

REPORT TO SHASTA COUNTY RTPA

SUBJECT		MEETING DATE	ITEM NUMBER
Accept Northern California Google Transit Feasibility Study		10/27/09	7

RECOMMENDATION

It is recommended that the Board:

1. Receive a Google Transit presentation by Trillium Solutions; and
2. Accept the Google Transit Feasibility Study.

SUMMARY

The RTPA is the lead agency for a nine-county pilot project to determine if Google Transit's "trip planner" can be used in rural areas. Caltrans Division of Mass Transportation (DMT) is funding this project. The study report is ready for acceptance by the RTPA.

DISCUSSION

Google Transit utilizes Google's search engines to plan trips using public transportation. The RTPA is the lead agency for a pilot study to determine if the trip planner tool is viable in rural areas.

Five transit agencies were selected to participate in the pilot project data testing. Route data and agency information were collected and tested in Google's trip planner. Most data issues are resolved. Several agencies need to submit current GIS road maps to Google's map source.

Four of the five transit agencies are ready to go public with the trip planner. Agencies may chose to go public with a "soft" launch. A soft launch displays a disclaimer that route information is being tested and that users should confirm routes with the transit provider. This allows the agency to use the trip planner feature while issues are being resolved. Redding Area Bus Authority, Siskiyou Transit and General Express, and Trinity Transit have signed agreements with Google and are ready to launch the trip planner. Tehama Rural Area Express is planning to launch in the near future. Plumas County is delaying launch until Google can resolve an issue with the trip planner not displaying a return trip from Reno to Plumas County.

The RTPA will continue as lead agency until the pilot agencies go live. Trillium Solutions will continue to provide agency support during an evaluation period. The DMT and agencies will need to determine if continued data maintenance will require a lead agency.

An Executive Summary of the feasibility study is attached. The full report can be viewed at <http://www.scrtpa.org/RTwhat.htm>. The study concludes that Google's trip planner is a viable customer information tool for rural transportation services. Based on this project, DMT is planning a second phase to launch the trip planner statewide in rural areas. It is recommended that the Board receive a presentation and accept the Northern California Google Transit Feasibility Study.

ALTERNATIVES

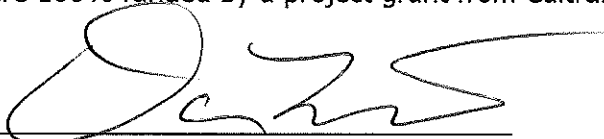
The Board could request additional information, or make specific requests regarding implementation in Shasta County.

OTHER AGENCY INVOLVEMENT

Caltrans Division of Mass Transportation, Caltrans District 2 and District 9, Modoc County Transportation Commission, Redding Area Bus Authority, and the counties and transit operators in Inyo, Mono, Lassen, Plumas, Siskiyou, Tehama, and Trinity have participated in the development of this study. This item was discussed at the October 6 Technical Advisory Committee (TAC) meeting. TAC supports the staff recommendation.

FINANCING

There are sufficient funds to implement the pilot counties. Consultant services and RTPA staff time are 100% funded by a project grant from Caltrans and the Federal Transit Administration.



Daniel S. Little, AICP, Executive Director

DSL/SLC/jac

Attachment: Northern California Google Transit Feasibility Study - Executive Summary and Presentation Handouts (ppt)

The entire document of the Google Transit Feasibility Study is available on the RTPA website at www.scrtpa.org/rtwhat.htm

Executive summary

This pilot planning study has been funded by 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 operators 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)

Modoc Sage Stage is already on Google Transit. 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	All RABA routes, specifically route 2, often have long transit travel times, and preference walking trips, because long (sometimes 20+ min) gaps between timing points. 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 10 miles. 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
Address locations in Google Maps are inaccurate					X	Locations S Main and Antelope Blvd in Red Bluff incorrect; incorrect address locations in many other areas	Provide updated county street address data to TeleAtlas.
Google Maps road atlas is incorrect	X				X	Widespread inaccuracies	Coordinate between county 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.
Redding/RABA	No	Google Maps road network layer missing some roads. Sparse timing points cause trip planner to overestimate transit travel times and show walking trips instead.
Siskiyou/STAGE	Yes	None.
Tehama/TRAX	Pending additional input from agency.	Google Maps road network layer missing some roads. Some addresses are incorrectly plotted. Google trip planner returns walking, instead of transit directions, when travel on loop routes would involve long travel times.
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) and Trinity Transit are planning to go live on Google Transit. Staff at these agencies have 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.

Three agencies, RABA, PT, and TRAX, have not decided whether or not to go live on Google Transit. Their decision hinges on the resolution of critical and high priority issues such as Plumas Transit Reno-Quincy service's currently inexplicable unavailability in the trip planner, incorrectly located addresses, street map layer inaccuracies, and cases in which walking directions are returned instead of long transit trips.

It is recommended to address these 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 July 1, 2009 through August 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.



Point A to B



Northern California
Google Transit Feasibility
Study

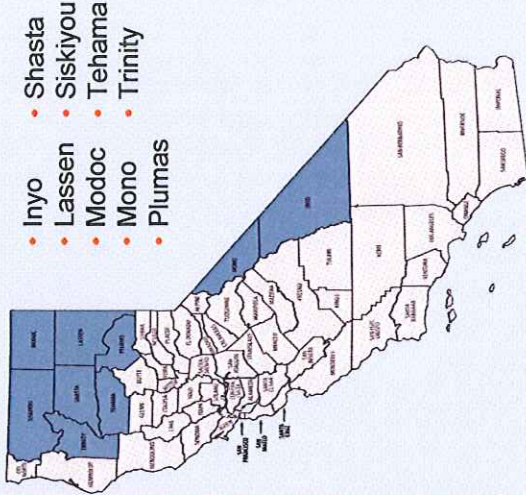
*Outcomes and next
steps*

Shasta County RTPA Board Meeting
October 27, 2009



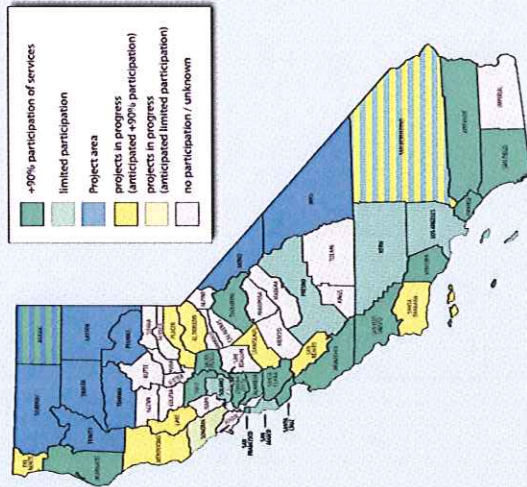
Study area

Study purpose
Demonstration
Next steps
Implementation



Study area

Study purpose
Demonstration
Next steps
Implementation



Study area

Study purpose

Demonstration
Next steps
Implementation

areas

- Create methodology for implementing and maintaining Google Transit within and beyond, project study area.
- Inventory available tools for maintaining Google Transit data
- Survey options for re-using Google Transit data.
- Recommend implementation tools and

Study area	1. Anderson to Mt. Shasta Mall (Redding Area Bus Authority)
Study purpose	2. Weaverville (Trinity Transit) to Eureka (Humboldt Transit / Eureka Transit)
Demonstration	3. Shasta Lake to Alturas
Next steps	4. Burney to Shasta Lake
Implementation	5. Burney to Anderson
	6. Mt. Shasta Mall to Palo Cedro

Study area	A. Launch viable agencies
Study purpose	Some agencies are choosing to include a disclaimer message and request for feedback on a trip planner form
Demonstration	
Next steps	
Implementation	

Trip Planner
Powered by Google Transit.

Start

End

66 St Shasta Mall, Redding, CA

66 777 Cypress Ave, Redding, CA

Get Directions

Depart at or Arrive by

9/28 15:15

RADA is testing Google Transit's trip planner. Please report any errors you experience using the link below the trip planner form on the RADA website.

OK

Timeframe: Already begin, ongoing

Study area	B. Resolve critical trip planner issues
Study purpose	Recommend direct communication between Caltrans DMT and Google, with consultant and stakeholder support/participation to identify issues and seek resolution.
Demonstration	
Next steps	
Implementation	

Timeframe: Beginning immediately, ongoing

Study area	Trip planner issues
Study purpose	- Trip planner returns walking directions instead of available transit option for complete trip or segment - Queries for travel times more than 48 hours in advance of scheduled service return no results - Maximum walking distance threshold prevents display of available transit service - Service doesn't return for certain trips - Address locations in Google Maps are inaccurate - Google Maps road atlas is incorrect
Demonstration	
Next steps	
Implementation	

Current viability of trip planner by agency

Agency	Viable?
PT/Plumas	No
RABA/Shasta	Assessing
STAGE/Siskiyou	Yes
TRAX/Tehama	Assessing
TT/Trinity	Yes

Study area
Study purpose
Demonstration
Next steps
Implementation

C. Launch remaining stakeholder agencies
Timeframe: Begin as critical issues are resolved

D. Promote

E. Leverage Google Transit data
Use for creating timetables, etc.

Timeframe: Data is ready for use. Implement when agencies and partners identify need and opportunity.

Study area
Study purpose
Demonstration
Next steps
Implementation

Leverage investment:
Take advantage of other uses for Google Transit feed data



Sendero GPS:
GTFS can be used to create transit point of interest libraries for sight-impaired people to use with talking GPS

Leverage investment:

Take advantage of other uses for Google Transit feed data

The screenshot shows the TimeTable Publisher website interface. At the top, there's a navigation bar with links like 'Home', 'Configure', 'Compare', 'Print', 'Test', 'View', 'Vertical View', and 'Early Schedule Data'. Below this, there's a section titled 'TimeTable Publisher: COMPARE' with a sub-header 'TimeTable Publisher: COMPARE'. The main content area displays a list of routes under the heading 'Route'. The routes listed are: 104-A Line (Weekday - Inbound), 104-A Line (Weekday - Outbound), 104-A Line (Saturday - Inbound), 104-A Line (Saturday - Outbound), 104-A Line (Sunday - Inbound), and 104-A Line (Sunday - Outbound). Each route has a corresponding 'Timepoint Diff Stop Time Diff' column. Below the route list, there's a section titled 'TimeTable Publisher: COMPARE' with a sub-header 'TimeTable Publisher: COMPARE'. This section contains a table with columns for 'Service Date (on / after): 11-5-2009', '2nd Service Date (to compare): 1-1-2010', and 'Time Buffer (in minutes): 3'. The table lists various routes and their corresponding times. At the bottom, there's a section titled 'TimeTable Publisher: COMPARE' with a sub-header 'TimeTable Publisher: COMPARE'. This section contains a table with columns for 'Service Date (on / after): 11-5-2009', '2nd Service Date (to compare): 1-1-2010', and 'Time Buffer (in minutes): 3'. The table lists various routes and their corresponding times.

108-H Line

Weekday	Inbound
Downtown Berkeley BART	Downtown Berkeley BART
Station @	Station @
Evans Hall: Circle Side	Evans Hall: Circle Side
Stop ID 2532	Stop ID 2532
Strawberry Area	Strawberry Area
Stop ID 2530	Stop ID 2530
UC Botanical Garden	UC Botanical Garden
Stop ID 2592	Stop ID 2592
Lawrence Hall of Science	Lawrence Hall of Science
Stop ID 2579	Stop ID 2579
SoCS Sciences Lab/MSRI	SoCS Sciences Lab/MSRI
Stop ID 2539	Stop ID 2539
UC Botanical Garden	UC Botanical Garden
Stop ID 2533	Stop ID 2533
Strawberry Area	Strawberry Area
Stop ID 2551	Stop ID 2551
Evans Hall: Circle Side	Evans Hall: Circle Side
Stop ID 2532	Stop ID 2532

F. 2-1-1 Virtual call center integration

Shasta County is being considered as a pilot county for a rural California 2-1-1 site. Shasta County Health and Human Services would be the lead agency.

Timeframe: 2-1-1 implementation begins early 2010

Study area

Study purpose
Demonstration
Next steps
Implementation

G. Evaluation

Compare ridership, customer service call volume pre- and post-implementation
Timeframe: 1 year after implementation

Study area

Study purpose
Demonstration
Next steps
Implementation

Questions?

Aaron Antrim
Trillium Solutions
aaron@trilliumtransit.com
707.633.4464



Study area
Study purpose
Demonstration
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Task	Cost
Implement interested pilot agencies	\$500
Implement Eastern Sierra Transit Authority (Inyo/Mono)	\$4,000 (+\$3,225 for onboard data gathering by consultant)
Lassen Rural Bus	\$3,000 (+\$2,225 for onboard data gathering by consultant)