



TECHNICAL PROPOSAL FOR

NEVADA COUNTY TRANSIT SERVICES DIVISION

RFP 204232 – CATEGORY A

COMPUTER AIDED DISPATCHING, SCHEDULING
AND VEHICLE LOCATION (CAD-AVL) SOFTWARE
AND HARDWARE FOR FIXED ROUTE SERVICES
AND DEMAND RESPONSE PARATRANSIT SERVICES,
INCLUDING A MOBILE APPLICATION FOR DEMAND
RESPONSE

For:



Nevada County Transit Services Division

ATTN: **Justin Howell**

Nevada County Purchasing Division

Eric Rood Administrative Center, 1st Floor Suite 129

950 Maidu Avenue

Nevada City, CA 95959

Submitted By:

GMV

Cristina Fanjul, Business Development Manager

GMV

700 S Flower St, Suite 470 Los Angeles, CA 90017

(213) 973-1209

www.gmvsync.com

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1 COVER LETTER

GMV
700 S. Flower St, Suite 470
Los Angeles, CA, 90017
www.gmv.com

Dear Nevada County Transit Services Division Stakeholders,

Our company and solutions are an ideal fit for the technology needs of NCTSD. Achieving a well aligned vendor-client fit is the most important aspect of any new business partnership, so we've outlined how our company and our approach will help you achieve your goals in this proposal. GMV is proposing to deliver the required services for Category A.

You can rely on our company to provide a proven ITS solution because we are not a flash in the pan. We are the North American arm of GMV, an international technology company based in Spain with broad operations in various industries around the world. GMV's global transportation division deploys Intelligent Transportation Systems in cities like Barcelona, Madrid, and Sydney, as well as Santa Rosa (CA), Tahoe (CA), Petaluma (CA), and Los Angeles (CA). GMV's corporate leadership fully supports GMV's continued product development, best in class support of existing clients, and new projects with transit agencies across the country.

We have been operating in North America for nearly two decades. In that time, we have seen other CAD/AVL companies come and go. While our road has not always been perfect – we have learned some hard lessons and felt our share of growing pains – we have persisted and improved by listening to our customers, admitting our stumbles, and dedicating ourselves to continuous development to ensure a robust, easy-to-use, and reliable turnkey product.

Our hardware solution is designed to be simple and modular. We bring together the best technologies in each category to provide a single integrated solution. We are constantly adding to our range of solutions, so you can be confident that as technology changes, your agency will have the ability to change with it. While integrations may be a challenge to other ITS providers, they are absolutely core to our business and give our clients a level of flexibility and capability that cannot be found elsewhere.

All of our software products are continuously developed, and updates are delivered to all our clients simultaneously at no additional charge. Your agency should expect to get features that you don't even realize you need, but that your peers have collectively encouraged us to develop.

We are easy to work with because our system is designed so that non-technical staff can engage with every aspect of the software without relying on a big IT staff to keep things up and running. Most of our clients do not have an in-house IT staff or rely on part time help from the local City or County government. That means we must ensure our technology is self-sufficient and doesn't impose IT burdens on our clients.

GMV has full faith that our product can serve your agency and your community with a reliable ITS solution. But our role does not end with hardware and software – we are dedicated to serving as your long-term transit technology partner. At the foundation of our work together is the full-time, dedicated staff at GMV who will not only guide you through implementation but will remain devoted to helping you address challenges and seize new opportunities throughout the life of your contract.



We have included detailed reference information for several customers similar in size and scope. These clients have years of history with GMV and can vouch for how we transitioned them from their previous software provider, how we perform over time, and how we respond to their requests for new product capabilities and features. We strongly encourage you to speak with these agencies due to their relatively similar operating profiles and to get a sense of how we do business compared to the competition. Our company's strategy is built around long-term customer relationships, and we've worked hard to develop the trust and continued business of our current clients.

GMV looks forward to the opportunity to partner with NCTSD by fulfilling the requirements for Category A, as outlined in RFP 204232. If you have questions, please don't hesitate to contact me at (909)-957-5821 or cristina.fanjul@gmv.com.

Sincerely,

Cristina Fanjul
Business Development Manager

This proposal is submitted by GMV Syncromatics, CORP in response to Nevada County Transit Services Division **RFP 204232, Computer Aided Dispatching, Scheduling and Vehicle Location (CAD-AVL) Software and Hardware for Fixed Services and Demand Response Paratransit Services, Including a Mobile Application for Demand Response.**

GMV's headquarters location and mailing address is 700 S. Flower Street, Suite 470, Los Angeles, CA 90017. GMV is the prime contractor for this proposal.

The appropriate contact person at GMV is Cristina Fanjul, Business Development Manager. Cristina is authorized to represent the company on all matters related to this proposal. Cristina can be reached at 909-957-5821 or cristina.fanjul@gmv.com. Cristina and GMV Syncromatics, COPR do not have a fax number. Cristina is based out of GMV's Houston, TX office, located at 15503 W. Hardy Road, Houston, Texas 77060. An alternate email address for Cristina Fanjul, which includes the rest of the GMV Business Development team, is sales-na@gmv.com.

2 TAB A - FIRM'S QUALIFICATIONS

2.1 Describe the Firm: About GMV

GMV is a privately held technology company that works in a variety of industrial sectors that share common attributes:

- High Reliability is Critical
- Detailed and Challenging Technical Requirements
- Customers Entrust us with Long Term Projects
- Complex Integrations with Other Tech Companies
- Highly Regulated and/or Government Operated



Aeronautics



Space



Defense & Security



Cybersecurity



Healthcare



Intelligent Transport Systems



Telecommunication



Public Sector and Corporate IT



Banking & Finance

GMV's leading position in these sectors is based on an in-depth knowledge of its customers' needs, which allows it to deliver customized solutions. GMV's employees, operating model and corporate culture values are geared towards ensuring that each customer receives exactly what they need.

Founded in 1984, GMV employs more than 3,000 staff at offices in 12 countries around the world. GMV serves clients in 80 countries. GMV's revenue in 2022 was in excess of \$300M.

Proven North American Results with Decades of Global Experience

Starting from our roots as an independent California startup called Syncromatics, we now have more than 50 staff in the United States and offices in Los Angeles and Houston. GMV has been operating in the US public transit market for more than 18 years. We have a deep knowledge of the special regulatory and operational challenges facing small public transit agencies in the United States, and we have helped more than 100 US transit agencies to solve their problems using novel technology. Our systems are used daily by **Tahoe Transportation District** (CA), **Santa Rosa City Bus** (CA), **Petaluma Transit** (CA), and the City and County of **Los Angeles** (CA) to keep buses running on time and keep passengers informed with real-time information.



Corporate headquarters in Los Angeles, CA



Production and logistics facility in Houston, TX



Remote staff are ready to help across the country

GMV is also a global Intelligent Transportation Systems powerhouse. We provide complete technology solutions for major Metro transit systems around the world, from thousands of buses in Barcelona and Madrid (Spain), to light rail in Sydney (Australia) and hundreds of urban streetcars in Warsaw (Poland).

Furthermore, GMV's experience extends well beyond CAD/AVL systems to include Rail Fleet Management, Transit Fare Collection, and Autonomous Vehicle Systems. This diverse international experience gives us a broad understanding of the technologies that are in use globally to make public transit more efficient and comfortable for passengers, and we pull the best examples together to build solutions for our clients.

2.2 Statement of the Firm’s Qualifications

GMV is a leading Intelligent Transportation Systems provider offering a cloud-based, integrated platform that unites core transit functions—Computer-Aided Dispatch, Automatic Vehicle Location, and Real-Time Passenger Information—along with a full suite of onboard hardware and software solutions. Designed to be intuitive and easy to use, our system is backed by free, unlimited training and lifetime support for the duration of our contract. With deployments at more than 100 North American agencies—including Santa Rosa (CA), Tahoe (CA), Petaluma (CA), and Los Angeles (CA)—and over 750 agencies worldwide, GMV brings unmatched experience and reliability. Just as your riders trust Nevada County Connects, your agency can trust GMV to deliver a proven, accurate, and dependable solution.

GMV Intelligent Transportation Systems

GMV is one of the world's pioneering companies in developing and implementing transit technologies. GMV’s solutions improve the efficiency of operations and increase the quality of service to passengers.

GMV’s Transportation Technology Portfolio includes:

- CAD/AVL software and vehicle equipment for bus, streetcar, metro rail, and national high-speed rail
- Real-Time Passenger Information System
- Fare Collection Systems
- Surveillance Video Systems (CCTV)
- Public Announcement System (PA) and Intercom
- Planning & Optimization Tools
- Driver Performance Management with Real-time Feedback – “Eco-Driving”
- Critical Positioning for Autonomous Vehicles (GPS)

The following customers rely on GMV’s Intelligent Transportation Systems technologies.





EXPERIENCE WITH BUS MANUFACTURERS FOR FACTORY-INSTALLED CAD/AVL EQUIPMENT

We can coordinate with bus manufacturers, such as Gillig, New Flyer, BYD, Phoenix Motors, Arboc, and others, to have GMV ITS equipment installed at the bus factory. This streamlines deployment and helps transit agencies leverage federal grant funding for capital purchases to include the ITS hardware.

GMV process “factory install” projects on more than 100 buses per year on behalf of more than 40 different transit agency clients who choose this method of deployment. We work with all major manufacturers and have earned their trust by demonstrating the following critical attributes:

- Thorough engineering and design process to develop a good technical plan
- On time delivery of parts, properly kitted and labeled for factory line installation
- Easy to install and test systems, with clear validation procedures
- Low rate of warranty issues on ITS components after bus delivery

Below is a selected list (not exhaustive) of recent projects where GMV worked directly with a bus manufacturer to deliver ITS systems on a client’s new buses:

Client	Bus Manufacturer	Qty of Buses
LADOT Los Angeles, CA	BYD	130
CARTA Charleston, SC	Proterra	20
Cyride Ames, IA	Gillig	8
Connect Transit Bloomington, IL	Proterra	5
Maui Bus Maui, HI	Gillig	6
Napa Valley Transit Authority Napa, CA	BYD	5
Marin Transit San Rafael, CA	Gillig	4
Valley Transit Roanoke, VA	Gillig	3
Cyride Ames, IA	Nova (Volvo)	2
Hawaii County Hilo, HI	New Flyer	2
Waukesha Metro Waukesha, WI	Gillig	3
Beach Cities Transit Redondo Beach, CA	ENC (El Dorado National)	5



2.3 Services Completed by GMV Staff

GMV will be the primary contractor for this project. Where necessary, GMV has partnered with other best-in-class suppliers to provide a comprehensive solution for NCTSD.

GMV is responsible for providing the hardware and software necessary to meet the requirements for Category A: Fixed-Route CAD/AVL Solution, including those outlined in the GTFIS-RT, Hardware, and Admin Portal sections of the RFP. In addition, our team will serve as the dedicated Point of Contact during the implementation of NCTSD's new CAD/AVL system, from contracting, to the Design and Planning Phase, Configuration, Equipment Provisioning, Test Planning, Installation, Validation, Training and Documentation, and Ongoing Customer Support and Account Management.

2.4 Services Completed by Sub-Consultants

2.4.1 INSTALLATION AND VALIDATION

GMV proposes to subcontract Brosh Surveillance Solutions (Brosh) for the installation of Nevada County Transit Services Division's CAD/AVL system. We have included details about the tasks to be performed by Brosh below and have outlined their qualifications in "Tab B" of this proposal.

The installation and testing of vehicles will proceed in phases according to the project's milestone schedule. A two-person team of Brosh technicians, with supervision by a GMV Field Engineer, will install the mini-fleet vehicles. The first vehicles will undergo testing to confirm proper system function, then we will ramp up the pace of installation for the balance of the fleet.

Following the mini-fleet installation, technicians will complete the full fleet installation. Brosh and GMV staff will closely coordinate with the client team to ensure vehicle availability. The technicians will be able to complete roughly one fixed route vehicle in a day, including installation and validation procedures.

After completing each vehicle installation, Brosh will do a "installation validation" test by reviewing a checklist and testing each system on the bus. Then they will do an "operational validation" by taking the bus for a short test route and checking that onboard systems work with the cloud based central systems properly. Once these tests are completed and approved by client staff, a particular vehicle is considered complete.

2.4.2 SCHEDULING, RUNCUTTING, AND DRIVER BIDS

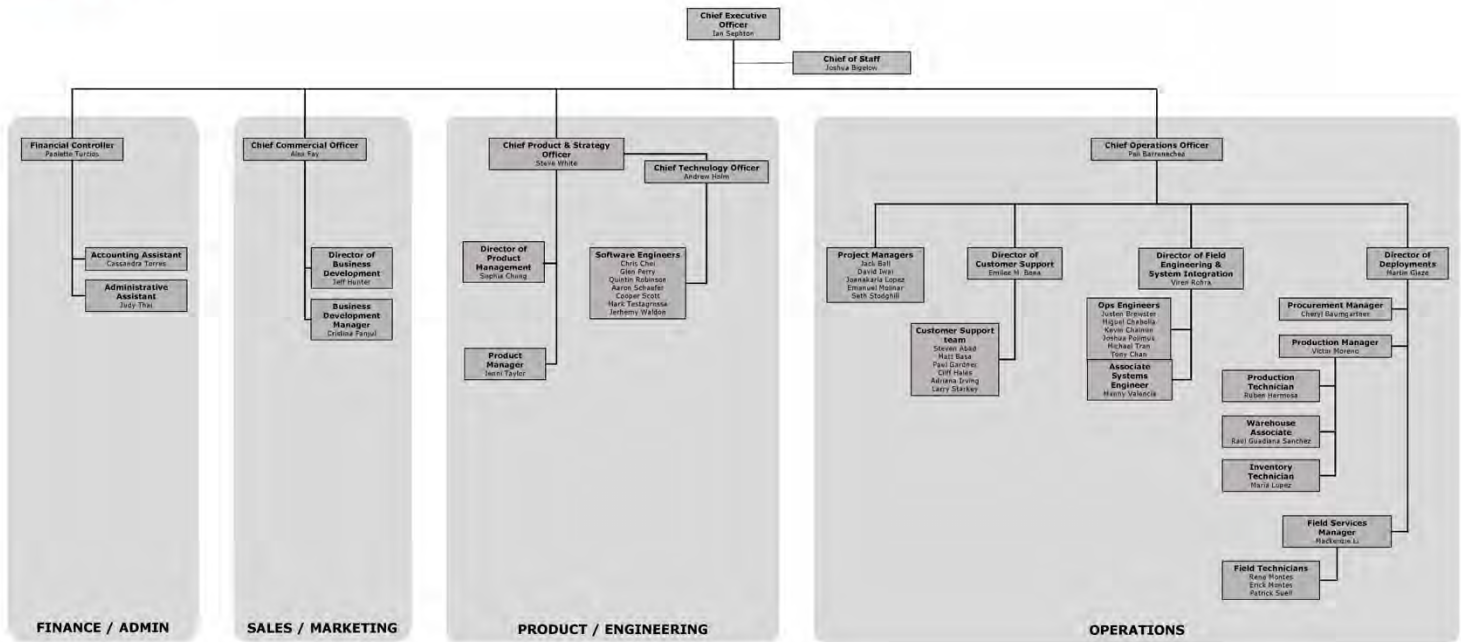
GMV proposes to subcontract Remix to fulfill the "Bid System" requirements for Category A. We have included details of the tasks to be performed by Remix below and have outlined their qualifications in "Tab B" of this proposal.

We understand that Nevada County Connects contracts directly with Via for access to Remix's Planning software. This existing contract provides NCTSD with access to Route Planning and Timetable Planning features.

As stated in this RFP, NCTSD has started using Remix's Scheduling software, which provides agency staff blocking / runcutting and employee scheduling / rostering functionality. In addition, Remix generates, cleans, and validates GTFIS files. We understand that this software was obtained by NCTSD through Cal-ITP. Should NCTSD ever wish to procure this software through it's contract with GMV, we have included optional pricing for your consideration.

We propose to expand upon these solutions already being utilized by NCTSD by providing Remix's Day-of-Operations module to achieve your bid system goals. Remix's Day-of-Operations module supports transit agencies through every phase of daily service execution, streamlining operator bidding, run assignments, attendance tracking, and operational reporting. The platform enables driver assignments and provides real-time visibility into assignments, attendance, and bid history. Agencies can reassign runs, split work, manage special or standby assignments, and assign vehicles to blocks — all within a unified, flexible interface.

2.5 GMV Organizational Chart



2.6 Staff Variation in Last Five Years

GMV has maintained a staff of 50-60 full-time employees for the last five years.

3 TAB B - EXPERIENCE AND REFERENCES

3.1 Summary of Firm's Experience

GMV can launch new clients quickly because we have done this before. Our system is designed to be repeatable with minimal customization. We've installed the very same set of equipment many times before, so we don't need to waste your time by starting each project from scratch. All of our projects have 90% common elements, and 10% configuration for routes, stops, vehicle types, schedule, etc. This enables us to get new client sites like NCTSD fully deployed, tested, and live to the public within weeks.

We have included detailed reference information for several customers similar in size and scope below. These clients have years of history with GMV and can vouch for how we transitioned them from their previous software provider, how we perform over time, and how we respond to their requests for new product capabilities and features. We strongly encourage you to speak with these agencies due to their relatively similar operating profiles and to get a sense of how we do business compared to the competition. Our company's strategy is built around long-term customer relationships, and we've worked hard to develop the trust and continued business of our current clients.

3.2 References



George Fink

Transportation Services Director
Tahoe Transportation District
128 Market Street, Suite 3F, Stateline, NV 89449
PO Box 499, Zephyr Cove, NV 89448
209-327-6322 Mobile | 775-589-5325 Desk | gfink@tahoetransportation.org

Project Scope:

- 28 Fixed Route Vehicles
- CAD/AVL
- Real-Time Passenger Information
- Automatic Passenger Counter System
- Automated Voice Annunciator System
- Integration with Interior LED Signs
- Integration with Destination Signs
- On-Board Infotainment
- Digital Vehicle Inspection (Pre- and Post-Trip)
- LCD Signage
- Manufacturer Installation of GMV System on New Vehicles (Proterra, Gillig)

GMV began working with Tahoe Transportation District in 2019 by outfitting three newly ordered vehicles with our CAD/AVL system at the manufacturer. The TTD team wanted to bring their fleet into the 21st century by outfitting buses with an ADA compliant annunciator system, interior LED signs, and Infotainment. TTD saw the value in a consolidated technology solution that offered vehicle tracking and GTFS-RT to the public, and implemented GMV's full system on their fleet in 2023. Since then, we have launched additional passenger communication features, including integration with LCD signage.



Scott Allen
 Technology Coordinator
 Santa Rosa City Bus
 45 Stony Point Road, Santa Rosa, CA 95401
 Tel. (707) 543-3118 | swallen@srcity.org

Project Scope:

- 34 Fixed Route Vehicles
- CAD/AVL
- Real-Time Passenger Information
- Automated Voice Annunciator System
- UTA APC Software
- Automatic Passenger Counter System
- Digital Vehicle Inspection (Pre- and Post-Trip)
- Basic Vehicle Tracking (Non-Revenue Vehicles)
- iOS/Android Mobile App for Riders
- Rider Communication: IVR and SMS
- Integration with Interior LED Signs
- Integration with Covert Alarm Button
- Integration with Destination Signs
- Integration with GFI Farebox
- LED Signage
- LCD Signage
- Extended Hardware Warranty
- Manufacturer Installation of GMV System on New Vehicles (Gillig, New Flyer, Arboc, Proterra)

GMV implemented Santa Rosa City Bus' CAD/AVL system in 2023. The agency was seeking to upgrade their onboard technology and liked that GMV offers an integrated solution. During our initial configuration of the system, GMV and the Santa Rosa team identified some complexities in the way schedules are created and patterns are drawn, specifically that vehicles often go off route before finishing their trips at the Transit Center because they need to enter from different bays based on where their next trip departs. Realizing there may be friction with GMV's Automatic Trip Switch feature's functionality, both teams worked together to identify a solution, and GMV developed an Automatic Trip Switch feature enhancement to ensure the logic behind the software and the daily operations at Santa Rosa City Bus align. We have continued to partner over the years, working directly with manufacturers to outfit new buses with our system, and upgrading a portion of Santa Rosa's onboard hardware to the GMV Hub earlier this year.



Jared Hall
 Transit Manager
 Petaluma Transit
 555 North McDowell Blvd., Petaluma, CA 94954
 office. (707) 778-4421 | mobile. (303)-681-5349 | JHALL@cityofpetaluma.org

Project Scope:

- 13 Fixed Route Vehicles
- CAD/AVL
- Real-Time Passenger Information
- Automated Voice Annunciator System
- Automatic Passenger Counter System
- Digital Vehicle Inspection (Pre- and Post-Trip)
- VOIP Radio System
- Basic Vehicle Tracking (Non-Revenue Vehicles)
- Integration with Interior LED Signs
- Integration with Destination Signs
- Manufacturer Installation of GMV System on New Vehicles (New Flyer)
- GMV implemented TTD's CAD/AVL system in 2023.



Brian Engelking
Transit Manager
Waukesha Metro
2311 Badger Dr, Waukesha, WI 53188
262-524-3634 | bengelki@waukesha-wi.gov

Project Scope:

- 22 Fixed Route Buses
- CAD/AVL
- Cellular Data for Fixed Route Buses
- Real-Time Passenger Information
- Automated Voice Annunciator System
- Automatic Passenger Counter System
- Basic Vehicle Tracking (Non-Revenue Vehicles)
- Cellular Data for Non-Revenue Vehicles
- Digital Vehicle Inspection (Pre- and Post-Trip)
- Integration with Interior LED Signs
- Integration with Destination Signs
- LCD Digital Signage
- Manufacturer Installation of GMV System on New Vehicles (Gillig)

GMV implemented Waukesha Metro's CAD/AVL system in 2023. Waukesha Metro tasked us with implementing a full CAD/AVL solution on their fleet. Metro had experience with another provider and had not chosen us in their initial CAD/AVL procurement in 2015. Through our proposal and presentation, they recognized a team of thorough professionals that were ready to partner with the agency to maximize the effectiveness of their technology. Further, they saw that over the years where their previous provider was failing to service customers, GMV had continued moving forward to release new features and functionality to all of our clients. The system that they saw in 2021 was hardly recognizable from what was offered in 2015. Since our initial implementation, GMV and Waukesha Metro have continued to grow together, expanding the technology systems onboard and outfitting their new buses with our system at the Gillig facility. We are now beginning three new projects – upgrading the hardware on their buses to the GMV Hub, working with Urban Transportation Associates (UTA) to launch APC analytics software, and outfitting their transit center with LED signs at each bus bay.



Andrew Cotton
Transit Assistant Manager
Town of Breckenridge Free Ride
1105 Airport Road, Breckenridge, CO 80424
970-547-3141 | andrewc@townofbreckenridge.com

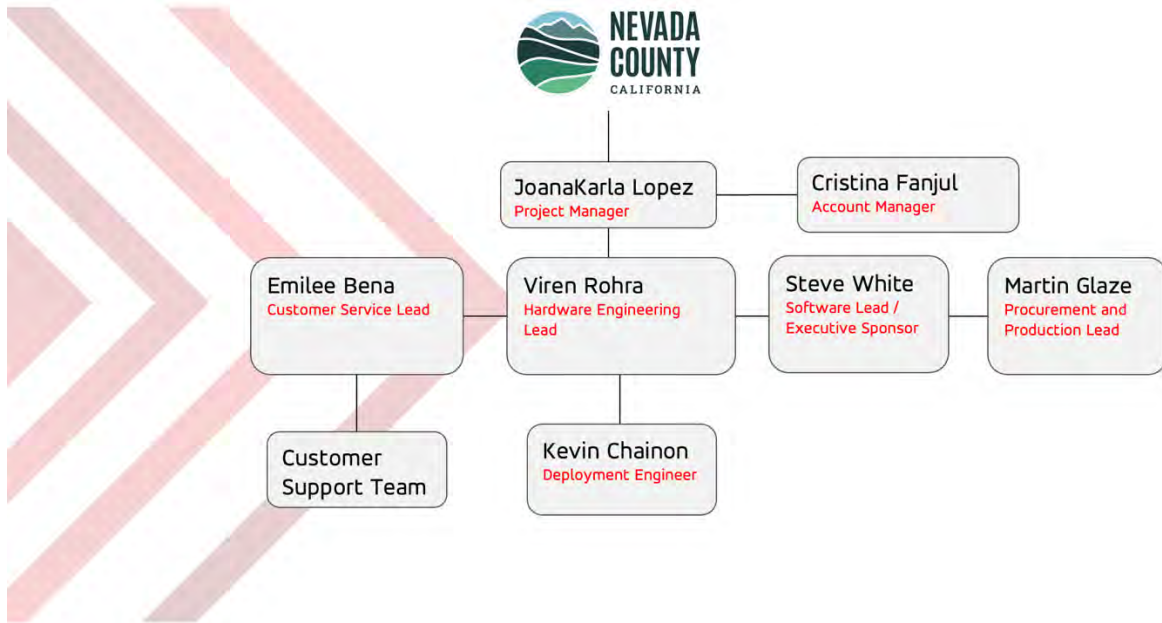
Project Scope:

- 19 Fixed Route Vehicles
- CAD/AVL
- Cellular Data for Fixed Route Buses
- Real-Time Passenger Information
- Automated Voice Annunciator System
- Automatic Passenger Counter System
- Rider Communication: IVR and SMS
- Integration with Interior LED Signs
- Integration with Destination Signs
- LED Signage
- Manufacturer Installation of GMV System on New Vehicles (Gillig)

GMV implemented Breck Free Ride's CAD/AVL system in 2017. The Town of Breckenridge operates a fixed-route system that is heavily used both by locals as well as all-season tourists for the area. Due to the level of visibility a technology deployment would have, the Free Ride staff were very focused on accurate arrival predictions. They were faced with a decision between a low-cost competitor making unrealistic promises and GMV, offering a proven solution to meet their needs at a great value. While that competitor made promises of "100% accuracy" of arrival predictions, GMV took the more disciplined approach of explaining the interactions between CAD/AVL technology, operational consistency and the sometimes-messy reality of transit operations. Free Ride awarded the contract to GMV, and we collaborated with their staff extensively to ensure that the technology has the best interface possible with their operations. Today, their Arrival Prediction accuracy is among our best because they are an ongoing collaborator and a "power user" of our software.

4 TAB C - QUALIFICATIONS OF THE TEAM

Every deployment that GMV does is a whole of team effort, and we have specifically called out the organizational chart for those that will be most engaged with Nevada County Transit Services Division throughout the effort. Key to organizing this is the Project Manager, who will be the primary point of contact for all matters involving deployment and will be responsible for delivering service and coordinating all other GMV staff.



4.1 Key GMV Staff Resumes

GMV staff resumes for the project are provided on the following pages.



Project Manager – Joanakarla Lopez

Joanakarla has worked in the transportation technology industry for more than 5 years, including launching LYFT ride share partnerships across the Western US. Her personal touch gets results from her GMV colleagues and customer stakeholders to drive projects forward. Nothing slips through the cracks when Joanakarla is in charge. Her attention to detail and technical experience will ensure GMV fulfills the project requirements on time and on budget.

5

Years in Transportation Tech
(2 years with GMV)

Relevant Project Experience

- Victor Valley Transit Authority - Infotainment on 76 vehicles
- Big Bear, CA - CAD/AVL deployment on 30 vehicles
- LADOT, CA - Project Manager for most recent project phase
- Commerce, CA - Project Manager for GMV Hub Equipment Upgrade
- As a project manager for Lyft's ride sharing service, she launched multiple projects in partnership with cities and universities.

Qualifications

- M.B.A. Hawaii Pacific University
- B.A. Communication, UC Santa Barbara

Role on Team

- Track status and drive completion of tasks and deliverables
- Ensure clear communication between GMV and client
- Coordinate with all subcontractors and project partners



Customer Support Lead – Emilee Bena

Combine the detailed orientation and analytical skills of a successful Project Manager with the patience of an elementary school teacher, and you've got Emilee. She has heard and seen just about every transit tech scenario under the sun, and she helps client staff become self-sufficient power users.

Prior to her role as Director of Customer Success, Emilee was a Senior Project Manager, so she knows where you're coming from when the torch is passed to her team after a successful deployment.

6

Years with GMV

Relevant Project Experience

- Director of Customer Success for all US clients' tech support tickets, initial and follow up training, and assignment of support technicians.
- Project Manager and Lead Trainer for Los Angeles DOT (320 buses)
- Project Manager for Victor Valley Transit Authority (75 Buses), Roanoke, VA (35 Buses), Ventura County Transportation Commission (125 Buses)

Qualifications

- B.A. Psychology
- Former Senior Project Manager for GMV
- PMP Certified since 2021

Role on Team

- Ensure prompt and effective response to client issues over the life of the relationship
- Review KPIs and metrics related to hardware performance, feature utilization, and user engagement
- Monitor adherence to warranty and support service level agreements to ensure GMV is living up to its service commitments



Hardware Lead – Viren Rohra

Viren brings deep expertise in system architecture, technical integrations, and process management to every project, ensuring all technology components work seamlessly together. With a Master's degree in Electrical Engineering and a strong foundation as a technical trainer, Viren understands how to translate complex systems into practical, field-ready solutions. He has extensive experience deploying intelligent transportation systems and managing the risks that come with integrating third-party technologies. During system implementation, Viren serves as a key point of escalation—providing hands-on leadership to resolve issues quickly and keep the project moving forward.

5

Years with GMV

Relevant Project Experience

- Los Angeles DOT, CA – CAD/AVL, Infotainment, APC, AVA on 320 buses
- Westchester, NY – CAD/AVL, Garage Management, CCTV on 325 buses
- Victor Valley Transit, CA – CAD/AVL, Fare Collection, VOIP, on 75 buses

Qualifications

- B.S. Electrical and Electronics Engineering
- M.S. Electrical and Electronics Engineering

Role on Team

- Design the onboard architecture for each distinct vehicle type and configuration.
- Provide technical support to project manager and client team
- Ensure all technical developments meet project specifications
- Technical coordination with 3rd party systems and customer's pre-existing technology



Hardware Lead – Kevin Chainon

Kevin will apply his focus on system architecture, technical integrations, and process management to ensure all the technology pieces come together. Combining a variety of GMV technologies as well as integrating with 3rd party systems poses significant risks, and Kevin's industry experience means he has seen it all before.

7

Years with GMV

Relevant Project Experience

- Los Angeles DOT, CA – CAD/AVL, Infotainment, APC, AVA on 320 buses
- Commerce, CA – GMV Hub initial pilot and full fleet roll-out
- Victor Valley Transit, CA – CAD/AVL, Fare Collection, VOIP, on 75 buses

Qualifications

- B.S. Electrical and Computer Sciences
- M.S. Industrial Engineering
- Project Management Certificate
- 2 years engineering at SNCF French national railway

Role on Team

- Design the onboard architecture for each distinct vehicle type and configuration.
- Provide technical support to project manager and client team
- Ensure all technical developments meet project specifications
- Technical coordination with 3rd party systems and customer's pre-existing technology



Lead Field Technician – Tony Chan

When it is time for the rubber to meet the road and get equipment installed on your buses, you will expect to see Tony come on-site. He will ensure that all equipment and staff are in place to ensure a successful installation and will not rest until any unexpected challenges have been resolved. Although Tony has the experience that comes with supporting our clients across the country, Tony's favorites are Bay Area clients where he can be available at a moment's notice and be back home every evening.

4

Years with GMV

Relevant Project Experience

- Local Field Technician for San Francisco Bay Area, working with clients such as Marin Transit, NVTA, Merced Transit and the Presidio
- Familiar with Marin Transit's fleet and operations
- Local to the Bay Area

Qualifications

- Certificate in Communications, APT College
- US Army Squad Leader
- ATT Technician

Role on Team

- Executes the installation of high-quality systems as directed by GMV Syncromatics' Operations team.
- Troubleshoots, repairs, and maintains previously installed systems at new and existing customer sites.
- Collaborates with Customer Support and Project Engineering teams on any hardware and software modifications which require on-site support.
- Manages an inventory of parts, components, and assemblies.



Software Lead – Steve White

At GMV, our software is developed to meet the needs of users, from bus drivers to dispatchers, managers to administrators. We develop new features in close collaboration with our customers. Steve leads the team that delivers on these features. As a regular transit rider and experienced technology executive, Steve is an expert at understanding client use cases and developing solutions for them.

40 UNDER FORTY MASS TRANSIT (2021)

9

Years with GMV

Relevant Project Experience

- Los Angeles DOT, CA – CAD/AVL, Infotainment, APC, AVA on 320 buses
- Houston, Texas – Digital Passenger Information Signs at 1,000+ bus stops, rail/BRT platforms, and transit centers
- Madison County, IL – CAD/AVL, VOIP Radio, APC, AVA on 90 buses

Qualifications

- B.A. Cinema-TV Production
- M.B.A. (in progress, exp. 2025)
- 10+ years as a car-free transit rider in Los Angeles
- 40 Under 40 honoree (Mass Transit Magazine, 2021)

Role on Team

- Analysis of customer requirements and evaluation of GMV's systems ability to meet requirements
- Lead designer of new features and product enhancements
- Expert level trainer and troubleshooter for complex situations
- Consultant for transit agency staff looking for tech solutions to their challenges in managing transit operations



Software Lead – Sophia Chong

Sophia serves as GMV's Director of Product. She keeps her finger on the pulse of the transit technology market and works alongside clients and software engineers to deliver the features and functionality that our user community needs. A native San Franciscan, Sophia relies of public transportation to get around her city. Her empathetic approach to product management means that your feedback is heard, and that our product roadmap will reflect the needs of your public transit agency.

10

Years in Software and Tech
(1 year with GMV)

Relevant Project Experience

- Led development of detour management tool and enhanced route editor
- Oversees ongoing improvements to Insights, our business intelligence tool
- Managing the upgrade of the Sync Infotainment product offering
- Coordinates new features and product enhancements

Qualifications

- Certified Scrum Product Owner
- BA in History
- MLA in Digital Media Design
- Expertise in transit tech standards including GTFS, NTD, and CAD/AVL systems

Role on Team

- Analysis of customer requirements and evaluation of GMV's systems ability to meet requirements
- Lead designer of new features and product enhancements
- Champion for transit agency staff looking for tech solutions to their challenges in managing transit operations



Procurement and Production Lead – Martin Glaze

After a bright career as a transit executive who supervised two CAD/AVL deployments in 5 years (first another firm, then GMV), Martin decided he liked our product enough to join our team. Martin contributes immensely to our product development by leveraging his transit experience to ensure our tools will work well for transit operations staff and managers. Day to day, he runs our Houston logistics facility, but he also serves as an internal “voice of the client” and ensures GMV products and service live up to the expectations of our clients.

10

Years in Transit Industry
(4 years with GMV)

Relevant Project Experience

- Connect Transit, IL – Implementation of GMV CAD/AVL project (client-side project manager), route network redesign, and strategic plan development
- Manages all project planning for CAD/AVL projects at client sites and bus factory installations

Qualifications

- Real-world experience as a transit executive (COO, Interim CEO)
- B.S. Operations Management

Role on Team

- Supervise the planning and procurement of all materials for the project
- Direct the production team in receiving/inspection, kitting, and assembly of bus equipment sets
- Manage all logistics and shipping for project materials



Account Manager – Cristina Fanjul

Cristina brings a background in technology procurement and account management, giving her a deep understanding of the challenges and opportunities that come with implementing new systems. She is passionate about delivering solutions that make a meaningful difference in people’s lives—starting with partnering with agencies whose goals align with GMV’s technology.

As the leader of the proposal team, Cristina provides continuity throughout the project, ensuring GMV delivers on its commitments. Following deployment, she will remain your dedicated Account Manager—advocating for your needs, resolving issues, and helping identify new opportunities.

2

Years with GMV

Relevant Project Experience

- Concord-Kannapolis, NC – 11 Vehicles, CAD/AVL, AVAS, APC, Digital Signage
- Breckenridge, CO – 19 Vehicles, CAD/AVL, AVAS, APC, Infotainment
- Waukesha, WI – 22 Vehicles, CAD/AVL, AVAS, Digital Vehicle Inspection
- Morongo Basin, CA – 25 Vehicles, CAD/AVL, AVAS, APC, VOIP, Surveillance Camera Integration

Qualifications

- BA Anthropology, UCLA
- PMP Certification
- Scrum Master Certification
- 2 years in technology procurement and product management

Role on Team

- Participate in key project meetings and ensure GMV honors the letter and spirit of its proposal throughout the full project term and beyond
- Champion for client’s needs and interests within the project team – GMV’s long term business interest is best served by happy reference clients
- Meet quarterly with client executive leadership to track project status



4.2 Qualifications of the Subcontractor

4.2.1 BROSH SURVEILLANCE SOLUTIONS (BROSH)

GMV will subcontract Brosh Surveillance Solutions (Brosh) for the installation, testing, and validation of all hardware and onboard systems associated with NCTSD's CAD/AVL system.

Brosh was founded in 2018 and is based out of Rancho Cucamonga, CA. The company is comprised of three employees but has the capacity to provide a team of four if necessary. Brosh focuses their expertise on installing, servicing, integrating, removing, and repairing all transit vehicle systems.

Brosh exists to provide superior installation work, along with the highest attention to detail and customer service. Their unique structure of two owners who are actively in charge of half of the operations allows Brosh to pay closer attention to specifics and maintain the highest quality of work, which is valued second only to safety. Keeping clients updated and informed, as well as providing timely and thorough documentation, are just a few ways Brosh separates themselves from the competition. Since the company's founding, Brosh has created a reputation of being a trusted and reliable company you can depend on when quality and proven results are needed.

Brosh has performed hundreds of installations on fleets large and small all over the Country. With a proven track record of top-quality service, Brosh is now the preferred installation company for many of the industry's top service providers. Products installed by Brosh include (but are not limited to) tablets, vehicle logic units, passenger counters, GPS antennas, headsights, monitors, covert alarms, cameras, microphones, speakers, stop requests and fare boxes. The types of vehicles these installations are performed on include many different passenger vehicles, transportation buses, school buses, cutaways, trollies, and moving trucks.

Brosh can deliver an all-inclusive installation experience for their customers. These services include planning, pre-installation documentation, scheduling, scope of work review, hardware installation, system integration, pre-existing system removal, programming, troubleshooting, documenting, customer communications, and proof of completion. Brosh can provide these services in any State in the United States and is happy to construct the perfect installation plan to meet any client's needs.

GMV has hired Brosh to participate in installations of our ITS suite of integrated hardware systems on transit buses since 2018. Projects of note include: City of Los Angeles, Department of Transportation (LADOT), Victor Valley Transit Authority (VVTA), Ventura County Transportation Commission (VCTC), City of Tulare, Marin County Transit, Burbank Bus, Pepperdine University, and City of Ames (Cyride) in Ames, Iowa.

4.2.1.1 BROSH Team Experience

Bradley Giles - CEO / Co-Founder
w. 909-375-0182 | c. 310-686-0728 | brad@broshusa.com

Brad has over 15 years of contract, accounting, logistics and management experience. Once teamed up with Mr. McCowen, the Brosh company was created to achieve greatness. Current responsibilities include personnel, accounting, scheduling, legal and logistics. For any administrative dealings Mr. Giles will be your primary point of contact.

Josh McCowen - COO / Co-Founder
josh@broshusa.com

After being in the surveillance installation industry for over 10 years, Josh realized he was delivering superior installations and service to customers, but most competitors did not live up to the same standard. Recognizing the opportunity, Josh decided to start his own company and hasn't looked back since. Today Josh is the Project Manager for Brosh's installation jobs and oversees any work that gets contracted. You will likely find him on a job site or training our growing team of highly skilled technicians.

Mailing Address:
6081 Hellman Avenue, Rancho Cucamonga, CA 91737



4.2.2 REMIX

GMV will contract Remix to meet the “Bid System” requirements, as outlined by NCTSD.

Founded in October 2014, Remix is the world’s most advanced fixed-route and on-demand transportation planning and scheduling software. They work with partners around the world to enable transit agencies, cities, universities, and states to visualize and solve the mobility challenges their communities face — from full network redesigns to daily scheduling operations.

In 2021, Remix was acquired by Via, the world’s leading developer of end-to-end TransitTech solutions. Together, Remix and Via have a global staff of over 1,500, including hundreds of software engineers who are deeply committed to developing and enhancing the world-leading efficiency algorithms that power Remix so that the tool constantly improves. Remix leverages these algorithms to continuously propose data-driven recommendations for dynamic scheduling and optimized service performance across both fixed-route and on-demand services.

Remix has over 10 years of experience partnering with hundreds of transit agencies on projects similar to Nevada County’s Scope of Work described in the RFP. Their planning module has been live since 2014 and is currently used by 400+ transit agencies; the blocking, run cutting and rostering modules have been live since 2016 and are currently used by 100+ transit agencies.

The Remix team will work expeditiously to deliver streamlined implementation and onboarding within the first 60 days. To deploy Remix for Nevada County, Remix Launch Manager Hannah Mirviss will configure a unique instance of the software, enabling full access to Remix’s modules. During the configuration stage, Remix will migrate pertinent data to Nevada County’s Remix accounts to ensure the platform is prepared for Nevada County’s specific needs. Following the initial setup and training, Nevada County’s designated Partner Success Manager Ton Chookhare will oversee all aspects of ongoing support to ensure a smooth transition and sustained effectiveness. Furthermore, the implementation process will benefit from Nevada County already being users of Remix Planning.

Their intensive partner support suite is a critical facet of Remix’s approach. User-friendliness is key to our ethos and methodology, and Remix supplements their intuitive self-service interface with real-time, readily available assistance from various Remix teams. Remix’s Customer Support Suite includes Onboarding, Training, Help Site, a Partner Success Manager, and an Enablement Specialist.

Nevada County’s Partner Success Manager, Ton Chookhare, will support account creation, training, continued education, and best practice sharing. Remix releases new features immediately to active customers, and support will always be available should Nevada County require guidance learning how to use new elements of the platform. They also provide upfront and ongoing training support for no additional cost in the Learning Hub, the online platform for educational Remix webinars.

4.2.2.1 Remix Team Experience

Hannah Mirviss – Expansion Associate Principal

Hannah brings hands-on experience from her role in expansion at Via, where she has designed and deployed tailored transit operations through Remix. She is adept at translating agency-specific requirements into unique instance configurations, ensuring solutions closely align with clients like NCTSD.

Ton Chookhare – Partner Success Manager

Ton, based in Los Angeles (CA), works closely with transportation leaders to support many highly visible transit services across California (e.g. VTA, Palo Alto, Cupertino, Santa Clara, Redding, Visalia, and Porterville). His professional background also includes a decade as a management consultant focused on the tech and communications industries.



5 TAB D - PROJECT IMPLEMENTATION PLAN

5.1 Proposed Work Schedule

Considering GMV’s current and projected workload, we propose the following timeline. Our project manager will work directly with your agency to develop a detailed project schedule, taking into account agency requirements, specific vehicle availability and replacement plans, and more.

This proposed work schedule lays out the required tasks and desired timeline to implement Nevada County Connects’ new CAD/AVL system.

	Dec 2025	Jan 2026	Feb 2026	March 2026	April 2026
Notice to Proceed / Contract Award					
Kick off meeting					
Fleet Survey and Preliminary Engineering					
Planning, Software Configuration					
System Design and Scope of Work Completed					
Mini-Fleet Installed and Accepted					
Full Fleet Installation					
Training and Documentation					
System online for internal use and baseline data gathering					
Public Launch					
System Acceptance					
Transition to Account Management (ongoing)					

We strive to meet or exceed our clients’ expectations for deployment timeline. In fact, our typical deployment schedule is far shorter than most others in the industry. We will work with you to ensure we deliver a quality system that meets your timeline. While launching a CAD/AVL system is not landing on the moon, it can require complex coordination, and you are much more likely to be successful working with a vendor who has done this before and consistently meets client expectations.

The following page reflects GMV’s approach to the successful implementation of this project.



5.2 GMV's Approach to a Successful Implementation

- Award** **Assigned to: GMV Account Manager, GMV Project Manager**
Upon award notification GMV's executive sponsor and project manager will work with the client to define the specific scope of work (SOW) for the project.
- Design Phase** **Assigned to: GMV Project Manager, GMV Director of Deployments, GMV Hardware Engineer**
GMV will begin the design and planning phase for the full hardware deployment. The project manager will lead the technical and operations team to prepare a project binder that outlines all key tasks, documents, and procedures for the entire project. We will receive client feedback on our approach through a preliminary design review meeting and then incorporate feedback into a final System Design Document.
- Configure Software** **Assigned to: GMV Project Manager, Remix Expansion Associate Principal**
The GMV team will begin configuring the web-based software for client's specific operations. This work happens remotely, and regular check-ins with the client will ensure that all routes are drawn properly, stops are located properly, and all aspects of the operation are properly modeled in GMV software.
- Equipment** **Assigned to: GMV Director of Deployments**
As equipment is delivered to our Houston Production Facility, it will go through receiving and inspection procedures and Factory Acceptance Testing before being assigned to project inventory. Equipment will be kitted and shipped to the client site in bus kits just prior to installation.
- Test Plan** **Assigned to: GMV Hardware Engineer, GMV Deployment Engineer**
In parallel to the software configuration work, GMV field operations team will draft an acceptance test plan that is specific to the physical equipment and configuration on client vehicles. This ATP will be unique to each vehicle type and each unique equipment configuration. Upon client review and approval, the ATP will be reviewed with the local implementation contractor for training.
- Install & Validate** **Assigned to: GMV Deployment Engineer, GMV Field Engineer, Sub-Contractor Field Tech Team**
The installation and testing of vehicles will proceed in phases according to the project's milestone schedule. A two-person team of Brosh technicians, with supervision of GMV Field Engineer, will install the mini-fleet vehicles. The first vehicles will undergo testing to confirm proper system function, and then we will ramp up the pace of installation for the balance of the fleet.

Then, the technicians will complete the full fleet installation. Brosh and GMV staff will closely coordinate with the client team to ensure vehicle availability. The technicians will be able to complete roughly one fixed route vehicle in a day, including installation and validation procedures.

After completing each vehicle installation, Brosh will do a "installation validation" test by reviewing a checklist and testing each system on the bus. Then they will do an "operational validation" by taking the bus for a short test route and checking that onboard systems work with the cloud based central systems properly. Once these tests are completed and approved by client staff, a particular vehicle is considered complete.
- Training** **Assigned to: GMV Customer Service Lead, Remix Partner Success Manager**
As the installations reach the finish line, GMV training lead will conduct on-site training for client staff. Role based training will be targeted at each user's primary function and interaction with the system - drivers need to know different things than dispatchers and management.
- Testing** **Assigned to: GMV Project Manager, GMV Customer Service Lead, GMV Deployment Engineer, GMV Field Engineer**
The complete system will run for a thirty-day endurance test to confirm proper function, at which point we will complete system acceptance and transition to the operations and maintenance phase of the project.
- Ongoing Operations** **Assigned to: GMV Account Manager, GMV Customer Service Lead, Remix Partner Success Manager**
Any software bugs or vehicle specific problems will be reported to GMV by client staff through the support ticket system. An email to support-na@gmv.com will trigger an investigation, troubleshooting, and resolution to each issue. Your Customer Account Manager and the Customer Success team will perform twice a year client reviews to ensure you are getting maximum value from the system, and we are meeting your expectations.

5.3 Firm’s Methodologies: System Design

Before we begin any installation work our team will conduct a thorough design phase to ensure that both vendor and client staff fully understand:

- The existing condition of all vehicles prior to CAD/AVL installation
- The plan for installing new equipment on each bus
- The plan for integrating with existing equipment on each bus
- How these plans vary based on different bus models and types
- How we will test and validate that the systems are properly installed
- How the onboard hardware will interact with the central system

These topics and more will be covered in a detailed System Design Document that will be developed by GMV and submitted for client review and approval. We will conduct a design review meeting to ensure all feedback is understood and can be addressed with a revision to a Final Design Document.

We’ve included samples from prior design documents so you can get an idea of what to expect as a deliverable. These documents will be tailored to match each customers’ expectations.

SAMPLE CAD/AVL Design Documentation

GMV SYNCROMATICS
523 W 6th St, Suite 444
Los Angeles, California, 90014
(855) 792-7962
www.gmv-syncromatics.com

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SYSTEM DESIGN DOCUMENT: PRELIMINARY
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6.4.2. MDT 1100 (BASIC) WITH DOCK STATION

- The MDT1100 Tablet will be mounted on the right side of driver on the dashboard (Figure 4).
- We will use a 5" KAM mount that will be mounted to the frame and secured with machine screws, lock nuts, and fender washers for stability.
- All connections from equipment cabinet (dock station power, GPS antenna, USB cable and Ethernet cable) to the MDT dock station will be secured with a custom bracket that attaches to the bottom of the dock and physically protects the connections.
- In order to connect GMV Syncromatics System located in equipment to the MDT dock station, the Field team will need to:
 1. Drill a 1" 1/8 hole on the right side of the driver dashboard (Figure 3).
 2. Loom all cables going from equipment cabinet to MDT dock station
 3. Run all cables from equipment cabinet to MDT dock station through dashboard
 4. Connect Ethernet cable, USB cable, MDT power and GPS antenna to MDT dock station.
 5. Then, secure all connections with custom bracket at the bottom of the dock.

Note: The hole made on the side of dashboard will also be used to run connections from equipment cabinet to Farebox and VOIP.

Figure 4- MDT Tablet location

Figure 3- Future hole in dashboard to run cables

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5.4 Firm's Methodologies: Equipment Installation

5.4.1 CENTRAL SYSTEMS – NOTHING TO INSTALL

There are no central system components to be installed at client facilities. Our entire system is cloud based. No servers, no switches, no virtual machines. If you have web browsers and internet access, you're set.

5.4.2 FACTORY ACCEPTANCE TESTING BEFORE DELIVERY TO CLIENT

After trays have been assembled, they are tested for all functional performance criteria on a test bench at our Houston Production Facility. This test is documented and signed off by the tester and production manager to attest that we are sending quality product into the field and all components are properly matched. We log all device serial #s and associate them to a main assembly identifier that will in turn be associated with a client vehicle ID to ensure full parts traceability.

5.4.3 MINI FLEET IMPLEMENTATION

Our standard deployment process includes installing a representative pilot bus from each bus type (year, model) as a way to get familiar with your fleet and work out any kinks in our installation process. Once we have completed the pilot buses, we will have seen the full range of bus types and can make any adjustments to our process. This enables us to move more quickly and consistently through the full fleet deployment without any new surprises.

The mini-fleet vehicles will be subjected to the most rigorous testing and validation procedures of any vehicles in the fleet because they serve as the template for the remaining installs.

Mini-fleet vehicles will be tested in the following ways:

- Installation Validation
 - o While the bus is parked in the yard after the installation is completed,
 - Ensure that all the equipment is installed correctly on the vehicle
 - Ensure that all onboard systems power on and communicate with each other
 - Ensure that the onboard systems can connect to the central systems to exchange data
- Operational Validation
 - o Take the bus on a test drive on a short test route to test the systems in action
 - o Ensure that APC counts are correctly allocated to the right bus stops
 - o Ensure that AVA announcements are made properly at the right locations
 - o Ensure the MDT accurately tracks and reports the vehicle location

Following the mini-fleet testing any needed remediations are made on the mini-fleet vehicle, and a full report is made with recommendations for how to improve the installation on future vehicles of the same type.



5.4.4 EXPECTATIONS OF THE CLIENT STAFF AND FACILITIES

We expect that this project will be a coordinated team effort between our staff and the client staff to deliver a successful result. As such, we expect:

- Client staff assistance with making space available for vehicle installations, staging and storing equipment
- Client staff to participate in the initial vehicle surveys and installation of the mini-fleet so they can offer corrective guidance as we go (which will reduce their need to be involved on every bus later in the project)
- A client operator to be available to relocate vehicles and conduct operational validation testing of completed vehicles
- Client staff to observe formal / official testing and sign off on successfully completed tests or provide feedback on any deficiencies that need corrective action

5.4.5 SCENARIO: COUNTY BRINGS ITS OWN HARDWARE

Samsung A7 Tablets

GMV proposes to replace the existing Samsung A7 tablets with our GMV Hub vehicle logic unit and 10” touchscreen driver display. The process for installing and validating these system components is described at length in this section of the proposal. There is no supported scenario in which NCTSD can bring their own hardware to stand in for the GMV Hub or 10” driver display proposed herein.

NCTSD has outlined the requirement for digital pre- and post-trip vehicle inspection. GMV has proposed your agency re-use the Samsung A7 tablets, assuming they are functional, for these inspections. The integration and workflow are outline in “Tab E” of this proposal. The process for installing the digital vehicle inspection software and testing functionality will be overseen by GMV with participation by NCTSD staff.

R1900 Cradlepoint Routers

GMV proposes to utilize the existing Cradlepoint routers installed on NCTSD’s vehicles to provide network connectivity to our system. GMV’s team will work with your agency to configure the routers appropriately. The process for installing and validating these system components is described at length in this section of the proposal. Should NCTSD wish to outfit vehicles with different routers at any time, GMV will work with your agency to identify any impact on GMV’s system, aid in re-connecting the CAD/AVL system to the new router, and assist in validating the connectivity.

Verizon Wifi for Each Vehicle

NCTSD has specified that they will continue providing passenger Wifi through Verizon Wireless. GMV does not propose to bring or provide any hardware to support passenger Wifi. If the agency options to bring separate hardware to provide Wifi, GMV can advise on any impact to our system, though this is not anticipated as we will not interact with this system.

Hanover AVA, Headsigns, and TFT Onboard Monitors

NCTSD is ‘bringing their own hardware’ in this scenario, as it was specified that the existing Hanover system will manage onboard announcements, headsign, and interior TFT signage. GMV has not proposed to replace any of these systems. If at any time desired, we can integrate with the Hanover headsigns at no cost to NCTSD. We can also replace the Hanover AVA system with GMV’s ADA compliant AVA system at no cost to NCTSD.

Samsara GPS Locator Devices and Swiftly Solution

The proposed GMV Hub VLU and GMV’s real-time passenger information features and dispatching tools will render Samsara and Swiftly redundant solutions. GMV’s Project Manager will plan for the transition away from these services with NCTSD during the Design and Configuration phases of this project.

Additional ‘Bring Your Own Hardware’ Scenarios

If awarded, GMV will serve as NCTSD’s transit technology partner. Should your agency ever wish to add new systems to your fleet, we can discuss how to integrate with new third-party hardware.



5.5 Firm’s Methodologies: Testing and System Acceptance

Key acceptance testing elements include the following, each of which has its own set of test plans, documentation, and checklists.

5.5.1 FACTORY ACCEPTANCE TESTING

Aside from general system integration testing, vehicle specific testing is also performed in the lab. This setup mirrors our system integration testing but uses that actual pre-assembly tray to be installed in the vehicle. This further validates system components and final system configuration. Additionally, where possible vehicle specific peripheral integrations are added to the lab test scenarios. These integrations include vehicle destination signs and automated passenger counters.

5.5.2 INSTALLATION VALIDATION

GMV systems will be fully validated after installation prior to the vehicle being released to the customer. A system validation checklist is utilized to ensure all components, related software, and server-side data are properly synchronized. A series of functional tests are carried out on each vehicle to ensure all systems are functioning to previously validated standards.

5.5.3 OPERATIONAL VALIDATION

Operational validation will necessarily involve a ride in the bus on the route. This may happen as a test run or during actual service, depending on the agency’s preference. During the validation process, it will not be expected that drivers are signing in and interacting with the system, but GMV staff will perform the validation by signing in and observing the system while on route. This validation includes both the on-bus functioning of the system as well as the back-end dispatch process.

RIDE REPORT FORM						
Vehicle	4021		Run	0411M/F		
Date	15-Oct		Trip	920-894		
			Start Time	6:10		
Route	4A - NORTH OXNARD via GONZALES					
Notes						
MDT Power	<input checked="" type="checkbox"/>					
Sign In	<input checked="" type="checkbox"/>	by	MDT	ATS	Dispatch	(circle one)
Deadhead	<input checked="" type="checkbox"/>					
Trip Start	<input checked="" type="checkbox"/>	by	Manual	ATS	(circle one)	
Headsign	<input checked="" type="checkbox"/>					
Farebox	<input checked="" type="checkbox"/>					
Trip Switch / Sign Out	<input checked="" type="checkbox"/>	by	MDT	ATS	Dispatch	(circle one)
Key:	<input checked="" type="checkbox"/>	check indicates event occurred properly				
	<input checked="" type="checkbox"/>	cross indicates event occurred with an issue (include notes)				
	<input type="checkbox"/>	blank indicates event did not occur				
	Approach	LED Sign	Arrive	Stop Req	Door/Ext.	Passengers
OTC		Deadhead / Interline		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
4th & B St	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
4th & D	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3 On only one stop the entire time, the rear LED sign did not display the stop name when the front sign and AVAS did. The rear LED as blank while the front was displaying stop, then the both returned to date/time and resumed stops in sync the rest of the time without fail.
4th & F	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
F & 2nd	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5

A sample tool to track an issues that come out of these testing procedures is included on the following page. This checklist will generate a record of any defect, and these defects are centralized into a SmartSheet cloud hosted document that is visible to vendor and client staff to work through open issues.

5.5.4 PUNCHLIST FOR TRACKING AND RESOLVING ISSUES

All issues observed during testing (factory acceptance testing, installation validation, operational validation, and system acceptance testing) are funneled into a central web-based reporting tool called SmartSheet.

SmartSheet allows us to provide shared visibility and communication between GMV staff, contractor installers (as needed), and client staff. Each row represents a specific issue that is tracked to resolution with status updates, next steps, and assigned tasks. Rows can be appended with photos and comments to enrich the information sharing.

This same type of tool can be used to track progress toward completion of new feature deliverables, training milestones, and design documentation deliverables.

Some items may be tagged as blocking items that must be resolved before a GO-LIVE, whereas other items may be acceptable to resolve at a later date.

Once all critical items are resolved, we will launch the system and coordinate with the client on the GO-LIVE date.

Date Reported	Vehicle	Responsible Technician	Issue/Request	Status Log (right click to view cell history)	Date Closed
01/13/18	406	On Point	No sound outside. After rebooting I was able to login after also rebooting out another driver after reboot. But it stays on the same deadhead address. The voice announcements is split on wife locations and stops, but the screen is frozen. (From operator report, run 5021)	Mic, inside and outside speakers work. (Attached screenshot)	01/23/18
01/20/18	406	On Point	Does not auto-populate direction in GFI. (From operator report, Run 5021)	MDT signs in GFI. See attached pictures	01/21/18
02/02/18	406		Driver has not been working for the last two days, and most noticeably today, 02/02 while on bus 406. (From operator report)	appears to be working as of 2/2-	02/02/18
01/17/18	406	On Point	AVAS from tablet, infodev inop, PA inop.	Mic, inside and outside speakers working, infodev red but counts in the rear only	01/25/18
01/24/18	407	Transit Tech	App won't load (problem closed multiple times, needs to power, internal watch and plug) on	Refile power app unplugged from device (1/24/18) Will not return. With any device and bus app is in-mp. Stop bus dock. No issue dock to find. Whatsapp for driver's working https://transitechinc-box.com/s/d1hamaggyhce63veut87jdfx3w53g5r6	01/25/18
01/24/18	407	Transit Tech	Moving with door open icon on map.	MDT shows proper signals, possible programming	01/25/18
01/24/18	407	Transit Tech	No internal or external announcements.		
01/30/18	407	Transit Tech	After I was logged in, it was set on Deadheading to starting point. It also said I was 405 minutes early. The time in the corner was 7 hours off of actual time. Later in the day it started telling route & running route times but kept saying I was hours early all shift. Had to input all signs and GFI manually. (From operator report, run 1034)	Needs time settings changed in Android settings.	
02/02/18	407	Transit Tech	Showing that Run 1012 began at 01/04/2015 7:20AM.	Needs time settings changed in Android settings.	
02/02/18	602	On point	Bus is currently on route 41 and has not communicated for 3 hours.		
02/02/18	406		Driver has not been working for the last two days, and most noticeably today, 02/02 while on bus 406. (From operator report)	appears to be working as of 2/2-	02/02/18

5.6 Firm's Methodologies: Quality Management

As a company that provides critical technology to aerospace and defense projects as well as public transit projects, GMV is subject to significant levels of Quality Management and oversight that apply to the entire firm and improve the performance and results on all our projects across all industries.

5.6.1 GMV'S COMMITMENT TO QUALITY

The Mission established for GMV by its Board of Directors is to supply products and services with a high added value and high technology in the different industries in which GMV operates. GMV's Quality Policy is set directly by the CEO of the company, who establishes its fundamental principles and revises its status based on the previously defined mission and objectives defined for the organization.

GMV's commitment to its clients and to excellence, innovation and continuous improvement are strongly underpinned in its Quality Management processes; this Quality Management ensures a correct project execution according to stipulated requirements, cost, and duration.

The quality policy of GMV is based on the following principles:

- The purpose of GMV is providing its customers with systems that match their specifications, while meeting deadlines and budgets. The rigor and quality of our work, for total customer satisfaction is evidenced by their loyalty to our company, of which we are most proud.
- Top management provides, reviews, and approves the quality policy of the company and is fully committed to its full implementation in the organization.
- GMV understands that the quality of the company's products is not the sole responsibility of the Quality Department: all GMV staff is committed to the quality policy of the company and knows and applies the grounds set out in the Quality Management System (QMS).
- GMV bases its national and international prestige in the quality of products supplied to customers. The company's commitment to quality requires us to operate a QMS compliant with the standards and requirements generally accepted by the international community.
- The company management is committed to manage their business processes through continuous improvement models that allow the organization to have disciplined and mature processes and continually improve the effectiveness of the quality management system.

5.7 Project Management Plan

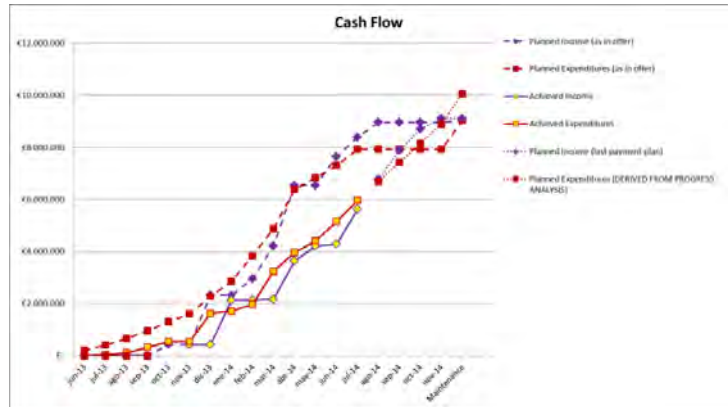
To satisfy all the customer's requirements concerning project management, GMV intends to set up a management and control scheme tailored to the specific needs of the project. For that purpose, the Project Manager will oversee the project control and management procedures as mentioned below:

5.7.1 COST AND FINANCIAL CONTROL

Cost and Financial monitoring and control within the frame of this project will be achieved by means of the definition and maintenance of a cost breakdown structure associated to the provided WBS and according to the main cost categories of the project:

- Labor
- Materials
- Subcontractors
- Travel

Based on those categories, a detailed cost breakdown reference structure will be created at GMV that will serve as reference for the cost control activities. In addition, a reference payment plan also serves as reference for the payment control.



5.7.2 SCHEDULE CONTROL

GMV operates a schedule control system based on Smartsheet. The system runs on the GMV intranet and is already operational and in use in many other projects. The Project Manager is responsible for the preparation and update of master and detailed schedules, compliant with the proposed Work Breakdown Structure (WBS) and the associated Work Package descriptions. They shall perform the following activities:

- Keep the project schedule updated at several WBS levels, including milestones.
- Generate printouts of the bar chart schedule.
- Keep track of milestone achievement and of the work in progress in all Work Packages.
- Generate the appropriate metrics for providing the customer with concise information about the project status.
- Exporting the schedules in .pdf or in the required format.
- Notify the customer of any substantial change in the schedule affecting milestones.

Effective schedule control is based on the agreed schedule (master or detailed). This schedule is the key reference for all related planning data. To avoid potential conflicts, all remaining sources of information refer only to dates relative to milestones and not to absolute dates. Three types of schedules (both in Master and Detailed breakdowns) will be considered:

- **Original Schedules**, to be set up and agreed at contract signature.
- **Baseline Schedules**, based on the Original Schedule but updated along the project according to the modifications agreed between GMV and the customer.
- **Working Schedules**, current planning of all activities that also serve as indication if schedule mitigation techniques are necessary.

The Project Manager will be responsible for feeding the schedule control system with the day-to-day information on the progress of the work, provided by the rest of the team. All the team members will have access to schedule data in read-only mode, but only the Project Manager will have the access rights required to update the status of the project.

5.7.3 ACTION ITEM CONTROL

GMV’s Project Manager shall be responsible for the follow-up of action items recorded at the progress and review meetings. Although the completion of the action items and the resolution of the technical issues is under the direct responsibility of the agreed assigned party, the project manager shall be responsible for following up on the status of any open action item. Should an action item or technical issue remain open after the expected due date, the project manager shall escalate it to the assigned party.

5.7.4 RISK MANAGEMENT

GMV’s Risk Management Policy describes the procedures to be followed within the different projects and quantify the severity of the different risks for the different risk categories (e.g. functional, performance, schedule and cost). This quantification is a function of the type of project.

GMV’s policy also defines the criteria for acceptability as a function of the probability and severity. As a general rule, High Probability/High Impact risks should not be acceptable (unless a specific explicit provision is made to cope with them) while Low Risk/Low Probability do not need specific monitoring. The rest of the combinations are to be managed and specific mitigation procedures to be identified.

Different Risks are classified according to the following different criteria:

		Severity		
		Minor	Medium	High
Category	Technical	No relevant impact in functionalities or performance	Impact in function and performance but can be compensated with work around	Impact in functionalities and performance
	Programmatic	No impact or only in internal milestones	Delay of internal milestones or final milestones < 2 month	Delays of final milestone > 2 months
	Cost	Impact negligible	Impact <5%	Impact > %5

Table 5-1: Criteria for risk severity determination.

5.7.4.1.1 Risk Management Process

The Risk Management process include the following main steps:

- Risk Identification.
- Risk Assessment and Analysis.
- Risk Monitoring.

It is important to emphasize that in order for the process to be efficient it has to start during the proposal preparation in order to have a detailed assessment of the project risks to take the decision to deliver an offer.

5.7.4.1.2 Main Risks Identified

Following are risks identified in the frame of the present proposal are reported in the following table. However, in detailed shall be prepared during the project phase.

#	Description	Prob.	Impact	Risk	Mitigation Actions
1	Delay in Contract Signature	MEDIUM	HIGH	Very Critical	To merge Phase 1 and Phase 2 Burn in test together.
2	Internal Team Coordination	MEDIUM	HIGH	Very Critical	Arrange periodic meetings via onsite, teleconference etc
3	User Requirements not closed (to be agreed during first phase of the project)	HIGH	HIGH	Unacceptable	Functional Description documentation approved and signed from client.
4	Acceptance Procedure period very long, that could involve delays or penalties	MEDIUM	MEDIUM	Critical	Agree on acceptance procedure and timely review and approval of deliverables from the beginning.
5	Team-Client communication that could cause misunderstandings	HIGH	MEDIUM	Very Critical	Periodic project status meetings with all responsible staff, including separate meetings for each relevant work package (e.g. installation, software, testing, etc.)
6	Technical failure of Commercial Off The Shelf items	MEDIUM	HIGH	Unacceptable	All necessary certification (IP, IK, FCC) and testing during FAT
7	Sudden unavailability of installation team	LOW	MEDIUM	Critical	Arrange several installation teams as backup
8	More time needed for installations than initially planned	MEDIUM	HIGH	Very Critical	Do some pilot installations in the beginning of the project to confirm installation time per vehicle
9	Installer errors during installations	MEDIUM	HIGH	Very Critical	Clear instructions and easy Acceptance procedure
10	Documentation Errors that could affect whole fleet	MEDIUM	HIGH	Very Critical	Pilot installations in the beginning of the project to test installations
11	Delay in purchased materials	HIGH	HIGH	Unacceptable	Launch purchase order for pilot elements as soon as project is signed, and Functional Description accepted.

5.7.5 COMMUNICATION PROCEDURES AND INTERFACE WITH CUSTOMER

The focal point of contact for all interfaces between the customer and the GMV team shall always be the appointed Project Manager. Moreover, he/she shall be kept informed of any communication between any Project Team member and any external entity. The Project Manager is assigned with full authority throughout the project to plan, organize, direct, and control all activities of the Project and to maintain effective and close liaison with the Customer Procurement Managers.

The Project Manager will have the support of the key personnel identified in the GMV's team and responsible for each of the activity areas to ensure the achievement of the project objectives.

The Project Communications Plan (PCP) defines the project's structure and methods of information collection, screening, formatting, and distribution of project information. It also outlines understanding among project teams regarding the actions and processes necessary to facilitate the critical links among people, ideas, and information that are necessary for project success.

5.7.5.1 COMMUNICATIONS ACTION MATRIX

The Communications Action Matrix is used to define details regarding the communications activities that are used during the course of the project. The matrix will be developed and maintained by the Project Manager, or a member of the Project Team. The Project Team and the Customer will work together to develop a matrix of communications activities around each project milestone. This matrix would include detailed activities such as:

- Designate “**owners**” responsible for communications products and activities for each project milestone.
- The **resources required** for these efforts in terms of personnel.
- A list of **key messages and benefits statements**, with an assigned “owner” as a central point of contact
- Processes for vetting communications messages and products
- List **priority stakeholders groups** targeted for participation

5.7.5.1 WORK SESSIONS AND OTHER COMMUNICATIONS

Vehicle	Target	Description Purpose	Frequency	Owner	Distribution Method	Internal/ External	Comments
<Progress meetings>	<SG1, SG2>	<Review progress and developments on the System implementation>	<Weekly>	<PM>	<Email for meeting invitation and minutes distribution>	<Internal>	<comments>

The work sessions will be different types of face-to-face meetings between the Customer and the Team to keep track on the project implementation progress, discuss the requirements, solve project-related matters, review documentation, etc. Each type of work sessions will require a different group of attendees.

A firm schedule for all the Work Sessions along the project life will be agreed with the Customer in the very first stages of the project together with the development of the final Configuration Management document. Our preliminary approach for the work sessions would be as described in the following sections.

Together with their schedule, the Project Configuration Management document shall include the type of information and format that must be presented in the documentation related to the meetings such as the progress reports or the minutes of meetings.



Progress Review Meetings will be the key vehicle for the healthy Communications Management process along the project as all the small details and matters will be discussed. The Team will conduct them in **weekly basis** during the development stage and monthly from the System Commissioning until the end of the Operations and Maintenance period. Reports shall be sent on weekly basis to the contracting authority designated PM at beginning of each week by Monday at 08:00 am.

In addition to those planned, there shall be additional meetings organized at discretion of Project Team and other for work package leader and/or the Customer to discuss urgent and critical matters when required.

The objective of the Progress Review Meetings will be for the Team to update the Customer on the progress, development and on-going operations and maintenance services of the system.



Management Review Meetings will be held monthly, and they will have a more general focus than the Progress Review Meetings. The overall development of the main project phases will be reviewed and discussed. These management review meetings will be led by the Project Manager (GMV).



Documentation and Design Meetings will be related to the submission of technical documentation related to the ITS and its components: Communications, Interfaces, IT Infrastructure, On Board Systems, Applications, etc. This type of meetings will be conducted upon the submission of the documentation to review it, agreeing on any changes, providing clarification, and granting final approval of the documents submitted. These meetings will be led by Technical Lead/Management from GMV.

5.7.6 SUBCONTRACTOR MANAGEMENT ACTIVITIES

In order to meet the project objectives, we will ensure adequate control of the subcontractors' activities, anticipate potential problems and ensure the coordination of various processes.

The management requirements flowed down to the subcontractors are based on the customer's requirement with additional requirements specific to GMV's management standards.



5.7.7 CHANGE MANAGEMENT

While contract change is expected not to occur along the project, mechanisms must be established to cope with potential changes as required. Two possible mechanisms are contemplated for the introduction of a Contract Change:

- Upon detection by GMV (or any of its lower tier subcontractors) of any significant problem affecting the contractual baseline (technical specifications, scope of the work or schedule of the project), the Project Manager will submit to the Customer a proposal for a Contract Change Notice (CCN). Should the change be proposed by a lower tier subcontractor, GMV will include its own assessment and conclusions/recommendations if he in turn intends to submit it as a proposed change to the Customer. Customer will analyze it and, from the analysis, accept or reject the proposed change.
- The customer submits a CCN to cope with new requirements or modification on the applicable contractual conditions. In this case GMV will analyze it and make a new proposal to cope with these new contractual conditions.

5.7.8 KEY PERSONNEL CHANGE MANAGEMENT

The positions reflected in the organization will be considered as key positions for the implementation of the project and any replacement will be communicated and agreed with the client to avoid the introduction of uncontrolled risk factors for the successful implementation of the proposed project. Experts replacing them (subjected to an approval from the customer) will meet all the project requirements by notifying the customer in writing at least two weeks in advance indicating the specific reason and qualification of replacement personnel.

5.7.9 CUSTOMER RESPONSIBILITIES

While GMV plans to implement the project in as independent and self-sufficient manner as possible and reduce the burden on NCTSD staff resources, there will be some support and deliverables needed from Nevada County Transit Services Division to make the project successful and keep it on schedule. These responsibilities will be fully discussed with your GMV Project Manager and agreed upon prior to substantial work beginning.

5.8 Project Challenges and How to Overcome Them

In any large and complex project, there are challenges that may impact on project delivery. Due to tremendous GMV experience in projects of similar or greater size and complexity, we can manage and overcome those challenges. GMV is confident we can deliver the proposed project and seamlessly integrate with current NCTSD systems.

5.8.1 CLIENT TEAM AND PERSONNEL MANAGEMENT

It is critical that the client-side project team has a clear leader who “owns” the project and is responsible for its success. This person needs to be empowered to make decisions on behalf of the entire project team, even if that means some client-side project stakeholders will not agree 100% of the time. GMV expects that we can get clear and consistent guidance from the client on questions related to system design, implementation, and ongoing operations. We need to client to speak with one voice – even though there are many stakeholders from a broad range of departments that will be involved in this project.

GMV tries to assist with this effort by engaging all stakeholders early to understand their priorities and concerns. We also try to structure project teams so that some project status meetings are attended by a larger group, and other meetings are limited to a more focused group of staff from GMV and the client to ensure we can be productive and make progress.

5.8.2 CHANGE MANAGEMENT FOR NCTSD STAFF

The new system will include more advanced technologies that can automated some functions within Nevada County Connects that are currently very manual and labor intensive. (e.g. syncing data between Scheduling > CAD/AVL or from CAD/AVL > Scheduling). As these labor-intensive tasks go away, some staff may feel like they are no longer necessary, and they can feel threatened by that prospect of change.

GMV is confident that the new system will help provide higher value tasks for the human beings at NCTSD so they can achieve at a higher level than before. We will work to show all staff that the technology is there to assist them and make their jobs easier so that they can take on more ambitious work that only a human can accomplish. This is critical to achieve “buy in” on the technology transition from all stakeholders and users, including staff that may be close to retirement and not excited about “learning a new system” or other circumstances. People are complicated, so we recognize that and build it into our project plan as a Change Management process.

5.9 Software Integrations with NCTSD Systems

5.9.1 DIVERSE TECHNOLOGIES

When integrating software from different vendors or developed with different technologies, compatibility issues can arise. To overcome this challenge, GMV uses standardized protocols and formats such as RESTful APIs, JSON, or XML. When it is absolutely required, we will develop a custom software integration using our internal best practices to ensure the integration is carefully designed up front, then implemented in a stable and reliable manner.

5.9.2 DATA MAPPING AND TRANSFORMATION

Integrating systems often involves mapping data fields between different formats and structures. For example, GMV's CAD/AVL system and the **Remix** scheduling systems contain much of the same data, but generally it is stored and managed in different formats that are unique to each application. To address this, GMV will create clear data mapping documentation and utilize data transformation tools or scripts to automate the process of data conversion. Establishing common data models or ontologies can also streamline data mapping.

5.9.3 SECURITY CONCERNS

Integrating software systems may expose sensitive data to security risks, such as unauthorized access or data breaches. GMV Implement robust authentication mechanisms, encryption techniques, and access control policies to safeguard data during integration. We also conduct thorough security assessments and audits to identify and address vulnerabilities proactively.

5.9.4 PERFORMANCE ISSUES

Integrating large-scale systems or processing high volumes of data can impact performance. GMV handle by Optimizing code and queries, employ caching mechanisms, and consider asynchronous processing to enhance system performance. Load testing and performance monitoring tools also help identify bottlenecks and optimize system performance.

5.9.5 DEPENDENCY MANAGEMENT

Software integration often involves managing dependencies on external services, libraries, or APIs. However, GMV ensures compatibility with existing systems and conduct thorough testing to mitigate the risk of introducing regressions. Before any system goes live, it will be tested in a separate environment to ensure it is working well.

5.9.6 VERSIONING AND COMPATIBILITY

Changes to software versions or APIs can break existing integrations. GMV maintains clear documentation of version compatibility and release notes for integrated systems. GMV implements versioning strategies such as semantic versioning and backward compatibility to minimize disruptions during updates.

Apart, other dependencies also play critical role such as effective communication and collaboration, Testing and Validation, Change Management, Monitoring and Maintenance etc. as indicated in the earlier section by addressing these challenges systematically and leveraging best practices, GMV will successfully integrate NCTSD systems.

5.9.7 TIMELINE COMMITMENT

GMV is committed to timelines, as well as being prepared to mitigate risks effectively (as indicated in the section 'risk') through proactive communication, strategic planning, and decisive action.

For example, as indicated in the risk section #1 delay in Notice to Proceed, which can be impacted by delays in the RFP evaluation, award and contracting process, and other agency projects that compete for staff attention and priority. To mitigate this delay, GMV could compress certain activities/tasks during the design phase. Many of these tasks are planned to run in parallel with the Software Development/Customization activities, so there would not be a major impact to the overall completion date if the design phase was compressed.



5.10 Migration of Existing Customer Data

As a Fixed Route solution, GMV does not store, house, or utilize data for NCTSD's customers.

5.11 Vendor Hosted Solution

5.11.1 DATA USAGE

- System has a minimal data footprint and does not require bulk transfer or yard/garage/depot Wi-Fi connectivity
- Data on drivers, routes, and annunciators synchronizes automatically and leverages text-to-speech and compression technology to avoid the need for large data transfers
- Most firmware and application updates are packaged and downloaded in compressed fashion over the air, via remote automation
- The entire CAD/AVL systems uses about 50MB/vehicle per month, including on average a once-a-month VLU software update delivered over the air (which accounts for about 60% of the total usage)

5.11.2 WEB BASED, VENDOR HOSTED SOFTWARE AND DATA

The GMV system is fully web-based and hosted by GMV. No servers or software will be installed at the client site.

GMV leverages a purpose-built network architecture running in a professional data center to achieve high performance and reliability in a cloud-based software program. A locally hosted server cannot achieve the efficiencies of scale of a cloud-based application running at a co-located data center. Our clients share in the costs of maintaining GMV' top notch network infrastructure and our innovative team of software developers, so the incremental cost to each customer is significantly less than operating their own servers.

For a low, fixed annual license fee, GMV offers an entirely turnkey system that doesn't impose extra costs on the agency for hardware or licensing, doesn't tie up existing technology or human resources, and doesn't require any IT commitment for support or integration.

GMV proposes to store all agency data in an immediately accessible format for at least five years. There will be no archiving or retrieval necessary. Accessing five-year-old data will happen the same way as accessing 2-week-old data.

5.12 Cybersecurity

In short, we host all central systems at a Tier 3 data center that meets all industry standards for reliability and security. We maintain backup systems off site and in cloud computing services.

GMV voluntarily undertook a cybersecurity penetration test to identify any weaknesses in our security practices and procedures. The report resulting from the test generally gave us high marks and did not identify any critical failures. The report did recommend some improvements which we have since made or are in the process of completing.

GMV commits to obtain SOC 2 Type 2 certification and perform renewal/review of our cybersecurity systems every 2 years.

5.13 User System Requirements

The cloud hosted system requires very little from users. All that is required is a computer (desktop, laptop, tablet) that has an internet connection (min 5 mbps) and a web browser. For VOIP voice communication functions, Chrome web browser is required.

5.14 Backups

GMV's servers are housed in a secure server facility near downtown Los Angeles. The facility is home to several thousand servers; it draws communications from the largest network communications hub in greater Los Angeles. The facility has multiple redundant power supplies, a 24x7 Network Operations staff, and is housed in an underground facility secured by a four-level security system (building, elevator, facility and rack). For these reasons, a high degree of confidence is placed on the reliability of the server infrastructure.

GMV's backup schedule is as follows:

- GMV consistently maintains backups of your critical data on a 4-hour interval
- Once per week, the entire structure of the system and all data is backed up inside the data center.

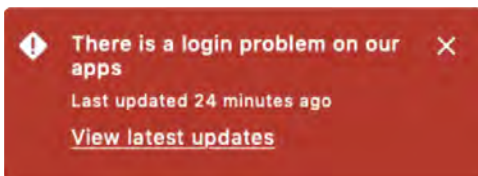
You may request that GMV restore route or stop data from one of its daily backups in the event that undesired changes are accidentally made.

5.15 Status Pages

Our system administration team uses an industry leading tool – StatusPage.io – to provide real-time status information to our clients and customer support technicians. If a particular component of our system is experiencing technical problems, the status will be updated here, and alerts will be sent out to email subscribers and in-app notifications.

<https://status.gmvsyncromatics.com/>

Example of alert notification within the GMV apps if there is a known problem.



System Component	Status
Real-Time Tracking	Operational
Arrival Predictions	Operational
Track / Sync Websites	Operational
Track API	Operational
Public Portal	Operational
RTPI API / Smartphone App	Operational
Messaging	Operational
VOIP	Operational
Digital Signs	Operational
Insights	Operational
Driver App	Operational



5.16 System Downtime – Service Level Agreement

GMV endeavors to keep its servers up and running 24x7x365. However, there are extreme cases which could cause downtime, which are beyond GMV' control. In the case of downtime, the following discounts will apply:

5.16.1 VEHICLE DOWNTIME

Vehicle downtime is defined as a service outage that affects only a single vehicle starting from the point at which GMV has identified a hardware device failure. Outages related to wiring tampering are not covered. If GMV has not shipped a replacement unit within 1 calendar week after receiving the defective equipment, the customer is eligible for a discount of the service fee from the day GMV received the defective unit until the replacement device arrived at the customer site.

5.16.2 SERVICE DOWNTIME

The 'downtimes' listed below relate to the GMV ITS system and exclude any local network issues at or near a client site, or internet routing failures beyond the control of GMV. Any downtime claims must be submitted within 2 weeks of the claimed downtime for evaluation. Downtimes caused by cellular outages or failures in the internet are not covered by the downtime discount policy.

Brief Downtime:

Brief downtime is defined as a service outage of the entire system for less than 8 hours. In the case of brief downtime, GMV will provide a one-time \$100.00 discount between 1-8 hours of downtime. For downtime less than 1 hour, a one-time \$50.00 discount will apply.

Extended Downtime:

Extended downtime may occur if GMV or its datacenters experience a major system failure which involves multiple hard-drive and/or server failures, a city-wide network outage, or a city-wide power outage. GMV will provide a \$300.00 discount for periods between 8 and 24 hours of downtime, as well as a \$300.00 discount for each 24 hour period thereafter.

Scheduled Maintenance:

GMV may conduct scheduled maintenance on its databases, web applications and in-vehicle hardware. Whenever possible, GMV will conduct this maintenance during the periods when the agency's vehicles are not in operation or when service is lightest. If GMV must conduct maintenance while vehicles are in service, GMV will give the agency at least 1 business day's notice, including the number of vehicles that will be affected. If it is not possible to give this notice, GMV will apply a \$25.00 discount for each unscheduled maintenance occurrence during normal operations.

Generally scheduled maintenance can be completed without any impact on normal operations or visibility to the client. Due to our system architecture and its inherent redundancies, we can perform hardware, software, and infrastructure upgrades on a rolling deployment basis. We have a load balancer that distributes load across multiple servers. Our new code deployment will take a node down, but there are other servers still serving those requests. The code is then updated on that downed node, quickly health checked and then added back. We continue to roll this process through all the servers. While a portion of our system is down during the upgrade, the traffic is routed around the down node so there is no visible impact to clients.



5.17 Training

5.17.1 FREE AND UNLIMITED TRAINING FOREVER

GMV understands that deploying and supporting an ITS system is an ongoing process, not a one-time event. Our staff will conduct initial training sessions with the stakeholders who are available and on staff at the time, but long-term value is established by conducting refresher sessions for new staff and providing daily support to the folks on the front lines.

Because ongoing training is so fundamental to the success of an ITS deployment, GMV doesn't charge for it, and we are happy to provide it any time to any audience.

GMV does not charge for training on a per-hour basis, and we do not limit our initial training to a certain number of hours. Our flat initial training fee includes unlimited training to ensure that all the stakeholders in your agency are comfortable and familiar with our system. Generally, training works best when it is delivered in small amounts, so we keep the information concise and allow students who need additional time and support to come back for follow up sessions.

We structure our training to match your requirements, and every deployment has a customized training program to meet the clients' needs. We understand that training is expensive for you – not the direct cost of training paid to your CAD/AVL vendor, but the cost of pulling your staff out of their regular jobs for a day or even a few hours can cause a major disruption. As such, we can break up our training into small pieces if you like, we can condense it into a few full day sessions, or anything in between.

5.17.2 GOOD DESIGN REDUCES NEED FOR TRAINING

We believe that software should be intuitive to use. A dispatcher or planner should be able to learn most of the software's functions within minutes, just by clicking around in our intuitive system. We design our software with this goal in mind and use standard graphical conventions from the web and consumer software to enhance familiarity.

5.17.3 TRAINING MATERIALS AND METHODS

Printed Training Manuals and User Guides are provided for each specific tool within the product delivered in printed binder and digitally for future client use. We also provide:

- Powerpoint Presentations delivered by GMV trainers
- Training Videos and Animations built into the product
- Video Recordings of in person and webinar training



5.17.4 TRAINING PROGRAM OVERVIEW

GMV’s training curriculum consists of modules that correspond with our suite of tools: DISPATCH, for the real-time operation of vehicles; OPS, for reports; PLAN, for service information and adjustments; RIDE, for rider communications; MAINTENANCE, for remote diagnostics; and ADMIN, for GMV account management. We can provide refresher training for all modules on an as-needed basis, as well.

Module	Operators	Dispatchers	Supervisors	Analysts & IT Personnel	Mgmt.	Customer Care Agents	Maintenance Personnel	Agency Trainers
DISPATCH	✓	✓	✓			✓		✓
OPS			✓	✓	✓			✓
PLAN			✓	✓				✓
RIDE		✓			✓	✓		✓
MAINTENANCE							✓	✓
ADMIN				✓	✓			✓
AD HOC	✓	✓	✓	✓	✓	✓	✓	✓

Training Module Syllabi

Summaries of the proposed training modules are provided in this section. These syllabi include intended audiences, topics reviewed, course duration, and other important considerations.

5.17.4.1 MODULE 1: DISPATCH

In this training module, we will explore how operators and dispatchers interact with SYNC DISPATCH technology. The intended audience for this training is purposefully broad and includes personnel who are responsible for — or should be informed of — day-to-day vehicle operations, dispatch, and vehicle tracking. The training provides a foundation for students to effectively use our software both under normal and unexpected (i.e., emergency) circumstances.

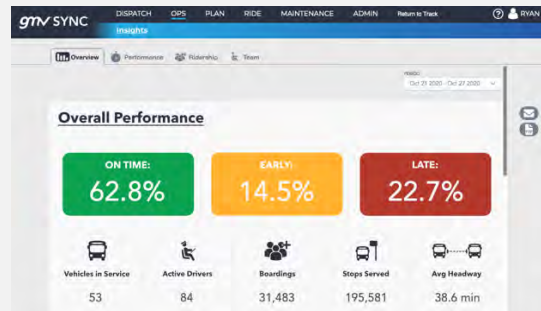


DISPATCH List View

Objective	To empower students to successfully use GMV driver and dispatch technology and understand the relationship between our driver and dispatch software.
Audience	Operators, Dispatchers, Supervisors, Customer Care Agents, Agency Trainers <i>Recommended Maximum Class Size: 12</i>
Content	<ul style="list-style-type: none"> • Dispatch Map and List <ul style="list-style-type: none"> ○ Filtering Vehicles and Status Pills ○ Action Cards • Dispatch/Operator Communications <ul style="list-style-type: none"> ○ Text ○ VoIP • Emergency Alerting <ul style="list-style-type: none"> ○ Triggering an Emergency ○ Managing an Emergency • MDT Hardware Basics • Driver Software <ul style="list-style-type: none"> ○ Sign In and Out ○ Pre-Trip Inspection ○ Going on Break ○ Switching Trips and Drivers • Other Dispatch Tools <ul style="list-style-type: none"> ○ Bunching Screen ○ Daily Schedule Performance
Duration	3.0 hours
Instruction	Instruction will take place in person and consist of standard training decks, live presentations of our software, as well as interactive demonstrations of our tools. In the event in-person training is not possible, the training can be held virtually.
Evaluation	<p>Students will be evaluated immediately following the training by an online test. In addition to testing students on the content of the course, we'll survey students about their training experience so we can continue to improve our training program.</p> <p>If the results of the evaluation suggest students require additional support, either on a specific topic or across the module, we can provide additional resources and customized training.</p>
Location(s)	Agency conference room or training center; virtual (optional)
Resources Required	Internet, monitor or projector and screen

5.17.4.2 MODULE 2: OPS

In this training module, we will explore how students can use SYNC OPS reporting technology to understand service trends and other historical information. We will detail how students who regularly work with service data can use the Insights reporting tool to easily create custom reports. Students will also be equipped to save and export reports for presentations, reports, or further analysis.



OPS Insights Reporting Tool

Objective	To allow students to explore and share service trends and historical information with GMV reporting technology.
Audience	Supervisors, Analysts & IT Personnel, Management, Agency Trainers <i>Recommended Maximum Class Size: 12</i>
Content	<ul style="list-style-type: none"> • Overview of OPS Tools • Insights <ul style="list-style-type: none"> ○ Navigating Insights ○ Export • Custom Reports <ul style="list-style-type: none"> ○ Builder ○ Dashboards • Stop Times • APC Accuracy • Other Reports <ul style="list-style-type: none"> ○ System Activity ○ Fare Count Analysis and Audit ○ Service Statistics
Duration	2.0 hours
Instruction	Instruction will take place in person and consist of standard training decks, live presentations of our software, as well as interactive demonstrations of our tools. In the event in-person training is not possible, the training can be held virtually.
Evaluation	<p>Students will be evaluated immediately following the training by an online test. In addition to testing students on the content of the course, we'll survey students about their training experience so we can continue to improve our training program.</p> <p>If the results of the evaluation suggest students require additional support, either on a specific topic or across the module, we can provide additional resources and customized training.</p>
Location(s)	Agency conference room or training center; virtual (optional)
Resources Required	Internet, monitor or projector and screen

5.17.4.3 MODULE 3: PLAN

In this training module, we will detail how service and schedule information is incorporated and updated in the GMV system. This session is intended for those people who routinely work with scheduling and service adjustments. Following the training, students will understand how to ensure GMV technology accurately reflects their service and schedule.

Manage Routes
[+ add a route](#) [Show Archived Routes](#)

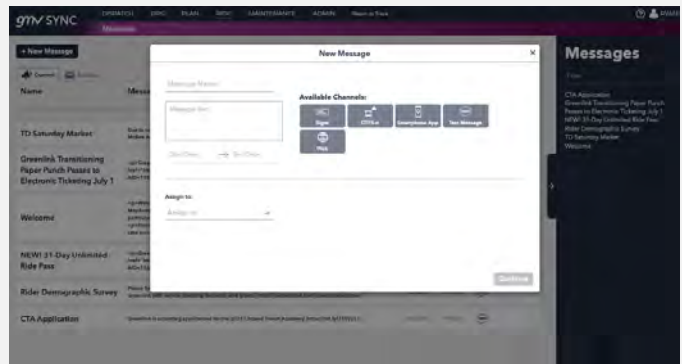
Name	Type	Direction Type	Public?	Perimeter	Stops	Schedule	Properties	Copy	Edit	Annunciator	Cleanup Tool	Archived?
501 S. Pleasantburg	Base	---	Yes	---	125	---	---	N/A	N/A	---	N/A	---
501 S. Pleasantburg	R Loop	Yes	N/A	42	---	---	---	N/A	N/A	---	Cleanup	---
501 S. Pleasantburg Effective 10-26-20	R Loop	No	N/A	42	None	---	---	N/A	N/A	---	Cleanup	---
501 S. Pleasantburg - TD Market	R Loop	Yes	N/A	41	---	---	---	N/A	N/A	---	Cleanup	---
502 White Horse	Base	---	Yes	---	34	---	---	N/A	N/A	---	N/A	---
502 White Horse	R Loop	Yes	N/A	34	---	---	---	N/A	N/A	---	Cleanup	---
503 Poinsett	Base	---	Yes	---	64	---	---	N/A	N/A	---	N/A	---
503 Poinsett	R Loop	Yes	N/A	32	---	---	---	N/A	N/A	---	Cleanup	---
503 Poinsett Effective 06-01-20	R Loop	No	N/A	32	None	---	---	N/A	N/A	---	Cleanup	---
504 Anderson	Base	---	Yes	---	39	---	---	N/A	N/A	---	N/A	---
504 Anderson	R Loop	Yes	N/A	39	---	---	---	N/A	N/A	---	Cleanup	---
505 Rutherford	Base	---	Yes	---	28	---	---	N/A	N/A	---	N/A	---

PLAN Manage Routes Tool

Objective	To allow students to incorporate accurate, up-to-date service and schedule information in GMV technology.
Audience	Supervisors, Analysts & IT Personnel, Agency Trainers <i>Recommended Maximum Class Size: 6</i>
Content	<ul style="list-style-type: none"> • Overview of PLAN Tools • Schedule Validator and Import • Service Packages • Routes <ul style="list-style-type: none"> ○ Manage Routes ○ Manage Route Stops • Manage Perimeters • Manage Alerts <ul style="list-style-type: none"> ○ Speed ○ Location • Primer on GTFS Static and GTFS Realtime
Duration	2.0 hours
Instruction	Instruction will take place in person and consist of standard training decks and live demonstrations of our software. In the event in-person training is not possible, the training can be held virtually.
Evaluation	<p>Students will be evaluated immediately following the training by an online test. In addition to testing students on the content of the course, we'll survey students about their training experience so we can continue to improve our training program.</p> <p>If the results of the evaluation suggest students require additional support, either on a specific topic or across the module, we can provide additional resources and customized training.</p>
Location(s)	Agency conference room or training center; virtual (optional)
Resources Required	Internet, monitor or projector and screen

5.17.4.4 MODULE 4: RIDE

In this training module, we will explore how GMV technology can be harnessed to effectively communicate service information to riders. Students will understand how to use GMV technology to draft messages for future use across multiple channels or instantly share critical service updates. Students will also learn how to manage voice announcements and destination signs on vehicles.

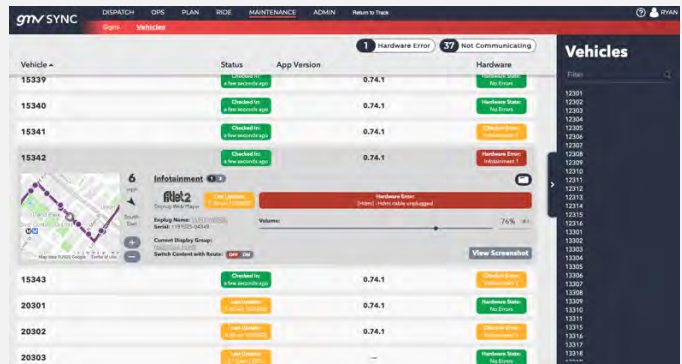


RIDE Messages Tool

Objective	To allow students to effectively communicate service information with their riders using SYNC MESSAGES technology.
Audience	Dispatchers, Management, Customer Care Agents, Agency Trainers <i>Recommended Maximum Class Size: 12</i>
Content	<ul style="list-style-type: none"> • Overview of RIDE Tools • Manage Portal • Messages <ul style="list-style-type: none"> ○ Signs ○ GTFS Realtime ○ Smartphone App ○ Text Message ○ Web • Manage Vehicle Destination Signs • In-Vehicle Communication <ul style="list-style-type: none"> ○ AVAS ○ Public Service Announcements • Manage Digital Signs
Duration	2.5 hours
Instruction	Instruction will take place in person and consist of standard training decks and live demonstrations of our software. In the event in-person training is not possible, the training can be held virtually.
Evaluation	Students will be evaluated immediately following the training by an online test. In addition to testing students on the content of the course, we'll survey students about their training experience so we can continue to improve our training program. If the results of the evaluation suggest students require additional support, either on a specific topic or across the module, we can provide additional resources and customized training.
Location(s)	Agency conference room or training center; virtual (optional)
Resources Required	Internet, monitor or projector and screen

5.17.4.5 MODULE 5: MAINTENANCE

In this training module, we will explore how students can use SYNC MAINTENANCE technology for remote diagnostics. Specifically, students will learn how to use GMV tools to understand the status of vehicles and digital signs without physically accessing the hardware. This training can help improve the efficiency of maintenance personnel by allowing them to focus on hardware that needs attention.



MAINTENANCE Vehicle Tool

Objective	To allow students to understand the status of vehicle and digital signs hardware as they relate to GMV technology.
Audience	Maintenance Personnel, Agency Trainers <i>Recommended Maximum Class Size: 12</i>
Content	<ul style="list-style-type: none"> • Overview of MAINTENANCE Tools • Common Maintenance Issues • Vehicle Status <ul style="list-style-type: none"> ○ Status ○ App Version ○ Hardware • Signs <ul style="list-style-type: none"> ○ Stop ○ Type ○ Version ○ Check In ○ Hardware
Duration	1.0 hour
Instruction	Instruction will take place in person and consist of standard training decks and live demonstrations of our software. In the event in-person training is not possible, the training can be held virtually.
Evaluation	<p>Students will be evaluated immediately following the training by an online test. In addition to testing students on the content of the course, we'll survey students about their training experience so we can continue to improve our training program.</p> <p>If the results of the evaluation suggest students require additional support, either on a specific topic or across the module, we can provide additional resources and customized training.</p>
Location(s)	Agency conference room or training center; virtual (optional)
Resources Required	Internet, monitor or projector and screen

Additional on-board maintenance training is performed during the installation process by working side by side with maintenance personnel during vehicle surveys, installations, and validation tests.

5.17.4.6 MODULE 6: ADMIN

In this training module, we will detail how students can manage their users, drivers, and emergency contacts within the GMV system. We will also outline how students can ensure their agency information is accurately reflected within GMV software, as well as how to contact Support for assistance as needed.



ADMIN Manage Users Tool

Objective	To allow students to manage their user and agency information within GMV technology.
Audience	Analysts & IT Personnel, Management, Agency Trainers <i>Recommended Maximum Class Size: 12</i>
Content	<ul style="list-style-type: none"> • Overview of ADMIN Tools • Manage Users <ul style="list-style-type: none"> ○ Roles ○ Permissions • Manage Drivers • Emergency Contacts • Agency Information • Customer Success <ul style="list-style-type: none"> ○ Submitting a Support Ticket ○ Account Manager
Duration	1.0 hour
Instruction	Instruction will take place in person and consist of standard training decks and live demonstrations of our software. Training will also consist of in-person or virtual introductions of the Customer Success team, including the Account Manager. In the event in-person training is not possible, the training can be held virtually.
Evaluation	<p>Students will be evaluated immediately following the training by an online test. In addition to testing students on the content of the course, we'll survey students about their training experience so we can continue to improve our training program.</p> <p>If the results of the evaluation suggest students require additional support, either on a specific topic or across the module, we can provide additional resources and customized training.</p>
Location(s)	Agency conference room or training center; virtual (optional)
Resources Required	Internet, monitor or projector and screen



5.18 Customer Support

You can rest assured that you won't face surprise bills or additional fees for customer support. We want our clients to get the most out of our technology so they will help promote our company, so we don't nickel and dime clients for customer support assistance. Our goal is to ensure your staff are happy with our system, so we will provide whatever support is needed to that end.

You can open a support ticket by e-mailing support-na@gmv.com, logging into our customer portal or calling our support line any time, day or night. For after-hours support, calls are routed to a 24x7 call center, and based on triage/urgency, the call center will get GMV staff to assist via a call tree that includes customer success team, software engineers, and executives. We have customer support associates in many time zones, and we stagger shifts so that we can have broader coverage for our 24-hour a day transit clients.

5.18.1 HOW DOES CUSTOMER SUPPORT WORK?

- You can open a support ticket by e-mailing support-na@gmv.com or logging into our customer portal any time, day or night.
- GMV has an online knowledgebase with training manuals, videos, and step by step guides to help your staff get educated, solve common problems, and ask questions when they need it.
- Need help now? Call us at 866-383-4418.
- Transit is a 24x7 operation, and so is GMV. If you have a critical issue after hours, our customer support staff will get the problem fixed, fast. Our support levels are detailed further later in this section, but issues of all levels will receive a reply within one business day and Level 1 or Level 2 issues within 20 minutes.
- Support is given through email, phone, and screen share as necessary.
- GMV doesn't charge extra for support, there isn't any limit, and our folks know what they're talking about. This proposal includes names, experience and roles of the team that you'll be working with.

All support is included in the recurring maintenance fees associated with our services (technical, help desk portal, after hours, and software upgrade). There are no per-incident or hidden support charges. We do not differentiate between technical or general questions. Instead, when a customer submits a support ticket, a category will be required (Level 1-4).

Support Level/Issues	Support Hours & Response Type	Response Policy
<u>Level 4</u> Software Issues and Questions not impacting vehicles	Phone, Email Self-Help Portal Available 24x7	GMV will reply within one (1) business day to any Level 4 ticket submitted.
<u>Level 3</u> Issues impacting <3 vehicles Issues impacting operational tools like dispatch	Regular Business Hours: 7:00AM – 7:00PM PST M-F Phone, Email Self-Help Portal Available 24x7	GMV will reply within Eight (8) hours from the time of ticket submission during regular business hours, and up to Twelve (12) hours outside regular hours.
<u>Level 2</u> Issues impacting >3 vehicles simultaneously Issues impacting more than one operational tool	24 x 7 call center Phone, Email Self-Help Portal Available 24x7	GMV will reply to Level 2 tickets within 20 minutes during regular business hours and within One (1) hour outside regular hours.
<u>Level 1</u> Issues impacting all vehicles System-wide downtime preventing use of all operational tools	24 x 7 call center Phone, Email, and Portal Direct Involvement by Executives	GMV will normally reply within 20 minutes to all Level 1 issues, and provides a Level 1 Escalation Policy in addition to our normal Escalation.



GMV provides its customers with a 24/7 customer support phone line that automatically routes to our office during normal business hours and to a fully staffed and trained call center after business hours. Call center representatives can categorize the support issue and take the necessary action, including calling GMV on-call personnel after hours to start working on a resolution.

GMV also provides a 24/7 customer support self-service portal that provides: articles with general information on all of our systems, wiring schematics, equipment pictures, equipment troubleshooting, and training videos.

This portal is also used for submitting support tickets and following up on any open tickets. This portal has automated triggers to ensure every ticket is handled in a timely manner. Respecting response times provided on the above table, the system is configured to trigger automatic escalation steps as delineated below.

5.18.2 STANDARD SUPPORT ESCALATION POLICY

Once a support ticket is submitted, based on the above response times, an automated reminder will be sent to the support team. If a ticket is not replied to once the reminder is sent to the support team, within an hour, an automated message will be sent to the Operations Manager. If the message sent to the Operations Manager is not replied to within 1 hour, an automated message will be sent to the VP of Operations.



5.19 Maintenance and Warranty Plan

5.19.1 LONG TERM SUPPORT FOR HARDWARE

Our business is built on long term customer relationships. Los Angeles DOT (CA) has worked with us for over 10 years and through many contract renewal cycles. We approach each new project with a goal of making it a 10+ year relationship.

We expect that we will be on the hook to support our technology for a long time. Our system architecture is designed to allow the hardware and software components to adapt and evolve over time as new vehicles come into the fleet, new functional requirements emerge, older technology is obsolete or end of life, etc.

We've never twisted a client's arm and forced them to upgrade onboard components, rather we regularly counsel our clients on their technology roadmaps and help them plan for replacements and upgrades as needed. Usually, a desire for an upgrade is due to enhanced functionality that is only available with new equipment (e.g. more accurate APC sensors) and not due to the failure of an older component. The 12+ year service life of a transit bus is eons in technology time, and we help our clients future proof their systems and stay on top of the latest capabilities.

5.19.1.1 Hardware Warranty

GMV offers a 1-year standard warranty on all hardware except the GMV Hub, which carries a 2-year standard warranty. The warranty includes parts and shipping in the event of a defective unit. GMV can provide, upon request, pricing for extended warranty on most systems.

The warranty does not cover damage found to be the result of external causes such as misuse, abuse, accident, natural disasters, acts by third parties, or negligence (e.g., liquids spilled on equipment, exposure to rain, or damage caused to equipment during the return). Standard warranties come at no additional cost with the equipment and are relative to the date of installation unless otherwise specified.

If a hardware issue is reported and troubleshooting procedures prove unsuccessful then steps will be initiated (as outlined in the table below), based on the warranty status of the malfunctioning equipment, to ensure replacement equipment is made available.

Equipment Warranty Status	Replacement Equipment Procedures
Covered (Standard or Extended)	<p>A Return Merchandise Authorization ("RMA") will be processed. Replacement equipment will ship within two (2) business days* from the date of authorization, with delivery scheduled no more than five (5) business days from the date of authorization.</p> <p><i>*Shipping delays will be communicated as soon as they are known and generally within the first two (2) business days from the date of authorization</i></p>
Out-of-Warranty	<p>A quote for replacement equipment will be provided. Replacement equipment will ship within two (2) business days from the date that the PO or equivalent form of purchase authorization is received.</p>

GMV offers an optional extended warranty through year 5. We have included pricing for your consideration in the "Detailed Price Proposal" section of this proposal.



5.19.1.2 RMA Timelines and Procedure

The equipment installed in your buses includes wiring diagrams and manuals. If your mechanics want to troubleshoot the issue themselves, that information is available to them anytime.

Our customer portal includes vehicle health monitoring utilities that let you see details on communications health, last GPS update, and even the real-time status of your APC door signals.

If it turns out you really need replacement hardware that is not available from your local spare parts inventory, our customer support staff will set you up with an RMA and overnight shipping within 48 hours for any critical communication components. For non-communication, non-critical components, the RMA will include ground shipping. We will send you a working unit so that you can have your system back up and running immediately, rather than waiting for us to repair the current unit. The non-working unit should be returning to GMV upon receipt of the replacement.

If your equipment needs on-site service, GMV has in-house field technicians that can come out to your site to service the equipment. They are specifically trained on how to install, troubleshoot, replace and service every component of our system, and they can train your maintenance folks when they're on site.

5.19.1.3 Optional Maintenance Service Plan

Over the years, we've found that many smaller agencies do not have the resources to keep up with the long-term maintenance on their ITS equipment. Often someone can complete minor repairs as problems arise, but this person is usually wearing many hats at the agency and is typically playing whack-a-mole as issue come up, with general upkeep suffering as a result. To offer further support to our clients, we developed our optional Maintenance Service Plans.

Maintenance Service Plans are comprised of:

Onsite Service Visits: We will work with the agency to develop an annual schedule for a GMV Field Technician to visit your facility. Common frequencies are twice per year or once per quarter. The goal of each visit is to fix issues with the hardware and ensure that all equipment is in ideal operating condition. We will also complete preventative maintenance, firmware updates, passenger counter calibration, etc., during these visits with the goal of prolonging the life of the equipment

Hardware Replacement Budget: When hardware reaches the end of its standard warranty period, agencies can option to purchase extended warranties, or those with an active Maintenance Service Plan can define a set budget that can be used towards replacement hardware. This budget is pre-paid, allowing your agency to develop a firm annual budget for the maintenance of your CAD/AVL system, and allows for quick access to replacement parts in the same manner that you would request replacements for equipment under warranty. The Hardware Replacement Budget allows GMV staff to arrive on-site with an inventory or replacement parts during Service Visits, preventing the need for a PO. Customers with an active Maintenance Service Plan also receive preferential pricing on replacement parts compared to ad-hoc purchases. Any unused portion of the Hardware Replacement Budget can be used to purchase spares or can be applied to the next year's MSP.

GMV has included pricing for the optional, annual Maintenance Service Plan for NCTSD's consideration.



5.19.2 LONG TERM SUPPORT FOR SOFTWARE

5.19.2.1 Software as a Service

Our cloud-based is always evolving and improving, and clients who have been with GMV for years are the beneficiaries of a technology platform that gets better over time.

We don't make a big deal out of version numbers for our software because all clients are automatically updated to the latest version and there is never a charge to upgrade. All GMV clients benefit from the wisdom and experience of each other because the GMV software is constantly evolving and improving. Our software is updated every two weeks to improve functionality, eliminate software bugs, and expand the capabilities of the software to meet the novel requests of our clients. When we make an improvement for one client, all our clients share the benefit at no additional cost.

These upgrades are delivered over the air and require no action or downloads on the part of the client. If there is the potential for an upgrade to interrupt a client's pre-existing workflows, we will work with you in advance to avoid disruption by training and planning for a cutover or ensuring the prior workflow is still available during a transition period.

This approach to software development is fundamentally different from that of other ITS vendors who subscribe to antiquated notions of version numbers, upsells for additional features, and planned obsolescence. Many other ITS vendors offer a "vendor hosted" option by simply taking software designed for a local server and running it remotely. This approach is worse than running the software on a local server because it introduces delays from the remote access application. GMV's system has been designed for the cloud from day one, and we leverage the cloud architecture to offer advanced features and service. Our approach to software matches our commitment to customer service, and both are aligned to enhance long term customer relationships.

When upgrades include only back-end improvements, documentation is kept internally. This documentation is not published because the changes do not affect the usage of the system by the end-user. When updates include additional features, reports, or a change in behavior of the dispatch software or driver interface, updates are documented and published via email to registered users.

This is the primary benefit of software-as-a-service – you don't buy something that degrades over time, you're paying for access to the latest and greatest version of something that is always improving.

5.19.2.2 Open Innovation

We embrace an open innovation model where third-party companies help make our system better by offering their own products and services that can "plug in" to our architecture. For example, our digital pre-trip inspection service comes from a third party, but it is seamlessly integrated into our product so that we can market it and support it as our own. This gives us access to a broader base of software innovation than we could maintain just with our own internal engineering team.

5.19.2.3 Product Roadmap and "Custom Features"

Our cloud-based software improves over time by accumulating new features. Many of these are built with specific clients in mind, and those clients help shape the requirements and design. But new features are never "custom" in that they only apply to a single client – if we are going to invest in building a new capability, we will do it in such a way that it becomes a product we can offer broadly to the industry.

This approach means all of our clients share the costs for new features (paid by the normal annual service fees), and as a result they are less expensive to build, maintain and support. For any project requirements that our system doesn't meet today, we commit to develop the necessary capabilities within the proposed project schedule. We also commit to continue developing these and other features on an ongoing basis so that your system gets better with age. We try to take a broad view of new feature development as something that benefits our Product as a whole.

6 TAB E - PRODUCT FUNCTIONALITY

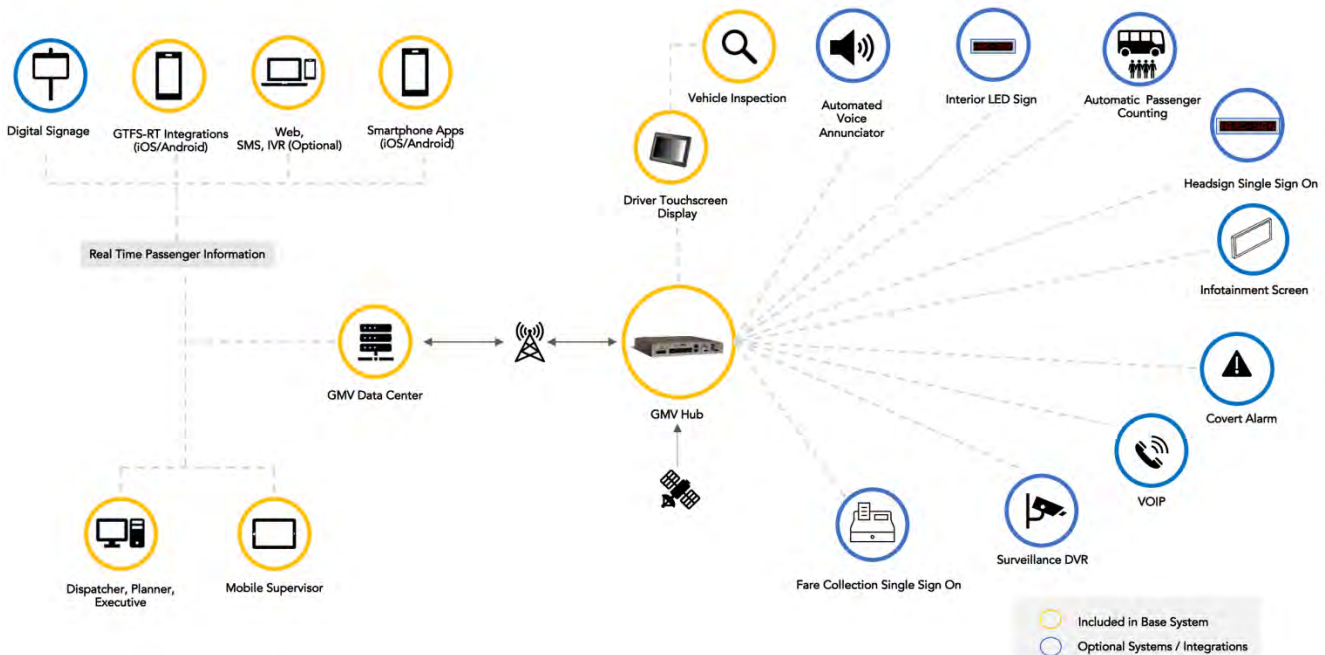
6.1 Understanding of the Project Scope

GMV is excited at the prospect of working with Nevada County Transit Services Division as your Intelligent Transportation System provider and strategic partner in leveraging existing and emerging technology to enhance the service you provide your riders. Launching a new CAD/AVL system is a large investment, not only financially but also of your staff's valuable time. Because we have worked with agencies in size and scope similar to the Nevada County Connects, we can help navigate challenges, identify and mitigate risks, and immediately deliver value to your staff and your riders with a reliable, turnkey system. We are confident we can help NCTSD achieve their goals to:

- Provide safe, convenient, reliable, and affordable fixed-route transit services and specialized paratransit services to the residents of Western Nevada County.
- Implement a system that allows NCTSD staff to streamline scheduling processes across both Fixed Route and Demand Response services, improve data capture and accuracy, and reduce staff time required to manage operations, while at the same time reducing overall system costs.
- Improve communication with community by providing riders and agency partners with access to the system via web-based and mobile platforms.

SYSTEM OVERVIEW

This diagram provides an overview of GMV technology on and off the bus. Yellow highlighted items are included in the base system. Blue highlighted features are capabilities of the GMV system, some of which are included in our proposal as optional.

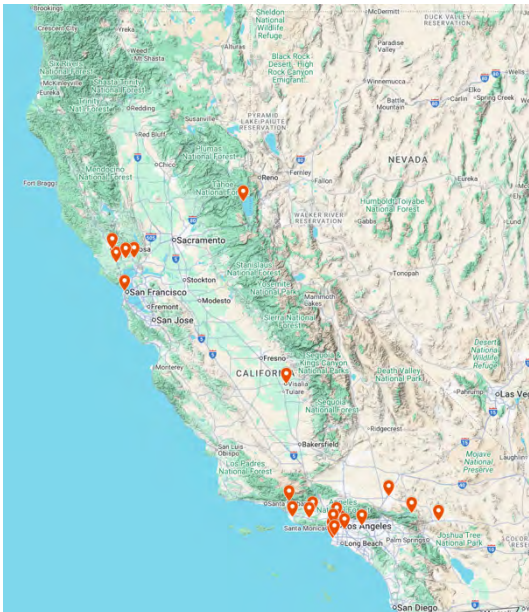


EXPAND FUNCTIONALITY WHILE REDUCING REDUNDANT SYSTEMS

NCTSD has a lot of systems in play on their vehicles – RouteMatch, Samsara, Swifly. In our experience, helpful tools that don’t integrate with each other eventually devolve into redundant, costly burdens that don’t deliver an appropriate return on investment. Rather than contracting more vendors to fill the gaps within the existing ecosystem, GMV proposes to provide a reliable, accurate, integrated solution.

Our onboard hardware, dispatching software, and real-time passenger information suite will render RouteMatch, Samsara, and Swifly obsolete. In this proposal, we have detailed how GMV intends to integrate with existing hardware and build upon the foundation of software being used for scheduling (Remix) and passenger communication (Transit). As NCTSD evaluates how GMV meets and fulfills the requirements as outlined in this RFP, we encourage you to also calculate the savings – both time and money – in store for your agency as you can offload some of the current solutions in place.

BASED IN CALIFORNIA – PROVEN HISTORY OF SERVING THE GOLDEN STATE



GMV’s headquarters and 50% of our staff, including NCTSD’s Project Manager, are located in California. If given the opportunity to work together, your project team will be comprised of Californians – from JoanaKarla Lopez (Project Manager) in Los Angeles to Tony Chan (Lead Field Technician) in Sacramento, back to Emilee Bena (Director of Customer Success) in Redondo Beach.

Following the initial deployment, you will continue to work with your local team in a number of ways. With Customer Support staff located in California, you don’t have to navigate time zones to get in touch with a real person when you have a question, and having a field technician just an hour away means that you can expect to see a cost and time savings in GMV staff visiting your facility for new projects or troubleshooting any issues that may arise.

Working with GMV means you can rest assured that when you need us, a real person is always just a phone call, short flight, or even shorter drive away.

GMV works with the following transit agencies and universities in California:

CAD/AVL Provider

- Big Bear
- Blythe
- Burbank
- Cal Poly Pomona
- Cedars-Sinai Medical Center
- Commerce
- LADOT
- Lawndale
- LAX
- Morongo Basin
- Napa
- Ojai
- Oxnard
- Petaluma
- Presidio Trust
- Redondo Beach
- Santa Rosa
- Simi Valley
- Sonoma
- Tahoe
- Thousand Oaks
- Victorville
- Visalia

Digital Signage Provider

- LA Metro
- West Hollywood



6.2 Integration with Agency's Current Technology/Software

RouteMatch

GMV will replace RouteMatch as NCTSD's CAD/AVL solution provider. As detailed later in this section of our proposal, GMV will:

- Produce, publish, ingest, and manage NCTSD's GTFS and GTFS-RT feeds
- Provide all hardware required to reliably and accurately track vehicle location
- Provide cloud-based software for the efficient and effective management of Fixed Route operations
- Empower bus operators to collect ridership data in an efficient manner
- Provide robust reports through our Insights and Insights Builder Business Intelligence tools
- Open a line of communication between NCTSD administrative staff and bus operators
- Enable digital pre- and post-trip vehicle inspection
- Provide multi-channel rider communication tools and support real-time rider communication
- Build upon systems already in use at NCTD by enabling Remix's Day-of-Operations module to manage driver bids and assignments

Samsara

GMV's system will help NCTSD reduce redundancy and save money. Our purpose-built onboard Vehicle Logic Unit hardware will allow your agency to reliably track Fixed Route service vehicles and our light-weight solution designed for tracking non-service vehicles can be installed anytime, meaning NCTSD can offboard Samsara upon the launch of GMV's system.

Swiftly

GMV prioritizes passenger communication – anytime, anywhere. We understand that building trust with your ridership is critical, so we provide a suite of real-time passenger information features. We will manage Nevada County Connects' GTFS and GTFS-RT feed, meaning that your riders can access real-time bus locations, service alerts, and arrival predictions across channels – Transit App, Google Maps, Apple Maps, digital signage, IVR/SMS, and other NCTSD preferred methods – by leveraging our APIs. For your staff, we offer a standard multi-channel rider communication tool, so service alerts can easily be sent to your riders from our cloud-based software. These offerings render Swiftly's services redundant, meaning NCTSD can offboard this solution and save money as a direct result of this procurement.

R1900 Cradlepoint Routers

GMV proposes to utilize NCTSD's existing Cradlepoint routers to provide network connectivity to GMV's system. This is standard practice for our team and only requires a port be designated and configured for our system. Your assigned Project Manager will coordinate the steps on how to do this directly with your agency during the Design and Configuration phase of the project. Should your agency ever wish to upgrade routers to a newer model or outfit new vehicles with Cradlepoint routers, this can be done through GMV.

Verizon Wireless Wi-Fi

NCTSD has expressed their desire to continue providing Wi-Fi via Verizon Wireless. GMV will therefore not provide Wi-Fi and will not interact with the current solution. Should your agency be interested in providing Wi-Fi via GMV, we can deploy that as part of our offering.

Hanover AVA

NCTSD has expressed their desire to continue providing onboard announcements via Hanover. GMV will therefore not provide an Automated Voice Annunciator System, however this is available to your agency at no cost in the future if desired.

Hanover TFT Signage

NCTSD has expressed their desire to continue utilizing Hanover TFT signage. GMV will therefore not install our line of interior LED signs and will not interact with the current solution.



Hanover Headsigns

NCTSD has expressed their desire for their future CAD/AVL provider not to integrate with the Hanover Headsigns installed on their fleet. GMV will therefore not provide our Single Sign On feature. Should your agency decide they are interested in Single Sign On in the future, GMV is able to provide this integration at no cost to the agency.

Kuba Contactless Fare System Validators

GMV understands that NCTSD has provided their riders with the option to pay their fares via Kuba's contactless fare system validators and through an open loop payment system. As specified in this RFP, GMV will not interact with the fare system validators. To support open loop payments through Transit App, GMV will facilitate NCTSD uploading their own GTFS files, including the Fares v2 files, to our system. As a result, the Fares v2 files will be published and available in GMV's GTFS directory for NCTSD.

Remix Scheduling Software

In reviewing NCTSD's current usage of Remix, we understand that:

1. NCTSD currently contracts with Remix (Via) for use of their Public Transit Planning Software
2. NCTSD currently has access to and uses Remix Scheduling software through Cal-ITP for 5311 recipients
3. NCTSD is seeking use of Remix's Day-of-Operations module to satisfy some requirements outlined in the Bid Systems portion of this RFP

GMV has included pricing for Remix's Day-of-Operations module. In addition, we have provided optional pricing for Remix's Scheduling software, should NCTSD wish to purchase this solution as part of this procurement under their contract with GMV. Depending on the solution selected to satisfy Category B of this procurement, GMV has also provided optional pricing for Remix's On-Demand Planning software.

GMV has a schedule import and validation tool that can be configured to import schedule files from Remix. Once the file is in the CAD/AVL system, the CAD/AVL system will become the source of truth for public facing GTFS that is shared with 3rd parties. In this way, all last-minute changes to routes, stops, and service will be reflected in the public GTFS and GTFS-RT.

Our base proposal includes the ability to import a schedule using the GTFS+RunID format. Remix natively support this standard-compliant schedule format with no special integration fees.

We can also export actual route segment running times from CAD/AVL for import into the Remix scheduling software to enable the scheduling software to use real world historical performance when optimizing future schedules. We can support this via our API and also bulk stop times export tools.

Transit App

While GMV provides our own, white-labeled iOS and Android rider mobile app, we think it's more effective for an agency to use the best passenger communication app for their unique operations. We understand that NCTSD currently works with Transit App – we love working with them too. So, rather than re-invent the wheel, we will manage your agency's GTFS and GTFS-RT feeds and pass vehicle location, arrival predictions, service alerts, and detour information data to Transit App. For your consideration, we have provided optional pricing for NCTSD to purchase Transit App's "Royale for Agencies" offering and their On-Demand Service integration under their contract with GMV.



Future Demand Response Solution

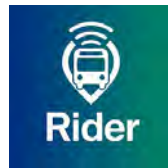
GMV has had the pleasure of working with NCTSD and Paratransit Services staff for over 10 years. As agency and operator staff utilized our Easy Rides solution to empower their community with mobility through Nevada County Now, we have aimed to support them with dedicated, top quality customer service. We understand that NCTSD’s needs have evolved and that your agency is seeking a new Demand Response solution. GMV will support the transition from Easy Rides to the new solution and, if selected as your Fixed Route CAD/AVL provider, is prepared to work alongside any Demand Response software NCTD selects as part of this procurement.

In our nearly 20 years serving transit agencies in North America, we have worked with a number of Demand Response solutions, including Ecolane, RideCo, Spare, and Via. Our primary interaction with each is producing and passing GTFS and GTFS-RT feeds to the paratransit software provider to enable a truly multi-modal trip planning rider application.

We encourage you to speak with GMV clients who work with a variety of Demand Response solutions to discuss how our products interact, as well as their agency’s experience with each vendor.



Waukesha Metro (Waukesha, WI)
Brian Engelking
Transit Manager
bengelki@waukesha-wi.gov
Solution: Ecolane



Rider Transit (Concord, NC)
Craig Meeks
Transit Planner & Technology Coordinator
meeksbc@concordnc.gov
Solution: RideCo



Mountain Line (Flagstaff, AZ)
Heather Dalmolin
CEO
hdalmolin@mountainline.az.gov
Solution: Spare



BATA (Traverse City, MI)
Erik Falcon
Operations Project Manager
falcone@bata.net
Solution: Via

6.3 Sync Dispatch Software (CAD/AVL)

6.3.1 DISPATCH LIST VIEW

The dispatch list view will enable the dispatcher to sort by various attributes, including: late/early arrival severity. This view will also group any vehicles that are off-route or not signed in correctly, so that you can always keep an eye out for “problem buses” at the top of the list.

Once you’ve selected a particular row (vehicle), an expanded drop-down card will display the individual features for that particular vehicle.

The oval buttons across the top display persistent alerts, which are always visible to the dispatcher. These alerts show vehicles that are currently in a particular error state, and selecting each of those alerts will automatically filter the list to show vehicles in that current state, and individual details about each vehicle.

The screenshot displays the gmV SYNC Dispatch List View interface. At the top, there are navigation tabs: DISPATCH, OPS, PLAN, RIDE, MAINTENANCE, ADMIN, and Return to Track. Below these are sub-tabs: Map, List, and Assignments. The main area shows a list of vehicles with columns: Vehicle, Run, Trip, Driver, Route, Load, and Status. A callout box points to the 'Sort vehicles by various attributes.' text. Another callout box points to the expanded details for vehicle MB-501, stating 'Rows expand to show details about the selected vehicle.' The expanded view for MB-501 shows a map, upcoming stops (Queen Ka'ahumanu Center), and connections. The interface also features alert buttons for 'Off Route' (2) and 'Early' (1) at the top right.

gmV SYNC DISPATCH OPS PLAN RIDE MAINTENANCE ADMIN Return to Track

Map List Assignments

2 Not Signed In 6 Off Route 7 Early 13 Late 16 Errors

Vehicle	Run	Trip	Driver	Route	Load	Status
15340	208	tevx73ckv 4:08 pm	DM Damon Metters	DASH B	0%	+3
15338	226	gpdcspbod 3:41 pm	DH Danny Ho	DASH A	7%	+18
12306	276	83qyoszqa 3:55 pm	DP Dermsey Paiz	DASH E	0%	+12
15310	278	kncqaxury 3:50 pm	JV			
15313	279	esicz7gzy 3:30 pm	JS Sanchez			

Filter to those vehicles that need attention with dynamic status pills.

Dispatchers can access multiple action cards, like messaging the driver, within expanded vehicle rows.

Message Driver

No message history to display.

Passenger says she left her jacket on the vehicle. Can you check for it at your next break?

Send

gmV SYNC DISPATCH OPS PLAN RIDE MAINTENANCE ADMIN Return to Track

Map List Assignments

13 Not Signed In 1 Off Route 1 Early 3 Late

Vehicles

Vehicle	Run	Trip	Driver	Route	Load	Status
304						
1914	3-F-502-...	424 3:30 pm	JD Jarrett Dawsc	502 White Horse	0%	
306	3-F-503-...	438 3:30 pm	BW Brend Williar	503 Poinsett	7%	
303	3-F-504-...	452 3:30 pm	GZ Geralc Zunigi	504 Anderson	19%	
302	3-F-505-...	466 3:30 pm	JR Julius C. Rhone	505 Rutherford	0%	
308	3-F-506-...	480 3:30 pm	TB Thoru Betze	506 Woodside	10%	
311		494			38%	
312					131%	0
401	3-F-508	522	SP Stever	508 E. Market	12%	

Open the sidebar to filter vehicles by route, pattern, run, trip, driver, or status.

Filter By

"Pleas"

Routes

- 501 S. Pleasantburg
- Effective July 1 - 501 S Pleasantburg
- Route 01 - Pleasantburg, Cleveland

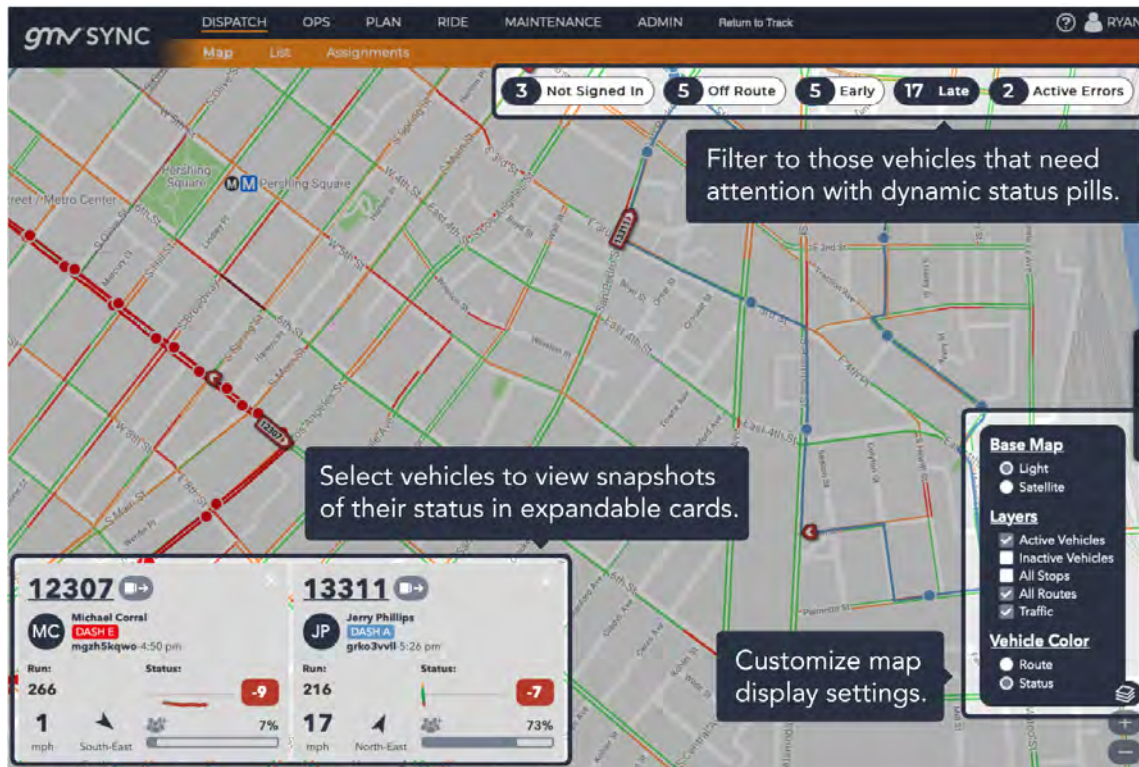
Patterns

- 501 S. Pleasantburg
- 501 S. Pleasantburg - TD Market

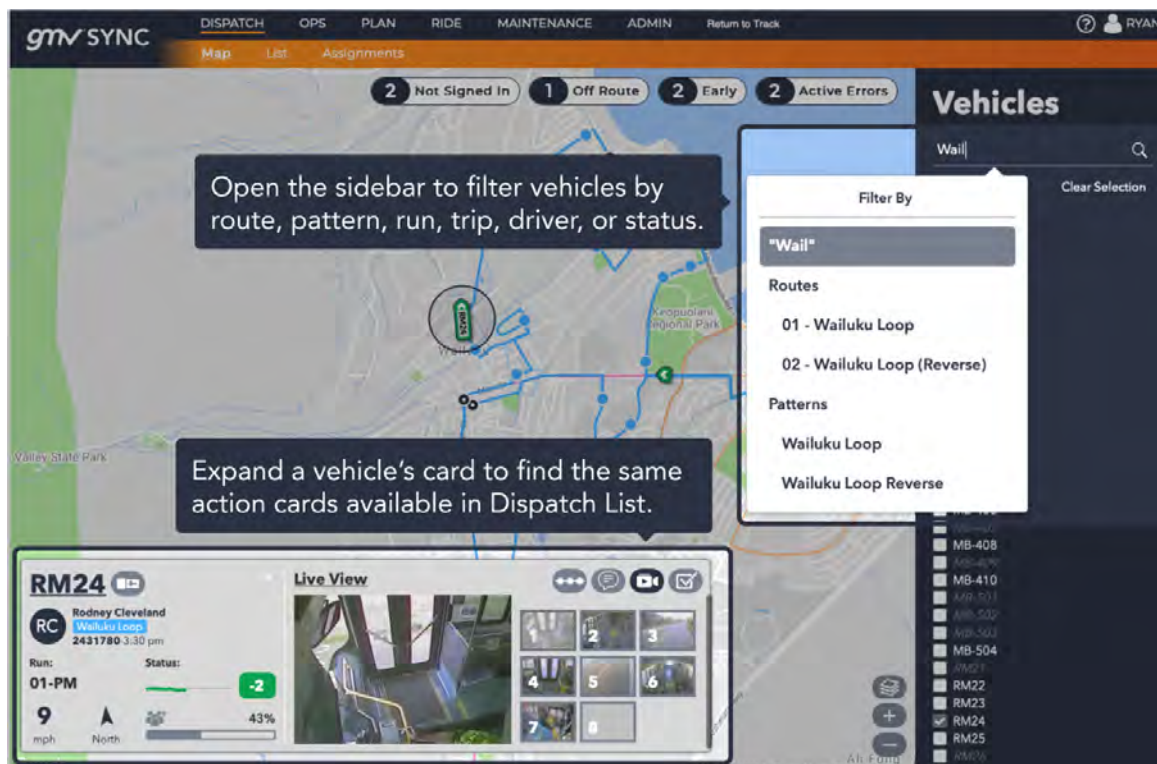
Tags on a route name show if a vehicle is off route or deadheading.

6.3.2 DISPATCH MAP VIEW

The dispatch map provides the same data as Dispatch List, but in a Google Maps interface.

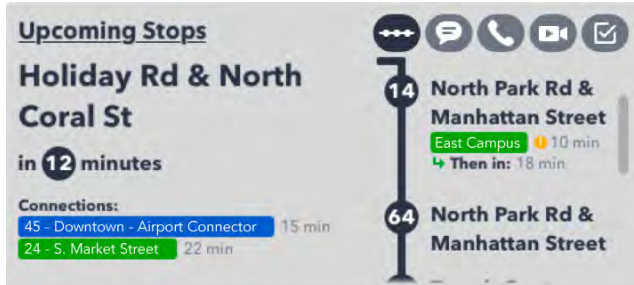


Consistent use of STATUS PILLS and ACTION CARDS allows for seamless use of dispatch tools for users switching between LIST and MAP views.



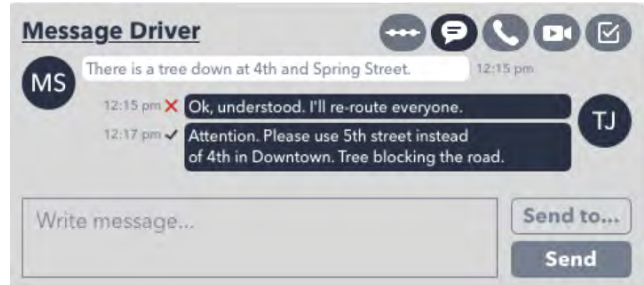
6.3.3 ACTION CARDS

Vehicle Action Cards are available in both Dispatch Map and Dispatch List. They allow dispatchers to easily access common tools to manage individually vehicles and drivers. Action Cards include: Upcoming Stops, Message Driver, Call Driver, Live View, Assign Vehicle, and Emergency.



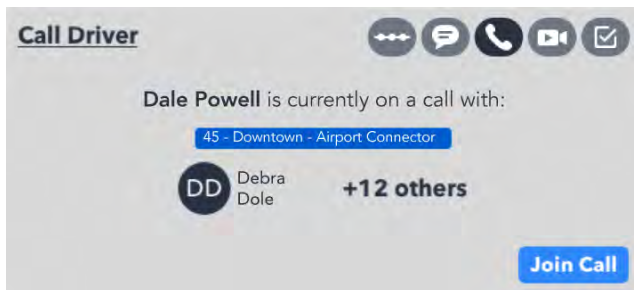
Upcoming Stops

- View future stops and connections
- Take action to prevent missed connections



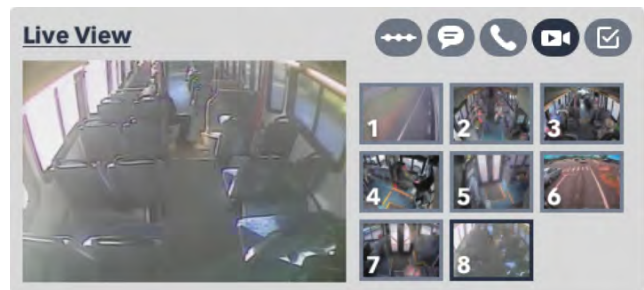
Message Driver

- Send and receive text messages with drivers
- View message history



Call Driver

- Talk using digital Voice over IP (VoIP) radio
- Speak to one or multiple drivers



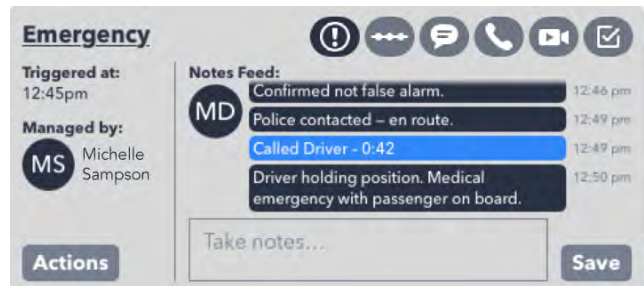
Live View

- See current conditions on and around a vehicle
- Observe emergency situations in real-time



Assign Vehicle

- Assign a driver to an active vehicle
- Correct run and trip information in realtime



Emergency Alarm Management

- Designate a dispatcher to manage emergency
- Records notes or mark incident as false alarm

6.3.4 SERVICE ADJUSTMENTS

With GMV's Service Adjustment tools, agency staff can create detours, skip stops, cancel trips, and perform other changes directly within the main dispatch interface. Changes in service can be communicated to bus operators, onboard passengers, and downstream passengers to keep every stakeholder informed with latest information.

TRIP CANCELLATIONS

Step 1: Select the route from the Dispatch screen

The screenshot shows the GMV Dispatch interface for vehicle 1002. At the top, it displays the vehicle ID (1002), run ID (R276), trip ID (T1506), driver name (Michael Smith), and route (45 - Uptown to Central Station). Below this is a timeline from 10 am to 4 pm with colored bars representing trips: 115 (purple), 117 (green), 115 (purple), 117 (green), 115 (purple), and 112 (blue). A 'Cancel Service' button is visible. On the right, there is a map showing the current location near Westlake MacArthur Park with a speed of 45 mph.

Step 2: Select one trip, multiple trips, or a time based range of trips to cancel

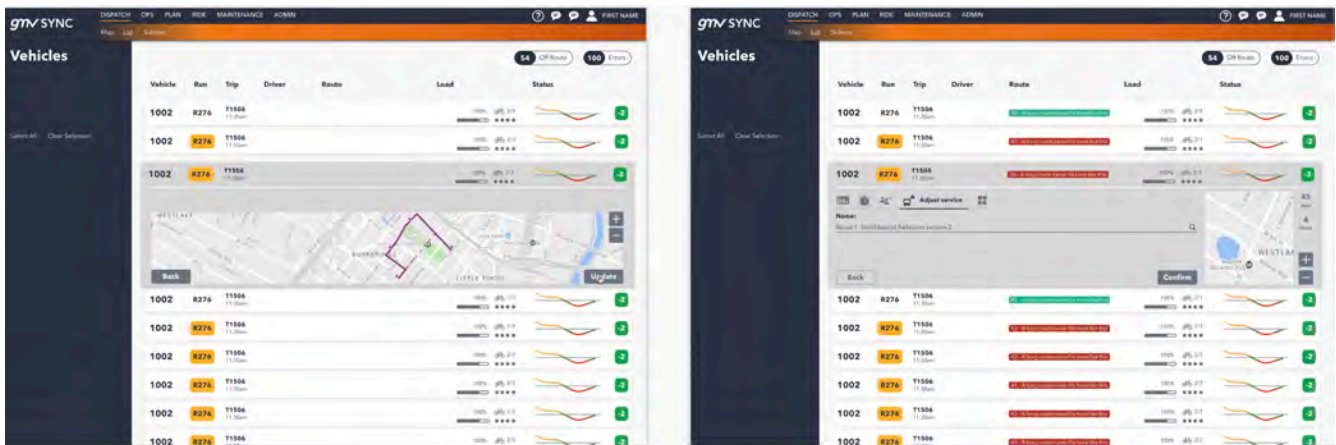
This screenshot shows a detailed view of the trip timeline from 9 am to 8 pm. A red vertical line indicates a selected time range from approximately 12:15 pm to 4:20 pm. A red bar labeled '115' is highlighted within this range. At the bottom, there are buttons for 'Select All', 'Clear Range', and 'Cancel Trips'.

Step 3: Confirm cancellation (updates sent to passenger information services, etc.)

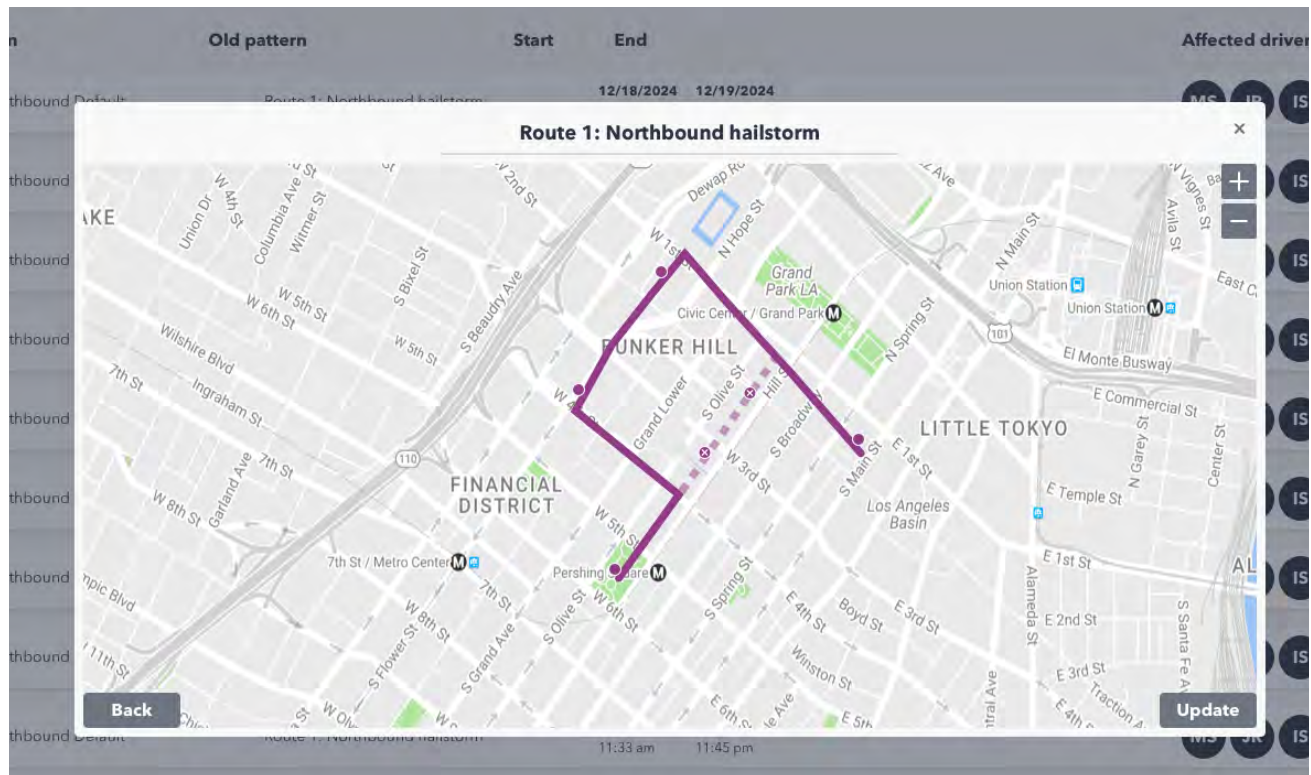
The screenshot shows a confirmation dialog box with the text: "You are canceling 4 trips on Run WeekdayR126 between 12:15 pm and 4:20 pm". At the bottom left is a "Go Back" button, and at the bottom right is a red "Yes, Cancel Trips" button.

DEFINE A DETOUR

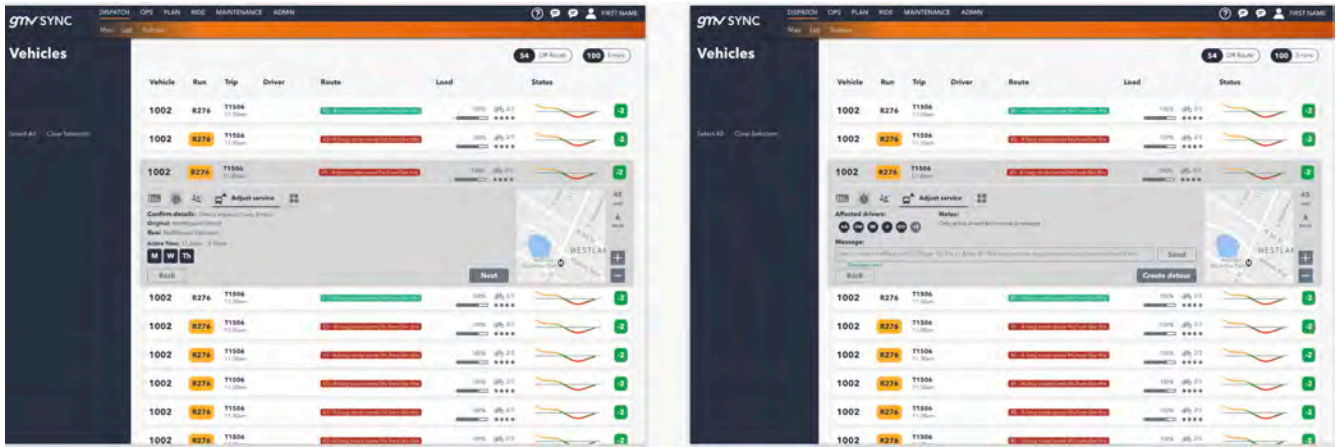
Until recently, there had not been a standard for communicating ad-hoc trip route shape updates over GTFS-RT. Now that this data standard has been added, GMV has released our Define a Detour feature.



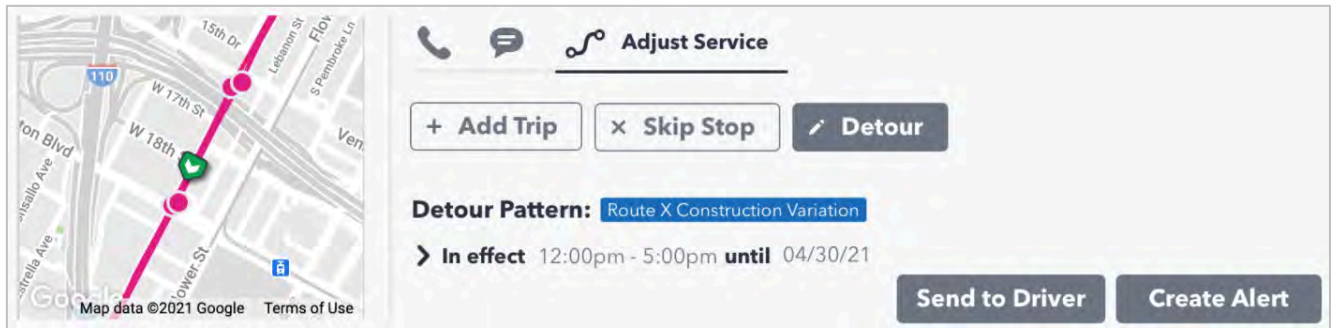
From the Dispatch screen, agency staff will click “Adjust Service” and can draw a new, detoured route. Once the new route is drawn, staff will assign a name to the detoured route.



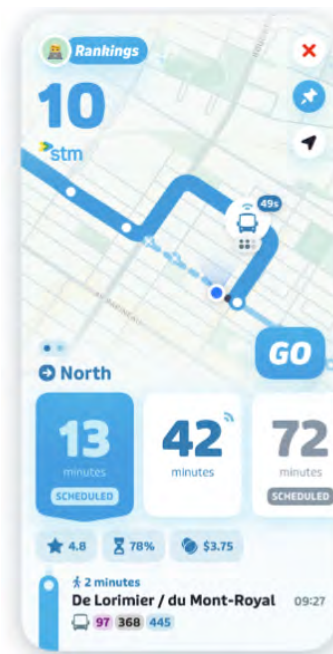
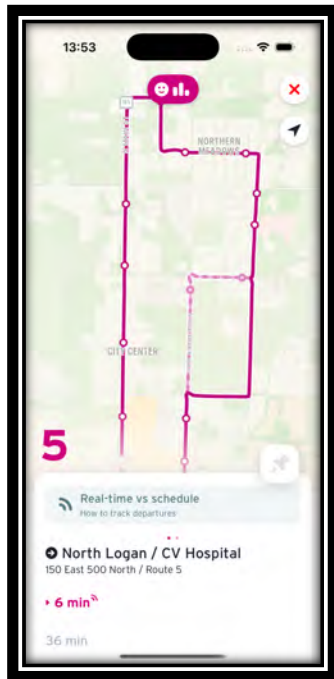
Detoured routes can easily be drawn by dragging and dropping your new pattern shape.



Once the temporary detour is defined, agency staff will review and save the changes. A message can be sent to bus operators serving the detoured route.



Dispatch staff can monitor vehicle location along a detoured route.



And, detoured routes will be communicated to riders via GTFS-RT so riders aren't left wondering when and where their bus will arrive.

6.3.5 EMERGENCY ALARMS

An emergency alarm can be triggered on the vehicle by either:

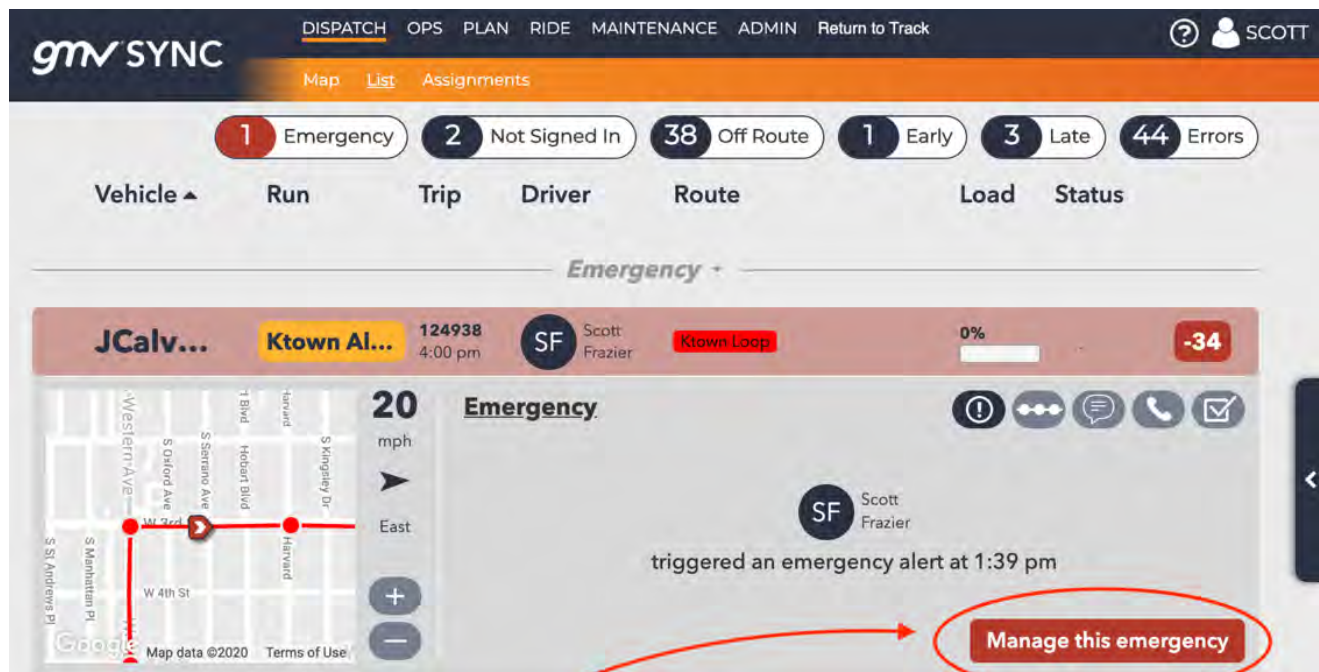
- MDT screen (softkey)
- Physical covert alarm button/switch mounted near driver seat (priced option)

Once an emergency is triggered on the bus, a number of actions occur:

- Notification sent to distribution list (email, phone call)
- Notification to dispatch – see below
- Headsigns change to designated emergency message (e.g. “Call 911”) (optional)
- Open an audio channel on VOIP Radio from bus to dispatch (optional)
- Create an incident record within incident management system

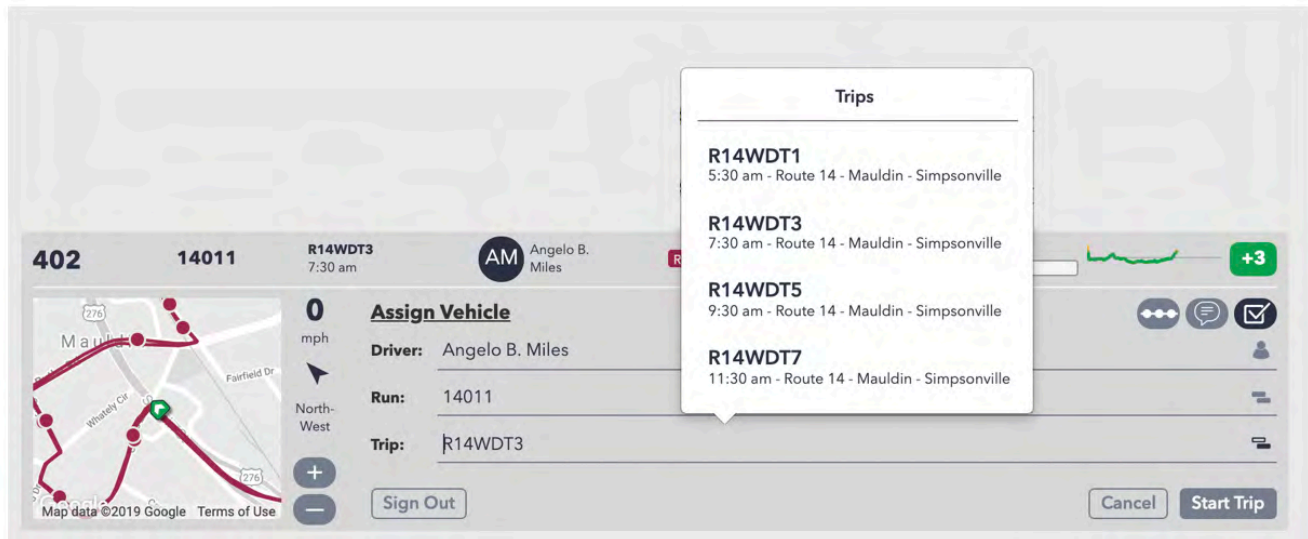
From the dispatch side, a dispatcher will receive a notification (audible and visual) about the emergency, and then will “claim” the emergency to take charge as the responsible party. The dispatcher can view live video from the bus and communicate with driver via text message / radio.

The dispatcher will take notes about the emergency that get saves as part of the incident record, and ultimately the dispatcher will “resolve” the incident once the necessary action has been taken (e.g. call paramedics, call police, send relief vehicle, etc).



6.3.6 DISPATCH SIGN-IN METHODS

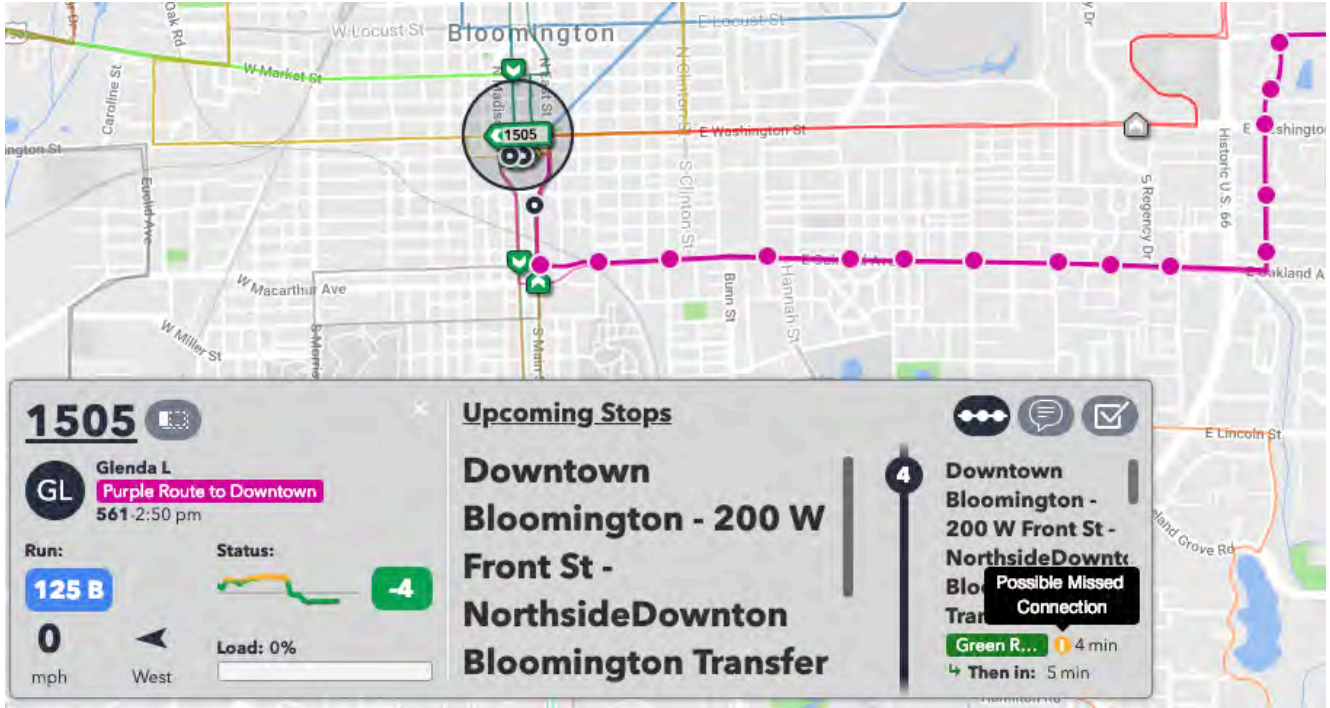
Dispatchers can adjust vehicle-route-driver assignments in real-time via Dispatch List and Dispatch Map “assignments” action card.



6.3.7 MANAGING TRANSFERS

Within the Dispatch Map and Dispatch List, a user can see upcoming stops for a bus as well as arrival predictions for the other routes serving that stop. A small yellow “!” icon indicates a potential missed connection.

Dispatchers have access to real-time arrival predictions for all routes at a given stop and can ask a leading bus to hold at a transfer point based on the amount of time predicted for the bus on the connecting route to arrive, allowing



passengers on the later bus to successfully make necessary connections between routes.

The driver display messenger function, while useful for communicating transfer information, can also be used for any number of other situations as well. This provides two-way text communication between the driver and the dispatchers. Bus drivers have access to a (customizable) set of “canned messages” that they can send with a single tap on the screen, or they can type a free-form message to the dispatch.

From the dispatch side, your staff will be able to send messages to individual drivers/vehicles, all vehicles on a particular route, or all vehicles across the system. This provides an easy opportunity for dispatchers to communicate about various issues with particular drivers, or broadcast system-wide concerns, detours, or other information to a larger selection of drivers with ease.

6.4 GMV Hub Onboard Computer + Driver Display

The GMV Hub is the brain and the heart of the on-board system. It acts as the central processor, data storage, and device manager for all onboard equipment. The Hub includes physical ports, sufficient processing capacity, and storage capacity for all functions of the proposed onboard system.



Designed from scratch by GMV to meet the needs of transit vehicles, the GMV Hub uses automotive grade components, and we have full control of the supply chain to ensure consistent quality and performance for 10+ years.



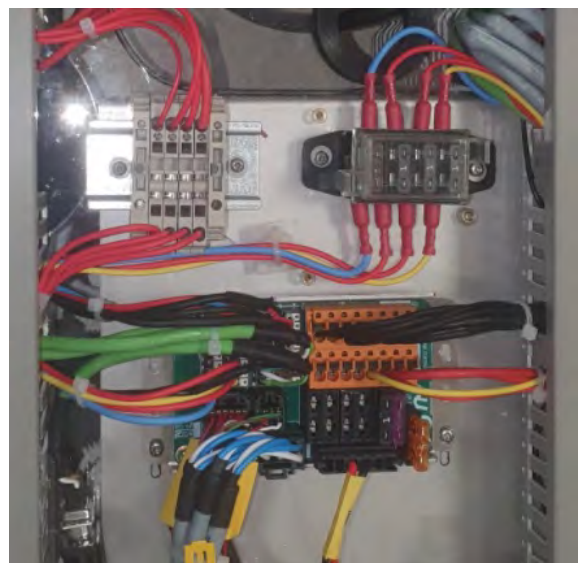
The Hub supports peripheral integrations like external antennae, automatic passenger counters, automatic voice annunciator, public service announcement display, route destination displays, surveillance camera DVR integration, passenger Wi-Fi, and more.

6.4.1 TERMINAL BLOCK

Our on-board design includes a terminal block that greatly facilitates wiring and fault detection tasks.

This design provides the following advantages:

- Labeling and arrangement of signal wiring carried out in a standardized and orderly manner.
- Easily detachable wiring through intermediate connectors
- Helpful for detecting and correcting faults in the wiring,
- Facilitates the use of standard prefabricated cables, which are safer and more reliable than those built in the field at the time of installation.



The terminal block and clear labeling keep wiring on the bus tidy and make swapping out system components easy. This enables NCTSD maintenance staff to painlessly pull and replace components.



6.4.2 EQUIPMENT SPECIFICATIONS (GMV HUB)

PERFORMANCE	
Processor	(4) ARM Cortex A53 processors, @ 1.6 GHz, L2-cache 512K.
RAM	From 1 GB to 4 GB (depending on the version).
Flash	eMMC from 8 GB to 64GB (depending on the version).
SSD (OPTIONAL)	(1) SSD up to 2 TB (depending on the version).
INTERFACES	
Power supply	9 to 36 V. (Un = 24V. in rail versions).
Video	(1) HDMI eARC 2.0a 1080p @60Hz. (1) HDMI 2.0 1080p @60Hz (depending on the version).
Audio	(3) audio outputs, of which (1) amplified 8 W; (2) audio inputs.
Ports	(1) USB 3.0; (1) SIM; (2) GigaETH; (1) CAN FD; (8) digital inputs, (4) digital outputs. (3) RS-232/422/485 or (2) RS232/485 + (1) CANBUS J1708 depending on version.
Sensors	3D accelerometer & 3D gyroscope. Temperature sensor.
WWAN + GNSS module	4G LTE Cat. 4 / WCDMA. Fallback 2G (CS). Single SIM – MicroSIMGPS, GLONASS, Galileo, Beidou. 40 channels. TTFF < 32 s. Accuracy < 2 m (50%); < 5 m (90%).
GNSS Dead Reckoning (OPTIONAL)	GNSS compatible: with GPS, GLONASS, Beidou, Galileo; 72 channels Dead Reckoning assisted by IMU. Accuracy < 1.5 m (50%).
WI-FI (OPTIONAL)	IEEE 802.11 a/b/g/n/ac; 2.4 GHz and 5 GHz (depending on version).
PHYSICAL PARAMETERS	
Temperature range	-20°C / 70°C (OT3 + ST0 in rail versions).
Environmental resistance	IP40.
Shock resistance	IK08 (except connectors).
ACCESSIBILITY	
Cyberpass (OPTIONAL)	Remote-activated announcement system for visually impaired persons (in bus versions).
APPROVALS	
Regulatory	CE, EMC R10.06, RoHS, FCC in USA version, EN50155 in rail versions.
EMC	ETSI EN 301 489-1 / 3 / 17 / 19 / 52.
Environmental	ETSI EN 300 019-2-5; EN 60068-2-1 / 2 / 14 / 30 / 56 IEC Class T5.1.
EMC Automotive	UN/ECE Regulation No 10.06; EN 50498; CISPR 25; ISO 11452-2 / 4; ISO 7637-1 / 4.
Safety	EN 62368-1 + AC:2015 + A11:2017.
Inflammability	UL 94 Class V-0.
Enclosure protection	EN 60529 Class IP40; EN 62262 Class IK08.
Exposure to electromagnetic fields	EN 62311.

6.4.3 DRIVER TOUCHSCREEN

Informed by drivers and designed to be easy to use, this modern user interface shows bus operators the information they need most, fostering a safe and more intuitive interaction with GMV's software.

Driver Functions:

- Monitor their schedule adherence, bus bunching and progress along a route
- Map based view of the route to provide navigation assistance for new drivers or detours
- Two-way text and voice (RTT/PRTT) communication with dispatch
- Manually record passenger counts by type (e.g. bicycle, child, senior, etc)
- Emergency alarm to summon assistance
- Manually play a pre-recorded audio message



6.4.4 DRIVER DISPLAY HARDWARE

Designed as a rugged monitor for vehicles, the display sports an IP54 chassis for harsh environments. The proposed screen includes an integrated controller with automatic and manual backlight adjustment, based on ambient light, making it suitable for applications from the darkest night to bright sunlight.

In addition, the proposed display includes a PCT (Projected Capacitive Multi-Touch) with RS232 controller, adding interactivity, that not only has higher light transmission, but also thicker glass. The display is anti-vandal and does not require recalibration.

It is designed for harsh environments such as a public transit vehicle, is not susceptible to scratches, withstands regular cleaning, and can be operated with a gloved hand.

The equipment has an HDMI video connection. All inputs are available as a factory option on the rear panel. It includes an "all-in-one cable" with lockable connector DSUB connector for quick and easy installation.



Scan this QR code on your phone for an interactive demo of the Driver App on the GMV Hub!

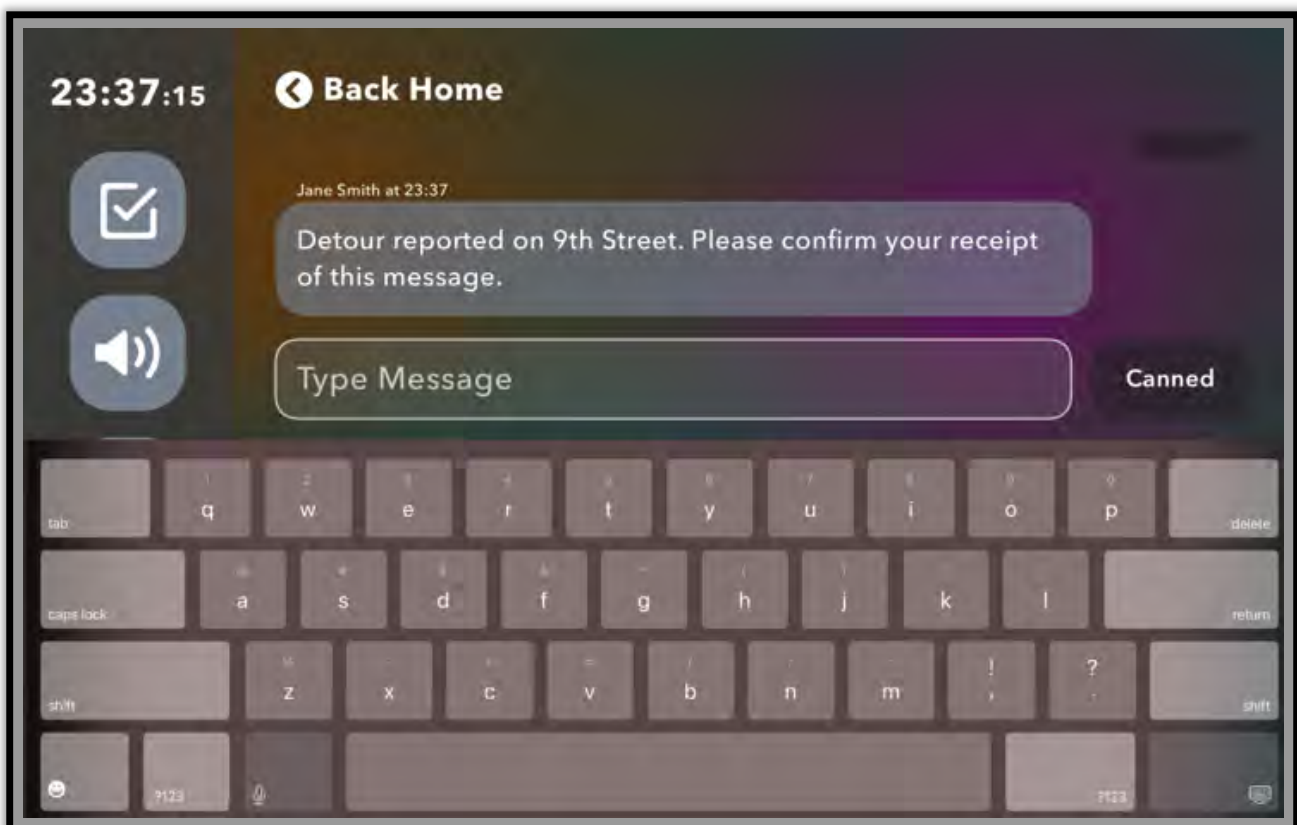
<https://gmvtransit.com/sync-driver-interface-overview/>

6.4.5 DRIVER AND DISPATCH MESSENGER ON TOUCHSCREEN DISPLAY

The messaging service allows dispatch to communicate with drivers through free form and canned text messages. The GMV Messenger function includes the ability to customize “canned messages.” In practice, the first canned message tends to be “10-4” – though this can be customized by your agency. 10-4 is commonly used as a read receipt and can be sent as a reply without the need to type out a message, informing dispatch that the driver has confirmed receipt and understanding of the message.

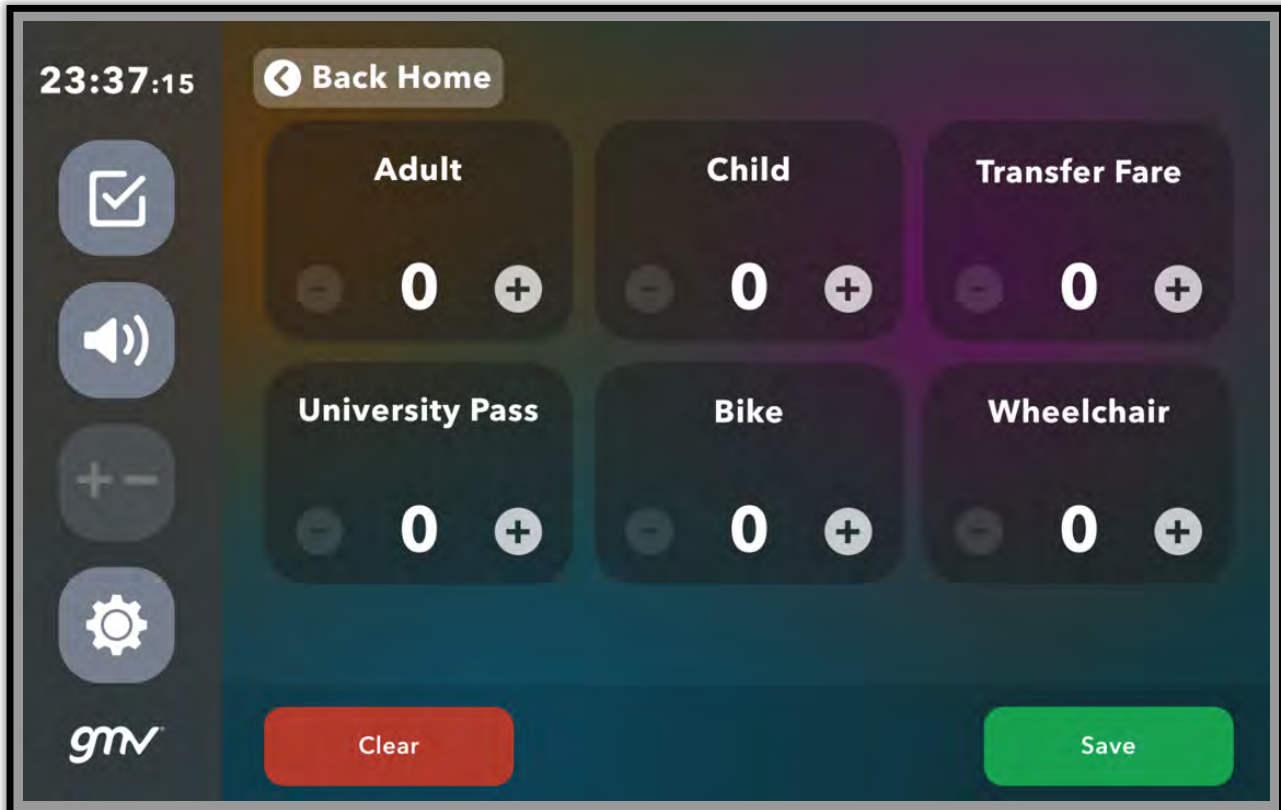
While “10-4” tends to be the industry standard for this recognition message, you are free to customize as you see fit, and it could potentially read “Acknowledged,” “Read,” or even simply “Ok.” Upon sending of this or any other message, dispatch will receive an alert and the message will be recorded in the dispatch and driver message history.

Messenger can be configured to only allow drivers to retrieve/view messages when vehicle is not in motion.



6.4.6 DIGITAL PASSENGER COUNTING TO AUGMENT APC DATA

Digital passenger counting involves the **bus driver manually counting passengers** as they enter the bus by tapping on the driver touchscreen display. Digital Passenger Counting is always included, for free, as part of the base system. When used in conjunction with APC, it would not be used to count total boardings, but rather can be used to count unique values such as the number of wheelchairs or bikes that board at each stop. The Count Fares Screen is fully customizable, so the agency can set any fare/passenger types it desires to keep track of. In addition to wheelchairs and bikes, this may be students and faculty, or it may be full fare, reduced fare, or adult, child, and senior fares.

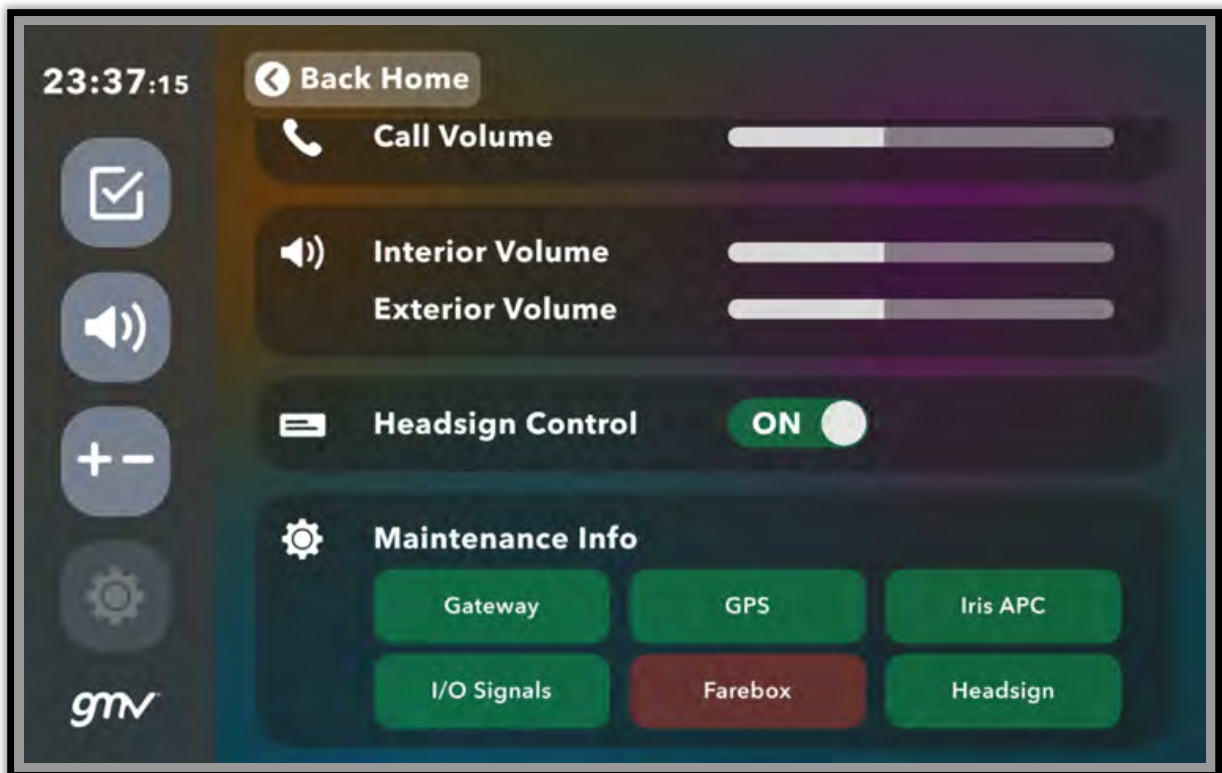


6.4.7 ONBOARD SYSTEM HEALTH MONITORING

Our technology package includes a number of features geared toward monitoring the health and proper function of the system itself.

Driver Display Maintenance Mode provides onboard diagnostics for core system and peripherals

- Gateway test to confirm data transmissions
- GPS test confirms location services
- APC test mode to confirm sensors and counting functions
- AVA test mode to confirm interior and exterior speakers, volume settings,
- Interior LED sign test
- Farebox and headsign interface tests



6.4.8 AUTOMATIC TRIP SWITCHING (ATS)

To alleviate the burden on drivers from manually selecting a new Trip every time a bus changes routes or inbound/outbound patterns, GMV offers Automatic Trip Switching (ATS). ATS combines data about the vehicle's current operations with schedule data about planned operations to intelligently re-assign the bus. **When a bus is nearing the end of its trip, the software will recognize that a switch is coming, identify the next trip scheduled in the run, and automatically move the bus to the next trip without any driver interaction. This process automatically updates headsign assignments as well.**

The software uses robust error checking algorithms to eliminate false positive re-assignments, and it always allows the driver or dispatcher to manually override the assignment in the event of a necessary deviation from the plan.

6.4.9 STORE AND FORWARD

The GMV Hub contains separate antennae for both cellular and GPS. While cellular coverage can drop in certain areas due to cellular provider network conditions, GPS tends to be more reliable as it is based on a number of different satellites.

In the absence of a cellular connection, the Hub will store all its events – sign-ins, APC data, GPS coordinates – and upload them to the server retroactively to ensure that the driver is not prevented from doing their job and the dispatcher gets the data as soon as it is available. All data will remain available in reports as expected.

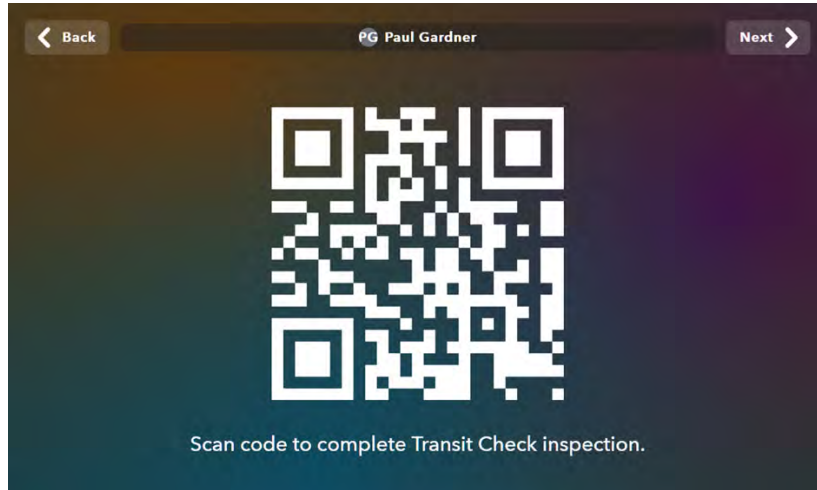
6.4.10 ROOF MOUNT ANTENNAE

To enhance signal quality and ensure a high reliability system, GMV recommends the use of roof mount antennae whenever possible and proposes to install as a component of our base scope

6.5 Digital Pre- and Post-Trip Inspection

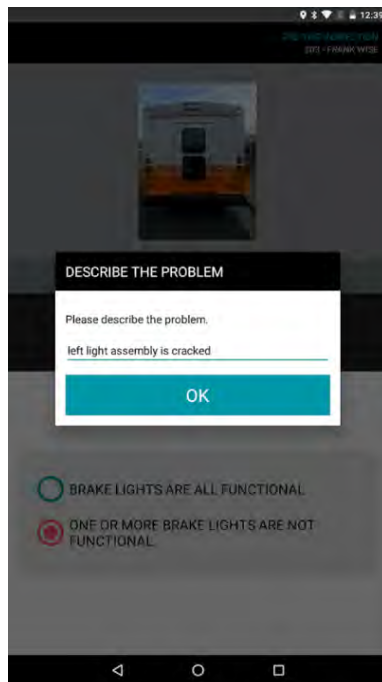
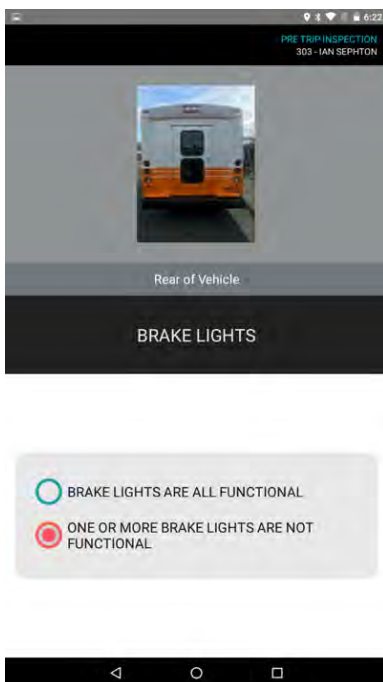
GMV proposes a customizable pre- and post-trip inspection software that runs on an off the shelf tablet. We have proposed utilizing the Samsung A7 tablets previously used to run the RouteMatch software, assuming these tablets are still functional. If NCTSD does not wish to use existing tablets, new tablets can be purchased off the shelf or through GMV.

At the start of their shift, Bus Operators will log in to the GMV system by selecting their name, route, and trip on the driver display. Once logged in, a QR code will appear. Operators will then use the third-party tablet to scan the QR code and complete their digital vehicle inspection.



While we offer a standard form inspection for drivers to check common things like headlights, taillights, turn signals, tire-pressure, and more, we also know that various states and agencies have their own policies and requirements. You can build your inspection templates off our templates and customize them to fit your needs, OR provide your current paper-based inspection and we will create a digital version.

Inspections can be customized for each vehicle type (make/model).



	Demo Client 5732 Lonetree Blvd Rocklin, CA 95765 (916) 786-1006	4081	PASS PRETRIP-AM BUS001 (DC - ISAM123)
VEHICLE DATA			
2014 THOMAS SCHOOL BUS		TIME START: 2015-09-27 18:58:42	DRIVER: lat, Mobil
1T8SP4E17C1148626		TIME END: 2015-09-27 18:59:22	DRIVER_ID: 111
TEMPLATE: 141 - Bus_Test		ELAPSED: 1 QOC: 123,320.0	
OBD DATA			
<small> OBD1: 11P1622A00238131 P134A 1211 M15 101 DTCM 011 OBD1 181 OBD9 181 OBD9 181 OBD10 101 OBD11 101 OBD1 11P1622A00238131 P134A 1211 M15 101 DTCM 011 OBD1 181 OBD9 181 OBD9 181 OBD10 101 OBD11 101 OBD1 11P1622A00238131 P134A 1211 M15 101 DTCM 011 OBD1 181 OBD9 181 OBD9 181 OBD10 101 OBD11 101 </small>			
PASSING INSPECTIONS			
Engine Bay → Fluid Leaks [PASS]	Engine Bay → Oil Level [PASS]	Exterior Front → Headlight Low Beams are OK [PASS]	Vehicle Exterior → Emergency 4-Way Flashers [PASS]
Engine Bay → Brake Fluid Level OK [PASS]	Exterior Front → Headlight High Beams OK [PASS]	Dashboard → Gauges Functional [PASS]	Drivers Seat → Steering Wheel OK [PASS]
Exterior Front → Tail Lights OK [PASS]	Dashboard → Interior Warning Lights [PASS]	Vehicle Interior → Brake Pedal and Brake Adjustment [PASS]	Vehicle Interior → Road Side Emergency Kit [PASS]
WARNING INSPECTIONS			
none			
FAILING INSPECTIONS			
none			
DRIVER SIGNATURE			
User certifies that the inspection for this vehicle was performed and that the above data for vehicle inspection 4081 contained within this report is true and correct.			
DRIVER_ID: 111 NAME: lat, Mobil SIGNED AT: 2015-09-27 18:59:22			
<small>Generated: 2015-09-27 18:59:23 URL: https://demo.transit-check.com/3055/latdemo/v1/get_inspection_report/4081</small>			



The tablet is used as a handheld device to record inspection results. Drivers can take photos of problem areas, which are uploaded to web portal for agency maintenance staff to instantly view. Bus Operators can also record custom notes by voice dictation or typing to detail problems that may not be visible in a photo or provide more information to any of the answers provided during the inspection.

The results of inspections (failed / warn items) can be passed to an agency's third-party maintenance management system as a new work order to be completed. And once the issue has been remedied, the "work order complete" status can be updated within the inspection system via a bi-directional API interface.

As an Android app, the pre-trip inspection can also function seamlessly on paratransit vehicles equipped with consumer grade tablets, so the entire fleet can be managed with a single technology platform.

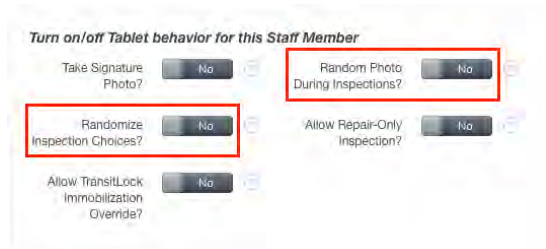
Fraud Prevention

The digital inspection system ensures inspections are completed thoroughly and diligently by incorporating features that prevent shortcuts or incomplete submissions.

Inspection Date: 28-MAY-2020 01:43 PM	Report ID: 4044112
2014 ELDORADO NATIONAL AXESS	Insp Template: 4044112-DEMO
Plate: CA-ABC123	Insp Tmpl Ver: 28-MAY-2020
VIN: 1N9APACL6EC084066	Insp Begin: 28-MAY-2020 01:39 PM
Asset: 1	Insp End: 28-MAY-2020 01:43 PM
Items Inspected: ALL ITEMS	Elapsed: 4 min / 126.46 ft

The system logs duration to complete an inspection (very fast inspections are likely fake/fraudulent/incomplete) and distance traveled during inspection (to ensure the driver actually walked around the vehicle).

Randomized order of multiple-choice options (to prevent "just hit the top choice each time" cheating). Randomly require a photo of an item, even if it is working fine. These settings can be configured on a PER USER basis to focus only on problematic drivers.



Log the precise location where an item was inspected via GPS.



Require drivers to scan a QR Code placed on the vehicle to confirm they completed a walkaround.

In addition to customizing the inspection items, you can set custom results – defining what constitutes a failed inspection - RED (do not drive this vehicle) and what constitutes a warning - YELLOW (ok to drive, but creates an alert for the maintenance staff).

Transit Check Portal

Home Administration Inspections Reports Maintenance

Home Inspections

Search

Inspection ID: Driver ID: Date From: Date To: Vehicle: Apply Filter

Q- Go Actions

Inspection Result Abbr = 'FAIL'
 Inspection Result Abbr = 'PASSWARN'
 Inspection Result Abbr = 'PASS'

Inspection Id	Raw Data	Obs Data	Inspection Start Dt	Inspection End Dt	Vehicle	Driver Id	Driver Name	Am Pts Flg	Mileage	Vehicle Plate	Vehicle Asset Barcode 1	Vehicle Asset Barcode 2	Inspection Result Abbr	Inspection Status Abbr
2533	2533		2015-06-08 12:02	2015-06-08 12:04	1 (1SAM123 - 0123456789A)	3	Michael St Denis	-	-	1SAM123	0123456789A	-	PASSWARN	COMPLETE
2533	2523		2015-06-05 19:08	2015-06-05 19:11	1 (1SAM124 - 0123456789B)	3	Michael St Denis	-	-	1SAM124	0123456789B	-	FAIL	COMPLETE
2511	2511		2015-06-02 14:21	2015-06-03 14:23	1 (1SAM123 - 0123456789A)	2	Michael St Denis	-	-	1SAM123	0123456789A	-	FAIL	COMPLETE
2501	2501		2015-06-03 14:34	2015-06-03 14:05	1 (1SAM123 - 0123456789A)	3	Michael St Denis	-	-	1SAM123	0123456789A	-	FAIL	COMPLETE
2501	2501		2015-06-02 17:42	2015-06-02 18:21	1 (1SAM123 - 0123456789A)	3	Michael St Denis	-	-	1SAM123	0123456789A	-	FAIL	COMPLETE
2501	2501		2015-06-02 17:07	2015-06-02 17:40	1 (1SAM123 - 0123456789A)	3	Michael St Denis	-	-	1SAM123	0123456789A	-	FAIL	COMPLETE
2521	2521		2015-06-02 16:58	2015-06-02 17:02	1 (1SAM123 - 0123456789A)	3	Michael St Denis	-	-	1SAM123	0123456789A	-	FAIL	COMPLETE
2501	2501		2015-06-02 16:29	2015-06-02 16:30	1 (1SAM123 - 0123456789A)	3	Michael St Denis	-	-	1SAM123	0123456789A	-	PASS	COMPLETE

Daily Mileage Report

NCTSD bus operators will utilize the digital vehicle inspection feature to complete pre- and post-trip mileage capture. Administrative staff can access this data using the Vehicle Odometer Summary report.

Records: 19

Vehicle Odometer Summary

Asset (FRONT) <ALL>

Date From: 2025-08-27

Date To: 2025-09-10

Q- Go Actions

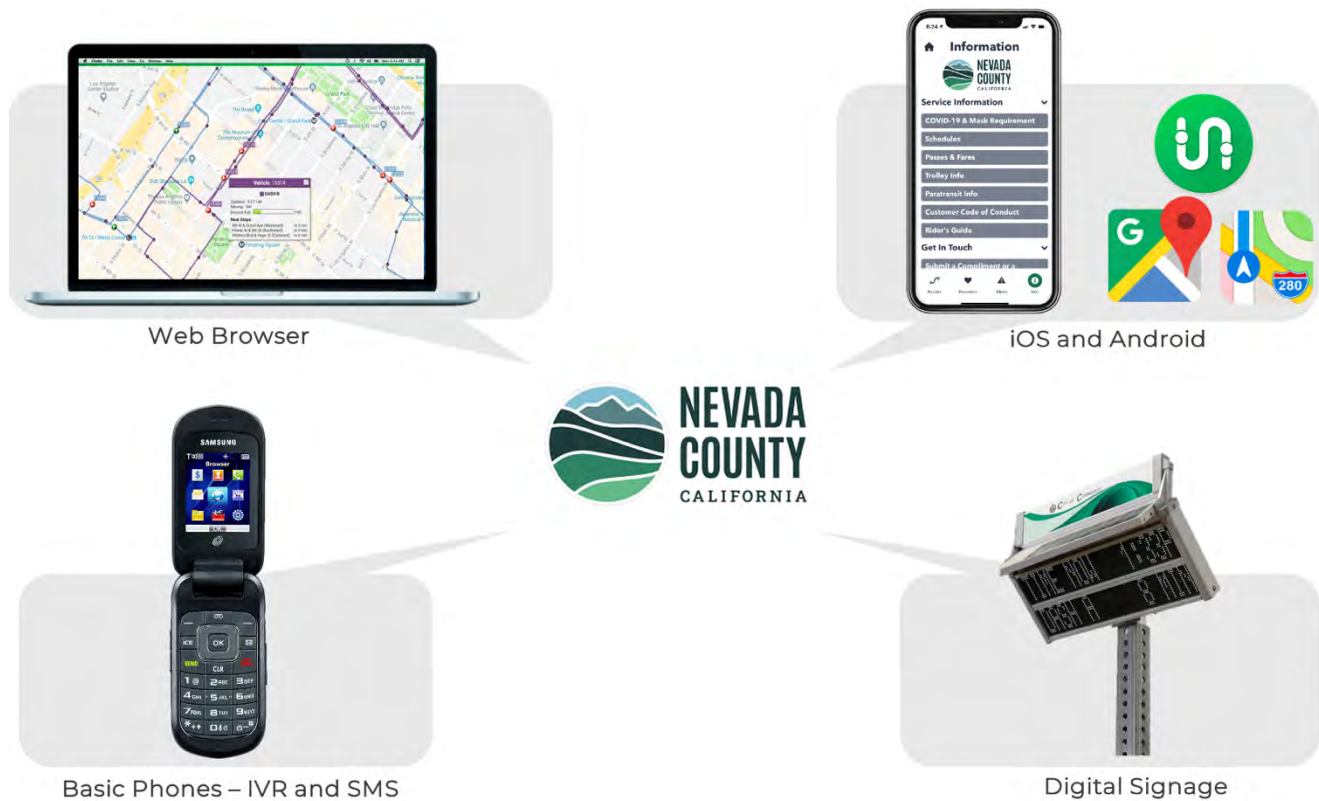
Odometer Difference Most Recent incl. Pr D...

1 - 19 of 19

Details	Asset T	Odometer on Date From	Odometer on Date To	Odometer Difference	Observation Count
Details	1999 NEW FLYER DLF-40 - 41 - 41	66,373.0	66,096.0	383.0	58
Details	2007 GILLIG GLLIG LF - 33 - 33	122,070.0	123,008.0	938.0	42
Details	2007 GILLIG GLLIG LF - 36 - 36	372,895.0	376,913.0	4,018.0	48
Details	2009 VAN LOM FLOOR - 1048 - 1048	716,843.0	716,916.0	73.0	13
Details	2011 GILLIG GLLIG LF - 37 - 37	338,675.0	339,612.0	937.0	45
Details	2011 GILLIG GLLIG LF - 38 - 38	192,836.0	193,736.0	899.0	10
Details	2011 GILLIG GLLIG LF - 39 - 39	381,003.0	382,263.0	1,260.0	93
Details	2011 GILLIG GLLIG LF - 40 - 40	344,514.0	345,532.0	1,018.0	21
Details	2012 FORD M6101 - 16 - 1FDEE3H0CBAE2608	93,286.0	93,389.0	103.0	8
Details	2013 FORD M6102 - 11 - 1FDEE4F9D0A56899	102,245.0	102,473.0	228.0	8
Details	2013 FORD M6101 - 17 - 1FDC3P1F0A09W27	119,729.0	120,303.0	574.0	29
Details	2016 GILLIG GLLIG LF - 31 - 31	277,904.0	278,962.0	1,058.0	66
Details	2016 GILLIG GLLIG LF - 32 - 32	308,614.0	310,438.0	1,824.0	48
Details	2016 GILLIG GLLIG LF - 44 - 44	192,009.0	192,604.0	595.0	43
Details	2017 FORD UNIVERSAL - 18 - 1FDEE4E2H0C2M667	89,002.0	89,605.0	603.0	19
Details	2017 FORD UNIVERSAL - 19 - 1FDEE4E5H0C24927	84,672.0	85,431.0	759.0	19
Details	2019 FORD COMMUTE - 21 - 1FDE8PACN891037	74,371.0	75,160.0	789.0	49

6.6 Real-Time Passenger Information

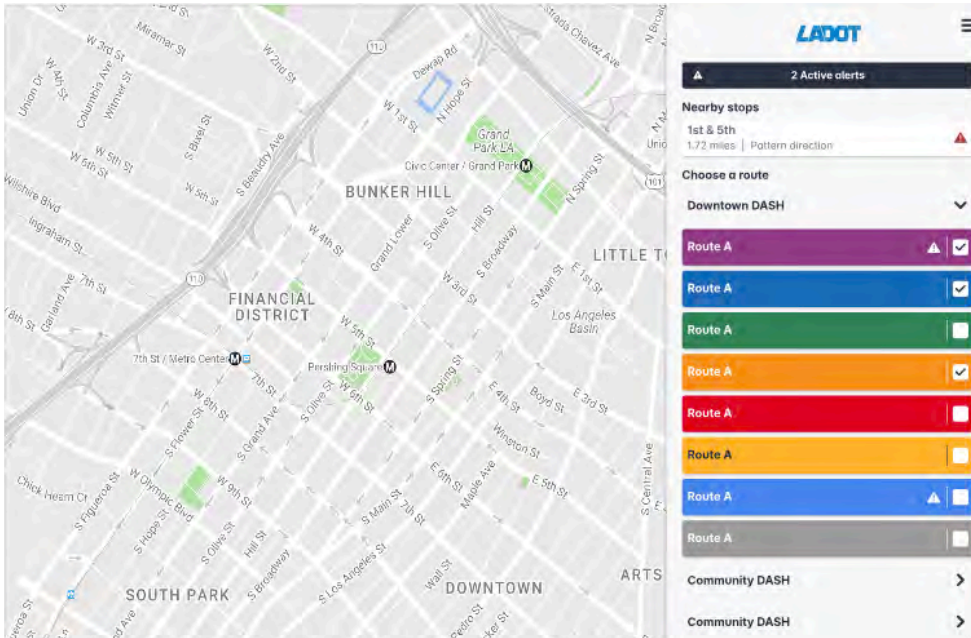
The GMV solution includes a comprehensive passenger information service. We present real time information with NCTSD’s brand front and center, even though the data comes from our servers. We can stand up apps and websites for you, or we can simply provide data to your other services for further processing and distribution.



Method	Features / Sample
Smartphone App	Fully featured native app, customized for your brand (iOS, Android)
Mobile Website	Mobile geo-location of stops, works on any phone with no apps to download www.ladotbus.com – see it now on a mobile device (Los Angeles DOT)
Desktop Website	Fully featured, optimized for larger screen. See the same URL above on a desktop device. Can also be embedded within a transit agency’s main website.
SMS – Text Messaging	Arrival predictions by stop #: e.g. Text “ladot 6143” to 41411 Subscription based rider alerts customized by route/stop/day of week/time
IVR – Telephone	Call (213) 785-3858, press 0, enter stop # 6143
Digital Signs	Various sizes and formats for transfer centers or individual stops

6.6.1 MOBILE WEBSITE

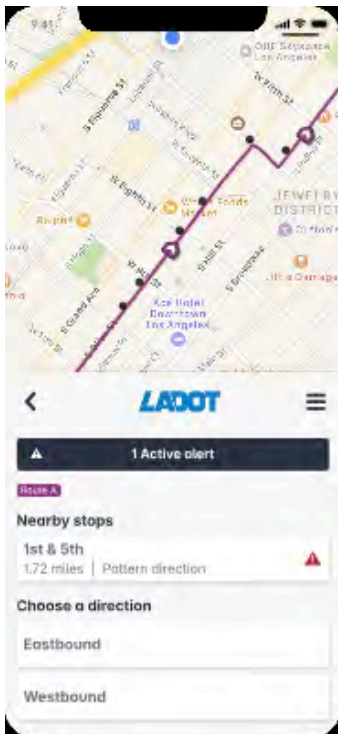
Passengers will see Nevada County Connects' brand and web address on the branded web-based live bus tracker. The web portal is compatible with all browsers and is optimized for mobile and desktop. The web-based live bus tracker allows users to choose a specific route and stop to receive arrival predictions. It also presents riders with associated stop numbers and information for visiting the mobile site or calling/texting to get updated information.



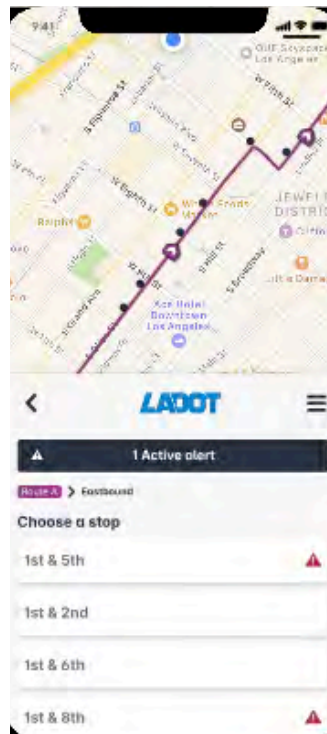
Standard Features:

- GPS geolocation automatically finds nearest stops to you at the first step
- Step by step navigation to get from landing to “Where’s the bus?”
- Administrators can create announcements which will appear here in real time
- Linked to your branded portal
- Embeddable in 3rd party applications

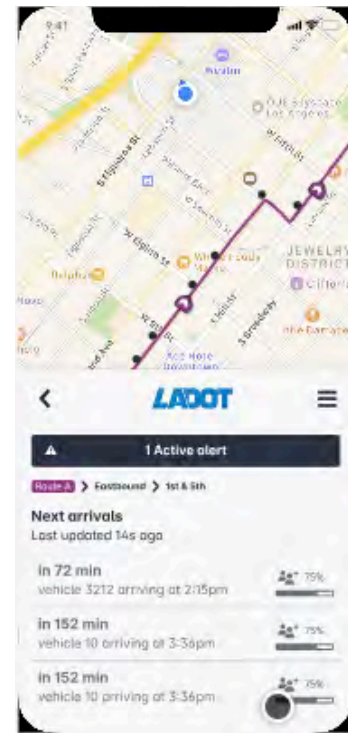
Riders can choose a direction:



Choose a stop:



And view arrival times:

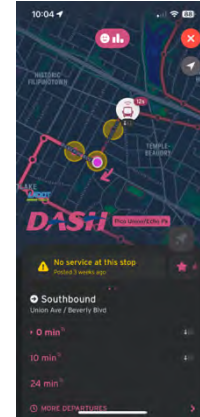
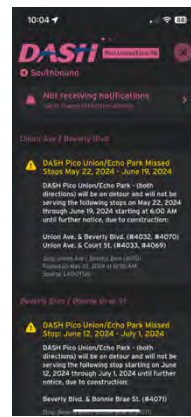
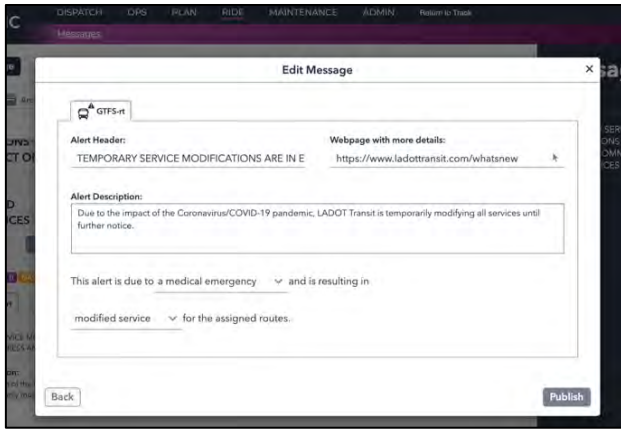


6.6.2 LEVERAGE TRANSIT APP FOR RIDER COMMUNICATION

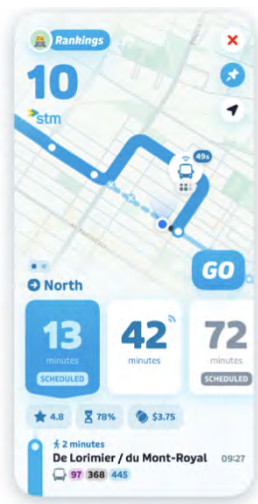
GMV proposes for Nevada County Connects to continue leveraging Transit App for their riders. Our base proposal includes passing GTFSS and GTFSS-RT feeds to Transit, Google Maps, and Apple Maps at no charge to NCTSD. By electing to utilize a third-party application like Transit, your agency will be removing barriers for the public to access important information about your operations, including live vehicle location, arrival predictions, and service alerts – including detours. For your consideration, we have included optional pricing for Transit Royale for Agencies and On-Demand Service integration.

Our native multi-channel rider communication tool seamless communicates with Transit App and can seamlessly fit into your existing passenger communication workflow. Your riders will always be informed with the most up-to-date information, because we push real-time arrival predictions to all endpoints every 4 seconds.

Below is an example from LA Department of Transportation communicating a delay via Apple Maps, Google Maps, and Transit App. First, configure a service alert with our Sync Messages tool, then push that information to your riders.



6.6.2.1 GMV Detours Display



Transit app is the only front-end application capable of consuming and displaying detours entered into the new Detours module in GMV's Sync tool. All detours entered by Nevada County Connects will be exported to the recently-adopted GTFSS-RT TripModifications data standard. Transit then consumes and displays that data in the app.

The regular route appears as a dashed line and closed stops are marked with an "X". The detour linework and temporary stops show up in Transit's map view, and stops are listed in line with other stops. Showing the usual routes and stops helps riders understand both where the bus normally goes, and where to go during the detour.

Transit's trip planner uses this data to plan trips, and send people to the temporary stops during the duration of the detour. Transit also interpolates arrival times for temporary detour stops from the standard stop predicted arrival times received through the GTFSS-RT Trip Updates feed, giving riders good information about when their bus will arrive. Once the detour ends in GMV, the exported TripModifications feed will be updated immediately and reflected in Transit.

Transit pulls real-time data every 10 seconds, so they will be able to publish new and resolved detours in near-real-time. This will keep Nevada County Connects passengers moving, and build their trust and satisfaction with the agency.

6.6.3 PASSENGER COMMUNICATION

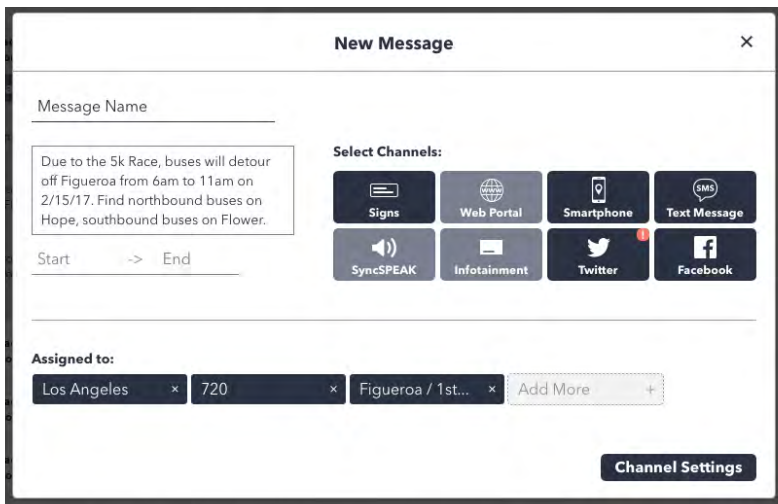
GMV software helps you easily create and share messages with your riders by bringing together previously disparate messaging platforms into **one single, multi-channel communication tool**. With the Sync Messages tool, you can send messages and alerts through:

- SMS / Email Notification
- Digital Signs
- Twitter and Facebook
- GTFS-Realtime
- Website Widget
- Onboard Annunciator
- Onboard Infotainment Screen
- Mobile App Push Notification

With our fully **web-controlled SyncSPEAK annunciator system**, your agency can put public service announcements on your in-bus audio annunciators.

New Message Creation Window

The New Message window is a simple, straightforward way for users to create messages. A user begins by filling in the top portion of the window.



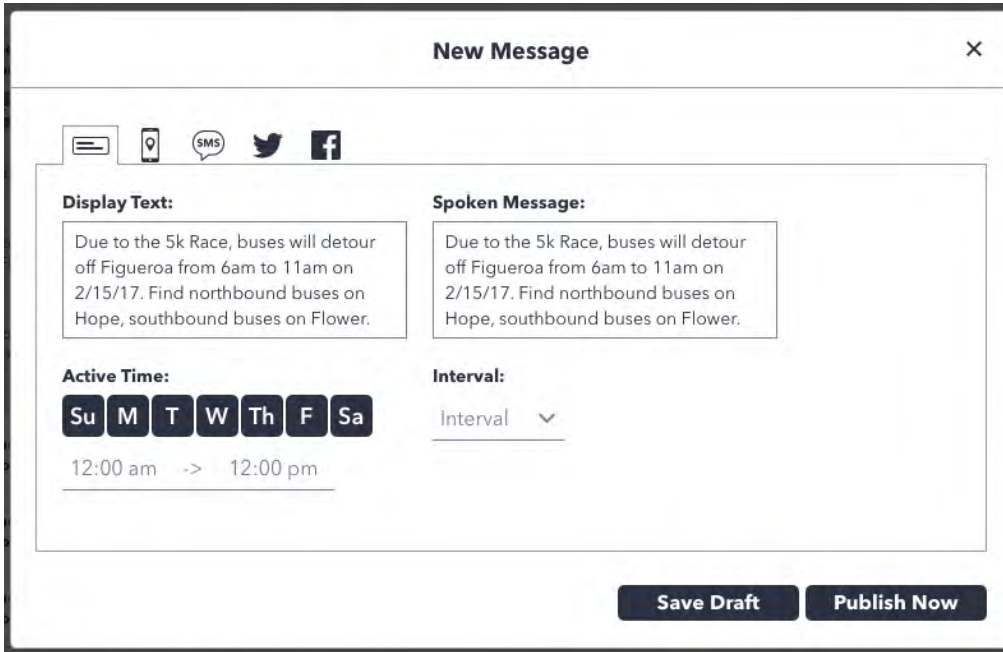
The **message name** is for internal use only and gives the user a way to refer to a message – this is seen by any user of the system.

In the **message text box**, a user inputs the default message that will be used as the base for all channels. As you type, we will automatically provide alerts for any channels your message won't work on (for example, if you enter a message longer than 140 characters, it will not fit on Twitter). In this example, you can see an alert over the "Twitter" box to the right.

These **channel selectors** are where the user chooses what channels to distribute the message on.

Assignments can be made by mode, route, stop, or tag (which can include regional areas, or any other categorization).

Upon clicking Channel Settings, we get to the next step, where we can customize the message specifically for each selected channel.



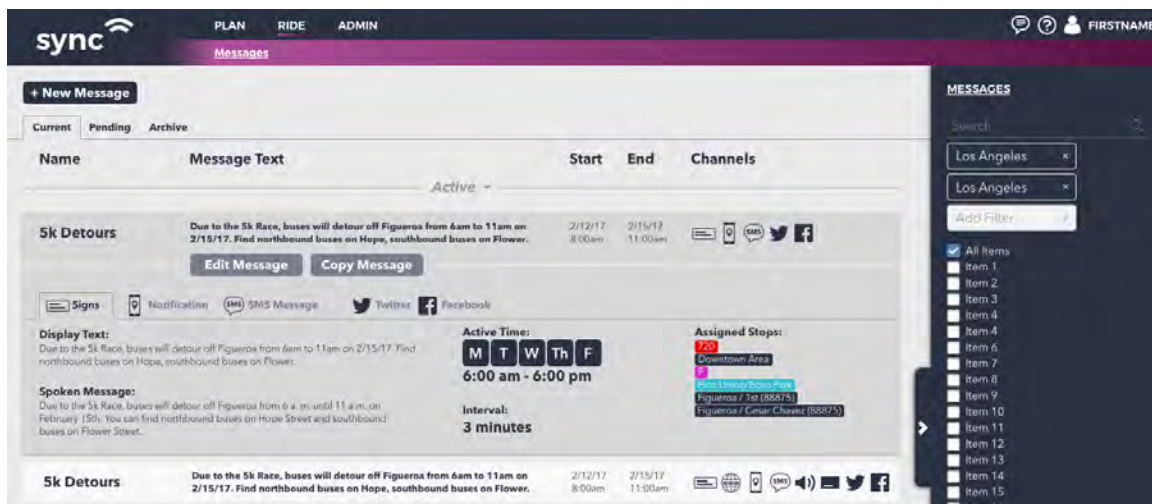
In the **Channel Settings** window, we have tabs for each of the channels selected in the previous step. Here we can edit the message or provide more information that applies only to specific channels. If there are basic formatting requirements, like message length, we will automatically apply those restrictions, but allow the user to customize the message as necessary.

Every channel to which a message can be sent has its own configuration tab within settings that apply to that channel. When the message is ready, a user can either “Save Draft” or, if they have adequate permissions, they can “Publish Now,” which instantly sends the message to each of the selected channels.

Messages List

Now that messages have been created, we look at the messages list, which gives users a full view of all messages. The sidebar on the right allows a user to quickly search or filter by various attributes, and the list will auto-populate with relevant messages.

In the main pane there are three tabs: **Current**, **Pending**, and **Archive**.



6.6.4 ARRIVAL PREDICTION ALGORITHM

Regardless of the way a prediction is delivered to the rider, if the prediction isn't accurate, then riders won't trust the system. A real time passenger information system is a very visible system, and if it isn't accurate and reliable, it can quickly become a black eye instead of a gold star.

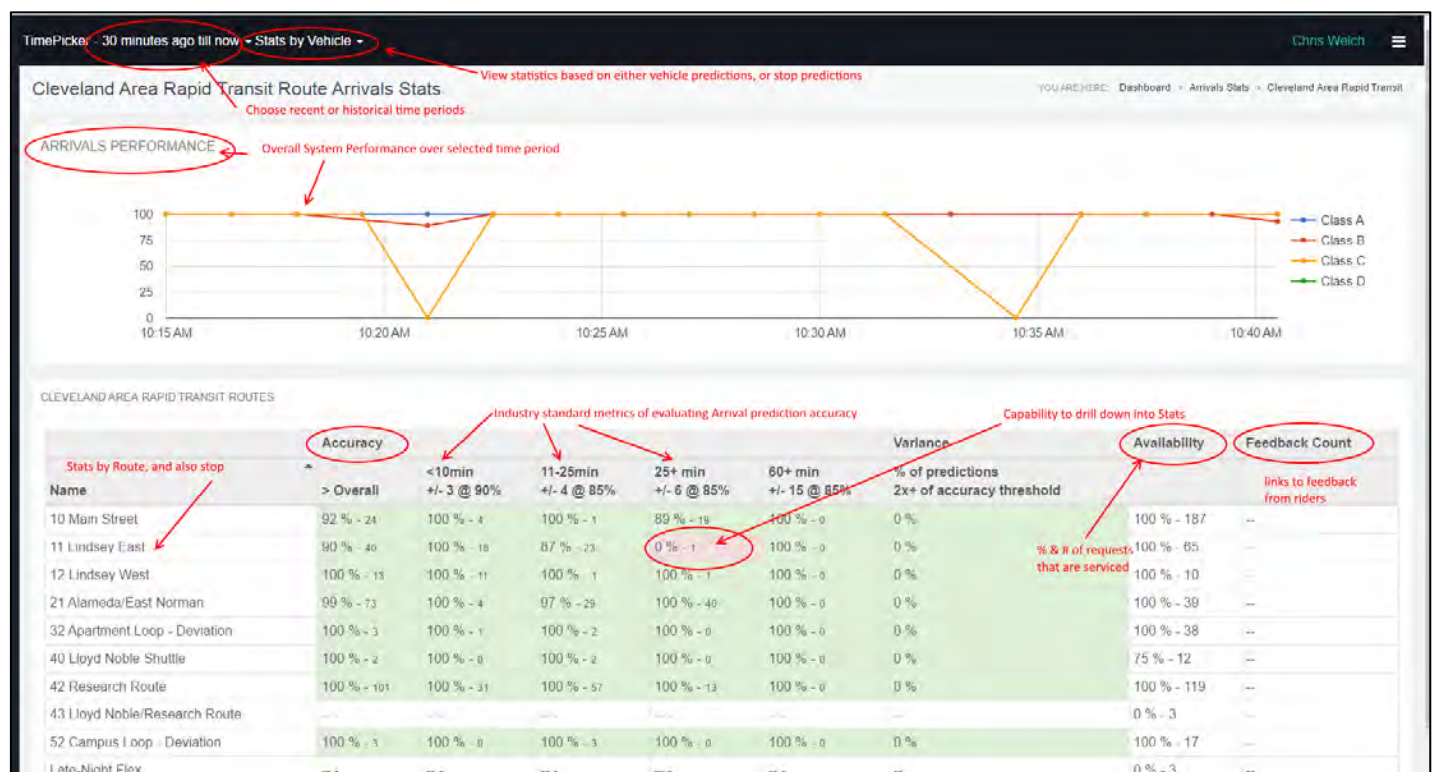
A unique aspect of GMV's algorithm is that it works independently of the bus schedule. We know that riders care less about whether the bus' actual trip matches the schedule, and they care more about their particular question: "When will the bus come to my stop?" So we provide pure predictions based on time relative to now, e.g. "The bus will arrive in 4 minutes." The algorithm does not regularly compare the bus's actual location and time with some hypothetical idealized "schedule," because a hypothetical schedule is by design a weighted average that rarely if ever actually exists in the world of transit operations.

By contrast, GMV uses real historical data about how long it took a bus on a given section of a given route to move from Point A to Point B. We also factor in additional data points, such as time of day, day of week, day of the year, and other conditions to eliminate any seasonal or cyclical effects that could skew the prediction. We apply these filters to all of the historical trips on the same section of the route which our database has saved, and we find the historical trip that best matches the present reality.

In theory, this historical best trip could have occurred months ago, when the weather, time, and day were the same; however, it is most likely that the most similar historical trip happened very recently, and that the bus traveling on the route right now will have an experience that is similar to the bus that preceded it.

We design the sensitivity of the analysis to place more emphasis on being late vs. early. It is most often better to consistently by a little bit early with the prediction and have a rider waiting for 30-60 seconds than to be a little bit late and have the rider miss their bus. We've tuned our algorithm to take this important rider experience into account.

Here is an example of our regular analysis of our algorithm's accuracy for a client:



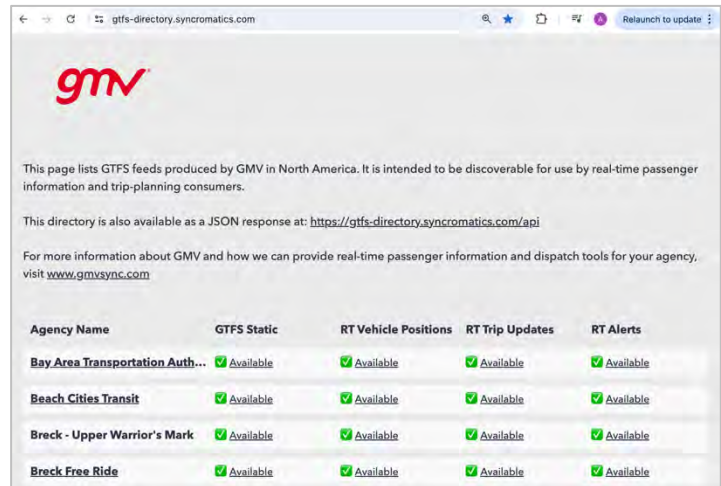
6.6.5 COMPLETE GTFS EXPORT + GTFS-REALTIME

The GMV system exports and hosts a complete set of GTFS, including all schedule and stop data.

GMV natively produces GTFS files that can be uploaded directly to Google Transit to ensure that the client's routes are visible on the Google Maps public site or other third party transit apps. GMV hosts the GTFS files within your public portal so that you don't have to update Google whenever there is a change.

GMV also natively supports GTFS-RT for all customers, so we can make real-time data available to third party apps using this standard.

For easy coordination with Apple Maps, Transit, and other GTFS consumers, we assembled all of our clients' current feeds into one place: <https://gtfs-directory.syncromatic.com/>



The screenshot shows a web browser displaying the GMV GTFS Directory. The page title is "gtfs-directory.syncromatic.com". The GMV logo is at the top left. Below the logo, there is a paragraph: "This page lists GTFS feeds produced by GMV in North America. It is intended to be discoverable for use by real-time passenger information and trip-planning consumers." Below this, it says: "This directory is also available as a JSON response at: <https://gtfs-directory.syncromatic.com/api>". At the bottom, it says: "For more information about GMV and how we can provide real-time passenger information and dispatch tools for your agency, visit www.gmvsync.com".

Agency Name	GTFS Static	RT Vehicle Positions	RT Trip Updates	RT Alerts
Bay Area Transportation Auth...	Available	Available	Available	Available
Beach Cities Transit	Available	Available	Available	Available
Breck - Upper Warrior's Mark	Available	Available	Available	Available
Breck Free Ride	Available	Available	Available	Available

GMV's solution eliminates the need for third party GTFS management tools (both static and GTFS-RT)

6.6.6 OPEN API AND THIRD-PARTY DATA ACCESS

All the data collected, hosted, and generated by the proposed system is the property of your agency, and it is freely available in automated formats at any time. GMV will not extra charge fees at any time for you to access your data.

GMV will offer API keys to developers you wish to be able to access your data – whether it is a student, transit reporting software, or a third-party app developer. Some of the world's most popular transit app developers (including "Transit App" and "Citymapper") have stress tested the GMV API and confirmed it works to offer our customer's data into their apps. This access is completely controlled by you, and we ensure that no unauthorized developers are able to access your data.

Formats

- RESTful APIs are web-based with HTTP endpoints
- Available in JSON format for standards compliance
- CSV/XLS downloadable with a request wizard on the CAD/AVL front-end system
- All information is secured with API keys issued by GMV to your agencies or third parties as needed, so we can control which third parties have access to your data

Data Available

- Route/Stop/Schedule Database
- Real-time Arrival Information
- Real-time Vehicle Locations
- Real-time Bus Occupancy
- Arrive/depart stop records of actual service
- Schedule adherence data
- Additional CAD/AVL data can be made available via API on request

The same data available to app developers can be pushed to digital signage controlled by GMV or by a third party.

6.7 Reports and Data Analytics – Sync Insights

All reports shown below, and many additional reports not featured, are available out of the box. Each report can be configured and customized by the user, so there are infinite potential report combinations by combining various data items and filters. All reports can export to MS Excel (.csv) or PDF.

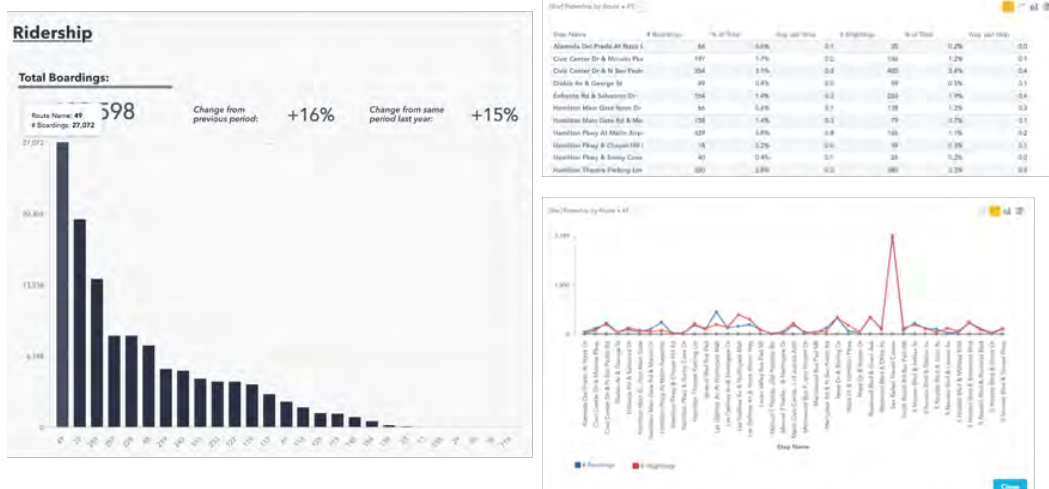
The tools include native graphical report generation within the analytics software, see examples below. All graphics will update in real-time as filters and configurations are modified. Individual reports can be assembled into custom dashboards for easy reference.

6.7.1 INTERACTIVE ANALYTICS PLATFORM

GMV includes an interactive data analysis platform as a standard part of its software to enable clients to get the most value out of their data. Screenshots of individual reports are included below.

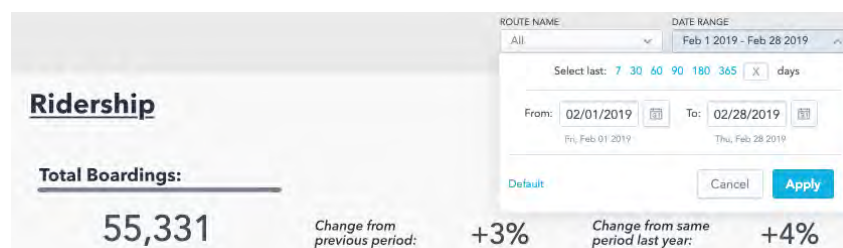
Drill Down into Reports for More Detail

All data items are clickable to “drill down” for additional details. This example shows a ridership report by route (bar chart at left). Click on a particular route to see a table showing the ridership by stops on that route. Switch to a line chart view to see the ridership data in stop sequence order – the transit center stands out as a major outlier (most popular stop on the route).



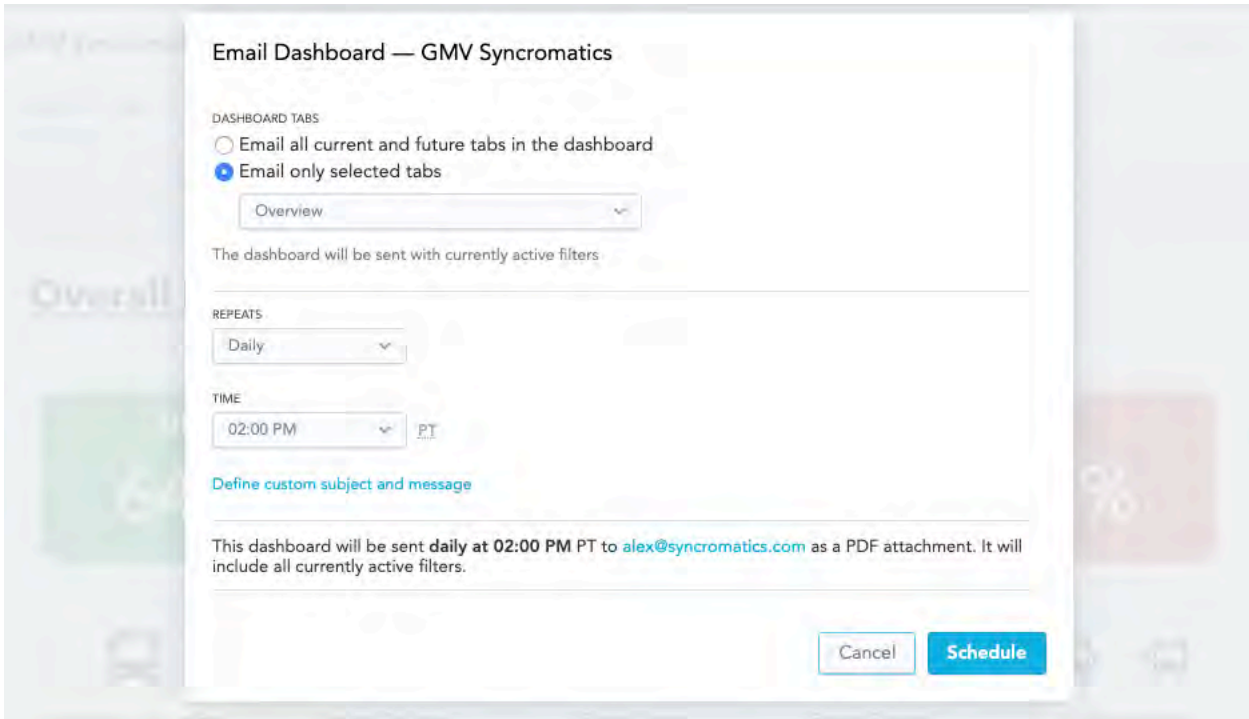
Custom Date Range and Comparison to Prior Period

All reports can be adjusted with custom date ranges to focus on specific data. The system automatically generates a comparison to the previous period (e.g. compare February to January) and to the same period last year (e.g. compare February 2019 to February 2018).



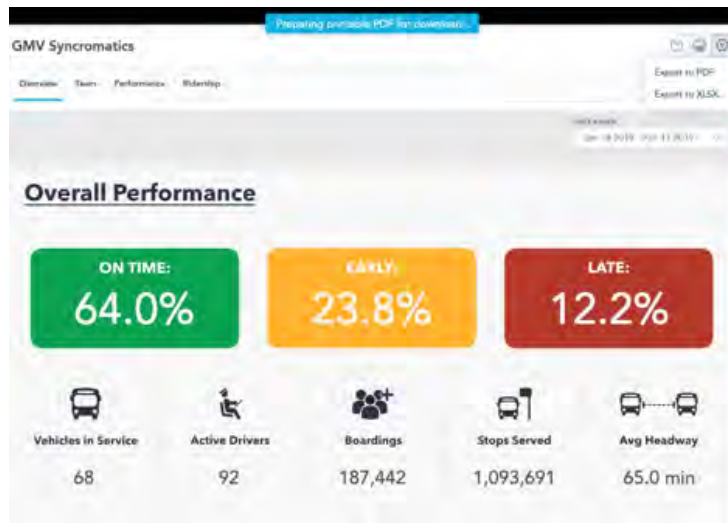
Auto-Schedule Report Distribution by Email

Set up a specific report or dashboard to be emailed to you at regular intervals. The system will automatically run the report with parameters you specify and send the result as a PDF email attachment.



Export Reports as Excel or PDF

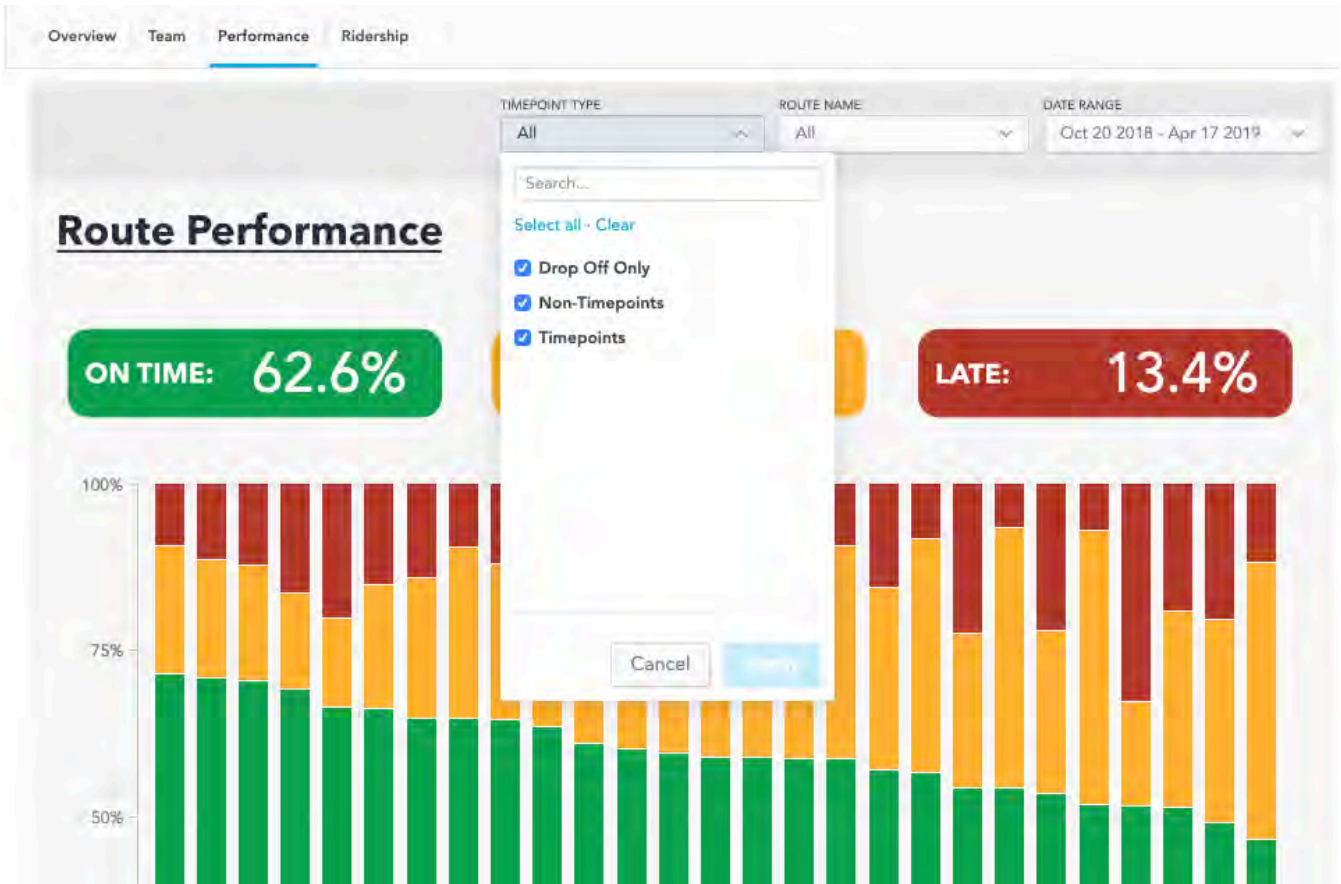
All reports, charts, and tables can be saved as a PDF for sharing with colleagues and board members or exported to Excel for further data analysis.



	A	B	C
1	Applied filters:	Top LATE Routes	
2		Dates: 01/18/19 - 04/17/19	
3			
4	Route Name	% Late	
5	151		32.8%
6	125		23.2%
7	68		21.6%
8	61		20.5%
9	119		18.8%
10	35		17.1%
11	122		15.9%
12	115		15.0%

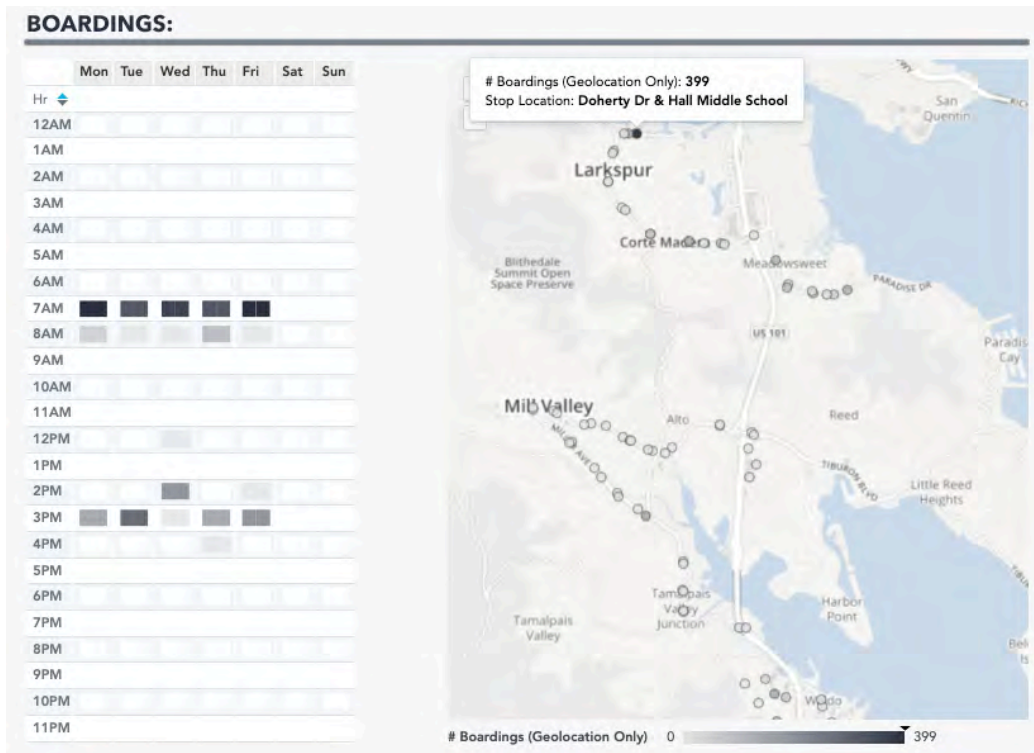
On Time Performance, Filtered by All Stops vs. Timepoints

All Schedule Adherence reports can be filtered to show data for all stops or to show only data for stops designated as timepoints



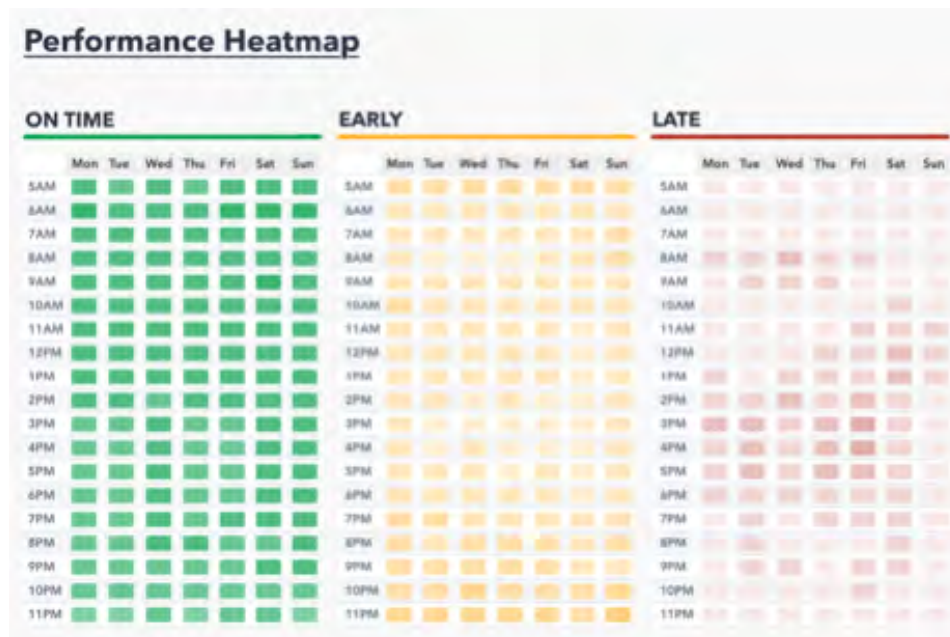
Map Based Reports for Geo-Spatial Analysis

Many reports can be displayed on a map to establish patterns and trends in the local context and see how the distance/terrain affects the data being reported. This example shows a ridership report on a map at right with stops color coded by ridership (high ridership is darker). A user can hover over a stop for more details. The example also shows a Day-Time Heatmap to identify times of day and days of week with the highest ridership – helpful for route and schedule planning.



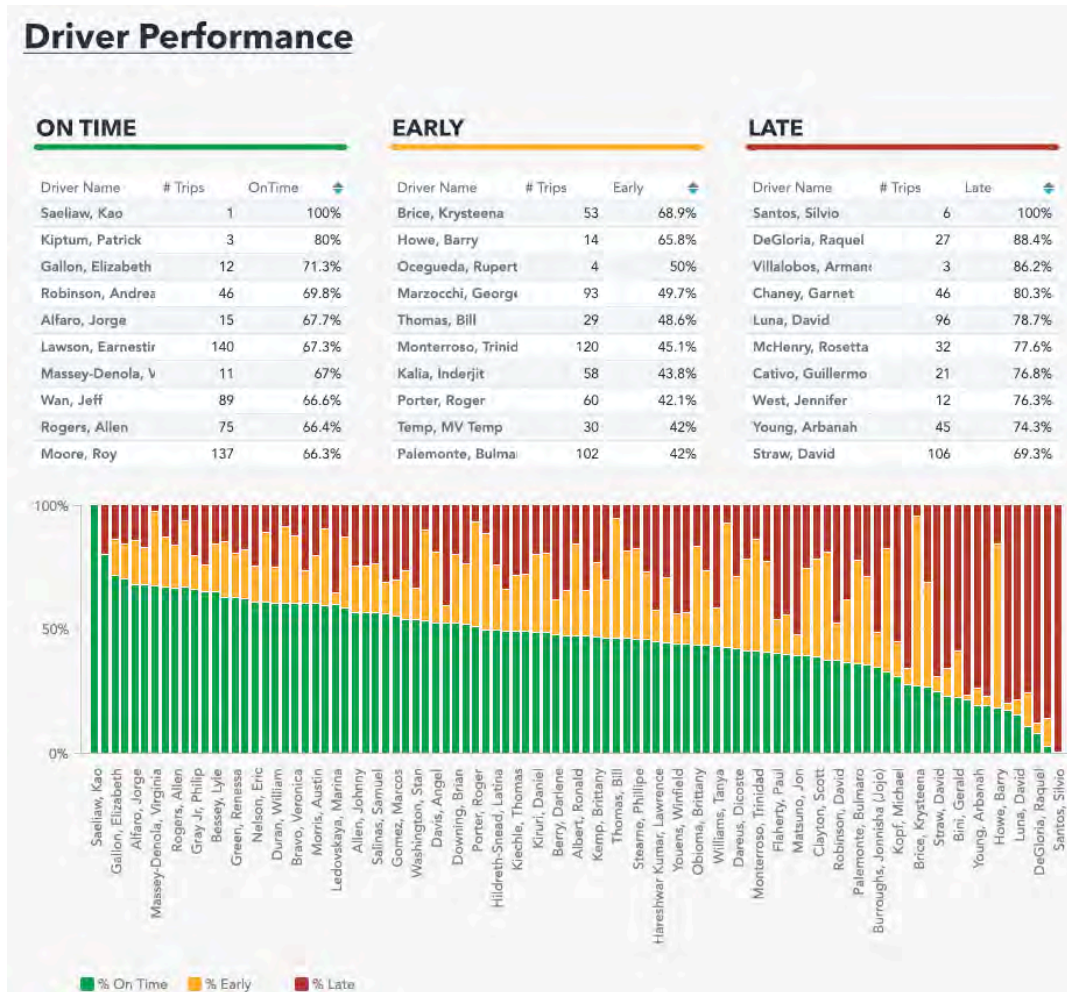
Schedule Adherence Day-Time Heatmap

This report shows how on time performance changes throughout the day and across the week. Darker colors mean higher values, so a dark red cell indicates chronic late OTP at that time of day/day of week.



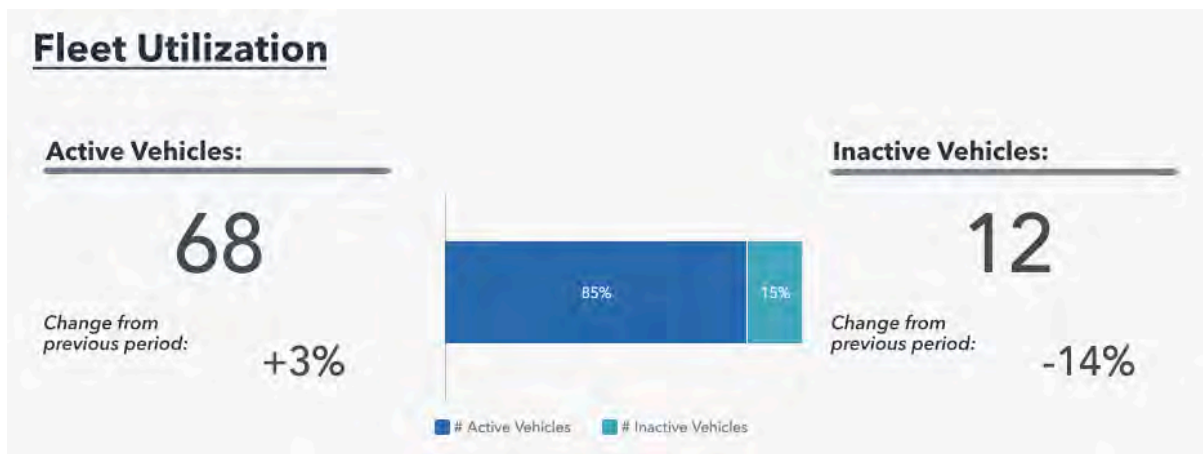
Schedule Adherence by Driver and Driver Performance Trends

This report shows an on time performance comparison for all drivers and it shows how the driver's OTP has changed over time with trend analysis.



Fleet Utilization / Spare Ratio

This report shows that actual number of vehicles that were in service during the selected time period, and a comparison with the previous period.





NTD Reports / Service Statistics

GMV offers a full NTD reporting solution as a standard element of its CAD/AVL software package to help transit agencies comply with their federal reporting requirements.

The report will automatically calculate totals and averages based on operations, this automated data collection and analysis will reduce the workload on client staff and help provide insights into the operations. The report will feature interactive drill downs to enable a user to validate any figures that are out of line with expectations and identify the specific day/vehicle/trip that is the source of the outlier.

The report can be exported to Excel to enable further analysis, data adjustment, or import into a third party business intelligence tools.

Service Statistics

Start Date **End Date** **All Routes**

[Export CSV](#)

All
Weekday
Saturday
Sunday

Passenger Statistics

Month	Unlinked Passenger Trips ⓘ	Passenger Miles Traveled ⓘ	Average Trip Length ⓘ
Nov 2018	118,754	544,667	4.59
Dec 2018	98,372	418,906	4.26
Jan 2019	93,910	445,280	4.74
Feb 2019	99,374	482,286	4.85
Total	410,410	1,891,139	4.61

Vehicle Service Statistics

Month	Vehicle Revenue Miles (VRM) ⓘ	Deadhead Miles ⓘ	Total Actual Vehicle Miles ⓘ	Vehicle Revenue Hours (VRH) ⓘ	Deadhead Hours ⓘ	Total Actual Vehicle Hours ⓘ
Nov 2018	110,663	5,581	116,244	9,463	1,033	10,496
Dec 2018	106,772	4,428	111,200	9,269	730	9,999
Jan 2019	107,691	4,932	112,623	9,384	863	10,247
Feb 2019	102,080	5,077	107,157	8,771	865	9,636
Total	427,206	20,018	447,224	36,887	3,491	40,378

Schedule Statistics

Month	Vehicles Operated in Max Service ⓘ	Total Days Operated ⓘ	Weekdays Operated ⓘ	Saturdays Operated ⓘ	Sundays Operated ⓘ
Nov 2018	30	29	21	4	4
Dec 2018	30	30	20	5	5
Jan 2019	30	30	22	4	4
Feb 2019	30	28	20	4	4

GMV understands that NCTSD recently began working with Urban Transportation Associates (UTA) to install APC systems on (2) vehicles in support of a Comprehensive Operations Analysis (COA) project being executed by Toole Design. For your consideration, we have included optional pricing to outfit all vehicles in the Nevada County Connects fleet with APCs, and pricing to continue to work with UTA for APC system analytics.

6.7.2 ADDITIONAL REPORTS

Event Logs:

System activity reports provide in-depth audit capabilities, with multiple levels of filtering and date tracking. Examples include vehicle assignment histories, yard pull in/out, triggered alerts, etc.

SUMMARY					
System Activity Logs					
Bus	Driver	Route	Event	Time	Location
99023	6054 Rodriguez, Raul	Route B	MDT: Signed In	Thu 11/29 5:48:25 AM	--
99023	6054 Rodriguez, Raul	Route B	Ignition: Off	Thu 11/29 5:50:41 AM	1251 Spr
99023	6054 Rodriguez, Raul	Route B	Ignition: On	Thu 11/29 5:52:36 AM	1251 Spr
99023	6054 Rodriguez, Raul	Route B	Exit	Thu 11/29 5:58:52 AM	Pull in/Pu
99023	6054 Rodriguez, Raul	Route B	Enter	Thu 11/29 5:59:02 AM	Pull in/Pu
99023	6054 Rodriguez, Raul	Route B	Ignition: Off	Thu 11/29 5:59:13 AM	1251 Spr
99023	6054 Rodriguez, Raul	Route B	Ignition: On	Thu 11/29 6:05:35 AM	1251 Spr
99023	6054 Rodriguez, Raul	Route B	Exit	Thu 11/29 6:06:43 AM	Pull in/Pu
99023	6054 Rodriguez, Raul	Route B	Enter	Thu 11/29 6:15:25 AM	Dash 6 La
99023	6054 Rodriguez, Raul	Route B	Exit	Thu 11/29 6:15:28 AM	Dash 6 La
99023	6054 Rodriguez, Raul	Route B	Enter	Thu 11/29 7:12:15 AM	Dash 6 La
99023	6054 Rodriguez, Raul	Route B	Exit	Thu 11/29 7:12:22 AM	Dash 6 La
99023	6054 Rodriguez, Raul	Route B	Enter	Thu 11/29 7:12:54 AM	Pull in/Pu

Actual Stop Records:

For every stop on every route, the system logs arrival time, departure time, dwell time and riding time, per stop, and between stops. With APC installed, the stop times report will also show boardings and alightings at each stop during each trip.

route														stop			
King East, Clockwise														[all]			
No.	Stop Name	Arr	Dep	At	IA	BT	On	Off	Arr	Dep	At	IA	BT	On	Off		
1	37th St. & Grand (Eastbound)	--	--	--	--	--	--	--	01:47P	01:48P	2m		2m				
2	Hill & 35th St	--	--	--	--	--	--	--	01:49P	01:49P	1m		1m				
3	Grand & Jefferson Blvd.	01:05P	01:05P	1m			3	1	01:50P	01:50P	1m	44m	1m				
4	Grand & 30th St.	01:06P	01:06P	1m		0m			01:50P	01:51P	1m	44m	1m				
5	Grand & 28th St.	01:07P	01:07P	1m		1m	0	1	01:51P	01:52P	2m	44m	0m	2	0		
6	Adams & Grand Ave.	01:08P	01:08P	1m		1m	1	0	01:52P	01:53P	1m	44m	0m	0	1		
7	Figueroa & Adams Blvd.	01:09P	01:10P	1m		1m	0	1	01:55P	01:56P	1m	45m	2m	3	0		
8	23rd & Figueroa St.	01:11P	01:11P	1m		0m	1	0	01:57P	01:58P	2m	45m	1m				
9	23rd & Grand Ave.	01:14P	01:16P	2m		3m	1	1	01:59P	02:00P	2m	43m	1m	1	0		
10	23rd & Broadway	01:16P	01:17P	1m		0m			02:01P	02:02P	2m	44m	0m				
11	23rd & Main St.	01:17P	01:18P	1m		0m			02:02P	02:02P	1m	44m	1m				
12	23rd & Maple Ave.	01:19P	01:20P	2m		1m	7	3	02:03P	02:05P	3m	43m	1m				

Daily Schedule Performance:

The Daily Schedule Performance report can be viewed at any time during the day, or it can be viewed for any day in the past and will give users an overview of every trip. Vertical columns representing trips will be color coded based on overall on-time performance, with individual stop times also color coded to show early or late status. Columns that appear white are used to indicate missed trips or no assignments.

Route	DASH B	Direction	Loop	Trip	Run	Block	Vehicle	Driver	OnTime	Late	Early	Scheduled Time	Actual Time	Variance
No Assignment									50%	0%	50%	N/A	No Assignment	
Alameda St & College St (Southward)												SCHEDULED	ACTUAL	OT
Alameda St & Los Angeles St (Southward)												05:50 am	--	--
Temple St & Spring St (Westward)												05:57 am	--	--
Grand Ave & 3rd St (Southward)												06:00 am	--	--
7th St & Hope St (Eastward)												06:07 am	--	--
Grand Ave & 3rd St (Northward)												06:15 am	--	--
Temple St & Spring St (Eastward)												06:24 am	--	--
Alameda St & Los Angeles St (Northward)												06:28 am	--	--
												06:32 am	--	--
No Assignment									75%	0%	25%	N/A	N/A	
												SCHEDULED	ACTUAL	OT
												05:58 am	05:56 am	-00:01
												06:05 am	06:06 am	+00:01
												06:08 am	06:10 am	+00:02
												06:15 am	06:14 am	+00:00
												06:23 am	06:23 am	+00:00
												06:32 am	06:27 am	-00:04
												06:36 am	06:35 am	+00:00
												06:40 am	06:39 am	+00:00

6.7.3 DATA OWNERSHIP

GMV will never claim ownership over the data generated by the ITS system. Your agency owns all data; we are just the good stewards of it.

- GMV stores and processes data for you as part of our turnkey hosted solution.
- If you need to download the data, GMV has a number of different raw data download mechanisms, including the route database, vehicle position history, stop time audit trail, etc. These are available via HTTP/web to make the access straightforward and available.
- GMV offers XML and JSON API endpoints for your staff and developers to access.
- At the end of the contract, GMV can provide a hard drive containing all relevant data for your agency to archive.

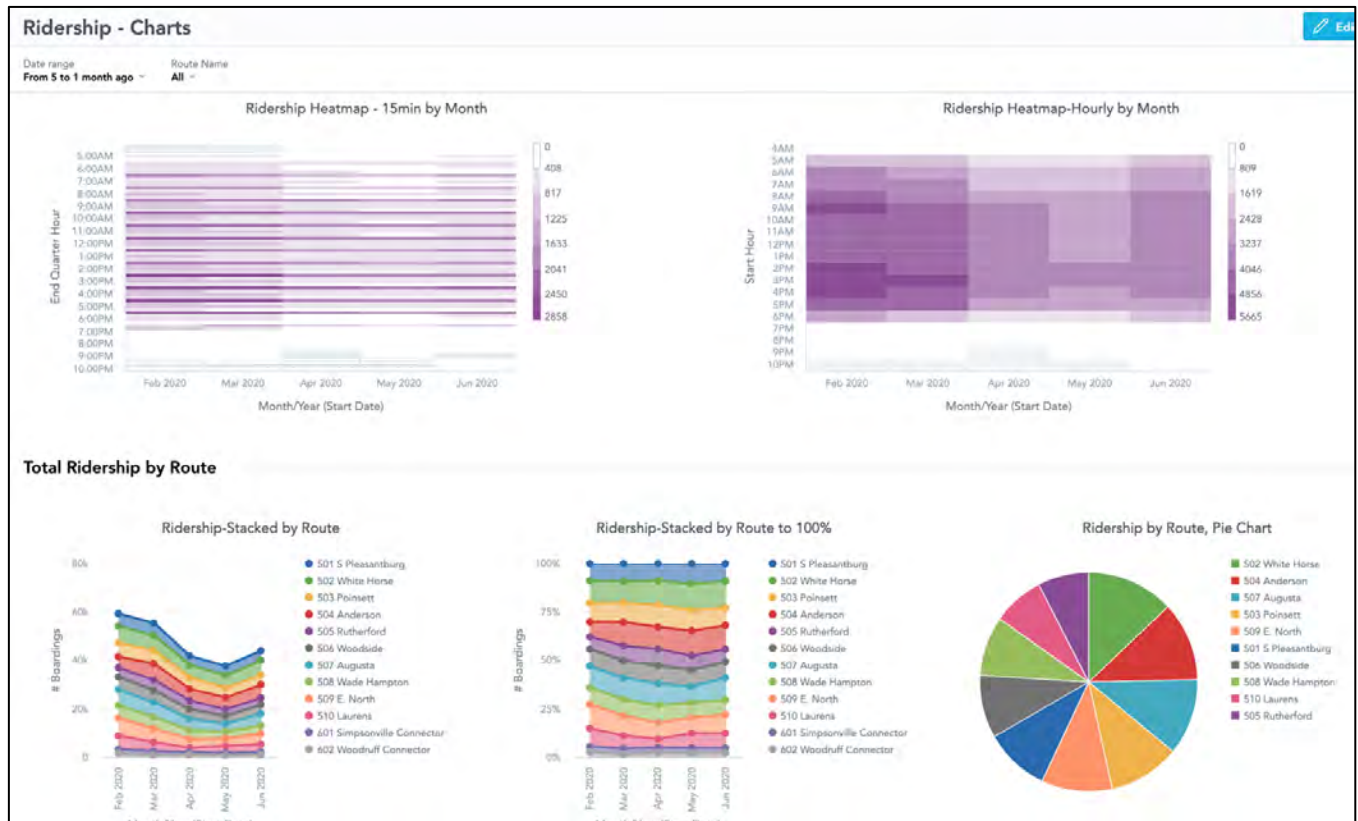
6.8 Insights Builder – Custom Reports / Business Intelligence

GMV provides a fully integrated business intelligence platform to design custom reports and build custom dashboards for analysis of system data, report generation, and generating dashboards to monitor system performance.

Features:

- **INTERACTIVE REPORTING** with live filtering and drill down functions – click on any chart or data item to explore the data
- **COMPARISON** to prior periods allows a user to put data in context based on historical performance and trends. How many riders did we have last week, AND how does that compare to the same week last year?
- **CUSTOMIZABLE DASHBOARDS** allow users to generate their own graphical and tabular reports and dashboards using any data item within the database. Simply drag and drop data items into the dashboard to modify the layout and content, then save the dashboard for personal or agency wide use
- **AUTOMATIC REPORT DELIVERY** at daily, weekly, or monthly intervals ensures that the right people see the right reports at the right time
- **RICH DATA VISUALIZATION** on maps, charts, and tables enables clients to interpret meaningful results from large data sets

Sample Ridership Dashboard Composed of Five Custom Data Visualizations:



6.8.1 HOW DOES INSIGHTS BUILDER WORK?

Here's a tour of the Insights Builder workspace and core functions:

Give your insight a title

Clear, open, save, and export your insight

Search and select the data you'd like to report. Try "late" or "boardings."

**Get started
Drag data here to begin.**

Drag data here to start your visualization

1 + Add data Import your own data from a CSV file

And follow these steps to create and customize your data visualizations:

1

2

End Date: Last 30 days

Filter by time period

1 Select type of visualization

2 Drag-and-drop data to find relationships between different service measures

CONFIGURATION
Adjust colors and other settings

Boardings and % Late Stop Times by Route

Unsaved changes

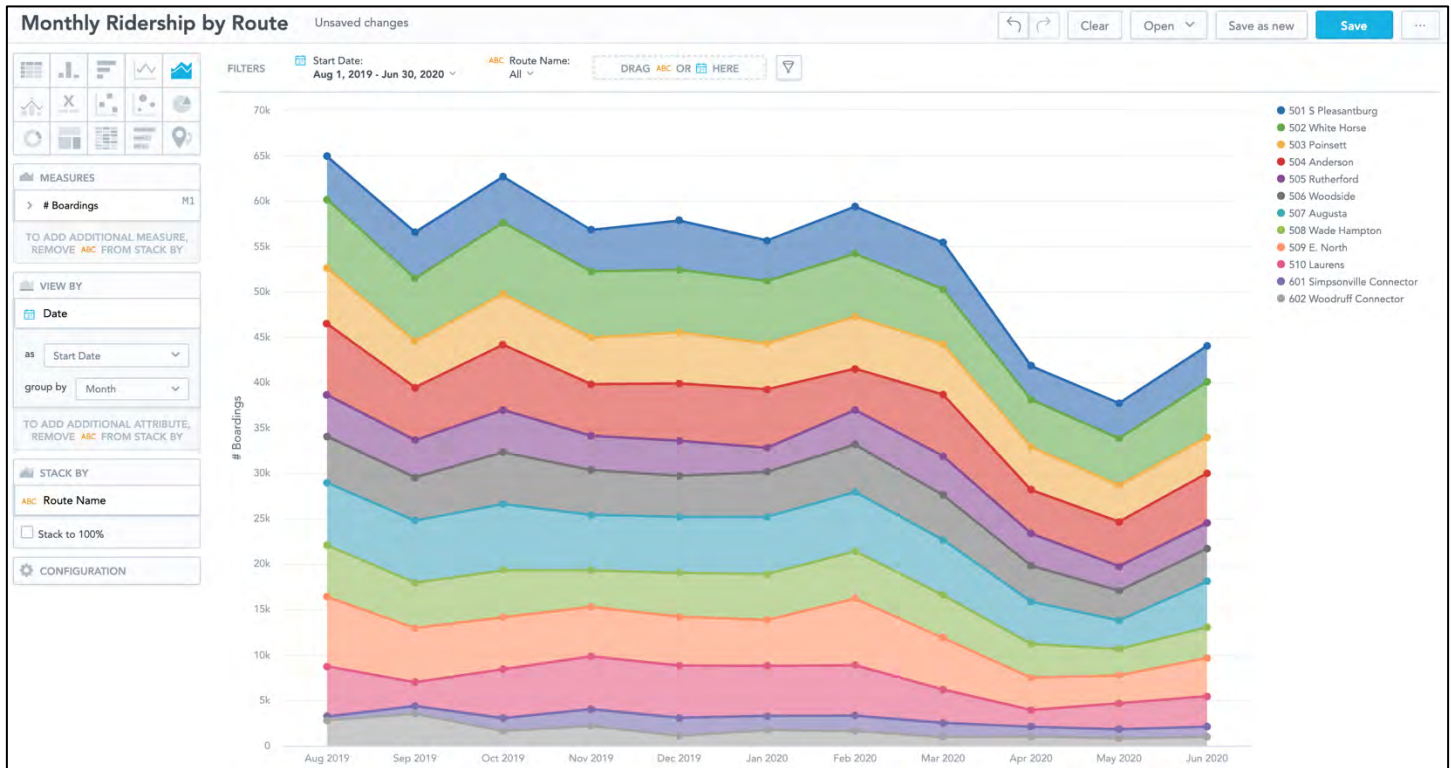
MEASURE (X-AXIS): # Boardings

MEASURE (Y-AXIS): % Late StopTimes

MEASURE (SIZE): # Boardings

VIEW BY: Route Short Name

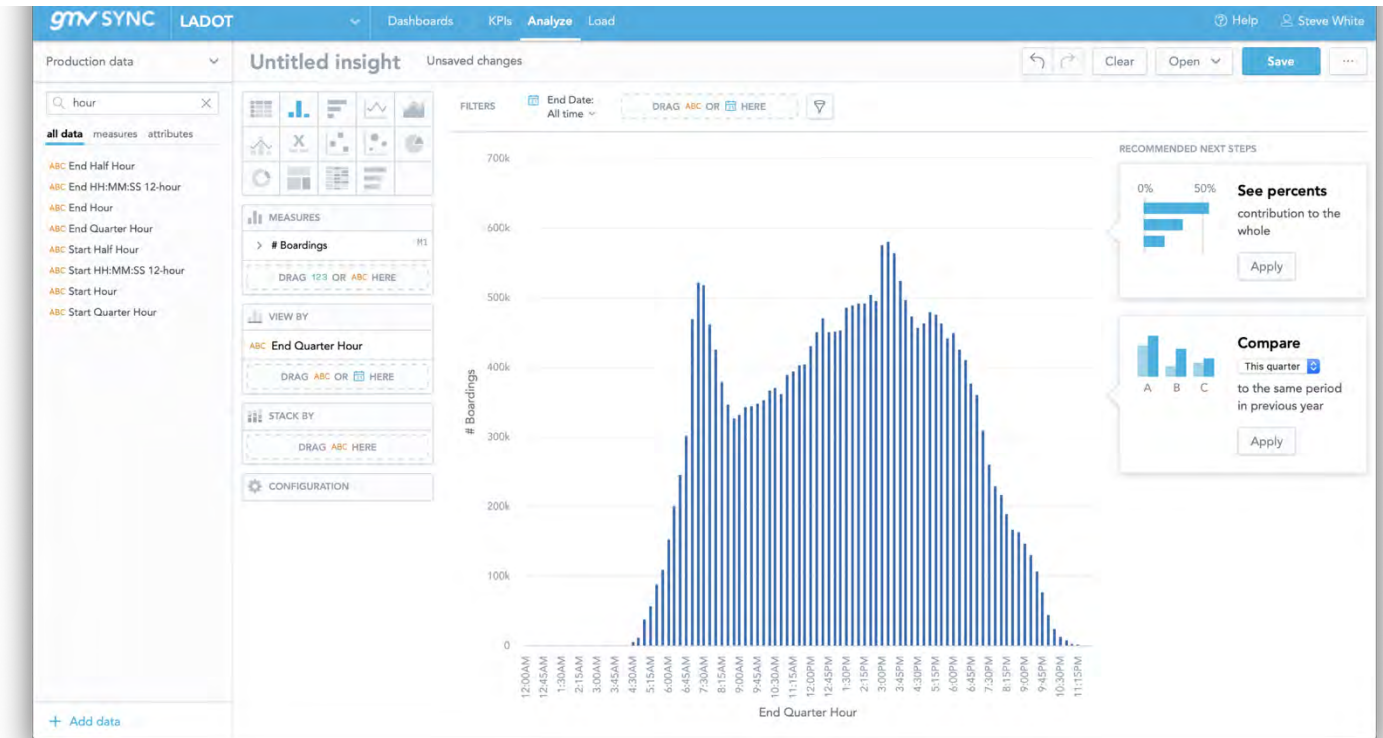
20th St Shuttle, Blue Route, Church Route, Citadel Outlets Express, Green Route, Red Route, Shopper Special Route



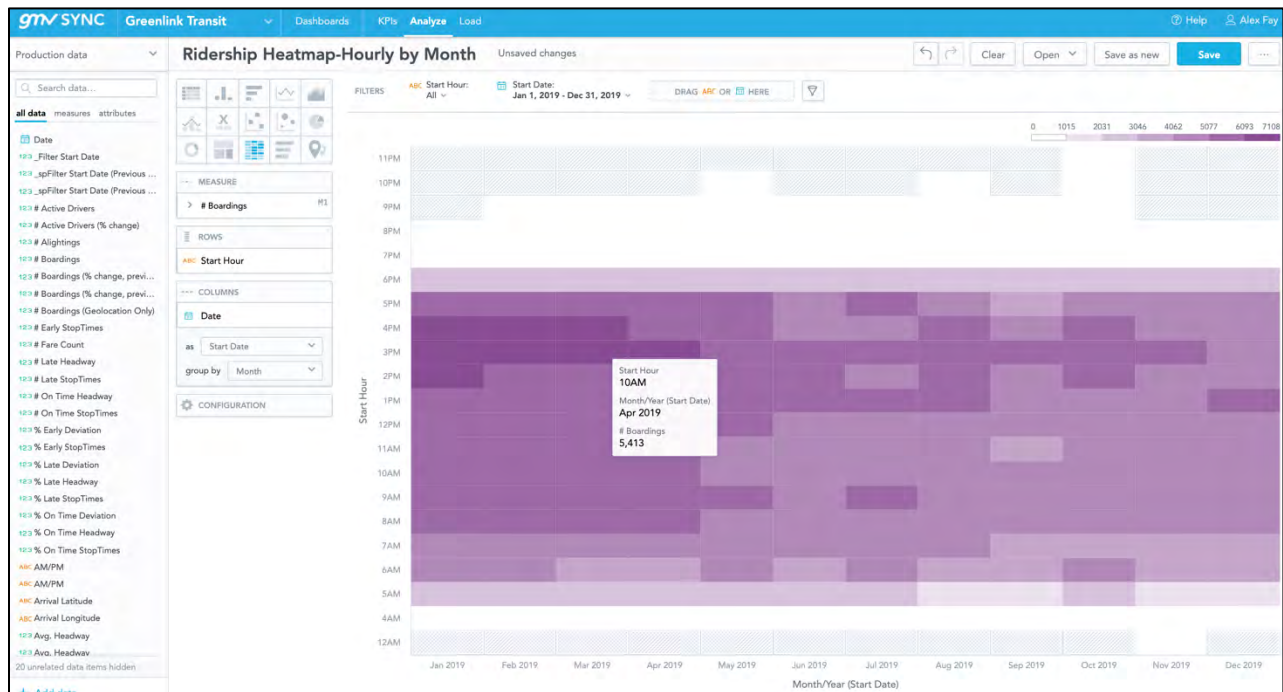
This chart shows total ridership each month, broken out by each route. The overall drop in March/April 2020 is due to COVID-19, and ridership shows some rebounding in June 2020.

This interactive report can be filtered by each route, set custom dates, or viewed alongside other performance metrics.

Here are some sample reports generated with Insights Builder:



Ridership in 15 minute increments (can be filtered by route as well)



Ridership Heatmap – what are the busiest times of day and days of the week?



6.11 GMV’s Standard Service Level Agreement (SLA)

GMV has detailed our Service level agreement, along with details about warranties, software upgrades, and customer support in “Tab D”. We are also providing information about our SLA in this section in the context of responding to Scenario A and B.

Ongoing support is included in the recurring maintenance fees associated with GMV services. Ongoing support includes access to a self-service support portal, product support staff, and software upgrades. There are no per-incident or hidden support charges.

Service level standards for support are outlined in the table below and based on categories of support issues ranging from Level 1 through Level 4, each with tailored approaches to effectively reach resolution.

Issue Severity	Issue Description	GMV Staff Involved	Submission and Response Method	Response Policy
Level 1	System-wide service disruption <i>It's rare but we're prepared</i>	Executive	No submission required Notification posted in app, to GMV Status Page ¹ , and emailed to subscribed users	A notification is posted within one (1) hour of a disruption occurring. Notification updates are posted at least every twelve (12) hours until the issue is fixed.
Level 2	Complex troubleshooting and recurring issues <i>In case we don't resolve an issue quickly or right the first time</i>	Specialist	Issue escalated from Level 3 A specialist intervenes to assist	Complex, recurring, and unique issues are escalated to GMV's most knowledgeable staff. This occurs when an issue requires extensive effort or back-and-forth to resolve.
Level 3	Product questions and technical assistance <i>It's what our dedicated support team's here for</i>	Support	Ticket submission or call A support team member responds	A substantive response will be sent within one (1) business day of the original submission.
Level 4	Requests and other inquiries <i>Ask us anything</i>	Account Manager	Ticket submission or call The appropriate staff member gets in touch	A confirmation that the submission has been received and referred to appropriate staff member within one (1) business day of the original submission.

GMV endeavors to keep its servers up and running 24x7x365 and avoid service disruptions (Level 1 issue). To do so, alerts and automated system notifications have been designed to reveal potential issues before they occur, engineers remain on-call after hours, and a 24/7 emergency support line is available to users. As a result, the benchmark for system uptime is in excess of 99%. And only a sliver of the overall number of support issues received by GMV are categorized as Level 1.

Users have access to a 24/7 self-service support portal that includes a Knowledge Base with helpful product documentation and training guides. The portal can also be used to submit support tickets, review previously submitted tickets, and to follow up on currently open tickets. The portal is actively managed to ensure tickets are handled in a timely manner and most tickets are responded to within 24 hours of submission.

Effective support for GMV’s intelligent transit system requires a collaborative effort. Issue reports submitted by users may be followed-up with requests for observations related to reported system behavior, explanations of troubleshooting steps attempted, and additional troubleshooting in accordance with real time recommendations made by GMV staff or as outlined in GMV’s product support documentation (e.g., troubleshooting binder).

6.11.1 NCTSD SCENARIO A

Situation: Staff notifies the vendor that the GPS signal of various vehicles are not being recorded and/or displayed on the dispatching screen. This is considered a priority item.

GMV Response: If a widespread issue is observed, NCTSD staff can check GMV’s status page to see if a known disruption or outage is occurring. If nothing is posted, they can call, email, or submit a support ticket for assistance. GMV staff will collect details about the issue from the NCTSD staff member and assess if the issue is Level 1 (system-wide service disruption) or a combination of factors (i.e. is this a recurring issue or a hardware defect across the various vehicles), which will result in a Level 2 or 3 designation. GMV staff will advise and assist in troubleshooting the issue. If the issues are not resolved through standard troubleshooting steps, the matter will be escalated for investigation and resolution. GMV endeavors to respond to issues affecting real-time service within 2-4 business hours. For priority items, calling our support line will result in faster attention and is encouraged.

6.11.2 NCTSD SCENARIO B

Before addressing GMV’s response to the issue, we want to provide a bit of context around how we ensure the system properly understands complex route paths. GPS data is inherently imprecise and commonly experiences ‘bounce’ or ‘drift’. Rather than rely on geofencing, we utilize Route Lock.

Route Lock is our process of taking imprecise GPS data and “locking” it to the pattern shape in real-time. We save the original GPS “breadcrumbs” for history but use Route Lock positions for real-time operations.

Pattern Shape – Actual Geography



By taking pattern shapes and viewing them as a straight line, the system

- Won’t make announcements for the wrong side of the street.
- Knows which direction it’s heading, even when stopped.
- Uses shape distance rather than road or “as the crow flies” distance to predict arrivals.
- Doesn’t get confused if multiple routes share a corridor or stop.

Pattern Shape – Route Lock View



With Route Lock a vehicle at the 6th stop will accurately recognize and record which stop the vehicle is approaching, at, and departing.





Situation: Staff notifies vendor of a multi-level issue with data: it is noted that the on-board data terminals are not automatically clearing stops when driver has passed the geofenced area, and it is also noted that randomly throughout the day passenger boardings entered into the data terminal are not being captured for the route.

GMV Response: Upon noticing an issue, NCTSD can call, email, or submit a support ticket. A GMV Product Specialist will be assigned to assist with this issue. The initial response would occur at most between 4-8 business hours of receiving the ticket. The Product specialist will seek to understand if the issue shares a common root cause that may result in multiple levels of issues, or if there are multiple root causes at play. With GMV’s Route Lock logic, we will verify that the configured route matches the route as it is performed in actuality. If differences exist, that may explain why the system is not show the correct stop information or why boardings are missed throughout the day. The product specialist would help NCTSDS staff fix the route configuration to match real-life operations. If the issues are not resolved through standard troubleshooting steps, the matter will be escalated for investigation and resolution.

6.12 Optional Functionality

Per the RFP, GMV has provided the additional costs associated with “Industry standard GTFS Schedule fee (“GTFS Schedule”).

	GTFS Schedule	Standard	Custom	N/A
25	Produce GTFS Schedule Fee*	✓		
26	Allow agency staff to update routes and stops directly (i.e., not via a request to the selected vendor*	✓		
27	Capable of scheduling, blocking, runcutting, and rostering**	✓		

*Standard as part of GMV’s base offering at no charge. Also available through NCTSD’s existing Remix solution.

** GMV natively supports scheduling via an Excel template at no charge. This capability is also standard through NCTSD’s existing Remix solution.