Trip Planning Tools for Flexible Transit Services

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presented by

Paul Sorensen

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Agenda

- GTFS Flex

- GTFS Flex and OpenTripPlanner

- Future Directions

- Building momentum for GTFS flex

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Takeaways

GTFS Flex is about:

➤ Making sure flexible transit services can be discovered within trip planning tools

➤ Making sure that trip planning tools have the necessary information to combine flexible transit with other modes to create efficient itineraries

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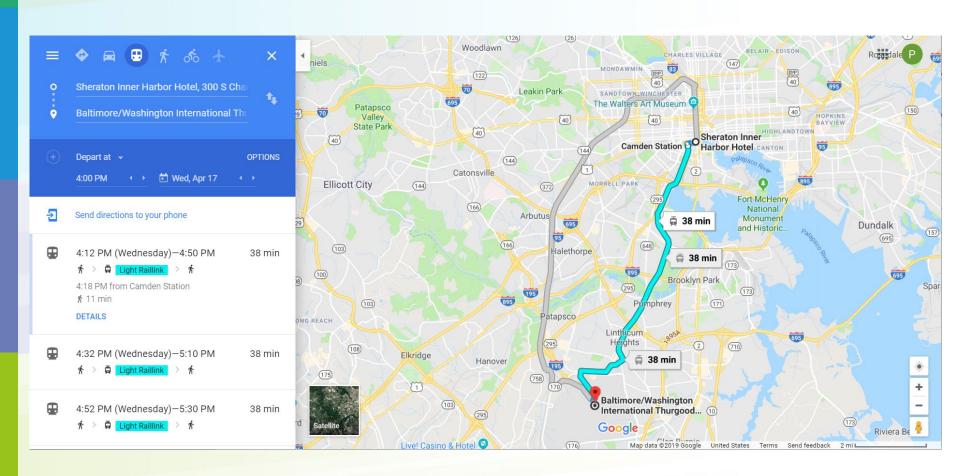
GTFS FLEX – WHAT AND WHY?

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Benefits of GTFS

➜ GTFS = General Transit Feed Specification

➜ Open standard for defining *fixed route* transit services
  » Routes, stops, days, times, etc.

➜ Dramatic impact over past decade
  » Agencies define their services using GTFS
  » Trip planners are built to read in GTFS
  » Result -> emergence of ubiquitous trip planning tools (e.g. Google transit) that include fixed route transit wherever it is available and GTFS has ben produced

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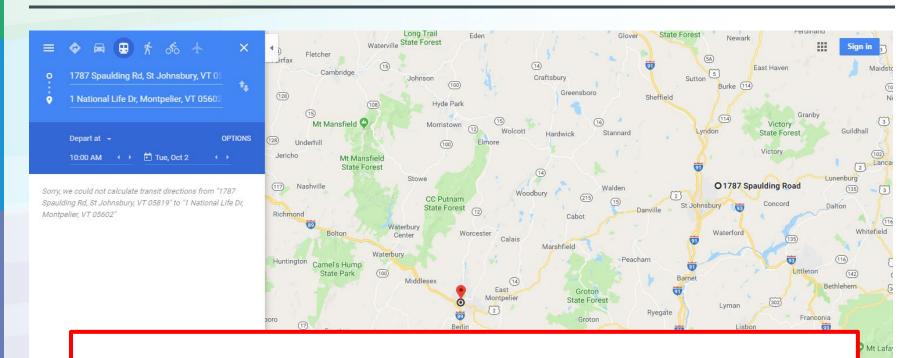# *Transit Trip Planning Works Well in Most Urban Areas*

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Limits of GTFS for Flexible Transit Services

➜ Fixed route transit is often not cost effective in lower population density areas

➜ Many rural and exurban areas may instead make use of various types of flexible, or demand responsive, transit:

» Flag stop / continuous stop

» Deviated fixed route

» Dial-a-ride / call-n-ride

➜ These services cannot be represented in GTFS, and so they are not included in current trip planning tools

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Current Trip Planning Tools Do Not Include Flexible Services

Sorry, we could not calculate transit directions from "1787 Spaulding Rd, St Johnsbury, VT 05819" to "1 National Life Dr, Montpelier, VT 05602"
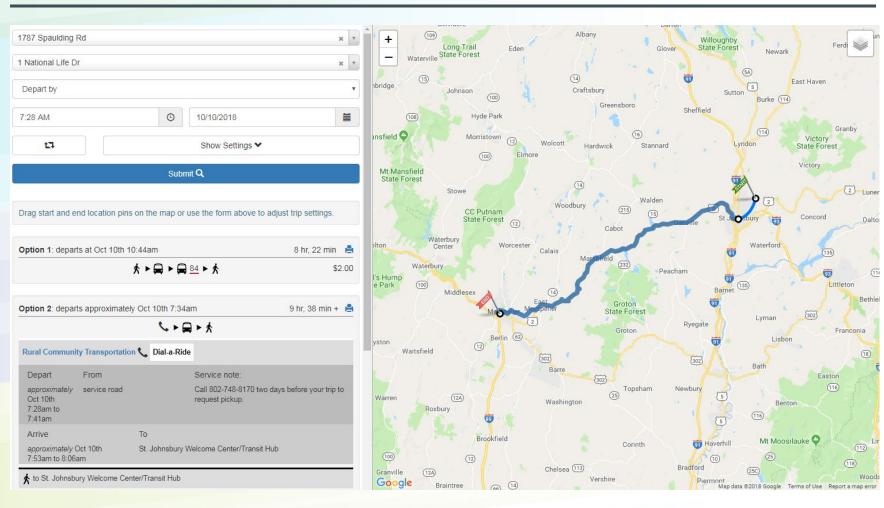
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GTFS Flex Extends GTFS To Define Flexible Transit Services

→ GTFS Flex is an emerging standard that provides additional information for defining flexible or "on demand" transit services

  » Such as: deviated fixed route, flag stops, dial-a-ride

→ Objectives of GTFS flex:

  » Make it possible for agencies to accurately specify the flexible services that they provide

  » Make it possible for trip planning tools to incorporate flexible services when searching for transit itineraries

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GTFS Flex Can Help Customers Discover Available Services

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GTFS FLEX AND
OPEN TRIP PLANNER (OTP)

What Is OTP?

➔ Open source trip planning tool with a strong and growing community of agency users
  » TriMet, RTD, LA Metro, VTA, NYMTA…

➔ Ingests GTFS and OpenStreetMap (OSM) data

➔ Can generate routes for combinations of fixed route transit, biking, walking, and driving

➔ Provides out-of-the-box user interfaces

➔ Open source -> can be modified to work with GTFS Flex as well!

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GTFS Flex / OTP MOD Sandbox Grant

➤ FTA awarded MOD Sandbox grant to VTrans

  » Project team includes Trillium, Cambridge Systematics

➤ First year objectives (done):

  » Use GTFS Flex to define flexible transit services across Vermont

  » Revise or extend GTFS Flex data standard as needed

  » Modify OpenTripPlanner to work with GTFS flex

    – Load data, optimize routes, symbolize in UI

➤ Second year objectives (ongoing):

  » Pilot test for Vermont, improving as needed

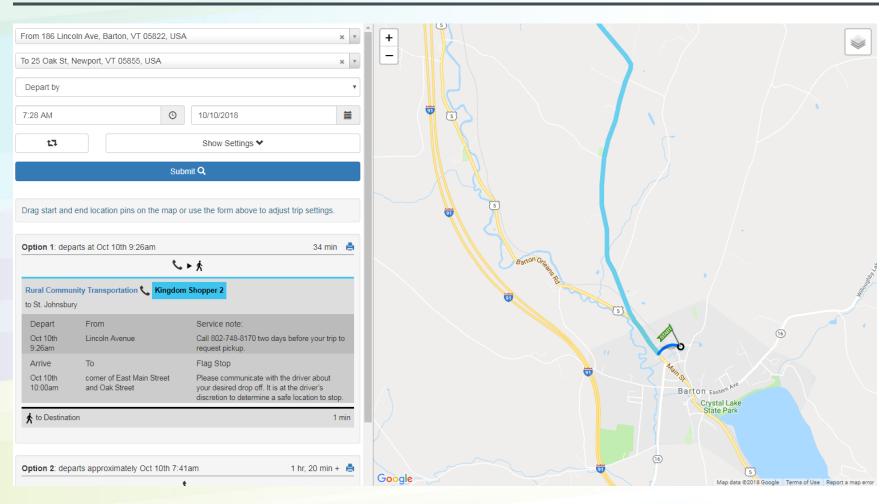 » Share data, code, lessons learned with developers, agencies

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Flexible Service Types in Vermont

➤ Deviated fixed route

➤ Flag stops / continuous stops

➤ Dial-a-ride / call-n-ride

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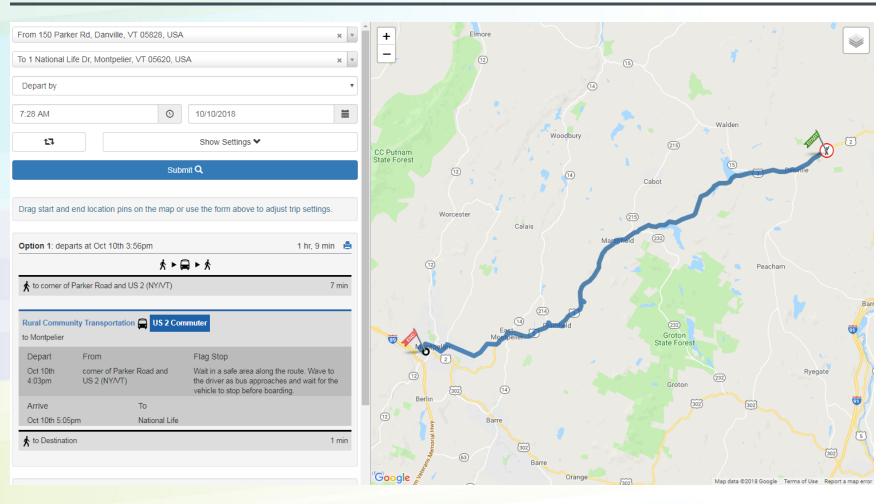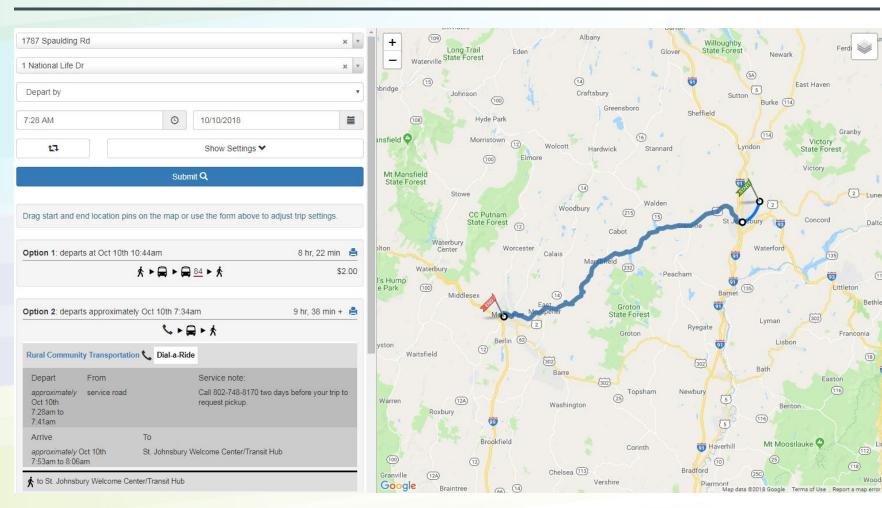
Deviated Fixed Route Example

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Flag Stop Example

Dial-A-Ride Example

New User Interface Conventions

Uncertain Stop Location
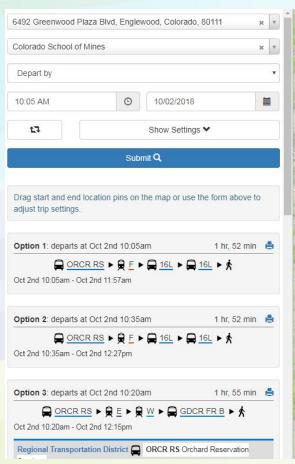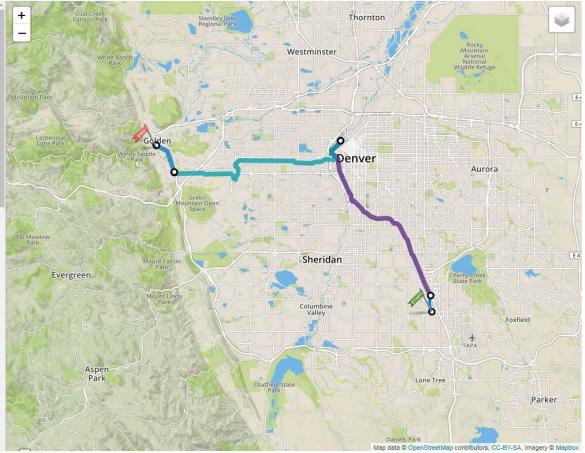

Uncertain Route

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Transferability of GTFS Flex: Testing with Denver RTD

➔ The "G" in GTFS stands for "General"

  » Should work well for other agencies!!!

➔ Denver RTD has strong interest in GTFS Flex

  » Extensive demand-responsive call-n-ride system

  » Already use OTP-based trip planning tools

➔ Testing out GTFS Flex with RTD

  » RTD created GTFS Flex files for call-n-ride system

  » CS deployed version of OTP with RTD's GTFS and GTFS Flex data

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Transferability of GTFS Flex: Testing with Denver RTD

FUTURE DIRECTIONS FOR MULTI-MODAL PLANNING

Future Directions

- Include additional modes in mixed-mode itineraries
  - » TNCs, bike share, scooter share, … (structurally, a TNC looks a lot like a call-n-ride in terms of routing algorithms)
  - » Complementary OTP work in TriMet MOD Sandbox

- Present tradeoffs between travel time and cost

- Allow for unified booking and payment options

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PUSHING GTFS FLEX FORWARD

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What You Can Do

➤ Building momentum for GTFS:

  » Play around with GTFS Flex at https://plan.govermont.org

  » Contact Google and let them know of your interest at transit-partners@google.com

  » Get engaged at gtfsflex.com – ask questions, express interest (GitHub repository)

  » Work with state DOTs / larger regional transit providers to start thinking about how to get flexible services included in state or regional trip planning tools

➤ Reach out to CS or Trillium with any additional questions:

  » psorensen@camsys.com

  » thomas@trilliumtransit.com

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Thanks! Questions?

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