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Section A: Transit Agency Information

City of Santa Clarita
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Santa Clarita, CA 91355

Air District: South Coast Air Quality Management District

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The City of Santa Clarita is not part of a Joint Group.

Section B: Rollout Plan General Information

The City of Santa Clarita's Zero Emission Rollout Plan ensures that the City will make a complete transition to zero emission vehicles by 2040. Additionally, this plan accounts for delivery timelines ranging from six (6) to twenty-four months (24) and ensures that vehicles will not have to be retired before reaching the end of their useful life. The City's replacement schedule does not allow for delivery of conventional buses after 2028.

This plan, which was prepared by City staff, was adopted by City Council on July 14, 2020. A copy of the resolution is attached in Appendix A

Section C: Technology Portfolio

The City's bus fleet consists of over the road coaches, low floor transit vehicles, and traditional cutaway buses used for seniors and ADA service. The City of Santa Clarita will be integrating fuel cell electric buses into the City's transit fleet. Fuel cell buses will be purchased and introduced to the fleet as CNG transit buses reach the end of their useful life. The City's fleet replacement plan calls for replacing one twelfth (1/12) of the bus fleet every year.

This effort will focus exclusively on the replacement of the City's local transit fleet between 2020 and 2026. Currently there is no commercially available commuter or cutaway vehicle that has successfully completed Altoona testing that also meets the range requirements of the City's commuter and demand response operations. This plan assumes that by 2026, battery electric (BEB) commuter and cutaway buses will be commercially available and have the range needed to meet the needs of the City. As technology evolves this plan will be updated to reflect any changes made by the City.

Section D: Current Bus Fleet Composition and Future Bus Purchases

The City's Transit fleet consists of transit, articulated, over-the-road, and cutaway vehicles. While we currently have a small number of diesel-powered over-the-road coaches, the majority of the City's fleet is powered by renewable compressed natural gas (CNG). The table below includes the bus number, engine model year, bus model year, fuel type, and bus type.

Table 1: Individual Bus Information of Current Bus Fleet

BUS #	ENGINE MODEL YEAR	MODEL YEAR	FUEL TYPE	BUS TYPE
100	2017	2017	CNG	Hometown Trolley
101	2001	2001	DSL	Chance AH28
103	2013	2013	CNG	Gillig Low Floor CNG
104	2013	2013	CNG	Gillig Low Floor CNG
106	2013	2013	CNG	Gillig Low Floor CNG
107	2013	2013	CNG	Gillig Low Floor CNG
108	2013	2013	CNG	Gillig Low Floor CNG
109	2013	2013	CNG	Gillig Low Floor CNG
110	2013	2013	CNG	Gillig Low Floor CNG
111	2013	2013	CNG	Gillig Low Floor CNG
112	2013	2013	CNG	Gillig Low Floor CNG
113	2014	2014	CNG	Gillig Low Floor CNG
114	2014	2014	CNG	Gillig Low Floor CNG
115	2014	2014	CNG	Gillig Low Floor CNG
116	2014	2014	CNG	Gillig Low Floor CNG
117	2014	2014	CNG	Gillig Low Floor CNG
118	2014	2014	CNG	Gillig Low Floor CNG
119	2014	2014	CNG	Gillig Low Floor CNG
120	2014	2014	CNG	Gillig Low Floor CNG
121	2014	2014	CNG	Gillig Low Floor CNG
122	2014	2014	CNG	Gillig Low Floor CNG
123	2014	2014	CNG	Gillig Low Floor CNG
124	2018	2018	CNG	Gillig Low Floor CNG
125	2018	2018	CNG	Gillig Low Floor CNG
126	2018	2018	CNG	Gillig Low Floor CNG
127	2018	2018	CNG	Gillig Low Floor CNG
128	2019	2019	CNG	Gillig Low Floor CNG
129	2019	2019	CNG	Gillig Low Floor CNG
130	2019	2019	CNG	Gillig Low Floor CNG
131	2019	2019	CNG	Gillig Low Floor CNG
132	2019	2019	CNG	Gillig Low Floor CNG G31D
133	2019	2019	CNG	Gillig Low Floor CNG G31D

BUS #	ENGINE MODEL YEAR	MODEL YEAR	FUEL TYPE	BUS TYPE
134	2019	2019	CNG	Gillig Low Floor CNG G31D
165	2005	2005	CNG	Newflyer C40LF
166	2005	2005	CNG	Newflyer C40LF
167	2005	2005	CNG	Newflyer C40LF
168	2005	2005	CNG	Newflyer C40LF
169	2005	2005	CNG	Newflyer C40LF
170	2005	2005	CNG	Newflyer C40LF
171	2005	2005	CNG	Newflyer C40LF
172	2005	2005	CNG	Newflyer C40LF
173	2005	2005	CNG	Newflyer C40LF
174	2005	2005	CNG	Newflyer C40LF
175	2005	2005	CNG	Newflyer C40LF
177	2007	2007	CNG	Nabi 60 BRT-Articulated
178	2007	2007	CNG	Nabi 60 BRT-Articulated
179	2008	2008	CNG	NABI LFW-41
180	2008	2008	CNG	NABI LFW-41
181	2008	2008	CNG	NABI LFW-41
182	2008	2008	CNG	NABI LFW-41
183	2008	2008	CNG	NABI LFW-41
184	2008	2008	CNG	NABI LFW-41
185	2008	2008	CNG	NABI LFW-41
186	2008	2008	CNG	NABI LFW-41
188	2010	2010	CNG	NewFlyer C40LFR
189	2010	2010	CNG	NewFlyer C40LFR
190	2010	2010	CNG	NewFlyer C40LFR
191	2010	2010	CNG	NewFlyer C40LFR
192	2010	2010	CNG	NewFlyer C40LFR
193	2010	2010	CNG	NewFlyer C40LFR
194	2010	2010	CNG	NewFlyer C40LFR
255	2010	2010	DSL	MCI D4500-Over the Road
256	2010	2010	DSL	MCI D4500-Over the Road
257	2010	2010	DSL	MCI D4500-Over the Road
258	2010	2010	DSL	MCI D4500-Over the Road
259	2013	2013	DSL	MCI D4500-Over the Road
260	2013	2013	DSL	MCI D4500-Over the Road
261	2013	2013	DSL	MCI D4500-Over the Road
262	2013	2013	DSL	MCI D4500-Over the Road
263	2013	2013	DSL	MCI D4500-Over the Road
264	2013	2013	DSL	MCI D4500-Over the Road
265	2016	2016	CNG	MCI D4500-Over the Road
266	2016	2016	CNG	MCI D4500-Over the Road
267	2016	2016	CNG	MCI D4500-Over the Road

BUS #	ENGINE MODEL YEAR	MODEL YEAR	FUEL TYPE	BUS TYPE
268	2016	2016	CNG	MCI D4500-Over the Road
269	2016	2016	CNG	MCI D4500-Over the Road
270	2017	2017	CNG	MCI D4500-Over the Road
271	2017	2017	CNG	MCI D4500-Over the Road
272	2017	2017	CNG	MCI D4500-Over the Road
273	2017	2017	CNG	MCI D4500-Over the Road
274	2017	2017	CNG	MCI D4500-Over the Road
275	2017	2017	CNG	MCI D4500-Over the Road
276	2017	2017	CNG	MCI D4500-Over the Road
277	2017	2017	CNG	MCI D4500-Over the Road
278	2017	2017	CNG	MCI D4500-Over the Road
279	2017	2017	CNG	MCI D4500-Over the Road
280	2019	2019	CNG	MCI D4500-Over the Road
281	2019	2019	CNG	MCI D4500-Over the Road
282	2019	2019	CNG	MCI D4500-Over the Road
283	2020	2020	CNG	MCI D4500-Over the Road
284	2020	2020	CNG	MCI D4500-Over the Road
368	2010	2010	UNL	Ford E-450 Elkhart Cutaway
369	2010	2010	UNL	Ford E-450 Elkhart Cutaway
370	2010	2010	UNL	Ford E-450 Elkhart Cutaway
371	2010	2010	UNL	Ford E-450 Elkhart Cutaway
372	2016	2016	CNG	Glaval Universal-Cutaway
373	2016	2016	CNG	Glaval Universal-Cutaway
374	2017	2017	CNG	Glaval Universal-Cutaway
375	2017	2017	CNG	Glaval Universal-Cutaway
376	2017	2017	CNG	Glaval Universal-Cutaway
377	2017	2017	CNG	Glaval Universal-Cutaway
378	2017	2017	CNG	Glaval Universal-Cutaway
379	2017	2017	CNG	Glaval Universal-Cutaway
380	2017	2017	CNG	Glaval Universal-Cutaway
381	2017	2017	CNG	Glaval Universal-Cutaway
382	2017	2017	CNG	Glaval Universal-Cutaway
383	2017	2017	CNG	Glaval Universal-Cutaway
384	2017	2017	CNG	Glaval Universal-Cutaway
385	2017	2017	CNG	Glaval Universal-Cutaway
386	2017	2017	CNG	Glaval Universal-Cutaway
387	2017	2017	CNG	Glaval Universal-Cutaway
388	2017	2017	CNG	Glaval Universal-Cutaway
389	2017	2017	CNG	Glaval Universal-Cutaway

The Table below includes the total number of buses to be purchased though 2029 and the percentage of those expected to be zero emission vehicles. The table also identifies the vehicle type and zero emission bus (ZEB) technology type. After 2029, all qualifying bus purchases must be zero-emission.

Table 2: Future Bus Purchases

Local Transit Fleet

	Total Number of Buses to Purchase	Number of ZEB	Percentage of Annual ZEB Purchases	ZEB Bus Type	ZEB Fuel Type	Number of Conv Buses Purchases	Percentage of Conv Bus Purchase	Percentage of annual Conv Bus Purchases	Type of Conv Buses	Fuel Type of Conv Buses
2020	4	3	75%	Standard	Hydrogen	1	25%		Standard	CNG
2021	4	0	0%	N/A	N/A	4	100%		Standard	CNG
2022	4	2	50%	Standard	Hydrogen	2	50%		Standard	CNG
2023	3	1	33%	Standard	Hydrogen	2	67%		Standard	CNG
2024	3	2	67%	Standard	Hydrogen	1	33%		Standard	CNG
2025	4	2	50%	Standard	Hydrogen	2	50%		Standard	CNG
2026	4	2	50%	Standard	Hydrogen	2	50%		Standard	CNG
2027	4	2	50%	Standard	Hydrogen	2	50%		Standard	CNG
2028	6	3	50%	Standard	Hydrogen	3	50%		Articulated	CNG
2029	1	1	100%	Standard	Hydrogen	0	0%		Standard	CNG

Commuter (Over the Road) Fleet

	Total Number of Buses to Purchase	Number of ZEB	Percentage of Annual ZEB Purchases	ZEB Bus Type	ZEB Fuel Type	Number of Conv Buses Purchases	Percentage of Con Bus Purchase	Percentage of annual Conv Bus Purchases	Type of Conv Buses	Fuel Type of Conv Buses
2020	0	0	0%	0	0	0	0	0	Over the Road	CNG
2021	0	0	0%	0	0	0	0	0	Over the Road	CNG
2022	3	0	0%	0	0	0	0	0	Over the Road	CNG
2023	1	0	0%	0	0	0	0	0	Over the Road	CNG
2024	3	0	0%	0	0	0	0	0	Over the Road	CNG
2025	3	0	0%	0	0	0	0	0	Over the Road	CNG
2026	0	0	0%	0	0	0	0	0	Over the Road	CNG
2027	2	1	50%	BEB	Electric	1	50	100	Over the Road	CNG
2028	3	2	75%	BEB	Electric	1	25%	100	Over the Road	CNG
2029	4	4	100%	BEB	Electric	0	0	0	Over the Road	CNG

Dial-A-Ride (Cutaway) Fleet

	Total Number of Buses to Purchase	Number of ZEB	Percentage of Annual ZEB Purchases	ZEB Bus Type	ZEB Fuel Type	Number of Conv Buses Purchases	Percentage of Con Bus Purchase	Percentage of annual Conv Bus Purchases	Type of Conv Buses	Fuel Type of Conv Buses
2020	4	0	0%	0	0	0	0	0	Cutaways	CNG
2021	0	0	0%	0	0	0	0	0	Cutaways	CNG
2022	0	0	0%	0	0	0	0	0	Cutaways	CNG
2023	0	0	0%	0	0	0	0	0	Cutaways	CNG
2024	3	0	0%	0	0	0	0	0	Cutaways	CNG
2025	4	0	0%	0	0	0	0	0	Cutaways	CNG
2026	4	2	50%	BEB	Electric	2	50%	100	Cutaways	CNG
2027	4	2	50%	BEB	Electric	2	50%	100	Cutaways	CNG
2028	3	2	75%	BEB	Electric	1	25%	100	Cutaways	CNG
2029	0	0	0%	0	0	0	0	0	Cutaways	CNG

Table 3: Range and Estimated Cost

Transit Fleet

Timeline	Number of ZEB	ZEB Bus Type	ZEB Fuel Type	Required Range	Estimated Costs
2020	3	Standard	Hydrogen	>300 miles	$3.75 Million
2021	0	N/A	N/A		
2022	2	Standard	Hydrogen	>300 miles	$2.5 Million
2023	1	Standard	Hydrogen	>300 miles	$1.25 Million
2024	2	Standard	Hydrogen	>300 miles	$2.5 Million
2025	2	Standard	Hydrogen	>300 miles	$2.5 Million
2026	2	Standard	Hydrogen	>300 miles	$2.5 Million
2027	2	Standard	Hydrogen	>300 miles	$2.5 Million
2028	3	Standard	Hydrogen	>300 miles	$3.75 Million
2029	1	Standard	Hydrogen	>300 miles	$1.25 Million

Commuter Fleet

Timeline	Number of ZEB	ZEB Bus Type	ZEB Fuel Type	Required Range	Estimated Costs
2020	0	N/A	N/A	N/A	N/A
2021	0	N/A	N/A	N/A	N/A
2022	0	N/A	N/A	N/A	N/A
2023	0	N/A	N/A	N/A	N/A
2024	0	N/A	N/A	N/A	N/A
2025	0	N/A	N/A	N/A	N/A
2026	0	N/A	N/A	N/A	N/A
2027	1	BEB	Electric	>250 miles	$1.2 Million
2028	2	BEB	Electric	>250 miles	$2.4 Million
2029	4	BEB	Electric	>250 miles	$4.8 Million

Cutaway Fleet

Timeline	Number of ZEB	ZEB Bus Type	ZEB Fuel Type	Required Range	Estimated Costs
2020	0	N/A	N/A	N/A	N/A
2021	0	N/A	N/A	N/A	N/A
2022	0	N/A	N/A	N/A	N/A
2023	0	N/A	N/A	N/A	N/A
2024	0	N/A	N/A	N/A	N/A
2025	0	N/A	N/A	N/A	N/A
2026	2	BEB	Electric	>150 miles	$650,000
2027	2	BEB	Electric	>150 miles	$650,000
2028	2	BEB	Electric	>150 miles	$650,000
2029	0	N/A	N/A	N/A	N/A

The City does not intend to convert any of its conventional fleet to zero-emission buses.

Section E: Facilities and Infrastructure Modifications

The City of Santa Clarita's Transit Maintenance Facility (TMF) is a state-of-the-art LEED Gold certified building. Some of the unique characteristics include an expansive Photo Voltaic (PV) solar array, drought tolerant landscape and a public accessible Compressed Natural Gas station.

This location serves as both the operational and administrative headquarters for the City's transit operation, operating as Santa Clarita Transit The TMF would be used to store, maintain, fuel, and clean the City's ZEB fleet.

Table 4: Facilities Information and Construction Timeline

Facility Name	Address	Main Function	Types of Infrastructure	Service Capacity	Needs Upgrade (Y/N)	Estimated Construction Timeline
Transit Maintenance Facility	28250 Constellation Road, Santa Clarita CA 91355	Transit administrative, operations, and maintenance facility	Hydrogen reformer	Phase 1: 150 Kg/day Phase 2: 300 Kg/day Phase 4: 600 Kg/day Phase 5: 1500 Kg/day	Yes	Phase 1: 2020 Phase 2: 2024 Phase 4: 2029 Phase 5: 2034
Transit Maintenance Facility	28250 Constellation Road, Santa Clarita CA 91355	Transit administrative, operations, and maintenance facility	Electric Chargers	Phase 3: 150 Kw	Yes	Phase 3: 2026

In order to support the introduction of zero emission fuel cell buses, the TMF must be modified to include the necessary supporting Infrastructure. This process would be completed in phases to manage the capital outlay schedule improvements with the vehicle procurement and delivery schedule, and to ensure that the City is leveraging and implementing the latest technology available at the time.

During Phase 1, the City will design, procure, and commission a steam methane reforming system which will allow the City to produce up to 150 kg of hydrogen per day on site. This infrastructure will produce enough hydrogen to support up to six fuel cell buses. The system is also scalable, allowing the City to increase capacity as the City's fleet of fuel cell buses grows. Based on the proposed bus replacement schedule, the City's hydrogen fueling infrastructure would have to be expanded in late 2024.

Phase 2 of the hydrogen fueling infrastructure would include three additional compressors, 300 Kg of additional storage capacity, and a second hydrogen dispenser. The expanded capacity would support up to 15 fuel cell buses.

Phase 3 would take a slightly different approach and would require the installation of 30, two station, 150kw charging units to support the introduction of battery electric commuter and cutaways into the transit fleet. In addition to the charging infrastructure, charging management software would be procured to manage vehicle charging cycles and costs. This work would be commissioned in 2026.

Phase 4 of the infrastructure expansion would begin in 2029. During this phase, the production capacity of the methane reformer would be doubled to 600 Kg per day and support up to 30 buses.

Phase 5 would be undertaken in 2034 and would more than double production capacity. When fully completed, the steam methane reformer would be capable of producing 1,500 Kg of hydrogen per day, enough to support a fleet of 60 fuel cell buses.

Given that fuel cell technology allows the City to maintain a one for one replacement, we do not anticipate a need to change the current vehicle parking configuration. The entire City bus operation is located, and dispatched from the facility identified in Table 4. This facility is not located in the Nox exempt area and is served by Southern California Edison and the Southern California Gas Company.

Section F: Providing Service in Disadvantaged Communities

According to the California Office of Environmental Health Hazard Assessment, disadvantaged communities are defined as the top 25 percent scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations. CalEnviroScreen is a tool that was developed to identify communities disproportionally impacted by multiple sources of pollution.

Based on CalEnviroScreen 3.0, there are no disadvantaged communities located within the Santa Clarita Valley. However, Santa Clarita Transit does provide commuter service to the North Hollywood Redline Station which is located in Census Tract: 6037125310. Additionally, Santa Clarita Transit commuter Route 796 travels through Census Tracts 6037134305, 6037134522, 6037134521, 6037134001, 6037134520 in the west San Fernando Valley. These locations are considered to be disadvantaged communities by CalEnviroScreen.

Currently, there are no commercially available zero emission commuter buses available. Given the current pace of development, we anticipate that options will be available after 2026 when the Innovative Clean Transit (ICT) regulation requirement to purchase zero emission commuter and cutaway vehicles goes into effect. As is our regular practice, all zero emission buses would be assigned on a rotating basis to all commuter services. This practice was implemented over ten years ago to ensure that new buses are equitably distributed though out the entire service area. This practice will continue with the introduction of zero emission vehicles.

Section G: Workforce Training

The Southern California Regional Transit Training Consortium (SCRTTC) is a leading provider of training for the public transit industry. As a member of the SCRTTC, the City of Santa Clarita would use training courses developed by this organization to provide staff with an overview and introduction to the safe operation and maintenance of fuel cell buses.

No less than three months prior to the delivery of the first fuel cell bus, all operation and maintenance staff would be required to complete the *EV Transit Bus Safety Awareness and Familiarization* course. This course will provide a general understanding of safety do's and don'ts when working around electric high voltage transit vehicles. Additionally, maintenance staff would be required to complete the *Introduction and Troubleshooting Zero Emission Propulsion* course offered through SCRTTC.

This 16-hour course will orient participants to bus electrical systems and their safe operation. Staff will learn essential aspects of the high-voltage drive system and low-voltage accessories system, including safety protection, and safe operation. It also includes information about the high-voltage and chassis grounds. This hands-on course is designed to teach safe working conditions and practices, when servicing buses equipped with the zero emission propulsion system.

This training would be supplemented by vehicle and equipment specific training developed and conducted by the bus and equipment manufactures. To ensure staff has the training and tools necessary to safely repair and maintain the ZEB fleet, the City plans to allocate a percentage of the contract value to training and the purchase of specialized tools. For first time purchases, the allocation for tools and training would be approximately one percent of the purchase price. In subsequent contracts, the amount would be adjusted to meet the current needs of the staff.

Section H: Potential Funding Sources

The City has identified multiple federal, state and local funding sources to implement this project. In addition, discretionary and program specific funding sources have been identified. The list below reflects the funding available as of 2020 and is not all inclusive. New funding opportunities will be evaluated and pursued as they arise.

Local Funding

The City intends to use multiple local sources as a match for this project. Foremost, The City would be using revenue generated though each of the following four sales tax measures passed by Los Angeles County voters. The City receives an allocation of revenue from each source based on population.

Proposition A, approved by voters in 1980, is a one-half of one percent tax on most retail sales in the County. Proposition C, approved by voters in 1990, is an additional one-half of one percent tax on retail sales in the County.

Measure R, approved by voters in 2008, is an ordinance authorizing an additional one-half of one percent sales tax to fund traffic relief and rail expansion according to an expenditure plan contained in the ordinance. Measure R took effect July 1, 2009 and will remain in effect for 30 years.

Measure M, approved by voters in 2016, is one-half of one percent sales tax to fund the expansion of bus and rail services, bicycle networks and programs that reduce congestion throughout the County.

Regional Funding

Carl Moyer

The Carl Moyer Program is a voluntary, incentive grant program administered by the South Coast Air Quality Management District (AQMD) that reduces air pollution from vehicles and equipment by providing incentive funds to private companies and public agencies to purchase cleaner-than-required engines, equipment, and emission reduction technologies.

Volkswagen Mitigation

The VW Mitigation Trust has $130 million in funds to replace older, high-polluting transit, school, and shuttle buses with new battery-electric or fuel-cell buses. Replacing an older bus with a zero-emission bus eliminates particulate matter and other pollutants that impact children and residents riding the buses, as well as residents throughout California

communities. During the project's 10-year period, approximately 425 vehicles will be replaced with an incentive amount of up to $400,000 per vehicle.

State Funding

Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP)

HVIP offers point-of-sale incentives for clean trucks and buses in California. HVIP dealers offer reduced-price vehicles directly to purchasers. Purchasers do not need to submit proposals, complicated paper work or wait to be reimbursed. Incentives are locked in at the time of the purchase order. Dealers process the required documentation.

Transit and Intercity Rail Capital Program (TIRCP)

TIRCP was created by Senate Bill (SB)862 (Chapter 36, Statutes of 2014) and modified by SB 9 (Chapter 710, Statutes of 2015) to provide grants from the Greenhouse Gas Reduction Fund to fund transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems, and bus and ferry transit systems to reduce emissions of greenhouse gases by reducing congestion and vehicle miles traveled throughout California.

Low Carbon Transit Operations Program (LCTOP)

LCTOP provides operating and capital assistance for transit agencies to reduce greenhouse gas emissions and improve mobility, with a priority on serving disadvantaged communities. Approved projects in the program will support new or expanded bus or rail services, expand intermodal transit facilities, and may include equipment acquisition, fueling, maintenance and other costs to operate those services or facilities, with each project reducing greenhouse gas emissions.

Transportation Development Act (TDA)

The Mills-Alquist-Deddeh Act (SB 325) was enacted by the California Legislature to improve existing public transportation services and encourage regional transportation coordination. Known as the TDA, this law provides funding to be allocated to transit and non-transit related purposes that comply with regional transportation plans.

TDA established two funding sources; the Local Transportation Fund (LTF), and the State Transit Assistance (STA) fund. The LTF is derived from a one quarter cent of the general sales tax collected statewide. The California Department of Tax and Fee Administration, based on sales tax collected in each county, returns the general sales tax revenues to each county's LTF. Each county then apportions the LTF funds within the county based on population.

The STA funds are appropriated by the legislature to the State Controller's Office (SCO). The SCO then allocates the tax revenue, by formula, to planning agencies and other selected agencies. Statue requires that 50% of STA funds be allocated according to population and 50% be allocated according to transit operator revenues from the prior fiscal year.

Federal Funding

Bus and Bus Facility Program

The Grants for Buses and Bus Facilities Program (49 U.S.C. 5339) makes federal resources available to states and direct recipients to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities including technological changes or innovations to modify low or no emission vehicles or facilities. Funding is provided through formula allocations and competitive grants.

Low or No Emission Program (LowNo)

The LowNo competitive program provides funding to state and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities.

Urbanized Area Formula Funding Program (49 U.S.C. 5307)

The 5307 program makes federal resources available to urbanized areas and to governors for transit capital and operating assistance in urbanized areas and for transportation-related planning. An urbanized area is an incorporated area with a population of 50,000 or more that is designated as such by the U.S. Department of Commerce, Bureau of the Census.

As a large urbanized area, 5307 funding is apportioned and flows directly to the City of Santa Clarita. Eligible activities include: planning, engineering, design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities such as replacement, overhaul and rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software. In addition, associated transit improvements and certain expenses associated with mobility management programs are eligible under the program. All preventative maintenance and some Americans with Disabilities Act complementary para-transit service costs are considered capital costs.

Table 5: Funding Source and Project Use

Timeline (Year)	Name of Funding Sources	How Each Fund is Planned to be Used	Number of ZEB to Purchase or Types of Infrastructure to Install
2020	NoLow Grant, VW mitigation, Local Sales Tax	Purchase Fuel Cell Buses	3
2020	Bus and Bus Facilities, Carl Moyer, Local Sales Tax	Install Infrastructure	Install hydrogen reformer with capacity of 150 Kg/day
2022	5307, TIRCP, Local Sales Tax	Purchase Fuel Cell Buses	2
2023	5307, Local Sales Tax	Purchase Fuel Cell Buses	1
2024	5307, TIRCP, Local Sales Tax	Purchase Fuel Cell Buses	2
2024	Bus and Bus Facilities, Local Sales Tax	Install Infrastructure	Phase 2: Increase reformer capacity to 300 Kg/day
2025	3507, Local Sales Tax	Purchase Fuel Cell Buses	2
2026	5307, Local Sales Tax	Purchase Fuel Cell Buses	2
2026	NoLow Grant, TIRCP, Local Sales Tax	Install Infrastructure	Phase 3: Install 30, 150 Kw chargers for commuter fleet
2027	5307, Local Sales Tax	Purchase Fuel Cell Buses	2
2028	5307, Local Sales Tax	Purchase Fuel Cell Buses	3
2029	5307, Local Sales Tax	Purchase Fuel Cell Buses	1
2029	Bus and Bus Facilities, Local Sales Tax	Install Infrastructure	Phase 4: Increase reformer capacity to 600 Kg/day
2030	5307, Local Sales Tax	Purchase Fuel Cell and Electric Commuter Buses	4 Fuel Cell and 4 Electric Commuter
2031	5307, Local Sales Tax	Purchase Fuel Cell Buses	4 Fuel Cell, 3 Electric Commuter, and 3 electric Cutaways
2032	5307, Local Sales Tax	Purchase Fuel Cell Buses	3 Fuel Cell, 4 Electric Commuter, and 4 Electric Cutaways
2033	5307, Local Sales Tax	Purchase Fuel Cell Buses	4 Fuel Cell and 4 Electric Cutaways
2034	Bus and Bus Facilities, Local Sales Tax	Install Infrastructure	Phase 5: Increase reformer capacity to 1500 Kg/day
2034	5307, Local Sales Tax	Purchase Fuel Cell Buses	4 Fuel Cell, 3 Electric Commuter, and 4 Electric Cutaways
2035	5307, Local Sales Tax	Purchase Fuel Cell Buses	3 Fuel Cell, 1 Electric Commuter, and 3 Electric Cutaways
2036	5307, Local Sales Tax	Purchase Fuel Cell Buses	3 Fuel Cell and 3 Electric Commuter
2037	5307, Local Sales Tax	Purchase Fuel Cell Buses	4 Fuel Cell and 3 Electric Commuter
2038	5307, Local Sales Tax	Purchase Fuel Cell Buses	4 Fuel Cell and 3 Electric Cutaways
2039	5307, Local Sales Tax	Purchase Fuel Cell Buses	4 Fuel Cell, 2 Electric Commuter, and 4 Electric Cutaways
2040	5307, Local Sales Tax	Purchase Fuel Cell Buses	6 Fuel Cell, 3 Electric Commuter, and 4 Electric Cutaways

Section I: Start-up and Scale-up Challenges

There are two major challenges the City of Santa Clarita is facing in the small scale zero-emission bus deployment. They are technology advancements and on-going operating costs.

There are currently only two zero emission technology options commercially available within the US, battery electric and hydrogen fuel cell. Complicating matters, there are only three manufactures of battery electric buses and one manufacture of fuel cell buses. While the technology has improved significantly over the past few years, it is still far behind existing alternative fuel technology in terms of range, operating costs, reliability, and capital outlay.

The major disadvantage of battery electric technology is range. Based on current "real life" conditions within the Santa Clarita Valley, the City would need to purchase 1.3 BEB for every one CNG bus being replaced in order to maintain the current service levels. While fuel cell buses have operating ranges comparable to CNG, the cost of a fuel cell bus is approximately 35 percent higher than a CNG powered vehicle, and 15 percent higher than a battery electric bus.

Based on an analysis completed in 2018, the cost of operating a battery electric bus within the Santa Clarita service area is double that of a bus powered by renewable natural gas. When comparing the cost of hydrogen, the cost is nearly triple.

While studies show that the maintenance costs for battery electric and hydrogen powered buses are lower than a bus equipped with a combustion engine, it should be noted that these studies are based on a relatively small sample of ZEB fleets and over a limited period of time. These increased operating costs will strain the City's limited resources and could lead to reductions in service.

On a long-term basis, the biggest challenge faced by the City is securing the funding necessary to construct and maintain the infrastructure necessary to support a ZEB fleet. While this plan has identified potential funding sources and adopts a phased approach, the investment in required infrastructure will be significant.

The greatest assist California Air Resource Board can provide is sources of long-term funding that provides operators the flexibility of using the funding for both capital and the incremental increase in operating costs. This assistance will greatly assist in the

implementation of a ZEB program and ensure it does not come at the expense of the user in the form of fewer travel options.