CONNEXIONZ
Smart Transit Solutions

CASE STUDY

Santa Clarita Transit

With increasing demand for transit services, Santa Clarita Transit chose Connexionz to optimize bus performance and improve the passenger experience with astonishingly reliable data.

The City of Santa Clarita Transit provides bus services within and outside of Santa Clarita, enabling commuters to travel to and from areas such as Los Angeles, Century City, North Hollywood, San Fernando Valley, and Burbank.

When the agency assumed responsibility for the service in August 1991, 300,000 riders were boarding one of 13 buses along eight fixed local routes. In the months that followed, the network introduced a new Dial-A-Ride service, expanded its commuter services, and added a paratransit service for seniors and disabled within the Santa Clarita Valley.

Since then the demand for transport services has been steadily increasing, as new residents and businesses continue to relocate to Santa Clarita Valley. Today, Santa Clarita Transit's 100-vehicle fleet provides service for 3 million passengers per year, along 11 local fixed routes. Offering several supplemental school day routes to relieve crowding on local buses in the morning and afternoon, as well as station link routes to open more travel options for passengers who are commuting from nearby areas.

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RELIABLE AGENCY PERFORMANCE MONITORING IN REAL-TIME

To manage quick growth and maintain service reliability, the agency sought a system that could monitor the network in real time while also providing reliable predictions of bus arrival times in the most accurate format possible. They collected data hoping it would be used to highlight issues and areas for improvement. In 2009, after considering many available options, they decided to invest in the Connexionz Intelligent Transit System.

The baseline for all the important service information needed by the agency is found in the sophisticated algorithms in the Connexionz real-time tracking system, which calculates live arrival predictions for buses at all bus stops.

Adrian Aguilar, Transit Manager, City of Santa Clarita explained, “At the time we didn’t have advanced technology in place that allowed us to track vehicles or provide real-time arrival information. While we did test cell phone based GPS systems, the data was limited, not very reliable, and could only provide a high-level view of the operation. We collected all on-time and system performance data by a team of ride checkers by randomly sampling riding trips on a weekly basis.

“We decided to run the new Connexionz system for a few months before advising our bus operators and customers that we were tracking routes, collecting trip data, and providing real-time arrival information. The reason was to test the data collected and fix any bugs first, while also providing a baseline for performance data compiled by the system.”

Once the system went live, Santa Clarita Transit’s on-time performance rate increased from an average of 81% to 88% without making any substantial changes to the routes or schedules.

“We attributed the difference to the system’s ability to monitor individual operator behavior and performance,” said Aguilar.

PROVEN ACCURACY REALLY DOES MATTER

Not every intelligent transit system is created equal. Only a system like Connexionz can produce these considerable results in such a short amount of time. Connexionz prediction algorithms continuously ‘learn’ the nuances of an agency’s operations in conjunction with real-time positions and a set of complex historical data. When it comes to increasing the passenger’s perception of service, nothing does quicker work than accurate data.

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Connexionz performance has been proven on a global scale, and recent analyses in Canterbury, New Zealand, have provided detailed statistical evidence for the accuracy of the RTT system. The Connexionz RTT system was shown to maintain accuracy across different active routes, bus stops, and during peak travel hours, demonstrating the versatility and sophistication of the system. Despite this compelling data, further analysis in Santa Clarita hoped to extend these findings to overseas regions and ensure that the RTT system’s high performance was preserved on a global scale. A comprehensive statistical analysis was conducted in Santa Clarita to assess the Connexionz RTT system which, uses sophisticated algorithms to derive real time arrival predictions for buses at all bus stops

In this analysis, 20 bus stops were analyzed ranging across the Santa Clarita region, and extending to areas such as Los Angeles and North Hollywood for those commuting out of town. The analysis was conducted over approximately 6 days, assessing 38 routes in total. The analysis primarily compared actual versus predicted arrival times for buses to verify the accuracy of the Connexionz RTT systems prediction

algorithms. The data was obtained through a reliable and repeatable methodology that obtains actual times of arrival when predicted time is set to a certain level. In this analysis, predicted time was set to 10 minutes, and further analyses at predicted times of 5 minutes and 20 minutes were conducted to corroborate evidence. During that time, it showed that the two data sets (predicted versus actual) were within 0.75 percent of each other, and the system maintained accuracy across Santa Clarita Transit's different active routes, bus stops, as well as during peak travel hours.

"The statistical evidence Connexionz provided was enough to convince our contractor of the system's reliability and for us to transition away from manually collected data to using Connexionz RTT data in the payment of incentives and assessment of damages," said Aguilar. This was an important and crucial step in bringing Santa Clarita a much more impressive and safe level of service delivery.

Data count and average arrival times		
Route No.	Count	Average actual arrival time
1	296	11.834
2	197	9.406
3	114	10.289
4	138	11.196
5	334	10.749
6	518	10.488
7	195	10.559
12	552	9.877
14	189	11.196
501	23	9.130
502	35	10.914
620	7	11.143
621	3	10.333
622	3	7.667
623	8	12.250
624	3	11.333
625	0	N/A
626	11	14.727
627	6	11.500
628	7	11.143

Data count and average arrival times		
Route No.	Count	Average actual arrival time
629	6	12.167
631	4	11.500
632	3	9.000
633	0	N/A
634	0	N/A
635	6	14.167
636	10	11.000
637	2	13.500
638	1	14.000
639	3	12.667
640	7	12
757	77	11.857
791	20	13.300
792	27	13.444
794	23	12.652
796	10	9.300
797	71	10.423
799	94	10.084
Grand total	**3003**	**10.658**

Table 1: Count of pieces of data obtained and calculated average actual arrival time for analyzed routes with a predicted arrival time of 10 minutes.

AGENCY IMPROVEMENTS

Accurate and reliable prediction of bus arrival times:

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  - Keeps passengers informed
  - Increases service reliability
  - Improves passenger experience and customer satisfaction
  - Increases ridership rates
- Customizing passenger information content for displays with accurate predictions for every route
- Manage to route and schedule more efficiently
- Develop system of incentives to reward driver performance
- Accurate reporting and assessment of damages, service inefficiencies, emergencies, and important National Transit Database mileage data

IMPROVING THE PASSENGER EXPERIENCE WITH ACCURATELY PREDICTED ARRIVAL TIMES

The proven accurate data collected by the system not only improves bus operations by allowing for the efficient management of routing, scheduling, and driver performance, it also helps to improve the passenger journey.

Santa Clarita Transit passengers immediately noticed the benefit of the new predicted arrival times. With live updates on LED displays at the bus stops, riders no longer worried where their next bus was or whether they were running on time. Providing passengers with peace of mind makes the trip a lot more comfortable.

Even with longer estimated arrivals of 10 minutes or more, the accuracy of the system is reliable enough that passengers can be 95% confident that their bus would arrive within seconds of the predicted arrival time across all routes both inside and outside of the city.

"It's so much more convenient knowing when our bus is going to arrive. Before Santa Clarita installed the new information signs, we had no idea how long we'd have to wait, or even if we'd just missed our bus. Now, we can plan to be at the bus stop on time, or if it's going to be later, we can make alternative arrangements, or let friends know that we're running late." – Santa Clarita passenger Wayne Mead still makes praise about a reliable service even almost ten years after the initial technology installation.

BETTER SERVICE FOR PASSENGERS

- Know when the next bus is arriving via LED displays at bus stops
- Keep informed throughout the journey with audio announcements of next stops
- Travel with confidence knowing when you will arrive at your destination
- Other California agencies might experience unreliable predictions while Santa Clarita's predictions have remained consistent since 2010, creating a positive and increasing brand value