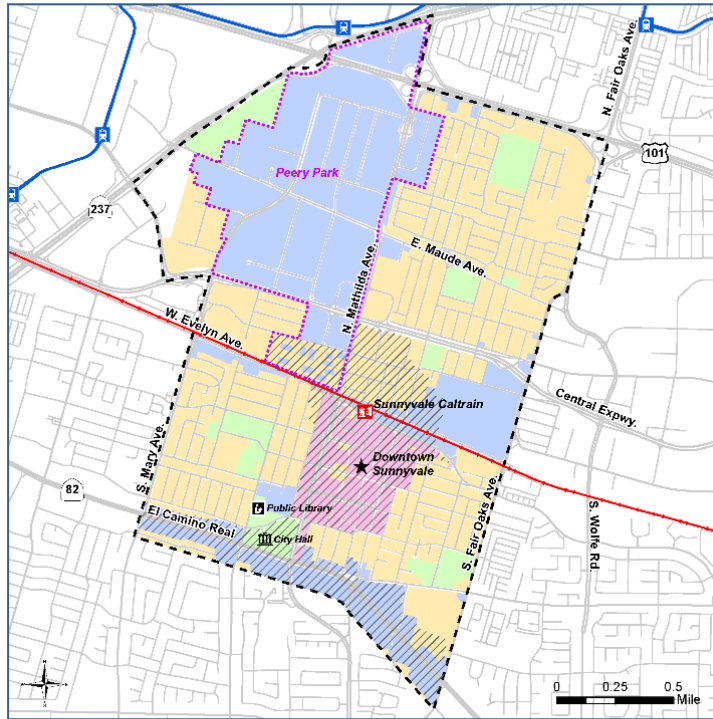# VTA FLEX: On-Demand Public Shuttle

Partnered with RideCell

- Monday – Friday, 5:30a-8:30p

- 5.5 square miles

- Flat fare: $2 midday, $3 peak hours

- Request rides within designated FLEX service area

- FLEX stops marked by sidewalk decals

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Peery Park Rides: Flexible TDM Shuttle

- Combine supply side and demand side strategies to reduce auto trips to Peery Park development area

- Demand side: Require aggressive trip reduction goals to induce demand for alternative transportation options

- Supply side: Provide flexible shuttle service help meet demand for transit

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Paratransit Service Expansion: On-Demand Solution

- On-demand service using excess capacity on Paratransit vehicles

- Possible multi-provider approach: software can dispatch Paratransit vehicle, taxi, or ride share vehicle based on ETA and cost to provide service

- Open to public

- Payment by Moovel mobile app

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Core Connectivity Program: Tools to Innovate

- Fixed route transit is not one-size-fits-all solution

- Toolkit of innovative strategies to address first/last mile gaps, low-demand/low productivity areas, underserved markets

- Provide grant funding to encourage innovative mobility projects within the County

Solutions that move you

Autonomous Vehicle Development / Testing

Disruption in Transportation

Ride / Car Share

Electric Vehicles

Autonomous Vehicles

Connected Vehicles

Now

Seeing deployments

Early Testing
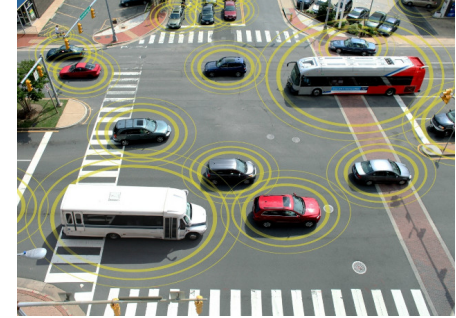
Evolving

Solutions that move you

Adopting Electric Vehicles

- VTA to electrify 20% of our fleet by 2025
  - 5 Proterra electric vehicles in production to be delivered this year
  - Requesting Board approval for 5 additional EV buses to be ordered in September
  - Getting Board authority to purchase another 25 in 2018/19

- Won an Innovation Research grant 1.9 million for eV power management
  - VTA Partners - Prospect SV, Clever Devices, Proterra, Charge Point, Kisensum, EV Alliance, NOVA,Calstart, NREL, CISCO, PG&E
  - Advanced power management - Grid and storage
  - Fleet management enhancements - EV

Solutions that move you

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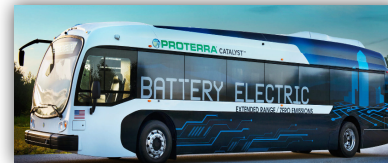
Innovation Example: Paratransit Monitoring & Customer Support

- Project submitted by *Allied Telesis* with the goal of improving passenger satisfaction and vehicle tracking on the Paratransit fleet

- 6 month project - VTA and *Allied Telesis* will follow up with an analysis of the data collected and "lessons learned"

- Evaluate the success of the innovation project based on:
    - An independent *VTA – Access* controlled GPS audit trail
    - Potential safety improvements and reductions in accidents
    - Real-time CCTV look-in
    - Passenger satisfaction increases
    - Vehicle costs / Maintenance savings
    - Driver management & training

Paratransit customer interactive display

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Innovation Example: Paratransit AV On-Demand

- Discussing On-Demand first/last mile business process with AV Provider
- Vehicle and AV equipment would belong to the AV provider due to liability
- VTA would leverage our on-demand application
  - On-demand mobile app would be deep linked to the VTA mobile ticketing solution
    - On-demand / standard ride linkage
    - Set up transfer rules
    - Set up Light Rail/Bus/On Demand promotions
- AV developer would expand AI deep learning in dealing with bus stops, transit vehicles, interaction with passengers, and dealing with train signals and BRT median operation.
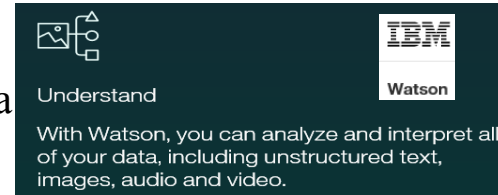

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Innovation Example: Accessible eAV Research, Testing & Pilot

- Innovation Research / Demonstration – much larger and more costly
  - Develop a fully ADA-Compliant and transit-ready electric autonomous shuttle
  - Develop robust management systems
  - Demonstrate and refine the Accessible Shuttle
  - Capture and disseminate findings

Local Motors

- Request grant or foundation funding
  - Can be $1.5 to $2.5 million and take 2 to 3 years

- Get multiple partners together and propose an innovation
  - Prospect SV, Local Motors, IBM, VA hospital, San Jose State, Mineta Institute, fks, CHK America

Understand

With Watson, you can analyze and interpret all of your data, including unstructured text, images, audio and video.

Department of Veteran Affairs
Palo Alto Health Care System

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What Makes This Unique

eAV Shuttle

Heads up Display

Automated Accessibility Using cognitive AI

Testing site – High Accessibility transit need

Testing

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Open Accessible eAV Platform

COAST AUTONOMOUS
Driverless vehicle Software

IBM WATSON
Cognitive Rider Experience

SIEMENS
Design software, V2X hardware

NXP
On board autonomous computing, embedded AV middleware, sensors, conduit for autonomous hardware

1 — INITIATION by app or kiosk

2 — SUPERVISION by remote operator

3 — Fleet Management

4 — CLOUD analytics and live data

kiosk

VIA

BESTMILE THE MISSING LINK

Solutions that move you

Sigmoid Curve - Getting on the Orange Curve

What is its relevance to VTA?

Sigmoid Curve

Today

Tomorrow

Becoming Irrelevant?
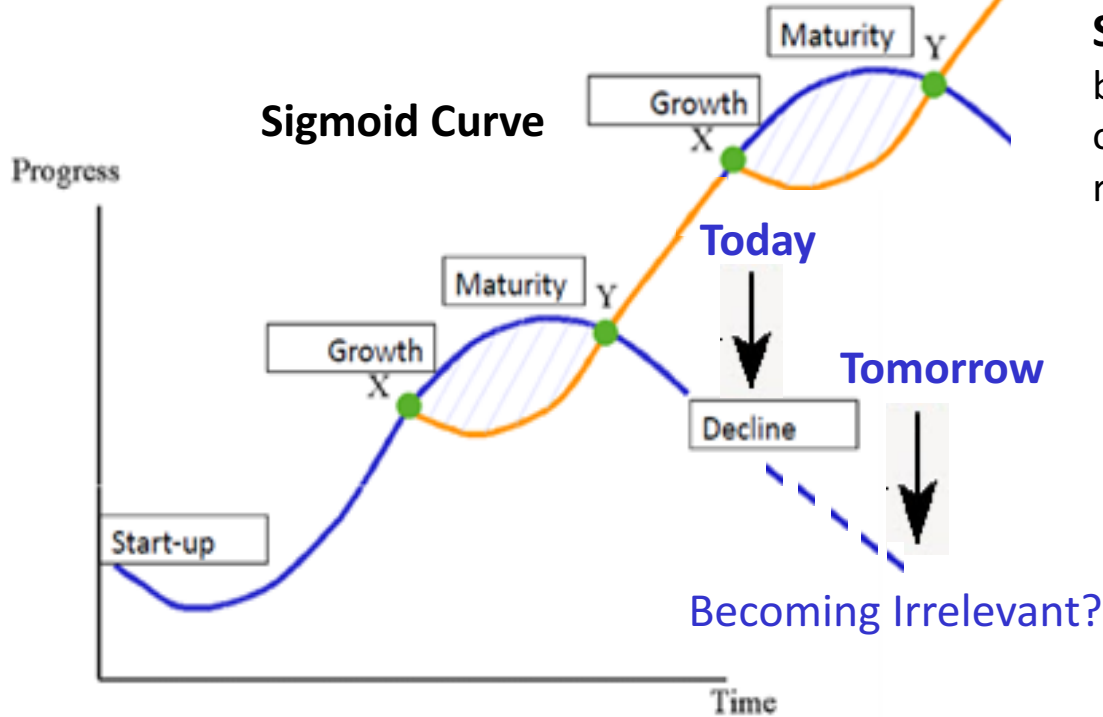
Sigmoid Curve is an outstanding tool to better understand the natural life cycle of a product, an organization, a relationship, a service , etc.

Future eAV Disruption

eAV Ride Hailing
eAV Car share
Electric Bike Share
eAV Car Pooling
eAV Company shuttles
eAV single drivers

Times are changing and you either evolve or die.

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Thank You!

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