

Executive summary

This pilot planning study has been funded by a Federal Transit Administration (FTA) Section 5311 grant through the California Department of Transportation (Caltrans) Division of Mass Transportation to improve online travel information dissemination and help travelers utilize connections between transportation services. The Shasta County Regional Transportation Planning Agency (SCRTPA) is the lead agency.

This project is to test and study integrating rural and small-urban public transit service schedule and geographic information into Google Maps/Transit. The study area includes nine California counties in Northern and Eastern California.

SCRTPA selected Trillium Solutions with Nelson\Nygaard Consulting Associates, Inc. to conduct a pilot implementation of the Google Transit trip planner for selected agencies within the study area and determine the feasibility of Google Transit.

The assessment of Google Transit feasibility regards its viability as a customer information tool for rural transportation services. The assessment covers costs and tools for maintaining Google Transit data, and the availability of agency staff and technical resources to support Google Transit, and opportunities to use and leverage Google Transit and Google Transit data.

Study goals

Historically, Google Transit and other transit trip planners have been more widely implemented by metropolitan transit agencies in dense urban environments. Many current and potential transit riders in rural areas do not benefit from online tools that make transit services easier to understand and use.

Rural agencies do not have the same technology and staff resources as metropolitan transit agencies. This study compares tools to publish data for Google Transit and assesses the staff time commitment necessary to maintain Google Transit data.

The Google Transit trip planner's current design is best suited to metropolitan transit services. This study makes recommendations for how Google Transit can be improved to address the needs of rural travelers and transit providers.

Stakeholder transportation and social service agencies are implementing and planning various mobility management, technology, information & referral, and marketing projects. This study identifies opportunities to leverage the Google Transit trip planner and source Google Transit data for some of these projects.

Regional context

The project study area includes seven Northern California counties (Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Trinity), and two California counties in the Eastern Sierra (Inyo and Mono). Together, these counties comprise 40,868 square miles of California populated by 371,517 residents. Overall, the area has low population densities. Shasta County has the highest density with 43 people per square mile. Inyo County has the lowest density, with 2 people per square mile. The study area includes several small cities and one small urban center (Redding). Over the next decade, the mobility needs of the elderly population (65+ years old) are projected to remain constant or grow significantly in each county.

Eight public transit agencies provide service in the study area:

- Eastern Sierra Transit Authority (ESTA)
- Lassen Rural Bus (LRB)
- Modoc Sage Stage (SS)
- Plumas Transit (PTS)
- Redding Area Bus Authority (RABA)
- Siskiyou Transit and General Express (STAGE)
- Tehama Rural Area Express (TRAX)
- Trinity Transit (TT)

Four agencies — Plumas Transit, Lassen Rural Bus, Eastern Sierra Transit Authority, and Modoc Sage Stage — operate regional (inter-county) services that are essential for customers who need out-of-county resources and medical services and resources.

Greyhound and Amtrak operate service along the Interstate 5 corridor through Tehama, Shasta, and Siskiyou Counties, and into Oregon.

Agency resources

A survey (attached as Appendix B) was conducted to determine agency interests and needs for Google Transit, available staff capacities, and relevant information resources and projects. This survey assisted in determining which of the eight agencies would be selected for the pilot study.

The results of the Resources Survey show stakeholder agencies are generally supportive of using Google Transit as a customer information tool. All agencies face budget constraints to pay for technology and consultant time to sustain Google Transit implementation on an ongoing basis. Staff time to maintain and support projects is limited. Projects that receive staff attention must demonstrate value to customers and the agency.

For agencies that do not contract services to a private operator, assisting potential travelers with trip planning takes requires considerable staff time. All agencies that contract to a private operator do not directly manage the trip planning help and customer service functions. Agency estimates for the number of trip planning help requests they receive vary between less than 20 requests/month to 2000 requests/month.

None of the transit services currently use Automated Vehicle Locator (AVL) technology, though several are looking into procurement options. Agencies are unlikely to implement AVL technology in the immediate future because of constrained funding. About half of the agencies have routes and stop locations in a Geographic Information System (GIS) library.

All agencies have high-speed Internet connections at their administrative offices. No agencies use specialized software for fixed-route scheduling. Agencies use standard office software applications for this function.

All transit operators in the survey area maintain websites. The majority of websites provide route maps and information about fares and schedules. Most websites are maintained in-house, and updated as needed.

Pilot project status and findings

Participation

Five transit agencies (PTS/Plumas, RABA/Shasta, STAGE/Siskiyou, TRAX/Tehama, TT/Trinity) are participating in a private Google Transit trip planner pilot.

Trip planner issues

The consultant, with agency input, has identified 13 generalized categories of issue that compromise the accuracy or usefulness of results returned by the Google Transit trip planner. The 5 issues identified as “critical” or “high priority” are listed in Table 1 (following page). All critical and high priority issues have been reported to Google.

All issues, including those which are “medium” and “low” priority are detailed in Table 9, Chapter 3.

Table 1. High priority issues with the Google Transit trip planner

Issue	Shasta	Trinity	Siskiyou	Plumas	Tehama	Issue manifestation / details	Proposed solution
Trip planner returns walking directions instead of available transit option for complete trip or segment	X				X	In cases of long transit travel times, the trip planner will return walking trips and walking legs, if travel by transit takes significantly longer. Example: TRAX Route 1, RABA loop routes.	Transit trip planner itineraries should maximize use of available transit service. Customers can choose “walking” directions option if they wish to compare.
Queries for travel times more than 48 hours in advance of scheduled service return no results		X		X		Intercity Plumas Transit routes and some Trinity Transit routes (Willow Creek / Down River).	Trip planner should search for and return service up to 7 days within query for desired time/date of travel.
Maximum walking distance threshold prevents display of available transit service		X	X	X		Low density, rural service areas are affected. For example, a search for Plumas Transit’s Chico route that has “Chico, CA” as its origin or destination will not return because the center of Chico is outside the maximum walking distance from Plumas’ Chico route.	Maximum travel to transit stop distance in Google Transit is increased to 25 miles for long-distance rural service. Drive-to-transit option is added.
Service doesn’t return for certain trips				X		The trip planner does not show a trip for the Plumas Transit Reno route from Reno to Plumas county (the Plumas Co. to Reno direction works fine)	Show service
Google Maps road atlas is incorrect	X					Widespread inaccuracies	Coordinate between county, city GIS and TeleAtlas

Outcomes by agency

The viability of the Google Transit trip planner as a customer information tool varies by agency. Difference in viability is due to factors that include particulars of service features and frequency, quality of Google Maps road and address data for each region, and particularities of the trip planner implementation. Table 2 (below) shows the assessment of Google Transit viability for each pilot agency participant. The consultant conducted this assessment with agency input.

Table 2. Viability of Google Transit trip planner by pilot agency

Agency	Presently viable?	Major outstanding issue(s)
Plumas/PT	No	Google software implementation: Some trips are not returned on Reno/Chico route. Maximum walking distance threshold is constrained to 4 miles.
Shasta/RABA	Yes — Will participate in public test phase.	Google Maps road network layer missing some roads.
Siskiyou/STAGE	Yes	None.
Tehama/TRAX	Yes	Google trip planner returns walking, instead of transit directions, when travel on loop routes would involve long travel times. Address location accuracy issues have been resolved.
Trinity/TT	Yes	Trip planner does not return services more than 48 hours in advance of desired service date/time. Maximum walking distance threshold is constrained to 4 miles.

Next steps to make Google Transit customer-ready and publicly available

The authority to decide to participate in Google Transit is with individual transit agencies. At the time of this writing, pilot agencies STAGE (Siskiyou), Trinity Transit, RABA (Shasta), and TRAX (Tehama) are planning to go live on Google Transit. Staff at these agencies determined the trip planner is presently useful and valuable for customers.

STAGE and Trinity Transit have identified some issues with the trip planner. High priority issues, specifically, are low maximum walking distance to transit and the 48-hour window limitation between queried and available service to return trip planner results. RABA has also identified issues with the trip planner, specifically that the Google Maps road network layer is missing some roads.

RABA will use a customized form to collect and track customer query information. This form will present a disclaimer that the trip planner is in a public test phase and solicits customer feedback.

Plumas Transit has determined not to go live on Google Transit. This decision hinges on the resolution of one critical and high priority issue: Plumas Transit Reno-Quincy service's currently inexplicable unavailability in the trip planner.

It is recommended to address issues through coordination between Caltrans DMT and Google. The recommended approach is to focus on the highest priority issues. Google takes an incremental approach to improving Google Transit. It is unrealistic that all identified trip planner issues will be solved at the same time.

It is recommended that transit agencies launch when critical and high priority issues are sufficiently resolved to make Google Transit a viable customer information tool. After launch, the data publishing consultant and transit agencies should continue to work with Google to incrementally solve issues in a post-launch evaluation and issue-resolution phase.

Opportunities to leverage Google Transit

Geographic and schedule data for public transportation contained in the Google Transit feeds¹ can be used for applications outside of the Google Transit trip planner. The Google Transit trip planner and Google Transit feed data for geographic and schedule information provide one of the building blocks for the mobility management and 2-1-1 information and referral projects proposed in Northern California (see discussion in Chapter 6). Ensuring Google Transit provides high quality travel information is particularly important if it is used in the 2-1-1 project because 2-1-1 phone operators may not be familiar with callers' regions.

A low-level integration of Google Transit into these programs would involve training phone operators to use Google Transit to assist callers who are planning fixed-route public transportation trips, and incorporating trip planning quick links into web-based information systems.

A potential longer-term and higher-level integration of Google Transit data and centralized mobility management and information and referral services may also be possible. The Northern California 2-1-1 Virtual Call Center is in the planning stage. Identifying opportunities and developing a roadmap for integration will involve further scoping. One integration option could involve importing Google Transit feed data into another system for multi-modal trip planning, service discovery, and travel reservations.

In addition to these opportunities, Google Transit data (in the Google Transit Feed Specification, or GTFS) can also be leveraged for other functions and applications, including:

- Timetable publishing
- Telephone-based interactive voice response (IVR) systems for travel planning
- Mobile schedule access
- Data and service visualization
- Improved accessibility for users who are disabled

These functions are detailed in Chapter 5. New opportunities to leverage Google Transit feed data will continue to emerge as the Google Transit Feed Specification continues to gain adoption as a data standard.

¹ Google Transit feeds contain the geographic, schedule, and fare data necessary to describe transit services and include them in the Google Transit trip planner. For more discussion, see Chapter 3.

Implementation plan

GTFS publishing tool recommendation

The recommendation for a GTFS publishing tool is based several criteria. These criteria are the availability of service and support for the selected tool, its ease of use for transit agency staff, inclusion of built-in data visualization and validation tools, ability to export optional data such as route alignments and preferred transfers, upgradability, and data ownership agreements and overall cost. The most important criteria are ease-of-use, overall cost, and that agencies must have full ownership over their published GTFS data.

Based on these criteria, hosted web-based tools offered by Trillium Solutions and Trillium Insight, Inc. are recommended.

Costs for maintenance and full implementation

The cost to launch the remaining project area services, Lassen Rural Bus and Eastern Sierra Transit Authority, is \$7,000. Ongoing costs for hosted GTFS publishing and maintenance tools for 7 agencies is \$8,000 per year.

Lead agency recommendation

Shasta County RTPA has served as the lead agency over the course of this project. A lead agency will be necessary for functions such as pursuing funding, evaluation, and coordination with related projects. If implementation of additional agencies and ongoing maintenance is funded through Caltrans, or if funding is regionally pooled, a lead agency will be necessary for grant administration.

It is recommended that Shasta County RTPA should continue to perform as the lead agency. Other potential lead agency candidates include Modoc CTC, Caltrans District 2 with the Division of Mass Transportation, or Redding Area Bus Authority.

Implementation phases and proposed next steps

A proposed schedule for implementation, evaluation, and marketing appears as Table 17 in Chapter 6.

Identified implementation phases and tasks are:

- 1. Resolve pilot trip planner issues.** Goal is achieved through coordination between agencies, Caltrans DMT, Google, and data publishing consultant. Begin July 1, 2009 and continue on an ongoing basis. The cost is approximately \$1,500 for consultant time. Continue ongoing attention to Google Transit trip planner issues and their resolution.

2. **Launch willing pilot agencies** beginning September 1, 2009 through October 31, 2009. The cost for consultation between consultant, agency, and Google is estimated at \$2,500. This cost is covered under existing project budget.
3. **Launch remaining stakeholder agencies** ESTA and LRB. Begin this phase August 31, 2009. The estimated cost is \$7,000.
4. **Promotion and marketing** to accompany Google Transit launch. Incorporate Google Transit into existing websites and marketing programs. Take advantage of earned media opportunity with press releases. This step requires agency and/or consultant time. Cost will depend on strategy.
5. **Ongoing data maintenance** must continue once agencies are launched. The cost for GTFS publishing and maintenance software for seven agencies with the proposed approach is \$8,000 per year. One day of agency staff time per quarter is estimated to be necessary for entering schedule updates.
6. **Leverage data.** Make GTFS data public (no cost). Consider implementing applications such as automated timetable publishing for which the cost is unknown.
7. **Agencies gather customer feedback** continuously from launch to use for evaluation.
8. **2-1-1 virtual call center integration.** Integrate links to Google Transit into 2-1-1 call center software. Prepare plan for deeper integration of GTFS data into mobility management and 2-1-1 operations.
9. **Evaluation.** Review and summarize customer and stakeholder feedback, compare ridership trends and volume of trip planning customer service calls pre- and post-implementation. Wait at least 9 months after implementation to give time for trip planner adoption before surveying customers.