

# Operational Impacts and Lifecycle Costs of Open Source RidePilot DRT Scheduling Software

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TRB – INTERNATIONAL DEMAND RESPONSE CONFERENCE

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# History of RidePilot

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# Early History of RidePilot

- Initially built by RideConnection in Portland
- First deployed in 2011
- Simple scheduling software aimed at smaller providers
- “Multi-tenant” – one deployment can serve many providers
- “Open source” licensing – promote broad adoption at low cost



# Recent History of RidePilot

- Adopted by UTA in 2015 to support small providers along the Wasatch Front Range (greater Salt Lake region)
- Phase 1 in 2015-16
  - Funded by VTCLI grant
  - Enhancements aimed at making system work in the UTA context
- Phase 2 in 2017-19
  - Enhancements aimed at making the system easier to use and more capable



# UTA Phase 2 Advancements to RidePilot

- Drag and drop scheduling
- Scheduling subscription trips and recurring runs
- Vehicle maintenance tracking
- Driver scheduling and driver availability forecast
- Reporting enhancements, including NTD reporting
- CAD/AVL
- Mobile app with driver manifest, mileage tracking, pre-trip inspections, chat, emergency alerts, ...

# Current RidePilot Architecture

- Single deployment with many providers that could cover any size region/state
- UTA deployment
  - UTA is system administrator
  - 17 current providers
  - FTA 5310 subrecipient oversight

# New CAD/AVL Screen

## RidePilot CAD/AVL Map

Logged in to Demo

Select Date: Mon Apr 01, 2019

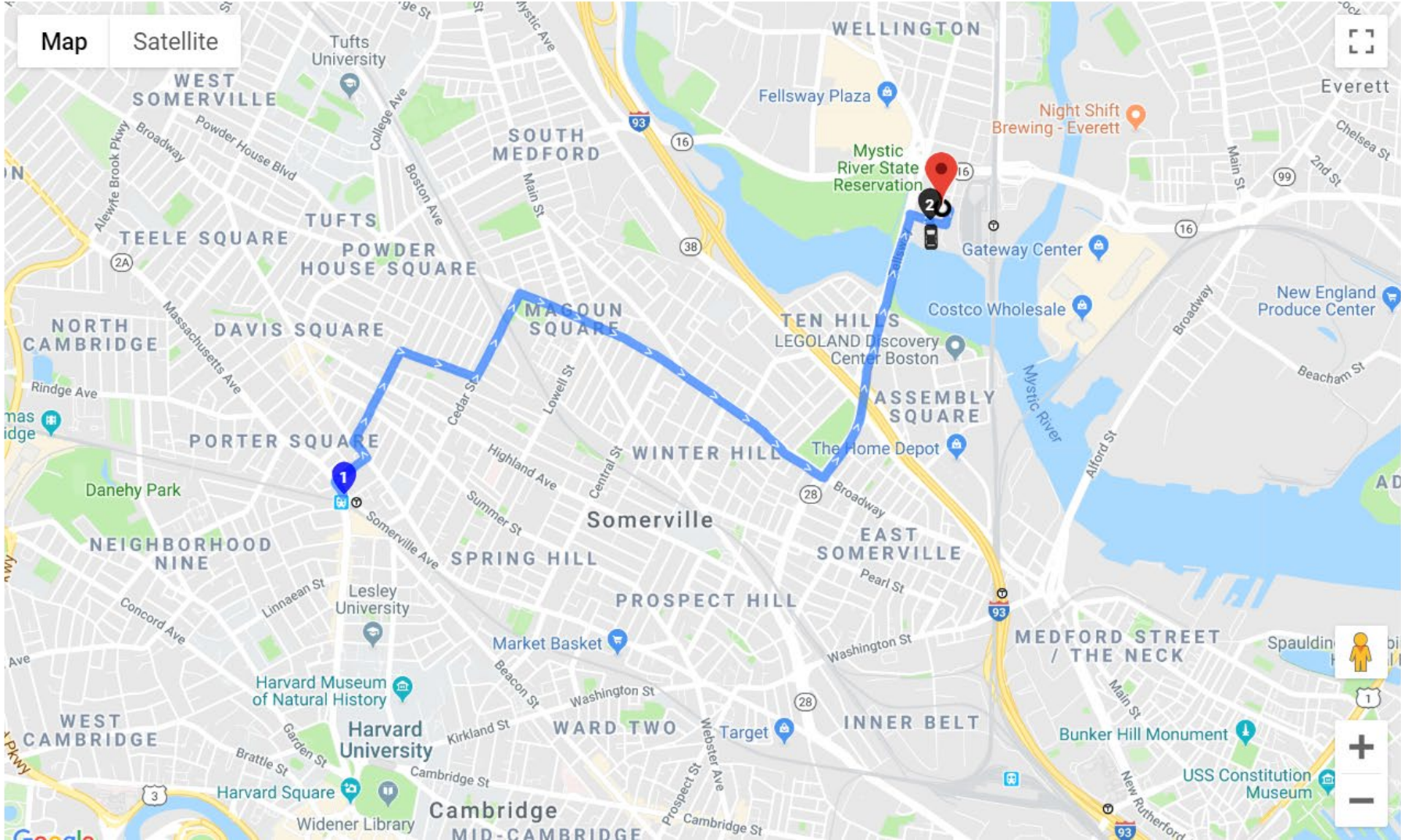
### Select Runs to Show:

All Runs

- Select All
- Office AM Run
  - Start
  - 1. Pick up John Doe
  - 2. Drop off John Doe
  - End

### For Selected Runs, Show:

- Upcoming Path
- Prior Path
- Garage, pickup and dropoff locations



## Login to RideAVL

LOGIN

[Forgot your Password?](#)

*Mobile App  
Driver Login Screen*





**Office AM Run**

**9:30 AM-1:00 PM**

Vehicle: Sedan #1

Trips: 1

Status: Not yet  
started

*Selecting a Run*

**9:30 AM**    **Pre-run vehicle inspection**    **Pending**  
80 Station Landing, Medford, MA 02155

**10:00 AM**    **Pickup: John Doe**    **Pending**  
Home (Porter Square, Cambridge, MA 02155)

**11:00 AM**    **Dropoff: John Doe**    **Pending**  
Office (101 Station Landing, Medford, MA 02155)

**1:00 PM**    **Finish the Run**    **Pending**  
80 Station Landing, Medford, MA 02155

*Viewing the Manifest for a Run*

*Next: Pre-run vehicle inspection*

TIME	SCH	ETA	GAP
02:55 PM	9:30 AM	N/A	N/A

80 Station Landing, Medford, MA 02155

Vehicle Inspections

✓ ✗ Interior compartment is clean.

✓ ✗ Tires are inflated to proper pressure.

✓ ✗ Fuel tank is full.

✓ ✗ Fuel tank is full.

✓ ✗ Tires are inflated to proper pressure.

Notes

Driver notes...

Start Odometer Start Odometer

*Filling in the  
Pre-Run Inspection*

80 Station Landing, Medford, MA 02155

- interior compartment is clean.
- Tires are inflated to proper pressure.
- Fuel tank is full.
- Fuel tank is full.
- Tires are inflated to proper pressure.

Notes

Driver notes...

Start Odometer 5017

START RUN

*Entering the Odometer  
At Start of Run*

Home (Porter Square, Cambridge, MA 02155)

Mobility Notes

Seat: 1, Tie-down: 1

Customer Notes

please park close to the curb

DEPART

*Preparing to Depart  
for the First Pickup*

Home (Porter Square, Cambridge, MA 02155)



Mobility Notes

Seat: 1, Tie-down: 1

Customer Notes

please park close to the curb

You have departed at 3:03 pm

UNDO

**ARRIVED**

*Traveling to the  
First Pickup*

Home (Porter Square, Cambridge, MA 02155)

Mobility Notes

Seat: 1, Tie-down: 1

Customer Notes

please park close to the curb

You have arrived at 3:05 pm

UNDO

**PICKED UP**

**NO SHOW**

*Arriving for the  
First Pickup*

Home (Porter Square, Cambridge, MA 02155)

Mobility Notes

Seat: 1, Tie-down: 1

Customer Notes

please park close to the curb

You have picked up at 3:07 pm

UNDO

**PROCEED TO NEXT STOP**

TIME	SCH	ETA	GAP
03:08 PM	10:00 AM	N/A	N/A

*Picked Up the First Passenger*



80 Station Landing, Medford, MA 02155

End Odometer 5035

END RUN

*Skip over  
several steps,  
then...*

*Completing Run*

# What does it cost?

RYAN TAYLOR

What does it cost?

Open Source...is it really free?

What does it cost?

Yes...it is free like a kitten is free.

(Kevin Chambers)



# RidePilot Costs

Total costs for UTA including, Initial Start Up and Enhancements

	Total Cost	UTA Investment	Per Agency Cost (17 Agencies) Total/UTA Investment
Phase 1	\$217K	\$0, PM Time	\$13K / \$0
Phase 2	\$850K	\$350K, PM Time	\$50K / \$21K
Total	\$1.067M	\$350K, PM Time	\$63K / \$21K

# Cost of Starting a New Deployment

Starting a New Deployment	O&M (Optional)	Hosting Fees	AVL/Google Fees	Total for first Year	Total per Year Ongoing	Total per Month
\$25K*	\$35k / Year*	\$350 / Month*	\$1K / Month*	\$51,200	\$26,200	\$2,183
<b>Per Agency Cost (17 Agencies)</b>						
\$1,470	\$2060 / Year	\$21 / Month	\$60 / Month	\$3,032	\$1,540	\$129

\* Est. 3<sup>rd</sup> Party Costs

# Cost of Starting a New Deployment

## Starting up a new deployment:

- Includes starting up RidePilot plus configuring/deploying Android driver app
- Includes some training for System Admin and Provider Admins

## O&M

- Includes updating system software components, addressing any defects that arise
- Includes secondary support

## Hosting Fees

- Would include multiple servers for testing and redundancy

## AVL / Google Fees

- This includes costs for ETA calculation in both RidePilot and the Android driver app

# Operational Impacts

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# Operational Challenges


- Change is HARD
- Use of other means of tracking trips
  - Excel
  - 3x5 Note Cards
  - In house programs
- No tool to manage their drivers
- No tool to manage vehicles and maintenance

# One Tool Box To Rule Them All

- A way to schedule and manage daily trips and runs
- A way to manage drivers
- A way to manage vehicles and maintenance



# Managing Runs and Trips



## RidePilot

Logged in to  
Tooele County

Dispatch
Trips
Runs
Customers
Drivers
Vehicles
Reports
CAD/AVL Map

Wed Mar 27, 2019

Recurring Scheduling

Runs
Total runs: 2 recurring
+ x ^

NAME	VEHICLE	DRIVER	START	END	TRIPS	ACTIONS
201	RECUR 17-001	VEH. TYPE? 1-click User	9:00am	2:00pm	2	<a href="#">🔗</a> <a href="#">🔄</a> <a href="#">+</a> <a href="#">✎</a> <a href="#">🔌</a>
Test Editing Run3	RECUR MV1-12	VEH. TYPE? eddievh User	11:00am	4:00pm	0	<a href="#">🔗</a> <a href="#">🔄</a> <a href="#">+</a> <a href="#">✎</a> <a href="#">🔌</a>

201 Vehicle: 17-001, Driver: 1-click User, Run Time: 9:00am - 2:00pm, 2 trips
Set trips as \*\*\* Assign to \*\*\* [🔄](#) [🔌](#) [✎](#) [+](#) [🔗](#) [✖](#) [^](#)

9am
9:30am
9:52am

ACTION	CUSTOMER	ADDRESS	SCHEDULE TIME	ETA	FLOOR	SEAT	TIE-DOWN	COMMENTS	RESULT	PHONE #	DRIVER NOTIFIED	ACTIONS
<input type="checkbox"/> PU <span style="background-color: #90ee90; padding: 2px;">NEW</span>	Tim Jones	Home (South 8950 West Magna, UT 84044)	9:30am	9:27am	0	0	0			(801) 231-2222 (801) 555-6688	<input type="checkbox"/>	<a href="#">🔗</a> <a href="#">✎</a>
<input type="checkbox"/> PU <span style="background-color: #90ee90; padding: 2px;">NEW</span>	Mickey Mouse	Home (3610 900 West South Salt Lake, UT 84119)	9:45am	9:52am	0	1	0			(801) 555-5555	<input type="checkbox"/>	<a href="#">🔗</a> <a href="#">✎</a>
<input type="checkbox"/> DO <span style="background-color: #90ee90; padding: 2px;">NEW</span>	Tim Jones	669 West 200 South Salt Lake City, UT 84101		10:12am	0	2	0			(801) 231-2222 (801) 555-6688	<input type="checkbox"/>	<a href="#">🔗</a> <a href="#">✎</a>
<input type="checkbox"/> DO <span style="background-color: #90ee90; padding: 2px;">NEW</span>	Mickey Mouse	400 West 300 South Salt Lake City, UT 84101		10:19am	0	1	0			(801) 555-5555	<input type="checkbox"/>	<a href="#">🔗</a> <a href="#">✎</a>

# Managing Driver Availability



- Dispatch
- Trips
- Runs
- Customers
- Drivers
- Vehicles
- Reports
- CAD/AVL Map

## Availability Forecast

### Driver Availability Forecast

DATE	RUNS			DRIVERS			
	TOTAL	ASSIGNED	UNASSIGNED	TOTAL	ASSIGNED	UNASSIGNED	ABSENT
Wed 03/27	2	2	0	3	2	1	0
Thu 03/28	4	3	1	2	2	0	0
Fri 03/29	4	3	1	2	2	0	0
Sat 03/30							
Sun 03/31							
Mon 04/01	4	0	4	1	0	1	0
Tue 04/02	3	0	3	2	0	2	0
Wed 04/03	5	4	1	3	2	1	0
Thu 04/04	4	3	1	2	2	0	0
Fri 04/05	4	3	1	2	2	0	0
Sat 04/06							
Sun 04/07							
Mon 04/08							

### Availability for Wednesday, March 27, 2019

2 Runs: 2 Assigned, 0 Unassigned



3 Available Drivers: 2 Assigned, 1 Unassigned



# Managing Driver Schedules

Recurring Availability



Daily Availability



	ALL DAY	6AM	8AM	10AM	12PM	2PM	4PM	6PM	8PM	10PM	
Fri 03/29	<input checked="" type="checkbox"/>										+ x ↻
Sat 03/30											
Sun 03/31											
Mon 04/01	<input checked="" type="checkbox"/>										+ x ↻
Tue 04/02	<input checked="" type="checkbox"/>										+ x ↻
Wed 04/03	<input checked="" type="checkbox"/>										+ x ↻
Thu 04/04	<input checked="" type="checkbox"/>										+ x ↻
Fri 04/05	<input checked="" type="checkbox"/>										+ x ↻
Sat 04/06											

# Managing Vehicles

## Vehicle Details

[Add Document](#)[Delete Vehicle](#)[Edit Vehicle](#)[Inactivate](#)

### Details

Name

Year

Make

Model

License Plate

VIN

Vehicle Type

Vehicle should appear on vehicle report

Is FTA 5310 Vehicle?

Initial Mileage  [Edit](#)

Last reported mileage

### Vehicle Documentation

UPLOADED AT	DESCRIPTION	FILE SIZE
No documents exist for this vehicle		

### Maintenance Events

SERVICE DATE	INVOICE DATE	ODOMETER	VENDOR NAME	INVOICE NUMBER	INVOICE AMOUNT	REIMBURSABLE	SERVICES PERFORMED
There are no maintenance events							

### Preventive Maintenance Logs (PM)

 Show All?

Maintenance Schedule Type **(Not Set)**

DUE	NAME	COMPLIANCE DATE	COMPLIANCE MILEAGE	INSPECTION REQUIREMENT SHEET
3,000 mi	PM Schedule "E"			
5,000 mi	Schedule A			
10,000 mi	Mileage event test			

# Reporting Features

- NTD
- FTA 5310
- Ridership
- Vehicle Maintenance
- Vehicle Productivity
- Driver Productivity



# Future of RidePilot

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# Where is RidePilot Going Next?

A few possibilities...

- Automated (optimized) scheduling & dispatch capabilities
- Brokerage capability to pass trips between providers
- Customer app to book rides, see when vehicle will arrive
- SaaS version for small agencies without an umbrella sponsor

*RidePilot is open source, so future directions are significantly influenced by client engagements and grant funding opportunities.*

Thank You!