

Standards-based GTFS Data

for Passenger-Facing
and Planning Applications

2018 STATE PUBLIC TRANSPORTATION PARTNERSHIPS CONFERENCE

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trilliumtransit.com
Portland, Oregon



Overview



What is GTFS?

Origin of the Spec;
Contents and Standardization;
Scale and Adoption;

Oregon's GTFS Programs

Customer-Facing Applications;
Coverage;
Contract and Lessons for State DOTs;

What's Next?

Real-time;
Network Planning & TNeXT;
GTFS-flex;
GTFS-ride;

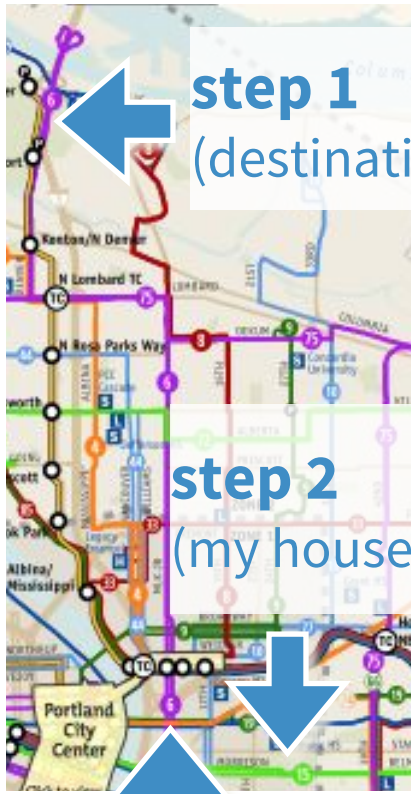
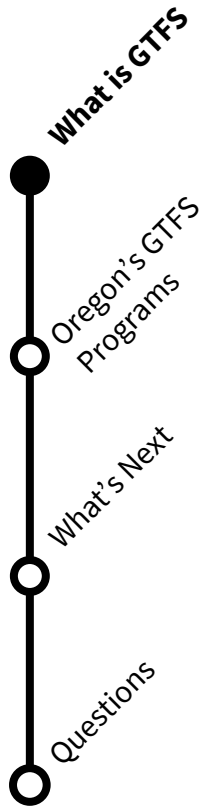
GTFS

(General Transit Feed Specification)



What is GTFS?

Origin of the Spec



step 3
(transfer point)

TRI MET
See where it takes you.

6-Martin Luther King Jr Blvd

Weekday		To Jantzen Beach				
SW 18th & Columbia Stop ID: 1114	SW Columbia & Warren St & 5th Stop ID: 12794	NE Grand & Pacific Stop ID: 2175	NE M.L. King & Alberta Stop ID: 2680	N Lombard & Interstate Stop ID: 3507	Jantzen Beach Stop ID: 3529	
5:12	5:16	5:25	5:30	5:41	5:50	
5:32	5:36	5:45	5:53	6:01	6:11	
5:52	5:56	6:05	6:13	6:21	6:31	
6:06	6:10	6:20	6:28	6:36	6:46	
6:21	6:25	6:35	6:43	6:52	7:02	
6:36	6:40	6:50	6:58	7:07	7:17	
6:51	6:55	7:05	7:14	7:24	7:34	
7:06	7:09	7:20	7:30	7:40	7:50	
7:19	7:24	7:35	7:45	7:55	8:05	
7:34	7:39	7:50	8:00	8:10	8:20	
7:48	7:53	8:05	8:15	8:25	8:35	
8:03	8:08	8:20	8:30	8:40	8:50	
8:18	8:23	8:35	8:45	8:55	9:05	
8:33	8:38	8:50	9:00	9:10	9:20	
8:48	8:53	9:05	9:15	9:25	9:35	
9:03	9:08	9:20	9:30	9:40	9:50	
9:18	9:23	9:35	9:45	9:55	10:05	
9:33	9:38	9:50	10:00	10:10	10:20	
9:48	9:53	10:05	10:15	10:25	10:35	
10:03	10:08	10:20	10:30	10:40	10:50	
10:18	10:23	10:35	10:45	10:55	11:05	
10:33	10:38	10:50	11:00	11:10	11:20	
10:48	10:53	11:05	11:15	11:25	11:35	
11:03	11:08	11:20	11:30	11:40	11:50	
11:18	11:23	11:35	11:45	11:55	12:05	
11:33	11:38	11:50	12:00	12:10	12:20	
11:48	11:53	12:05	12:15	12:25	12:35	
12:03	12:08	12:20	12:30	12:40	12:50	
12:18	12:23	12:35	12:45	12:55	1:05	
12:33	12:38	12:50	1:00	1:10	1:20	
12:48	12:53	1:05	1:15	1:25	1:35	
1:04	1:09	1:21	1:30	1:40	1:50	

step 5
(transfer stop)

step 4
(destination stop)

TRI MET
See where it takes you.

15-Belmont

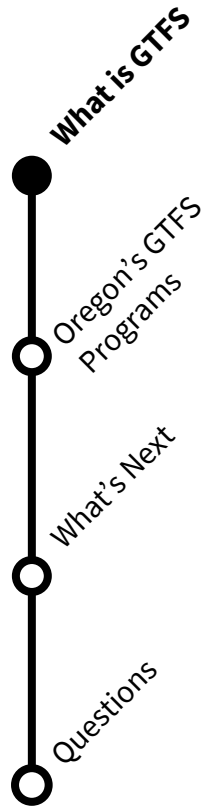
Weekday		To Portland City Center				
NE Sandy & Belmont Transit Center Stop ID: 5950	SE 102nd & Washington Stop ID: 6529	SE Stark & Belmont Stop ID: 6499	SE Belmont & 80th Stop ID: 651	SE Belmont & 80th Stop ID: 628	SE Meriton & 131st Stop ID: 614	SW Washington & 5th Stop ID: 6160
4:41	4:52	5:01	5:07	5:11	5:19	5:24
5:07	5:18	5:27	5:33	5:37	5:45	5:50
5:21	5:32	5:41	5:47	5:51	5:59	6:05
5:35	5:46	5:55	6:02	6:06	6:14	6:20
5:50	6:01	6:11	6:17	6:21	6:29	6:35
6:02	6:13	6:23	6:29	6:34	6:42	6:48
6:13	6:24	6:34	6:40	6:45	6:54	7:00
6:25	6:36	6:46	6:52	6:57	7:06	7:12
6:35	6:46	6:56	7:02	7:07	7:16	7:22
6:46	6:57	7:07	7:13	7:18	7:27	7:33
6:57	7:08	7:18	7:24	7:29	7:38	7:44
7:08	7:20	7:30	7:36	7:41	7:50	7:56
7:19	7:31	7:41	7:48	7:54	8:03	8:09
7:31	7:43	7:53	8:00	8:06	8:15	8:21
7:41	7:53	8:03	8:10	8:16	8:25	8:31
7:57	8:09	8:19	8:26	8:31	8:40	8:47
8:11	8:23	8:33	8:40	8:46	8:54	9:01
8:25	8:38	8:48	8:55	9:01	9:10	9:17
8:39	8:52	9:02	9:09	9:15	9:24	9:31
8:53	9:06	9:16	9:23	9:29	9:38	9:45
9:07	9:20	9:30	9:37	9:43	9:52	10:00

step 6
(transfer stop)

step 7
(origin stop)

What is GTFS?

Origin of the Spec



Why isn't it as easy to get transit directions as driving directions?



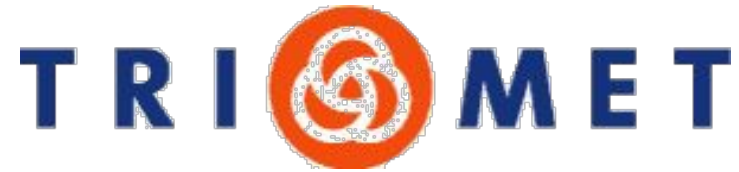
Bibiana McHugh,
IT Manager for GIS and
Location-Based Services,
TriMet, in 2005



What is GTFS?

Contents and Standardization

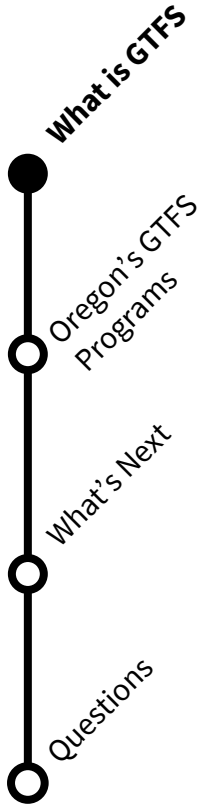
2005: Google Transit launches as a “Labs” product.



Google’s mission:

“Organize the world’s information and make it universally accessible and useful.”

This requires **standardized data.**

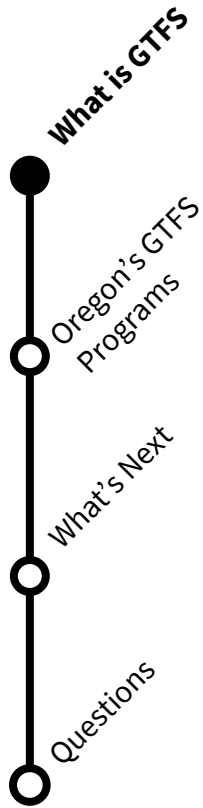


What is GTFS?

Contents and Standardization

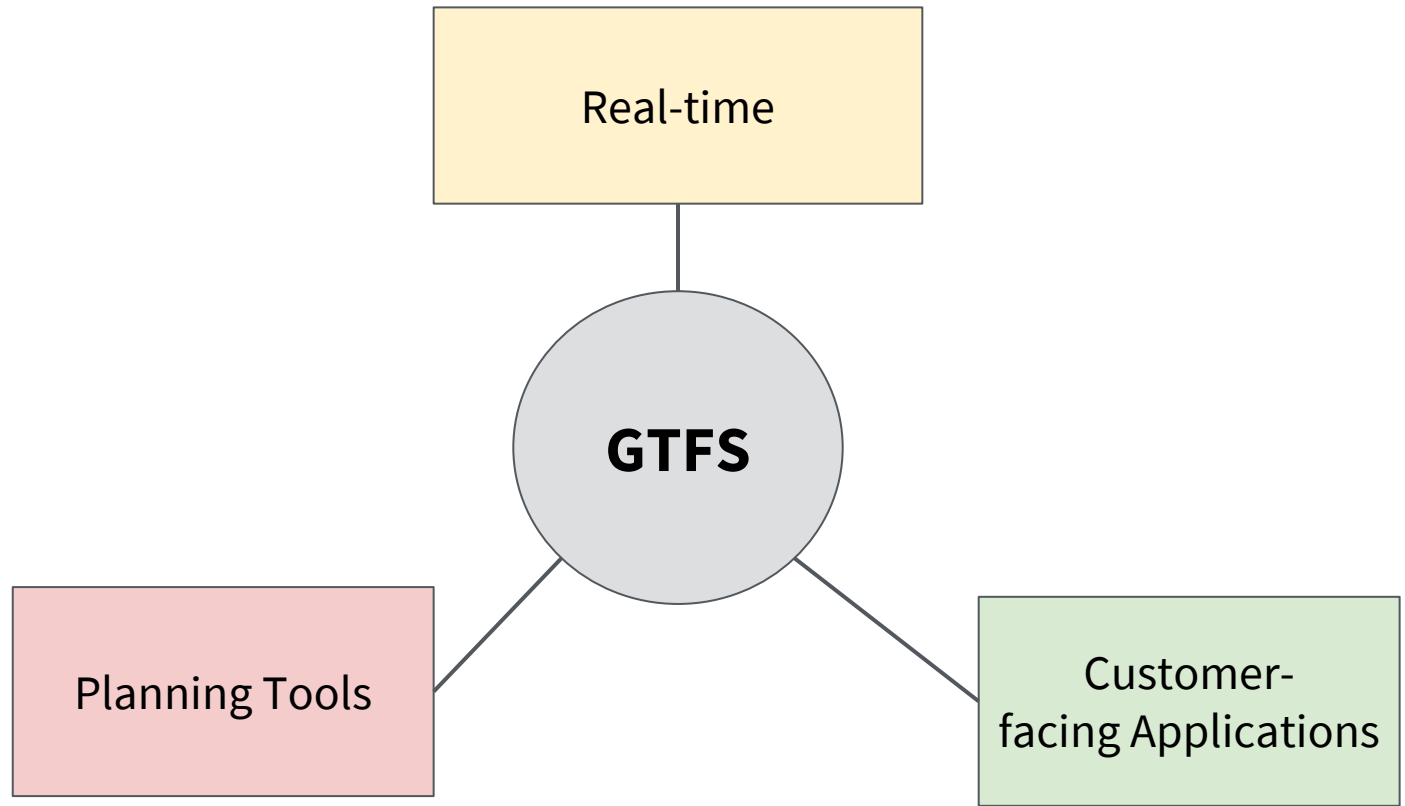
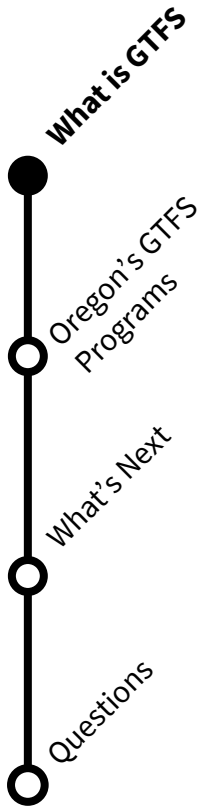
General Transit
Feed Specification

 **creative
commons**



What is GTFS?

Scale and Adoption



What is GTFS?

Customer-facing Applications



Google Maps



Apple Maps



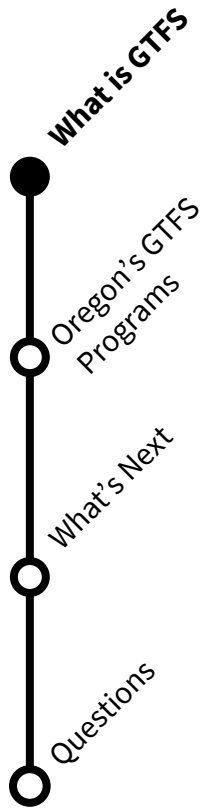
Bing Maps



Transit



Moovit



transit

Regions

Partners

Blog



GO YOUR OWN WAY

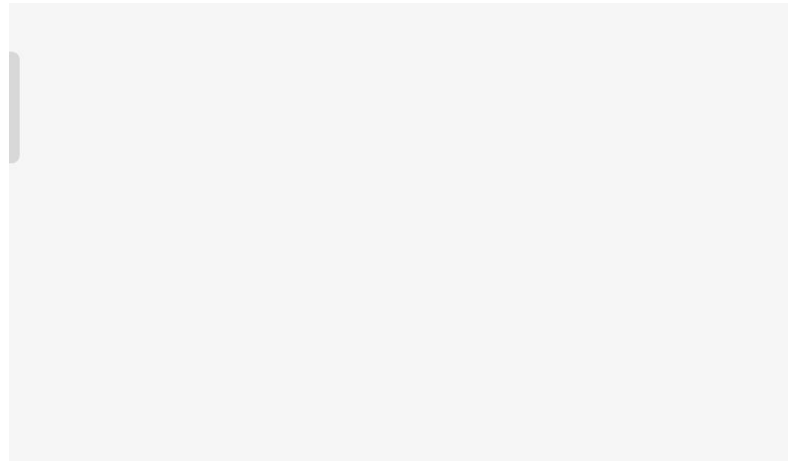
iPhone 

Android 

It's in the Name™




ANDROID, PLEASE



B37

↻ Bay Ridge Shore Rd via 3 Av
4 Av / Dean St

4
minutes

F

↻ Uptown & Queens
Broadway-Lafayette St

1
minute









R

↻ Manhattan & Queens
Atlantic Av / Barclays Ctr

6
minutes

Rome 2rio

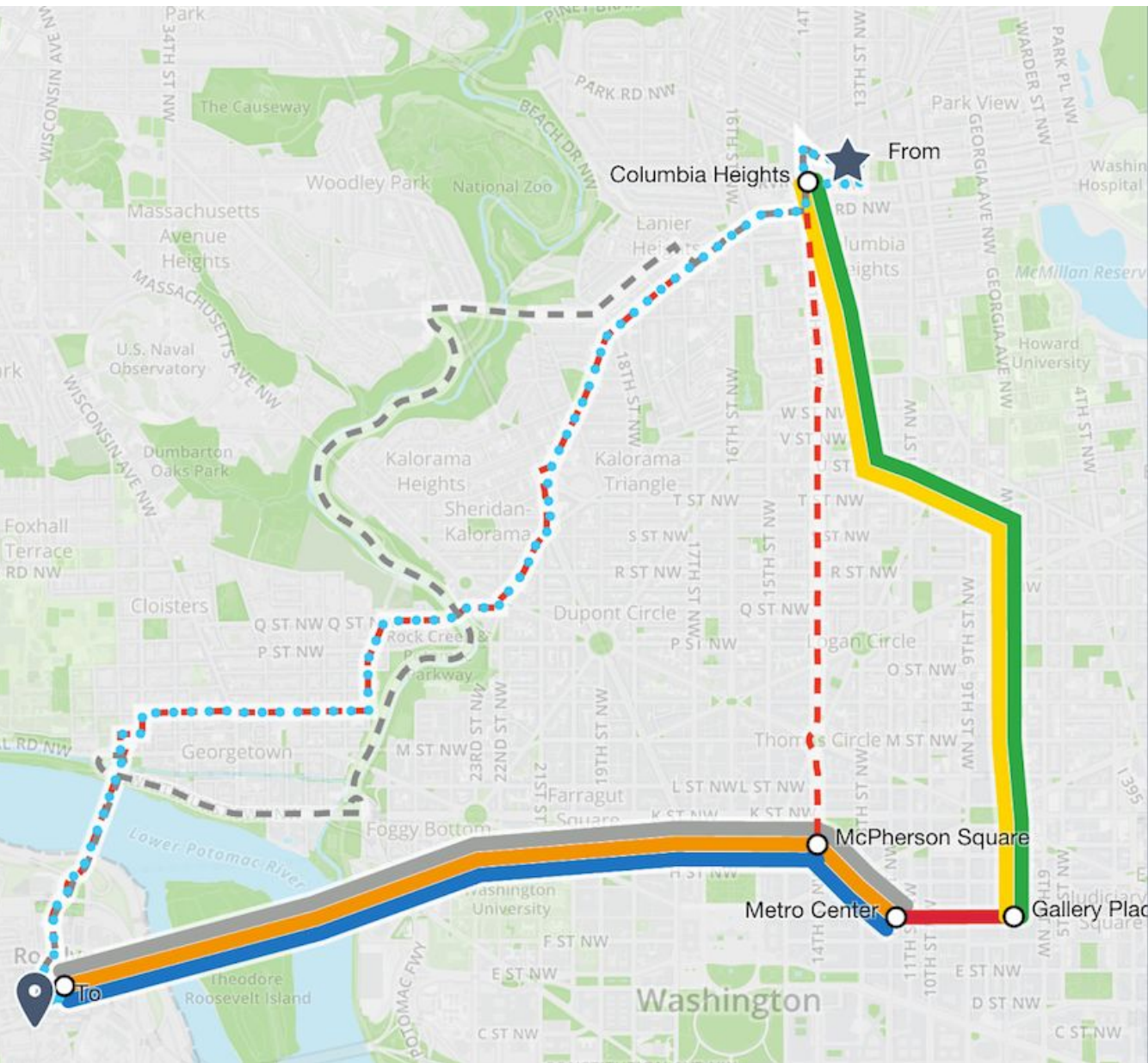


Fly		>
9hrs 48min	\$186 - \$656	
Bus, line 5039 bus, car ferry, drive	  	>
3days 18hrs	\$586 - \$1,379	
Bus, train, car ferry	  	>
4days 15hrs	\$677 - \$1,128	
Drive		>
2days 06hrs	\$260 - \$380	



opentripplanner.org

Open-source multi-modal trip planner



#1 bike Save \$3,044

29 min avg select
 4.1 mi bike ride

[+ details](#) [help improve trip](#)

#2 bike to transit Save \$2,539

26 min avg select
 14 min bike ride
 2 min walking

[+ details](#) [help improve trip](#)

#3 walk to transit Save \$2,456

30 min avg select
 7 min walking

[+ details](#) [help improve trip](#)

#4 rideshare Save \$1,522

25 min avg select
 18 without traffic

[+ details](#) [help improve trip](#)

What is GTFS?

Agency-facing Tools

GTFS-to-HTML

```
trip_id,arrival_time,departure_time,stop_id,stop_sequence,stop_headsign,pickup_type,drop_off_type,shape_dist_traveled,timepoint,area_id,service_area_radius,start_service_area_id,end_service_area_id,start_service_area_radius,end_service_area_radius,continuous_pickup,continuous_drop_off
t_168816_b_531_tn_1,07:33:00,07:33:00,2394809,1,,0,0,0,1,,,,,,,,,1,1
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```

full schedule →

17pm 3:17pm

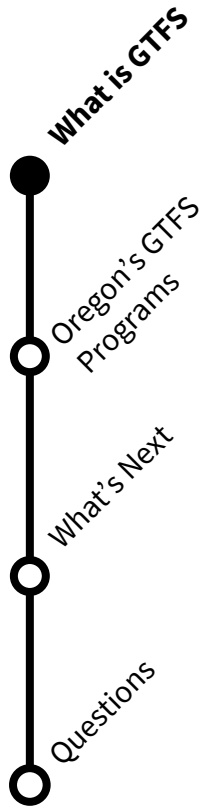
26pm 3:26pm

38pm 3:38pm

44pm 3:44pm

52pm 3:52pm

55pm 3:55pm



What is GTFS?

Real-time

- What is GTFS
- Oregon's GTFS Programs
- What's Next
- Questions

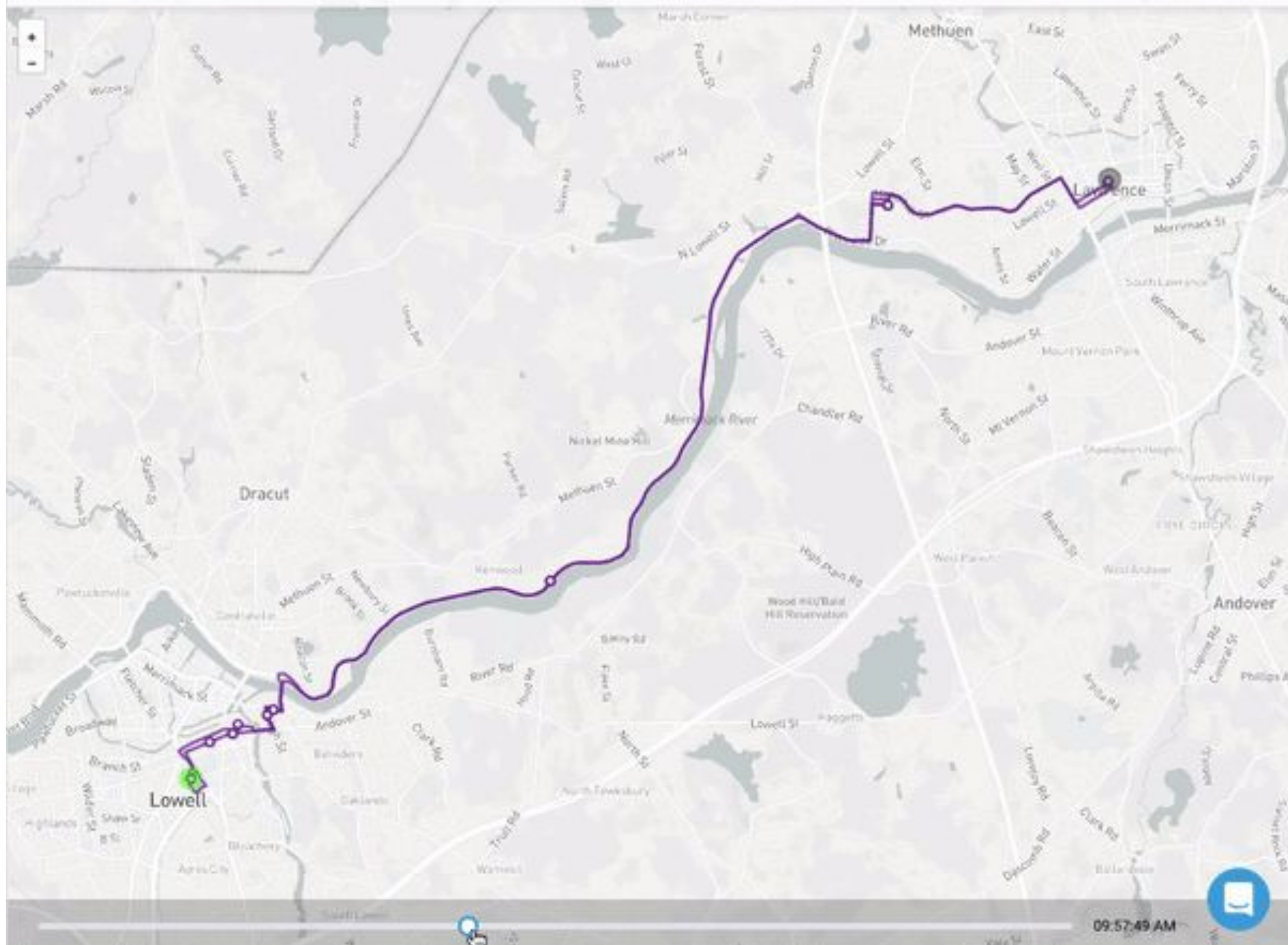


Swiftly

www.goswift.ly

GPS Playback for Route 41

Menu



On-Time Summary

Routes Monitored: 19 | Departures Tracked: 1,526



- Early: 13.1 %
- On-Time: 74.8 %
- Late: 12.1 %

On-Time Trends

Compared to the 30 days prior to 08-12-2018. Ignores time filters.



On-Time: **+6.6pts** (+9.8%)

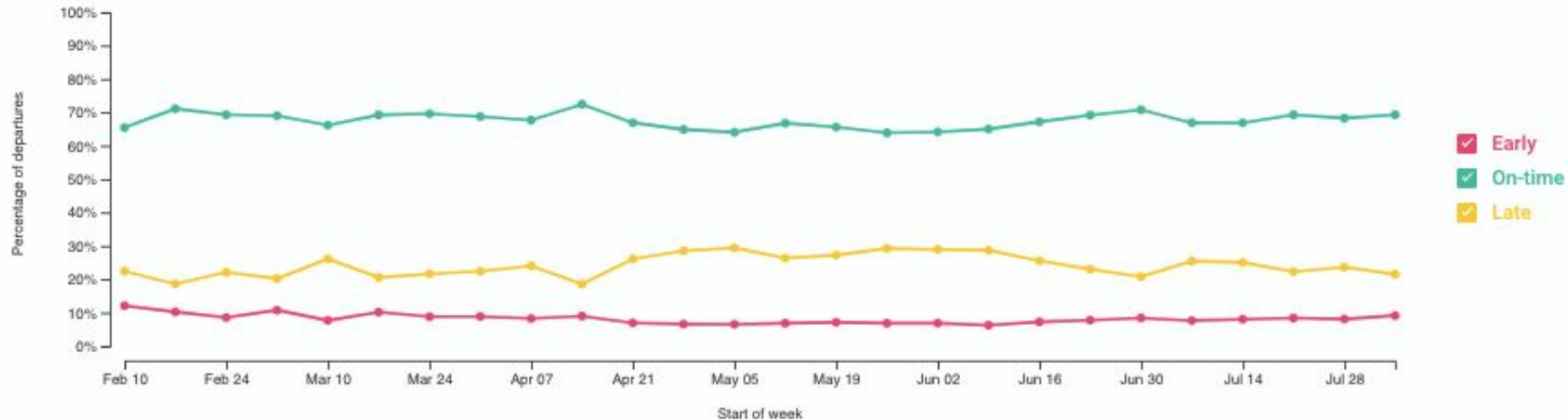
Early: **+5.5pts** (+71.5%)

Late: **-12.1pts** (-50.0%)

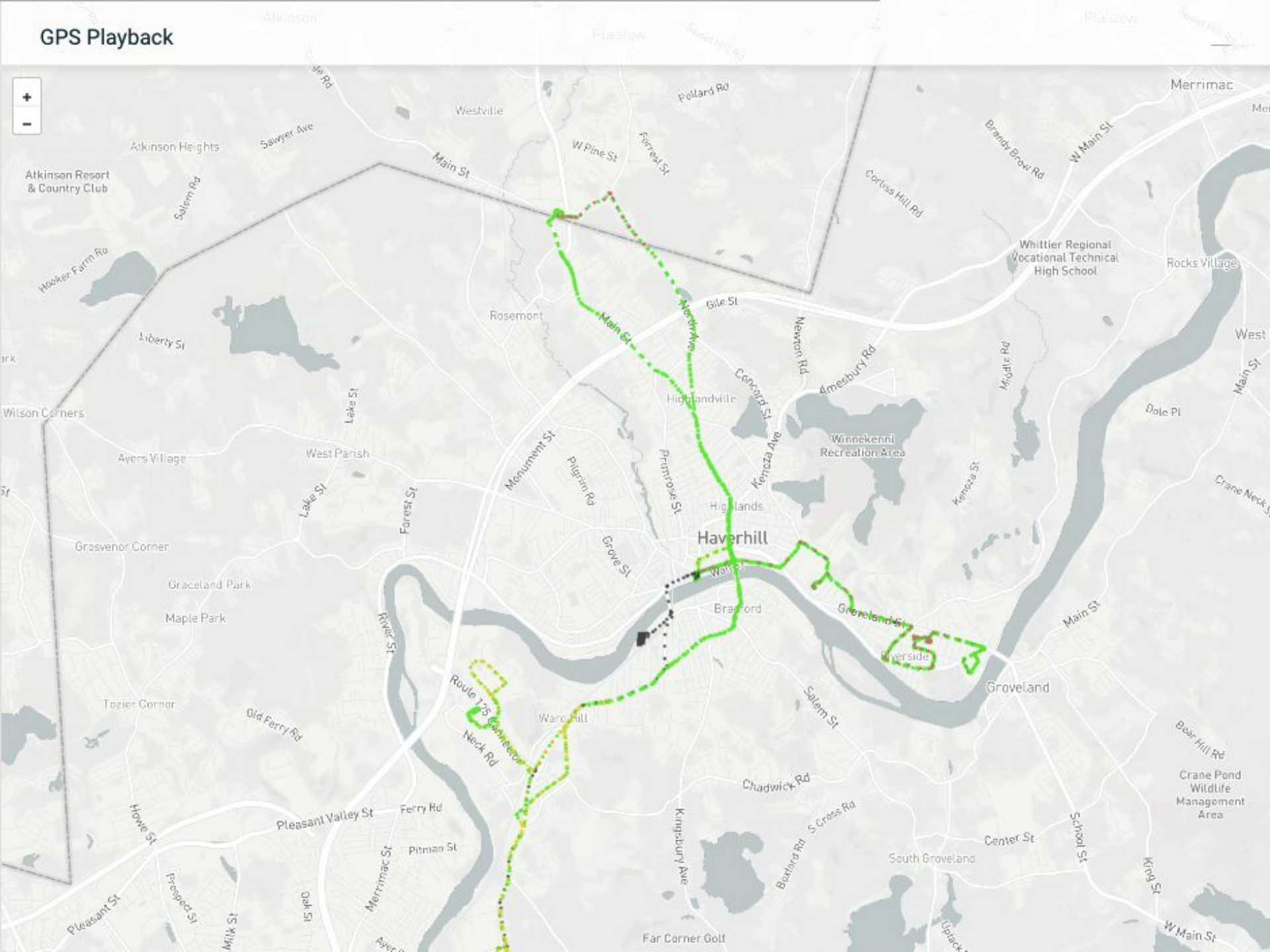
On-Time Performance By Week: All Routes

Time series chart is calculated based on OTP parameters: 1 min early and 4 min late over a 26 week period.

% #













GPS Playback

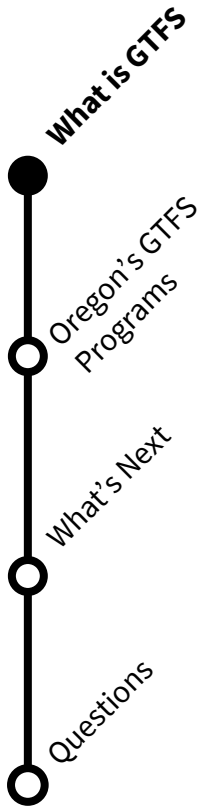


What is GTFS?

Scale and Adoption

transit.land

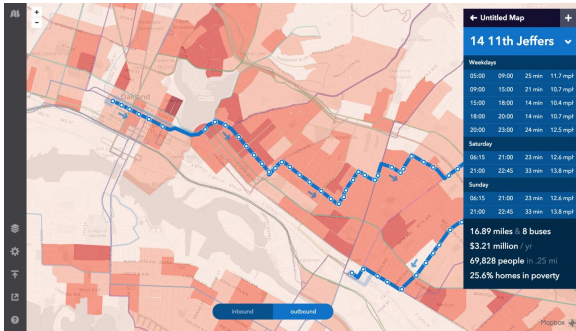
Operator Name	Metro	State or Province	Country	License	License Details
のみバス	Nomi	Ishikawa	Japan	<i>No feed registered (yet!)</i>	
128 Business Council	Waltham	Massachusetts	United States		  
360 Discovery	Auckland	Auckland	New Zealand		  
9 Town Transit	Centerbrook	Connecticut	United States		  
Aachener Verkehrsverbund (AVV)	Aachen	Nordrhein-Westfalen	Germany		  
Aachener Verkehrsverbund - West (AVV)		Nordrhein-Westfalen	Germany		  
Aare Seeland mobil (ASM)	Biel/Bienne	Bern	Switzerland		  
Aare Seeland Mobil	Langenthal	Bern	Switzerland		  



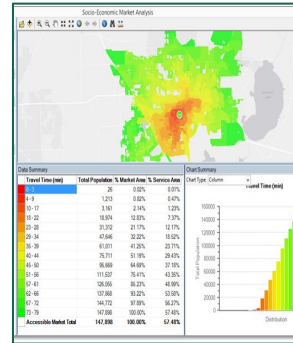
What is GTFS?

Planning Tools

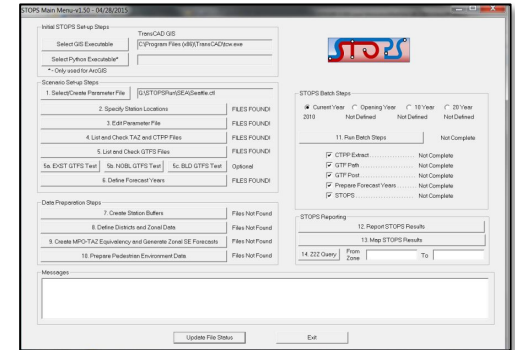
What is GTFS
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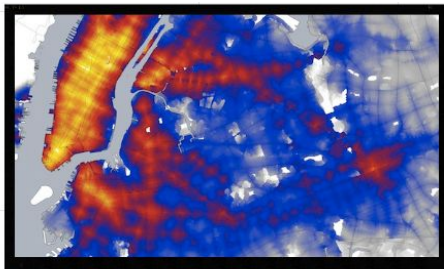
Remix



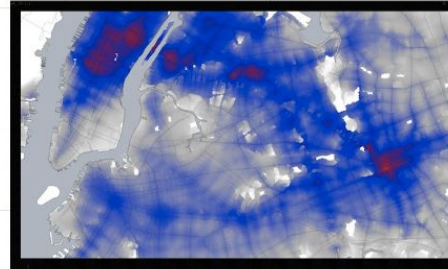
TBEST



FTA STOPS



OpenTripPlanner Analyst



Public Transportation

Transit Score™: **100** Rider's Paradise

71 nearby routes: 48 bus

- .06 mi - Blue Line
- .07 mi - Green Line
- .04 mi - 191
- .04 mi - 192

WalkScore

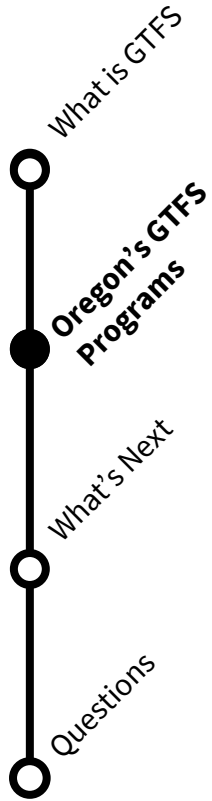
ODOT

Oregon's GTFS Programs



Oregon's GTFS Program

Customer-facing Applications



Portland Bus Station, 2846 NE 8th Ave.
Burns, Oregon 97720

Send directions to your phone

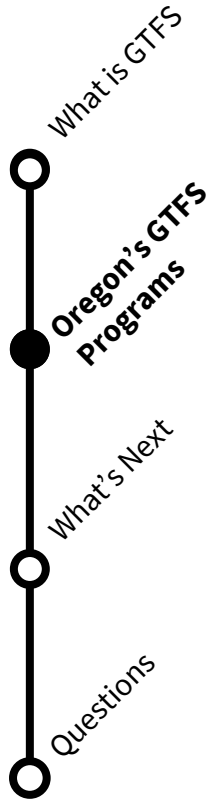
Route	Time	Duration	Carriers
11:00 PM–10:52 AM (Tuesday)	11 h 52 min	Greyhound > Eastern POINT > 🚶	
6:30 AM (Tuesday)–4:22 PM	9 h 52 min	Greyhound > Eugene to Bend > Eastern POINT > 🚶	
6:57 AM (Tuesday)–4:22 PM	9 h 25 min	Cascades POINT > Eugene to Bend > Eastern POINT > 🚶	
7:00 AM from Union Station	\$94.00	🚶 15 min	
2:55 PM–4:22 PM (Tuesday)	1 d 1 h	🚶 > Bolt > Eugene to Bend > Eastern POINT > 🚶	

Eugene Amtrak Station Bus Platform

Map showing route from Portland Bus Station to Eugene Amtrak Station Bus Platform via Salem. Duration: 9 h 52 min. Alternative route via Hawthorne Station: 9 h 25 min.

Oregon's GTFS Program

Coverage



ODOT Coverage
1 view

All changes saved in Drive

Add layer Share Preview

Agencies

Uniform style

All items (58)

- Albany Transit System
- Basin Transit Service
- Benton County Transportation
- Blue Star
- C-Tran
- Canby Area Transit
- Caravan Airport Transportati...
- Cascades East Transit
- Cascades POINT
- CCC Xpress
- Central Oregon Breeze
- City of Milton-Freewater
- City2City Shuttle
- Columbia Area Transit opera...
- Columbia County Rider

Google My Maps

Directions: Northbound (ID: 441) Southbound (ID: 442)

Add a Trip Print Table Refresh

Year-round service (173) 2018, Jan 01 - 2018, Jan 01 Showing 11 rows out of 21 total

Mon-Fri

[Overview](#) [Generate](#)

*County Transit Center
14505*
*7th Ave at 74th St (North)
14521*
*Amick Rd at 160th St (North)
14536*
*102407 Central Wisconsin Mills Station
14600*

Trip 1	05:00:00	05:04:00	04:05:00	04:14:00
Trip 2	06:00:00	06:04:00	07:05:00	07:14:00
Trip 3	07:00:00	07:04:00	08:05:00	08:14:00
Trip 4	08:00:00	08:04:00	09:05:00	09:14:00
Trip 5	10:00:00	10:01:00	10:40:00	10:49:00
Trip 6	12:00:00	12:01:00	12:13:00	12:14:00

Oregon's GTFS Program

Contract and Lessons for State DOTs

- **Travelers benefit from statewide coverage**
- **Use of data for multiple purposes:**
 - Creates efficiency
 - Improves accuracy and accountability
- **Standards-based interoperable data:**
 - Many components work together
 - Reduced vendor lock-in
 - Combine with other multimodal data
- **Multi-year commitment necessary to develop agency engagement**



What's Next

Real-time, TNeXT, Flex, Ride

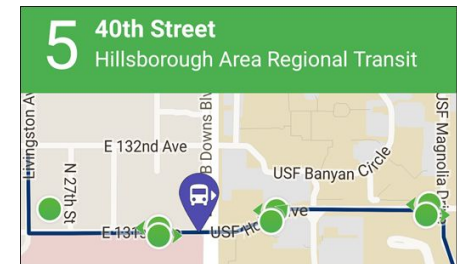


What's Next?

GTFS-realtime

Companion specification includes:

- vehicle positions
- real-time arrival estimates
- advisories

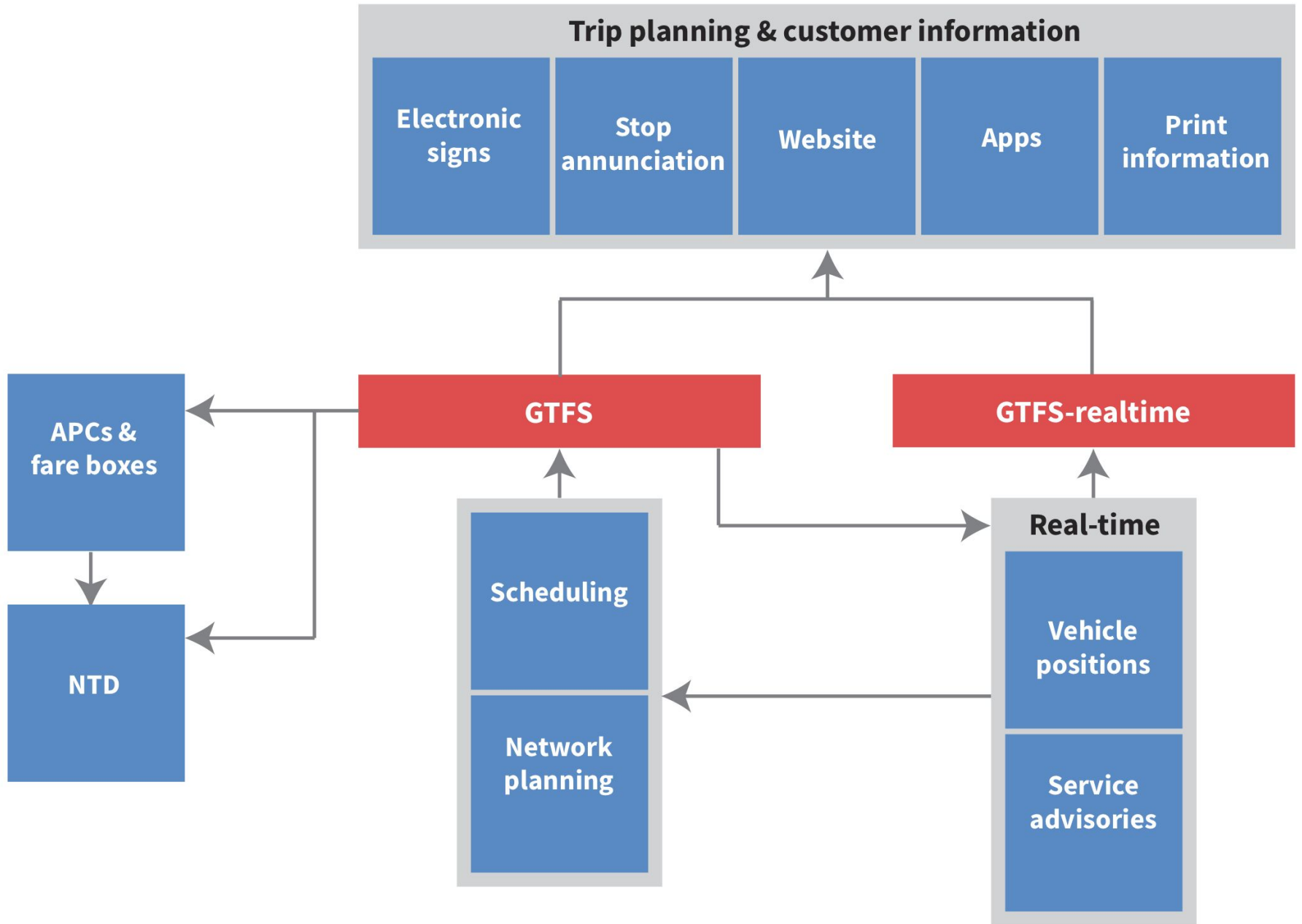


5 South to Downtown/MTC **18 min**

Route 5 is experiencing significant delays due to flooded roads



Transit Stack




What's Next?


GTFS-flex


Draft specification includes:

- deviated fixed-route
- dial-a-ride
- flag stop service



Addison County Transit Resources  TTSB/V		
Depart	From	
2:52pm	Main Street Library	
Arrive	To	Service note:
approximately 3:30pm to 3:33pm	Mopkins Road	Upon boarding, please let your driver know you would like a Deviation or a Request Only drop off.

Rural Community Transportation  Dial-a-Ride		
Depart	From	Service note:
approximately Aug 14th 1:32pm to 1:58pm	Munt Mill Road	Call 802-748-8170 two days before your trip to request pickup.

The Current  Brattleboro Blue Line		
to Guilford		
Depart	From	Flag Stop
11:35am	corner of Maple Street and Belmont Avenue	Wave the bus down in a safe location. The driver will not stop near corners, on steep hills, or other hazardous areas.

What's Next?

GTFS-flex

What is GTFS
Oregon's GTFS
Programs
What's Next
Questions

10:28 AM 🕒 08/13/2018 📅

↺ Show Settings ▾

Submit 🔍

Drag start and end location pins on the map or use the form above to adjust trip settings.

Option 1: departs at 2:38pm 55 min 🖨️

🚶 📞 [TTSB/V](#) \$1.00

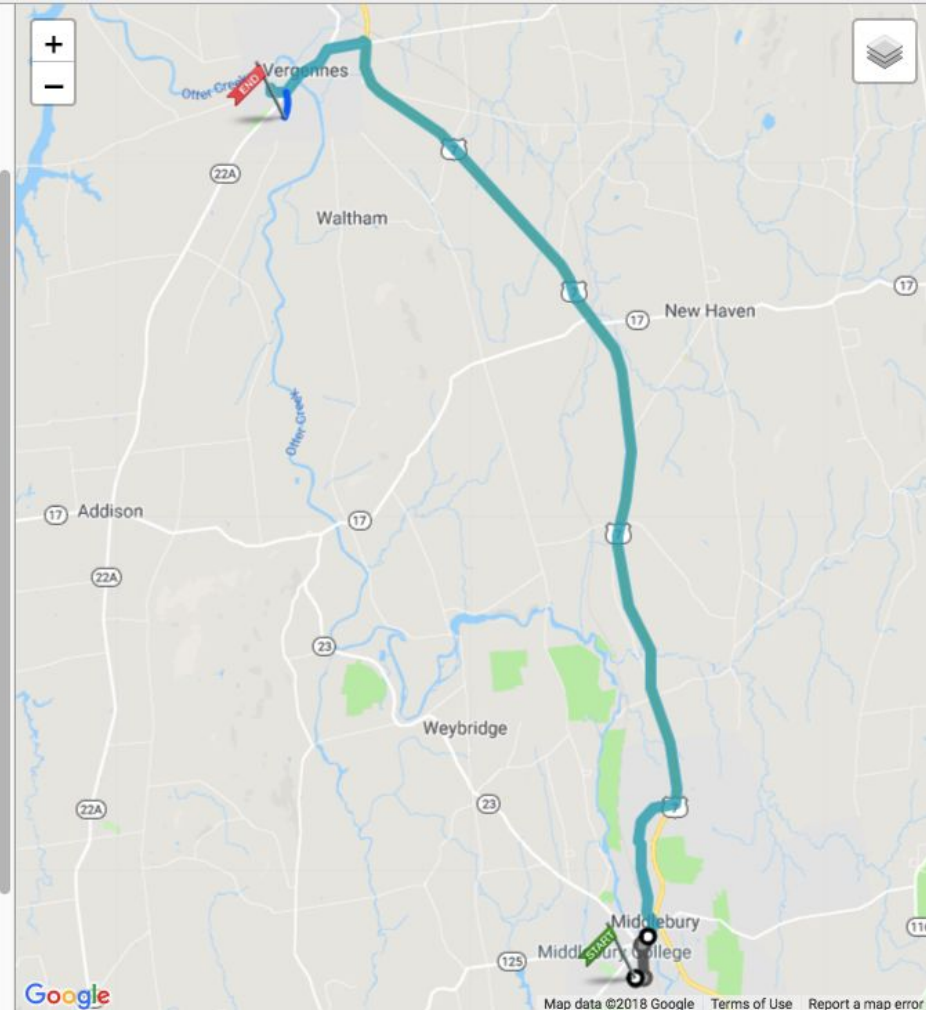
🚶 to Main Street Library 14 min

Addison County Transit Resources 📞 [TTSB/V](#)

Depart	From	
2:52pm	Main Street Library	
Arrive	To	Service note:
approximately 3:30pm to 3:33pm	Hopkins Road	Upon boarding, please let your driver know you would like a Deviation or a Request Only drop off.

Option 2: departs at 1:25pm 58 min 🖨️

🚶 📞 [TTSB/V](#) \$1.00



What's Next?

Network Planning: TNeXT and GTFS-ride



- **TNeXT (Transit Network Explorer Tool)** in statewide network planning
- **GTFS-ride** to relate ridership to schedules and stops

What's Next?

Network Planning: TNeXT and GTFS-ride



Transit Network Analysis Tool

https://tnasoftwaretool.engr.oregonstate.edu/TNAtoolAPI-Webapp/?n=-&dbindex=7

Oregon Transit Agencies

List of Agencies:

- 01. Albany Transit System
- 02. Amtrak Cascades
- 03. Basin Transit Service
- 04. Benton County Transportation
- 05. Blue Star Bus
- 06. Bolt Bus Oregon
- 07. C-TRAN
- 08. Canby Area Transit
- 09. Caravan Airport Transportation
- 10. Cascades East Transit
- 11. Cascades POINT
- 12. CCC Xpress
- 13. Central Oregon Breeze
- 14. Cherriots
- 15. City of Milton-Freewater
- 16. City2City Shuttle
- 17. Coast Starlight
- 18. Columbia Area Transit
- 19. Columbia County Rider
- 20. Coos County Area Transit
- 21. Corvallis Transit System
- 22. Curry Public Transit
- 23. Diamond Express
- 24. Eastern POINT
- 25. Empire Builder
- 26. Eugene to BEND
- 27. Eugene to Coos Bay
- 28. Greyhound
- 29. HighDesert POINT
- 30. HUT Airport Shuttle (Phone or web r
- 31. Josephine Community Transit
- 32. Kayak Public Transit
- 33. Klamath Shuttle

-Agencies in red color have an expired GTFS feed

Selected Dates:

Questions?

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