California Air Resources Board
Innovative Clean Transit (ICT) Rule

2023

Zero Emissions Bus
ROLLOUT PLAN

San Luis Obispo Regional Transit Authority

253 Elks Lane
San Luis Obispo CA 93401

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SECTION A: TRANSIT AGENCY INFORMATION

Background on the RTA

The San Luis Obispo Regional Transit Authority (RTA) was created in 1989 as a Joint Powers Authority to provide management of regional fixed-route public transportation services, as well as regional paratransit services. That latter service, called RTA Runabout, first established in 1977 under Section 504, became the sole Americans with Disabilities Act (ADA) complementary paratransit provider in 2001 for all fixed-route providers operating in the region.

The mission of the RTA is to provide safe, reliable and efficient transportation services that improve and enhance the quality of life for the citizens and visitors of San Luis Obispo County.

The county is located on the beautiful Central Coast of California, halfway between Los Angeles and San Francisco. The current population is 271,172, including that of three small urbanized areas (UZAs):

- San Luis Obispo designated in 1990;
- El Paso de Robles-Atascadero in 2000
- Arroyo Grande-Grover Beach in 2010

The RTA coordinates regional services with local fixed-route providers in each UZA in the county, as well as within Santa Maria (population 130,000) in nearby northern Santa Barbara County.

The 12-member RTA Board of Directors includes an elected representative from each of the seven cities in the county, as well as all five County Supervisors. The Regional

Transit Advisory Committee (RTAC) meets quarterly and provides advice to the RTA Board. The RTAC is comprised of representatives from each municipal transit agency, as well as from Cuesta Community College, California Polytechnic State University, and at-large members representing fixed-route and disabled riders.

The RTA directly operates hourly service on five regional fixed-routes and ADA complementary paratransit services primarily along the US-101 and SR-1 corridors, as well as express commuter services during peak travel periods. Four out of the five regional fixed-routes converge on downtown San Luis Obispo, 7 days a week. The RTA regional fixed-route service prior to the COVID-19 pandemic had a peak pull-out of 15 buses, and carried over 700,000 riders annually, while weekday productivity ranged from 18 to 28 boardings/hour. The RTA also operates community-based services funded by SLO County in small rural areas, and is funded by the City of Paso Robles to operate local fixed-routes and a local Dial-A-Ride program. The RTA also manages/maintains the fixed-route service operated in the Beach Communities of the Five Cities Area. Prior to the pandemic, these various fixed-routes provided over 1 million passenger-boardings annually. All of these various services fall under the control of the RTA, including administration, operations and maintenance of all vehicles. These services are based out of the newly completed Bus Maintenance Facility located at 253 Elks Lane in San Luis Obispo, as well as park-out facilities in Paso Robles and Arroyo Grande.

In total, the RTA manages a fleet of 79 vehicles, including those vehicles designated for fixed-route services, ADA complementary paratransit services and non-revenue support vehicles. Of the total fleet composition, **50 vehicles** have a gross vehicle weight of greater than 14,000 pounds and are identified in this plan for replacement with zero-emission technologies.

Table 1: Transit Agency Information

TRANSIT AGENCY INFORMATION		
i.	Transit Agency Name:	San Luis Obispo Regional Transit Authority (RTA)
ii.	Mailing Address:	253 Elks Lane San Luis Obispo, CA 93401
iii.	Name of Transit Agency's Air District:	San Luis Obispo County Air Pollution District (APCD)
iv.	Name of Transit Agency's Air Basin:	South Central Coast Basin-wide Air Pollution Control Council (SCC/BCC)
v.	Total Number of Applicable Vehicles (GVW > 14,000 pounds):	**50**
vi.	Population of the Urbanized Areas the Transit Agency is serving as published in the 2010 Census Urbanized Area Population data (Includes Arroyo Grande-Grover Beach, Paso Robles-Atascadero, San Luis Obispo and Santa Maria UZAs):	population 306,754
vii.	Contact Information of the Executive Manager, Chief Operator Officer, or equivalent: Contact Name, Title, Telephone, Email	Geoff Straw Executive Director (805) 541-2228 ext 4465 gstraw@slorta.org
viii.	The RTA is not part of a Joint Group.	

SECTION B: ROLLOUT PLAN GENERAL INFORMATION

The RTA's goal is to successfully transition to zero-emission fleet technologies by 2040 in a way that avoids early retirement of conventional buses. The RTA's *Innovative Clean Transit Rollout Plan* (*ICT Rollout Plan*) will enable the agency to fully transition its bus fleet to zero-emission by the 2040 deadline set in the California Air Resources Board *ICT Fleet Rule*. All buses will operate for their expected useful life to avoid early retirement of any vehicle. Much of the work described as part of this *ICT Rollout Plan* is based on the *Electrification-Readiness Plan and Deployment of Battery-Electric Buses by San Luis Obispo RTA* master plan developed in April 2019 as part of the design of the new Bus Maintenance Facility completed in January 2022. This *Electrification-Readiness Plan* also informed the *Zero-Emission Vehicle Purchase Policy* adopted by the RTA Board of Directors at its March 6, 2019 meeting

To comply with *ICT Fleet Rule* requirements, starting in 2026, 25% of RTA's applicable vehicles (greater than 14,000 pounds gross vehicle weight) purchased must be zero-emission buses (ZEB). By 2029, 100% of vehicle purchases must be zero-emission. With the prior planning and phasing in of zero-emission vehicles detailed in this plan, the RTA's goal is for vehicles operated in revenue service to be zero-emission vehicles as technology and funding permits. The *ICT Fleet Rule* states that transit agencies can no longer operate internal combustion engine-powered buses in 2040.

Six of the RTA's 35 fixed-route vehicles (17.1% of the fleet) were purchased between 2003 and 2011 and have, or are now approaching, the end of their economically useful life. The RTA has been able to complete midlife engine refurbishments on eleven of the fixed-route buses purchased between 2013 and 2015. In the absence of these refurbishments, all these buses would need to be replaced around the same time, which would drive a spike in procurement. Extending the lifetime of a portion of these buses through refurbishment helps equalize the number of new purchases from year to year.

The RTA's battery-electric bus (BEB) recharging infrastructure at the Bus Maintenance Facility was designed to enable a phased-in approach. In early 2023, the RTA will finalize construction and subsequently commission four fast-charge direct-current (DC) electric bus recharging stations, which is enough to satisfy demand for four (4) buses operating on the RTA's shorter routes. In May 2022, the RTA issued a purchase order to its first two BEBs, which should be delivered in late 2023. In addition, in 2022 the RTA secured funding to purchase five additional BEBs, and plans to issue purchase orders in summer 2023. As subsequent BEBs are procured, fast-charge DC recharging stations will be implemented for each bus, relegating the first four recharging stations to back-up status.

The RTA is currently developing funding proposals to develop master planning and design for fast-charge DC recharging stations at its two leased bus park-out yards in the North County (Paso Robles) and South County (Arroyo Grande), as well as feasibility studies for opportunity charging at:

1. The Route 9 layovers at passenger facilities in San Luis Obispo and in Paso Robles,
2. The Route 10 layovers at passenger facilities in San Luis Obispo and in Santa Maria, and
3. The Route 15 layovers at the Morro Bay Transit Center.

This *ICT Rollout Plan* was approved by the RTA's Board of Directors on March 1, 2023 under Resolution Number 23-02. The Board-approved Resolution is provided as an attached Appendix A and a copy has been submitted to the California Air Resources Board (CARB).

SECTION C: TECHNOLOGY PORTFOLIO

The RTA intends to continue to deploy both diesel-powered and BEBs as the fleet is transitioned to 100% zero-emission by 2040. The final fleet composition – 35 fixed-route BEBs, 2 cutaway fixed-route vehicles, 11 ADA Runabout Paratransit and 2 Trolleys – was determined to maximize performance and minimize cost.

As part of the *2019 Electrification Readiness Plan*, the RTA and its consultants used speed, distance and elevation data from the RTA's current routes/blocks to develop daily operating energy and peak power requirements for BEBs at each of its three operating locations and to determine which technology was most appropriate for each route. Additional constraints were considered such as infrastructure footprint limitations and available electrical capacity at the new Bus Maintenance Facility in San Luis Obispo Bus; the footprint and electrical capacity constraints for the Arroyo Grande and Paso Robles park-out facilities will be considered as part of future studies.

Project Constraints

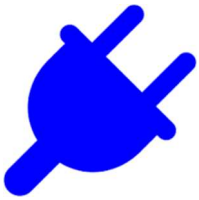
Two major constraints limiting the deployment of BEB infrastructure are the availability of capital funding, and possible electrical capacity needed at the two leased park-out facilities (in Paso Robles and Arroyo Grande) and at opportunity charging locations.

Figure A in Section E shows overhead views of Bus Maintenance Facility existing bus fueling/charging equipment as well as the expected location of future equipment. The location of future equipment shown in these figures is approximate – the exact siting will be determined through engineering analysis as the construction projects are planned.

The available electrical capacity at the Bus Maintenance Facility was assessed based on the total power required for BEBs parked at that facility, as well as for the Paso Robles and Arroyo Grande leased park-out sites compared to the loads on each meter. Further study is required to determine the feasibility and electrical capacity at these two remote park-out locations.

SECTION D: CURRENT BUS FLEET COMPOSITION & FUTURE BUS PURCHASES





Fleet Composition

As shown in Table 2 below, the RTA operates a total fleet of 50 vehicles with a GVW greater than 14,000 pounds: consisting of 35 fixed-route buses, 2 cutaway fixed-route vehicles, 11 ADA demand-response and 2 Trolley vehicles.

Table 2: Current Fleet Composition (>14,000 pounds GVW)

Total Number of Vehicles	Vehicle ID#	Engine Model Year	Bus Model Year	Fuel Type	Vehicle Type	Make	Service Type
3	204* (3 ARBOCS)	2003	2003	Diesel	Bus	Gillig Phantom	Fixed-Route
2	167, 168	2008	2008	Diesel	Bus	Gillig Phantom	Fixed-Route
2	1011, 1012	2010	2010	Diesel	Bus	Thor EZ Rider	Fixed-Route
1	1101	2011	2011	Diesel	Bus	El Dorado BRT	Fixed-Route
10	1301-1310	2013	2013	Diesel	Bus	Gillig Low Floor	Fixed-Route
9	1501-1509	2015	2015	Diesel	Bus	Gillig Low Floor	Fixed-Route
3	1801-1803	2018	2018	Diesel	Bus	Gillig Low Floor	Fixed-Route
3	1910-1912	2019	2019	Diesel	Bus	Gillig Low Floor	Fixed-Route
2	2101, 2102	2021	2021	Diesel	Bus	Gillig Low Floor	Fixed-Route
1	1013	2011	2010	Gasoline	Trolley	Double K Villager	Seasonal F/R
2	1510, 1512	2015	2015	Gasoline	Cutaway	Ford Starcraft E450	Fixed-Route
1	1511	2015	2015	Gasoline	Cutaway	Ford Starcraft E450	Demand-Response
1	1707	2017	2017	Gasoline	Trolley	Ford F550 Villager	Seasonal F/R
9	1901-1909	2019	2019	Gasoline	Cutaway	Ford Starcraft E450	Demand-Response
1	2031	2019	2020	Gasoline	Cutaway	Ford Starcraft E450	Demand-Response
50	**Total Vehicles**						

Tables 3 and 4 below show the total of new vehicle purchases anticipated by year for heavy-duty buses and for smaller fixed-route / demand-response vehicles.

Table 3: Heavy-Duty Bus Purchase Timeline (Fixed-Route Services)

Timeline (Purchase Year)*	Total Number of Buses Purchased	ZEB Purchases				Conventional Bus Purchases				*Small Agency ICT Rqmnt*
		Number of ZEB Purchases	Percentage of Annual ZEB Purchases	ZEB Bus Type(s)	ZEB Fuel Type(s)	Number of Conv. Bus Purchases	Percentage of Annual Conv. Bus Purchases	Type(s) of Conv. Buses	Fuel Type(s) of Conv. Buses	
2021	3	0	0%			3	100%	ARBOC Ford Starcraft E450	Gasoline	
2022	2	2	100%	Gillig Low Floor	Electric	0	0%			
2023	6	5	83%	Standard	Electric	1	17%	Standard	Diesel	
2024	0	0	0%			0	0%			
2025	7	0	0%			7	100%	Standard	Diesel	
2026	5	2	40%	Standard	Electric	3	60%	Standard	Diesel	25%
2027	4	1	25%	Standard	Electric	3	75%	Standard	Diesel	25%
2028	4	1	25%	Standard	Electric	3	75%	Standard	Diesel	25%
2029	2	2	100%	Standard	Electric	0	0%			*100%*
2030	0	0	0%	Standard	Electric	0	0%			*100%*
2031	2	2	100%	Standard	Electric	0	0%			*100%*
2032	0	0	0%	Standard	Electric	0	0%			*100%*
2033	3	3	100%	Standard	Electric	0	0%			*100%*
2034	2	2	100%	Standard	Electric	0	0%			*100%*
2035	2	2	100%	Standard	Electric	0	0%			*100%*
2036	3	3	100%	Standard	Electric	0	0%			*100%*
2037	3	3	100%	Standard	Electric	0	0%			*100%*
2038	4	4	100%	Standard	Electric	0	0%			*100%*
2039	5	5	100%	Standard	Electric	0	0%			*100%*
2040	7	7	100%	Standard	Electric	0	0%			*100%*
	64	**Total Purchases**								
	35	**Total Fixed- Route Vehicles**								

* Expected future bus purchases to be purchased or leased in the year of purchase. The ICT regulation defines a "bus purchase" (13 CCR § 2023(b)(7)) as occurring when a transit agency executes one of the following after it has identified, committed, and encumbered funds:
1. A written Notice to Proceed to a bus manufacturer to begin production of a bus either under a previously-entered purchase contract; or to execute a contract option;
2. If no Notice to Proceed is issued, a written purchase agreement between a transit agency and a bus manufacturer that specifies the date when the bus manufacturer is to proceed with the work to manufacture the bus; or purchases each year, as well as bus types and fuel types

Table 4: Other Vehicle Purchase Timeline (Small Fixed-Route, Demand-Response & Seasonal Vehicles)

Timeline (Purchase Year)	Total Number of Buses Purchased	ZEB Purchases				Convential Bus Purchases				*Small Agency ICT Rqmnt*
		Number of ZEB Purchases	Percentage of Annual ZEB Purchases	ZEB Bus Type(s)	ZEB Fuel Type(s)	Number of Conv. Bus Purchases	Percentage of Annual Conv. Bus Purchases	Type(s) of Conv. Buses	Fuel Type(s) of Conv. Buses	
2021	2	0	0%			2	100%	Ford Starcraft E450	Gasoline	
2022	0	0	0%			0	0%			
2023	2	0	0%			2	100%	Standard	Gasoline	
2024	0	0	0%			0	0%			
2025	5	0	0%			5	100%	Standard	Gasoline	
2026	4	1	25%	Standard	Electric	3	75%	Standard	Gasoline	25%
2027	0	0	0%			0	0%			25%
2028	3	1	33%	Standard	Electric	2	67%	Standard	Gasoline	25%
2029	1	1	100%	Standard	Electric	0	0%			*100%*
2030	0	0	0%			0	0%			*100%*
2031	1	1	100%	Standard	Electric	0	0%			*100%*
2032	5	5	100%			0	0%			*100%*
2033	4	4	100%			0	0%			*100%*
2034	3	3	100%			0	0%			*100%*
2035	0	0	0%			0	0%			*100%*
2036	0	0	0%			0	0%			*100%*
2037	1	1	100%			0	0%			*100%*
2038	1	1	100%			0	0%			*100%*
2039	4	4	100%			0	0%			*100%*
2040	5	5	100%			0	0%			*100%*
	41	**Total Purchases**								
	15	**Other Vehicles Over 14,000 GVWR**								

The replacement schedule was designed so that no bus retires before completing its FTA-defined economically useful life. The RTA's heavy-duty fixed-route buses were assumed to operate for no more than 20% beyond its design life (12-years/500k miles), which equates to essentially 14 years or 600k miles, whichever comes first. To avoid a single year with significantly more purchases than usual, the expected

retirement age was sometimes staggered to better distribute procurement actions across multiple years. All heavy-duty fixed-route buses were assumed to last at least 12 years and no bus was projected to last more than 15 years

The replacement schedule for smaller vehicles shown in Table 4 above assume each vehicle meets or exceeds FTA design life standards of 4 years or 100k miles, whichever comes first. This is consistent with current operations at the RTA, as no demand response vehicle was forecasted to be in operation longer than 6 years. In this plan, it was assumed that demand response vehicles will last 5 years on average. This will need to be revisited as electric paratransit vehicles become available and are road-tested for available range. After 2028, the vehicles identified in the table above will need to be replaced a second time. Should a ZEB vehicle be available at this time that meets this vehicle category, the RTA will implement that technology within as funding becomes available.

The cost of each new vehicle purchase was forecasted based on the most recent quotes received in 2022 by the RTA, projected timeline for replacement and national inflation rates.

Table 5 below shows the projected annual cost for all vehicles based on the purchase schedule identified in this plan.

Table 5: Estimated Total Cost of Vehicle Purchases

Timeline (Purchase Year)	# of ZEBs	# of Conv. Bus	Vehicle Type (s)	Estimate Cost of Each Bus (Cost in 2022)	Inflation Rate*	Comp. Inflation	Total Cost in Year of Expenditure
2021	0	3	3* ARBOC (gasoline)	$229,947	Purchase Order Issued		$689,841
		2	2* Ford Starcraft E450 (gasoline)	$147,987	Purchase Order Issued		$295,974
2022	2	0	2* Gillig Low Floor (electric)	$1,040,661	Purchase Order Issued		$2,081,322
2023	5	3	5* BEB	$1,040,661	2.00%	1.01	$5,308,412
			1* Standard (diesel)	$610,000	2.00%	1.01	$622,322
			1* Cutaway (gasoline)	$147,987	2.00%	1.01	$150,976

			1* Trolley (diesel)	$378,890	2.00%	1.01	$386,544
2024	0	0		$0	2.25%	1.02	$0
2025	0	12	7* Standard (diesel)	$610,000	2.50%	1.03	$4,379,953
			5* Cutaway (gasoline)	$147,987	2.50%	1.03	$758,988
2026	2	7	2* BEB	$1,040,661	2.75%	1.04	$2,140,848
			3* Standard (diesel)	$610,000	2.75%	1.04	$1,882,338
			3* Cutaway (gasoline)	$147,987	2.75%	1.04	$456,658
			1* Cutaway (electric)	$252,466	2.75%	1.04	$259,687
2027	1	3	1* BEB	$1,040,661	3.00%	1.05	$1,073,442
			3* Standard (diesel)	$610,000	3.00%	1.05	$1,887,645
2028	2	5	1* BEB	$1,040,661	3.25%	1.06	$1,076,512
			3* Standard (diesel)	$610,000	3.25%	1.06	$1,893,044
			2* Cutaway (gasoline)	$147,987	3.25%	1.06	$306,170
			1* Cutaway (electric)	$252,466	3.25%	1.06	$261,164
2029	3	0	2* BEB	$1,040,661	3.50%	1.07	$2,159,268
			1* Cutaway (electric)	$252,466	3.50%	1.07	$261,921
2030	0	0		$0	3.75%	1.08	$0
2031	3	0	2* BEB	$1,040,661	4.00%	1.09	$2,172,068
			1* Cutaway (electric)	$252,466	4.00%	1.09	$263,474
2032	5	0	5* Cutaway (electric)	$252,466	4.25%	1.10	$1,321,344
2033	7	0	7* Cutaway (electric)	$252,466	4.50%	1.20	$1,862,694
2034	5	0	2* BEB	$1,040,661	4.75%	1.30	$2,209,844
			2* Cutaway (electric)	$252,466	4.75%	1.30	$536,112
			1* Trolley (electric)	$454,668	4.75%	1.30	$482,744
2035	2	0	2* BEB	$1,040,661	5.00%	1.40	$2,227,015
2036	3	0	3* BEB	$1,040,661	5.25%	1.50	$3,367,839
2037	4	0	3* BEB	$1,040,661	5.50%	1.60	$3,396,718
			1* Trolley (electric)	$454,668	5.50%	1.60	$494,679
2038	5	0	4* BEB	$1,040,661	5.75%	1.70	$4,569,542
			1* Cutaway (electric)	$252,466	5.75%	1.70	$277,145
2039	9	0	5* BEB	$1,040,661	6.00%	1.80	$5,765,262
			4* Cutaway (electric)	$252,466	6.00%	1.80	$1,118,929
2040	12	0	7* BEB	$1,040,661	6.25%	1.90	$8,149,676
			5* Cutaway (electric)	$252,466	6.25%	1.90	$1,412,232
	70	**35**			**Estimated Total Cost of Vehicle Purchases**		**$67,960,341**
	105		**Total Purchases**				

The RTA is not considering converting any conventional buses to zero-emission propulsion systems due to the RTA's prior poor experience converting conventional

diesel-powered buses to gasoline-electric hybrid in the early 2000s. In other words, this plan assumes new replacement vehicles only.

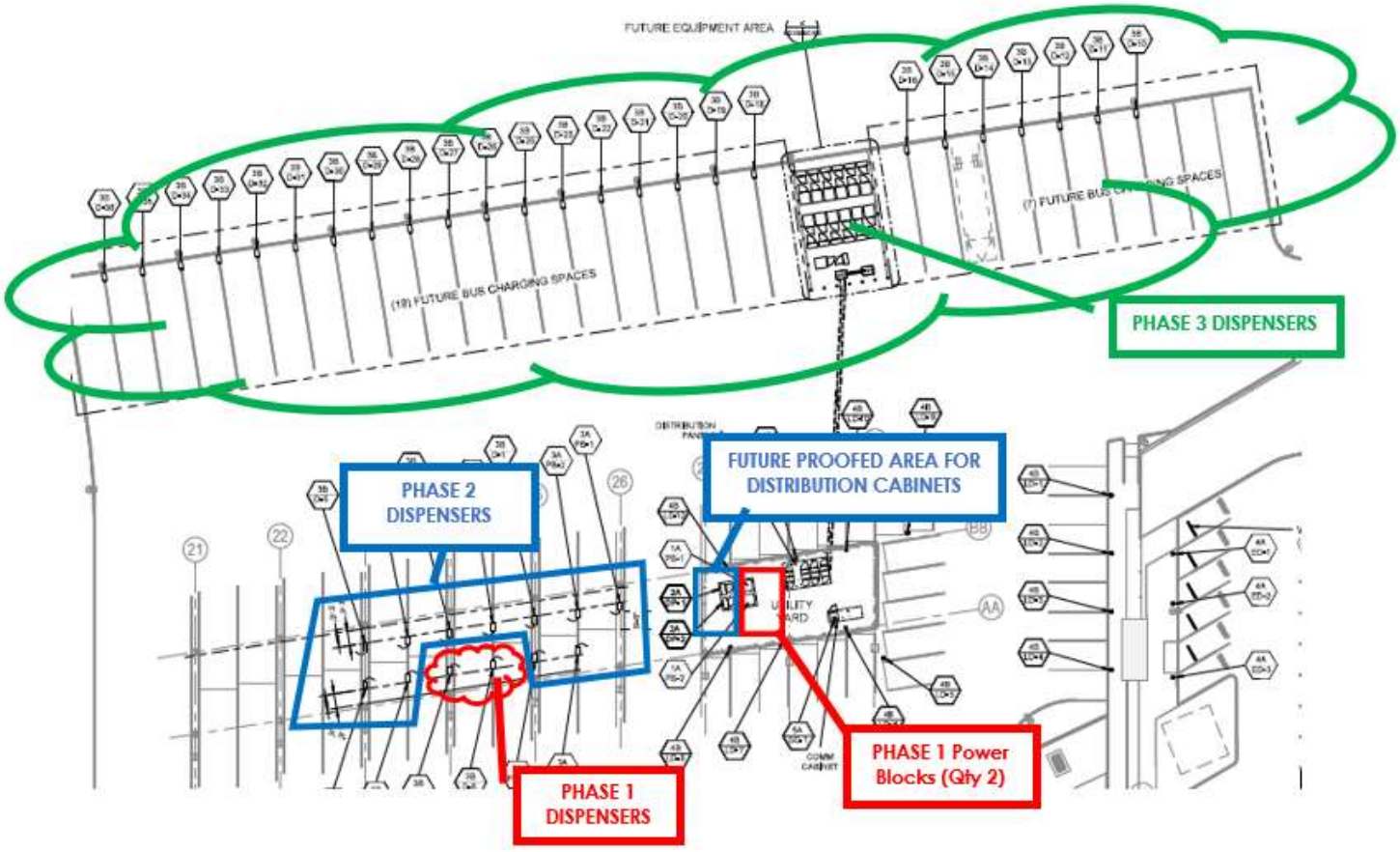
SECTION E: FACILITIES AND INFRASTRUCTURE MODIFICATIONS

The RTA issued its first purchase order for zero-emission buses on May 31, 2022. These two BEBs will replace conventional diesel-powered buses (Vehicle ID#167 and #168) that were placed into revenue service in 2008, and we expect delivery in late 2023. Before the first BEB is delivered, the RTA will have battery recharging infrastructure in place as part of the Phase 1 elements of the Bus Maintenance Facility (BMF) in San Luis Obispo to support the BEBs in its bus fleet and to enable future expansion.

The *Electrification-Readiness Plan* discussed in Section B above showed that a maximum peak demand of 2,220 kilowatt-hours (kW) is necessary at full build-out of the BEB fleet and is what has been implemented at the new BMF. In total, the BMF will charge up to 18,483 kWh/day. The BMF, including all underground vehicle recharging infrastructure, was substantially completed in January 2022, and the Phase 1 recharging equipment is expected to be operational in March 2023. As shown in the graphic at the end of this section, Phase 1 infrastructure includes two ChargePoint Express Plus 200kW DC charging power blocks, each connected to two Power Links with overhead dispensers.

The Phase 2 recharging infrastructure at the BMF will be installed as new BEBs are ordered and delivered. The figure shown below depicts the location of future distribution cabinets that are linked via already installed underground conduits to charging stations that will be installed along the western edge of the bus parking lane. The BMF was designed and constructed to incrementally add BEB charging elements without the need to upsize incoming cabling, distribution panels, conduits, etc.

Figure A: Bus Maintenance Facility Electrification Phases



The Phase 3 portion of the electrification project will include all remaining infrastructure needed to support the charging of applicable battery-electric vehicles. This will include installation of 25 chargers, the structural pads for the charger bases and dispensers, the wiring from the distribution boards to the chargers, and the wiring from the chargers to the dispensers.

Table 6 summarizes the facility infrastructure upgrades that will be required relating to the transition of the applicable vehicles to 100% zero emission. Further study will be needed to determine facility zero-emission infrastructure costs.

Table 6: Facility Infrastructure and Timeline

Facility Name	Address	Main Function	Infrastructure Type	Service Capacity	Needs Upgrade? (Yes/No)	Estimated Construction Timeline
Bus Maint Facility (BMF)	253 Elks Lane, SLO	Operations, Maint & BEB Charging	Phase 1: Four (4) AC/DC BEB Chargers	4 Buses	No	2023
			Phase 2: Eleven (11) AC/DC BEB Chargers	11 Buses	Yes	Further Study Required
			Phase 3: Twenty-five (25) AC/DC BEB Chargers	25 Buses & Cutaways	Yes	Further Study Required
North County	1735 Paso Robles St., Paso Robles	Parking & BEB Charging	TBD	TBD	Yes	Further Study Required
South County	800 Rodeo St., Arroyo Grande	Parking & BEB Charging	TBD	TBD	Yes	Further Study Required

As part of the *Electrification-Readiness Plan* discussed above, the number of kilowatt-hours (kW) necessary to recharge BEBs at the other two operating/park-out locations in Arroyo Grande and Paso Robles were also estimated, based on miles operated out of each facility. The Paso Robles facility will use up to 4,355 kWh/day and the Arroyo Grande facility will use up to 1,792 kWh/day. However, maximum electrical demand for these two facilities has yet to be estimated, and will require additional analysis – including layout of possible recharging equipment and the current limits of incoming power.

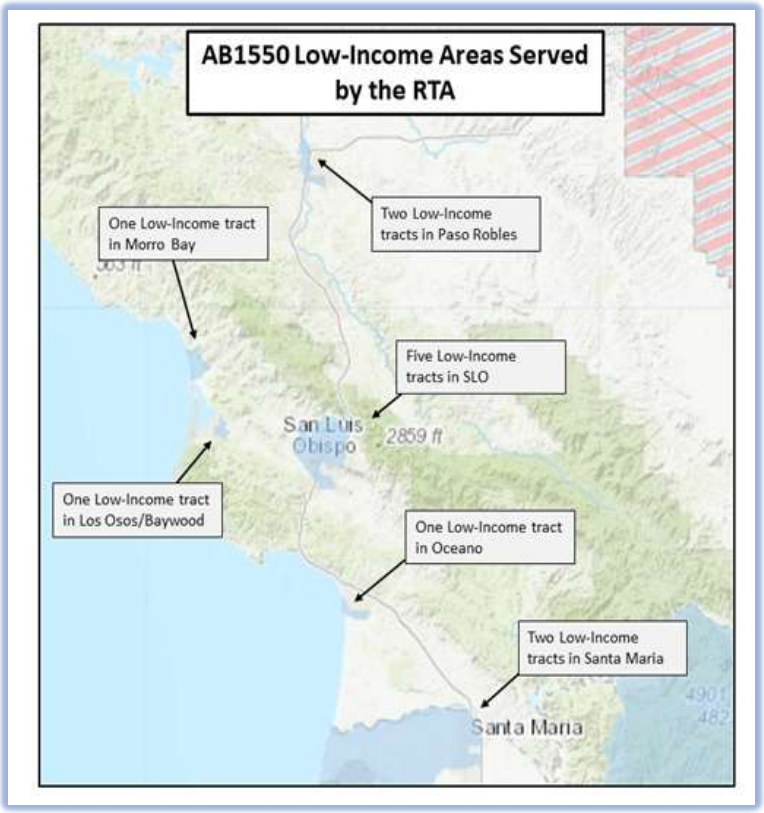
[1] This total includes 545 kWh for the Route 15 miles formerly operated from the Cambria yard but recently consolidated into the Paso Robles yard.

SECTION F: PROVIDING SERVICE IN DISADVANTAGED COMMUNITIES

There are no State-designated Disadvantaged Communities located in San Luis Obispo County. Figure B below shows State-designated Low-Income Communities within the RTA's service territory as defined by the latest version of CalEnviroScreen.

The RTA Bus Maintenance Facility is located within Census Tract 607901103, which is a CalEPA AB1550 Low-Income Community designated area. The RTA provides fixed-route services in all ten Low-Income Communities in San Luis Obispo County, which include the following Census Tracts:

Figure B: AB1550 Low-Income Areas Served



- 6079010102 (North Paso Robles),
- 6079010204 (Southeast Paso Robles),
- 6079010503 (North Morro Bay),
- 6079010703 (Baywood/Los Osos),
- 6079010901 (Northeast SLO),
- 6079011002 (East SLO),
- 6079011101 (Central SLO),
- 6079011103 (Southeast SLO),
- 6079011200 (West SLO), and
- 6079012200 (Oceano)

The RTA also serve Low-Income Communities in Santa Maria (Census Tracts 6083002101 and 6083002206).

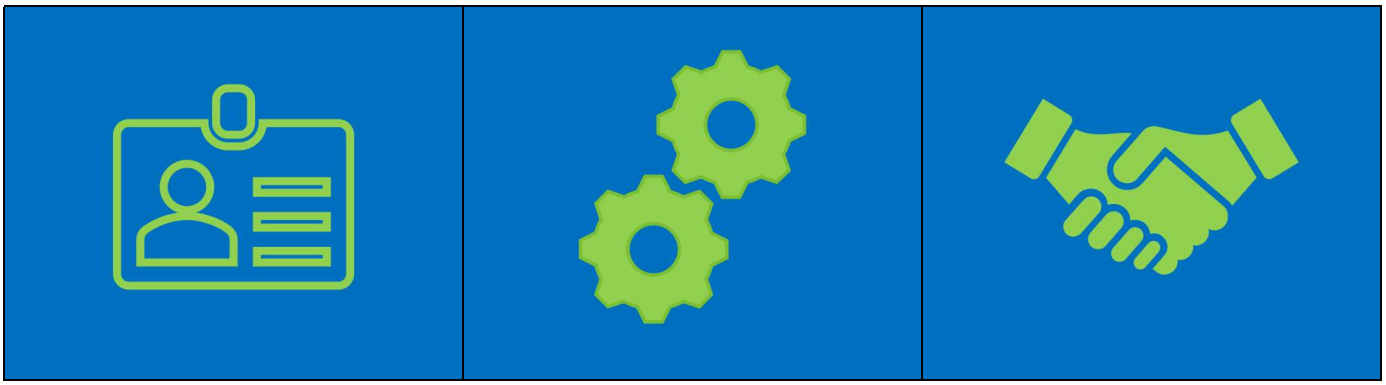
In terms of the more granular US Census block group level data, the project site is located in Census Tract 111.03 Block Group 2. While the percentage of persons living in poverty in the Block Group (15.6%) is high relative to the county (13.8%) and the

State (15.1%), it is lower than the City of San Luis Obispo proportion (32.4%). The proportion of minority residents in the Block Group (27.9%) is much higher than the county (14.1%) and City (15.3%), but it is lower than the State proportion (39.4%).

Many of the RTA's fixed-route and paratransit vehicles pass through these Low-Income Communities daily. This service is critical as it is relied upon by these communities for essential travel including to workplaces, medical appointments, government agencies, etc. As buses are transitioned from diesel or gasoline-powered to zero-emission technologies, it will eliminate critical criteria pollutant emissions of nitrogen oxides (NOx), carbon monoxide (CO) and volatile organic compounds (VOCs), along with particulate matter (PM2.5) and greenhouse gases (GHGs). This improvement in air quality will benefit the citizens of the local community, including those living in designated Low-Income Communities that the RTA serves.

Pollution and noise resulting from bus operation are a concern for citizens living adjacent to transit routes. Buses also drive in stop and go traffic where they spend considerable time idling, wasting fuel and creating pollutant emissions. BEBs produce no point-source emissions, use less energy than carbon-based fuels and offer significantly quieter operation. The RTA will operate the zero-emission buses on routes providing service within these Low-Income Communities providing cleaner, quieter service.

SECTION G: WORKFORCE DEVELOPMENT



The RTA is eager to implement clean fuel technologies and is currently developing the *RTA Electrical Safety Plan* for the training of our operations and maintenance employees.

As new BEBs join the fleet, the RTA will receive training from the bus manufacturers on operating and maintenance procedures specific to the vehicles. Similarly, training will be provided by equipment suppliers providing battery charging infrastructure. Depending on the specific equipment, training may occur in a "train-the-trainer" format where key RTA staff are trained thoroughly on equipment who pass on basic knowledge to other personnel, or batch training where all or most of the related staff receive instruction from the equipment manufacturer.

Workforce development topics may include the following:

- Leadership and Employee Relations
- Overview of Zero-Emission Bus Technologies
- Zero-Emission Bus Operations
- Zero-Emission Bus Maintenance
- Zero-Emission Bus Safety Training
- Coordination with local Emergency Responders for Zero-Emission Fleet Emergency Response

Other training could include zero-emission bus procurement and fiscal management, zero-emission bus policies and regulations, and planning for deployment of zero-emission bus technologies and infrastructure.

SECTION H: POTENTIAL FUNDING SOURCES

Execution of the zero-emission transition plan will require significant capital expenditures. Table 5 in Section D above shows the estimated annual capital cost for vehicle replacements. Between 2021 and 2040 it is estimated that the RTA will require almost **$68 million** to pay for all the zero-emission vehicle replacements. Table 6 in Section E above summarizes the needed facility infrastructure improvements and estimated timelines. It is important to note that further studies are required for infrastructure improvements, including inductive and conductive charging infrastructure and estimated costs.

The RTA actively seeks federal, state and local funds to fund on-going operations and for capital needs. Below is a list of potential federal, state and local funding sources that the RTA will continue to seek in greater proportions in comparison to historical amounts to support the acquisition of zero-emission technologies for both applicable vehicles and related infrastructure.

FEDERAL SOURCES

- Federal Transportation Administration (FTA) Funds
    - Section 5307 Urbanized Area Formula Program
    - Section 5339(a) Grants for Buses and Bus Facilities Formula Program
    - Section 5339(b) Buses and Bus Facilities Competitive Program
    - Section 5339(c) Low or No Emission Vehicle Program (competitive)

STATE & LOCAL SOURCES

- California Department of Transportation (Caltrans) Section 5311 Formula Grants for Rural Areas
- Low Carbon Transit Operation Program (LCTOP)
- Transit and Intercity Rail Capital Program (TIRCP)
- Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP)
- Caltrans State of Good Repair (SGR)
- State Transit Assistance (STA)

- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- Transportation Development Act (TDA)/Local Transportation Fund (LTF)
- Volkswagen Environmental Mitigation Trust Fund
- San Luis Obispo County Air Pollution Control District (APCD) Funds, including AB 617
- Pacific Gas & Electric (PG&E)
- Central Coast Community Energy (CCCE)
- Fares

SECTION I: START-UP AND SCALE-UP CHALLENGES

Technology Constraints

The RTA is committed to deploying zero-emission transit technologies. However, the RTA has identified several disadvantages in operating ZEBs versus traditional diesel- or gasoline-powered vehicles in our operating environment. The RTA's Executive Director and Maintenance Manager formerly worked together on a hydrogen bus demonstration project that was supported by a distinguished team of thought and technology leaders at the University of California at Davis. The technology proved to be complex and expensive from both a refueling infrastructure perspective and from a per kilogram cost of hydrogen. Given the RTA's lack of nearby technology expertise, skilled heavy-duty warranty providers and/or a cost-efficient hydrogen fuel provider, staff has recommended that the RTA Board not pursue Hydrogen Fuel Cell Electric Bus (HFCEB) technologies in San Luis Obispo until or unless the technology matures to a point that a small agency can reliably operate HFCEBs. Focusing on BEBs, disadvantages include relatively low range (particularly for intercity services), infrastructure cost for depot and/or opportunity charging, complex utility rates, electrical grid reliability, operational impacts, unproven battery life, and perceived safety challenges particularly as it relates to battery fires. Some of these same BEB disadvantages are shared with HFCEB technologies – particularly range and electrical grid reliability challenges – although likely to a lesser degree.

A challenge facing long-term transition planning is the uncertainty around performance and availability of zero-emission paratransit vehicles. At present, proven zero-emission paratransit vehicles (subject to the *ICT Fleet Rule's* current 14,000 pound GVR limit) that have completed FTA-required Altoona testing are not commercially available in North America. Little data is available to forecast vehicle performance or cost. Pilot scale deployment by larger transit agencies of zero-emission paratransit vehicles would benefit the industry by providing key insights into vehicle operation, reliability, range and per mile costs.

Geographic Service Area & Opportunity Charging Challenges

Another significant challenge is the nature of the RTA's intercity routes and terrain, particularly the steep and long Cuesta Grade on RTA Route 9 (Refer to Appendix B for Pre-COVID Bus Blocks Fuel Demand-Charge Hours). The RTA has worked with various BEB and HFCEB manufacturers to operate demonstration vehicles over the past several years, and both technologies exhibited significant shortcomings on Route 9. The BEBs' battery capacity was greatly diminished each time traversing the Cuesta Grade on a northbound trip, which under current service plans equates to 16 trips per weekday (not including some or all of the Route 9 Express trips that will likely be re-implemented once demand increases post-pandemic). Further, an HFCEB demonstrator was unable to traverse the grade and had to pull over to the side of US-101 to replenish its on-board buffer battery. Compounding the challenge is that the Cuesta Grade can frequently experience summer temperatures over 90 degrees Fahrenheit, which can be challenging to keep the batteries within optimum temperature ranges. Looking at the entire RTA fixed-route system, a significant portion of current weekday bus blocks travel over 300 miles. There is not currently a BEB or even an HFCEB that is proven to reliably travel that distance in an intercity setting on a single charge or single hydrogen fuel load. For that reason, staff has recommended that opportunity charging be pursued at route termini in Paso Robles, San Luis Obispo, Morro Bay and Santa Maria, and that the RTA closely monitor future HFCEB use as the technology matures and as hydrogen fueling infrastructure is implemented in the region.

The term 'opportunity charging' refers to charging an electric vehicle for short periods throughout the day. Wireless inductive charging hardware is installed at one or both ends of a route to top-up the batteries for typically 5 to 15 minutes while the bus is waiting at the terminus before a new trip/round-trip starts. Companies like WAVE, InductEV (formerly Momentum Dynamics), and IPT are currently providing wireless opportunity charging systems for buses. Although opportunity charging typically incurs higher electricity costs due to peak and demand charges, the technology allows for downsizing battery packs (and thus lighter buses) and can help extend the life of the batteries, since deep-cycle discharging and high charging rates degrade batteries due to the heat incurred in the battery. The effort to implement opportunity

charging systems necessarily must be coordinated with our transit agency partners that also operate within and adjacent to the RTA service area so that any investments can be shared across our respective fleets. This effort will require a focused planning/engineering study that is jointly funded and executed.

Financial Constraints

The most significant challenge facing transit agencies through the start-up and scale-up phases of the zero-emission transition is the financial requirements. ZEBs are more expensive to procure, and new infrastructure is required to operate and maintain the vehicles. Additional financial support from the federal, state, and local governments will be necessary to achieve the targets in the *ICT Fleet Rule*. Fortunately, the price gap between ZEBs and diesel-powered buses is expected to decline over time as manufacturing scales up and technology matures, so financial incentives are particularly important in the near to mid-term.

With the enormous charging infrastructure cost and the higher upfront price of ZEBs, there is currently a lack of funding available to meet the capital demands to meet CARB's *ICT Fleet Rule*. Current funding levels only provide for small-scale pilot deployments in the United States. Funding for large-scale deployments of at least 100 buses using different zero-emissions technologies (battery-electric and hydrogen fuel cell) is necessary to further learn how zero-emissions buses perform in transit applications so that smaller agencies with limited technological support like the RTA are not saddled unfairly with the growing pains of implementing cutting-edge systems.

The per vehicle cost of buses can be impacted by procurement volumes. With each California transit agency placing orders individually over the next few years, this will continue to pressure costs downward. It may be possible to reduce the per vehicle cost through a state-led bulk procurement of ZEBs that could incorporate demand from many agencies.

Funding should also be made available for workforce training. To ensure a successful transition, agencies must prepare staff for correct operation and maintenance of ZEBs. While many suggest that BEBs require less maintenance than conventional buses because they include fewer moving parts, they require new protocols and procedures to ensure safe and successful operation. However, many early implementers of ZEBs report increased overall costs due to reliability challenges that require additional staff time to resolve. The use of regenerative braking also alters ideal driving characteristics. Bus Operators must be adequately trained to ensure vehicles are operated optimally. Organizations providing training like the FTA-subsidized West Coast Center of Excellence in Zero-Emission Technology in Palm Desert will be an invaluable resource to transit agencies as we transition to ZEBs.

It is imperative that the CARB and related agencies provide funding to transit operators across the state to support the transition to ZEBs. As fleets are transitioned, agency capital and operating budgets will increase, and funding will be required to maintain the level of service provided. In addition to funding support for bus and infrastructure purchases, CARB should support training/educational programs as well as deployment of new bus platforms such as smaller paratransit vehicles.

LIST OF TABLES

LIST OF FIGURES

APPENDICES

A. RTA BOARD OF DIRECTORS RESOLUTION

B. SLO RTA PRE-COVID BUS BLOCKS FUEL DEMAND-CHARGE HOURS

C. SLO RTA BUS ROUTE MAPS

D. TRANSIT ASSET MANAGEMENT (TAM) PLAN

E. POSSIBLE FUTURE USE OF HYDROGEN FUEL CELL TECHNOLOGIES

F. FTA ZERO-EMISSION TRANSITION PLAN

G. GLOSSARY OF TERMS

SAN LUIS OBISPO REGIONAL TRANSIT AUTHORITY
RESOLUTION NO. 23-02

RESOLUTION ADOPTING THE SAN LUIS OBISPO REGIONAL TRANSIT AUTHORITY INNOVATIVE CLEAN TRANSIT ZERO EMISSIONS BUS ROLLOUT PLAN AND RELATED FEDERAL TRANSPORTATION ADMINISTRATION ZERO-EMISSION TRANSITION PLAN.

WHEREAS, the State of California Air Resources Control Board (CARB) Innovative Clean Transit (ICT) regulation became effective October 1, 2019, and requires all public transit agencies to gradually transition their eligible vehicle fleets to zero-emission technologies.

WHEREAS, the CARB ICT Zero Emissions Bus (ZEB) purchase requirements for small transit agencies begins in 2025 with a goal of complete transition to full zero emissions by 2040; and

WHEREAS, the California Code of Regulations Title 13, Division 3, Chapter 1 ICT regulation requires small transit agency to submit a complete ZEB Rollout Plan before purchase requirements take effect by July 1, 2023; and

WHEREAS, the Federal Transit Administration (FTA) published a "Dear Colleague" letter on December 1, 2021 that requires certain grant proposals to include an FTA Zero-Emission Transition Plan. This requirement was codified in the Infrastructure Investment and Jobs Act (IIJA), also known as the "Bipartisan Infrastructure Law," signed by the President on November 15, 2021. The IIJA amended the statutory provisions for the Buses and Bus Facilities Competitive Program (49 U.S.C. § 5339(b)) and the Low or No Emission Program (49 U.S.C. § 5339(c)) to include the requirement that any application for projects related to zero-emission vehicles include a Zero-Emission Transition Plan; and

WHEREAS, The FTA acknowledges that transit agencies may already have this information available with the ICT Rollout Plan and recommends consolidation of this information into a single document for the purpose of applying for zero-emission vehicles under the Grants for Buses and Bus Facilities Competitive and Low or No Emission Programs; and

WHEREAS, the California Code of Regulations Title 13, Division 3 Chapter 1, Article 4.3, Part 2023.1 (d) Zero Emissions Bus Rollout Plan Requirements requires that a transit agency Zero Emissions Bus Rollout Plan must be approved by its governing Board; and

WHEREAS, the RTA's ICT ZEB Rollout Plan and related FTA Zero-Emission Transition Plan sets forth the agency's plan which meets the following requirements:

- A goal of full transition to zero-emission buses by 2040 with careful planning that avoids early retirement of conventional internal combustion engine buses;
- Identification of the types of zero-emission bus technologies the RTA is planning to deploy;
- A schedule for infrastructure modifications or upgrades, including charging, fueling, and maintenance facilities, to deploy and maintain zero-emission vehicles;
- A schedule for zero-emission and conventional internal combustion engine bus replacement purchases;

- Identification of training opportunities for zero-emission trainers, bus operators and maintenance/repair staff;
- Identification of potential funding sources;
- Consider policy and legislation impacting relevant technologies.
- Describe the partnership of the applicant with the utility or alternative fuel provider.

NOW, THEREFORE, BE IT RESOLVED that the Governing Board hereby approves the RTA's Innovative Clean Transit Zero Emissions Bus Rollout Plan as set forth in full in Exhibit A to this Resolution.

NOW, THEREFORE, BE IT HEREBY RESOLVED, that the San Luis Obispo Regional Transit Authority Board of Directors approves the RTA's Innovative Clean Transit Zero Emissions Bus Rollout Plan as set forth in full in Exhibit A.

BE IT FURTHER RESOLVED, that the President of the Board is directed to sign this resolution to authorize the submittal of said Rollout Plan.

BE IT FURTHER RESOLVED, that the Executive Director is hereby authorized to submit said Rollout Plan to the California Air Resources Board.

Upon motion of Director ANDY PEASE, seconded by Director FRED STRONG and on the following roll call, to wit:

AYES: PEASE, STRONG, ARNOLD, GIBSON, GUTHRIE, MORENO, PAULDING, RUSHING, WAAGE
NOES: N/A LANDRUM
ABSENT: ORTIZ-LEGG, PESCHONG
ABSTAINING: N/A

The foregoing resolution is hereby adopted this 1st day of March, 2023.

Debbie Arnold
President of the RTA Board of Directors

ATTEST:

Geoff Straw, Executive Director
San Luis Obispo Regional Transit Authority

APPROVED AS TO FORM AND LEGAL EFFECT:

Rita L. Neal
County Counsel

By: _____
Jon Ansolabehere, Counsel
San Luis Obispo Regional Transit Authority

RTA Average Daily Mileage by Bus Block

2019 PRE-COVID BUS BLOCKS

FUEL DEMAND / RTA CHARGE HOURS

Frequently Paired Blocks					
Block	Block	Comb. Mi.	Yard	Bus Type	
914	102	371	SLO	40-foot	
91	97	288	PASO	40-foot	
92	913	296	PASO	40-foot	
93	105	284	PASO/SLO	40-foot	New
95	101	298	PASO	40-foot	
99	104	338	SLO	40-foot	New
103	106	391	SLO	40-foot	New
107	121	395	SLO	40-foot	
113	114	163	SLO	MCI	Fixed; now 112/113
123	126	84	SLO	40-foot	New
151	152	303	CAMBRIA	Cutaway	
71	72	135	PASO	32-foot	
81	82	126	PASO	32-foot	

MCI = 45 ft BUS

RTA Route 9 SLO to Paso Robles (40- or 45-foot buses, operate over the Cuesta Grade)

Yard	Block	Mon	Tue	Wed	Thu	Fri	Daily Average Miles	Often pairs with:	Bus Type
SLO	99	107	118	119	118	117	**116**	104	40-foot
SLO	914	148	148	147	148	147	**147**	102	40-foot
PASO	91	150	164	149	149	149	**152**	97	40-foot
PASO	92	149	147	146	147	151	**148**	913	40-foot
PASO	93	71	70	71	68	76	**71**	N/A	40-foot
PASO	94	75	74	75	98	75	**79**	N/A	MCI
PASO	95	182	208	169	202	212	**195**	101	40-foot
PASO	96	161	171	179	166	170	**169**	N/A	40-foot
PASO	97	172	123	119	130	137	**136**	91	40-foot
PASO	98	146	147	148	147	146	**147**	N/A	40-foot
PASO	913	150	148	147	148	149	**148**	92	40-foot
Total Miles/Day		**1,509**	**1,516**	**1,466**	**1,519**	**1,529**	**1,508**		

RTA Route 10 SLO to Santa Maria (40- or 45-foot buses)

Yard	Block	Mon	Tue	Wed	Thu	Fri	Daily Average Miles	Often pairs with:	Bus Type
SLO	101	103	103	103	104	104	**103**	95	40-foot
SLO	102	224	223	223	225	223	**223**	914	40-foot
SLO	103	158	172	177	161	157	**165**	N/A	40-foot
SLO	104	219	223	222	223	224	**222**	N/A	40-foot
SLO	105	221	176	224	223	222	**213**	N/A	40-foot
SLO	106	219	256	208	223	224	**226**	N/A	40-foot
SLO	107	231	221	222	224	224	**224**	121	40-foot
SLO	108	97	99	91	103	97	**97**	N/A	40-foot
SLO	113	80	80	81	80	80	**80**	114	MCI
SLO	114	82	83	82	82	83	**82**	113	MCI
Total Miles/Day		**1,632**	**1,635**	**1,631**	**1,649**	**1,638**	**1,637**		

RTA Route 12 SLO to Los Osos/Morro Bay (40-foot buses)

Yard	Block	Mon	Tue	Wed	Thu	Fri	Daily Average Miles	Often pairs with:	Bus Type
SLO	121	168	171	173	173	169	**171**	107	40-foot
SLO	122	175	177	177	182	176	**177**	N/A	40-foot
SLO	123	41	45	31	41	56	**43**	N/A	40-foot
SLO	124	176	174	177	175	176	**175**	N/A	40-foot
SLO	125	174	174	174	174	174	**174**	N/A	40-foot
SLO	126	42	42	42	42	42	**42**	N/A	40-foot
Total Miles/Day		**775**	**783**	**773**	**786**	**793**	**782**		

RTA Route 15 Morro Bay to San Simeon (gasoline cutaway vans)

Yard	Block	Mon	Tue	Wed	Thu	Fri	Daily Average Miles	Often pairs with:	Bus Type
CAMB	151	182	186	192	183	189	**187**	152	Cutaway
CAMB	152	118	113	113	118	120	**116**	151	Cutaway
Total Miles/Day		**300**	**300**	**305**	**301**	**309**	**303**		

Paso Express Local Fixed Routes in Paso Robles (32-foot Medium-Heavy Duty buses)

Yard	Block	Mon	Tue	Wed	Thu	Fri	Daily Average Miles	Often pairs with:	Bus Type
PASO	71	84	81	88	80	80	**82**	72	32-foot
PASO	72	51	59	50	50	53	**52**	71	32-foot
PASO	81	78	79	77	79	62	**75**	82	32-foot
PASO	82	54	57	52	46	47	**51**	81	32-foot
Total Miles/Day		**267**	**275**	**266**	**255**	**242**	**261**		

SCT Local Fixed Routes (35-foot buses, except Trolley & 40-foot on Tripper)

Yard	Route	Mon	Tue	Wed	Thu	Fri	Daily Average Miles	Often pairs with:	Bus Type
SCT	21	214	214	206	220	211	**213**	N/A	35-foot
SCT	24	166	166	168	166	166	**166**	N/A	35-foot
SCT	27	180	180	181	182	182	**181**	N/A	35-foot
SCT	28	185	185	174	173	175	**178**	N/A	35-foot
SCT	Tripper	23	23	26	22	24	**24**	N/A	40-foot
SCT	Trolley	0	0	0	0	248	**50**	N/A	Trolley
Total Miles/Day		**767**	**767**	**755**	**762**	**1,006**	**811**		

LD NRV = light duty non revenue vehicle

OEM	Size	Efficiency rate (kWh/mi)		size	average ER
New Flyer	40'	2.07		40'	2.13
Gillig	40'	2.30		32'-35'	1.88
Proterra	40'	2.01		60'	3.04
New Flyer	35'	1.94		Cutaway	1.17
BYD	35'	1.83			
Proterra	35'	1.88			
New Flyer	60'	3.45			
BYD	60'	2.62			
Motiv	Cutaway	1.41			
Lightning Systems	Cutaway	1.17			
Phoenix Motor Cars	Cutaway	0.93			

Table 1A – kW demand and kWh energy needed for buses deployed from SLO facility

	Description	40ft. Bus	Cutaway	Minivan	LD NRV
Bus Demand & Energy	Average Bus Miles/Day	248	77	62	38
	x Combined kWh/Mile Usage Rate	3.10	2.00	0.60	0.40
	= kWh charge required / bus / day	768.8	154.0	37.2	15.2
	+ safety margin	0%	0%	0%	0%
	= Final kWh charge req'd / bus / day	769	154	37	15
	/ available charge hours	10.00	8.00	9.00	10.00
	= Charger kW / bus (reference)	76.9	19.3	4.1	1.5
Dispenser Ratio					
	Selected dispenser ratio:	2	6	5	10
	= Req'd charger kW @ selected ratio	*153.8*	*115.5*	*20.7*	*15.2*
	Available charger kW	156.0	156.0	20.4	20.4
	Charger kW margin (req'd < available)	*2.2*	*40.5*	*– 0*	*5.2*
Facility kW Demand	Future gross BEB's / fleet segment	26	13	13	14
	Less spare ratio	20%	20%	10%	10%
	Net BEB/EV rollout / fleet segment	21.0	11.0	12.0	13.0
	/ dispenser ratio (@ ≤ 156kW or 20kW)	2	6	5	10
	= total chargers / fleet segment	**11.0**	**2.0**	**3.0**	**2.0**
	x kW rating / charger	156.0	156.0	20.7	20.4
	/ ~ charger efficiency	96%	96%	96%	96%
	= adjusted kW demand / charger	162.5	162.5	21.5	21.3
	= kW charger demand / fleet segment	1,788	325	65	43
Total kW Demand for BEB & Fleet EVs @ SLO Facility			**2,220**		
kWh Energy / Fleet Segment		16,145	1,694	446	198
Total kWh Energy / Day for BEB & Fleet EVs @ SLO Facility			**18,483**		

SLO RTA

	Description	40 ft bus	Cutaway	32 ft bus	35 ft bus	Max 40 ft bus	Max Cutaway	Max 32 ft bus	Max 35 ft bus
Bus Demand & Energy	Average Bus Mi/d	246	77	130	185	395	303	135	213
	x kWh/Mi Vehicle Efficiency Rate	3.13	2.17	2.88	2.88	3.13	2.17	2.88	2.88
	= kWh charge req'd /bus/d	**769.0**	**167.6**	**376.0**	532.1	**1236.4**	**657.5**	**388.8**	**613.4**
	+ safety margin	5%	5%	5%	5%	5%	5%	5%	5%
	= Final KWh charge req'd /bus/d	807	176	395	559	1298	690	408	644
	divide by available charge hours	6	6	11	8	6	6	11	8
	= Charger kW/bus (reference)	135	29	36	70	216	115	37	81
Dispenser Ratio									
	Selected dispenser ratio:	2	4	3	3	2	4	3	3
	= Req'd charger kW @ selected ratio:	**269.2**	**117.3**	**107.7**	209.5	**432.7**	**460.3**	**111.3**	**241.5**
	Available charger KW	150	100	150	250	300	350	150	300
	Charger KW margin (REQ'D < available)	**-119.2**	**-17.3**	**42.3**	40.5	**-132.7**	**-110.3**	**38.7**	**58.5**
Facility kW Dema	Future gross BEBs / fleet segment	26	13	4	4	26	13	4	4
	Less spare ratio	20%	20%	20%	20%	20%	20%	20%	20%
	Net BEB/EV rollout / fleet segmemt	21	10	3	3	21	10	3	3
	/ dispenser ratio	2	4	3	3	2	4	3	3
	= total chargers / fleet segment	10	3	1	1	10	3	1	1
	x kW rating / charger	150	100	150	250	300	350	150	300
	/ ≈ charger efficiency	96%	96%	96%	96%	96%	96%	96%	96%
	= adjusted kW demand / charger	144	96	144	240	288	336	144	288
	= kW charger demand / fleet segment	1497.6	249.6	153.6	256	2995.2	873.6	153.6	307.2
Total kW Demand for BEB & Fleet Evs @ SLO Facility			2156.8				4329.6		
kWh energy / fleet segment		15575.0	649.0	163.8	273.1	31150.1	2271.4	163.8	327.7
Total kWh energy / Day for BEB & EV fleet			16660.9				33913.0		

Paso Robles to San Luis Obispo

Effective August 2022

San Miguel

HWY 101
Mission St.
14th St.

San Miguel to Paso Robles
Approx. 10 miles

HWY 46
Buena Vista
Cuesta College North

Paso Robles

Paso Robles Detail at Right

Las Tablas Park & Ride
Twin Cities Hospital
Las Tablas Rd.

Templeton

Paso Robles to Atascadero
Approx. 14 miles

El Camino Real
Santa Cruz Rd.
Atalaya St.
Del Rio Rd. *Mission Oaks Plaza*
San Benito Rd.
Maya Ln. *Kennedy Club*
San Anselmo Rd. *Kmart*
San Jacinto Ave.
Rosario Ave.
Traffic Way
East Mall / West Mall
Lewis Ave. / *Atascadero Transit Center*
Highway 41 *Vons*
Pueblo Ave.
Palomar Ave.
Solano Rd.
Principal Ave.
El Bordo Ave. *Post Office*
Musselman Dr.
Buena Fortuna *Hidden Oaks Village*
Bocina Ln. *Bordeaux Apts.*
Viejo Camino
Santa Barbara Rd.
Santa Clara Rd.
Carmel Rd.
Pine St. *Garden Farms*

San Anselmo Rd. *Lutheran Church*
Entrada Ave.
Santa Ysabel Ave.
Car Wash
Albertson's Junipero Ave.
Glen Oaks Plaza Plata Ln.
Miner's Hardware Santa Rosa Rd.
Maple St.
Patria Cir.

HWY 101
Express Southbound Only

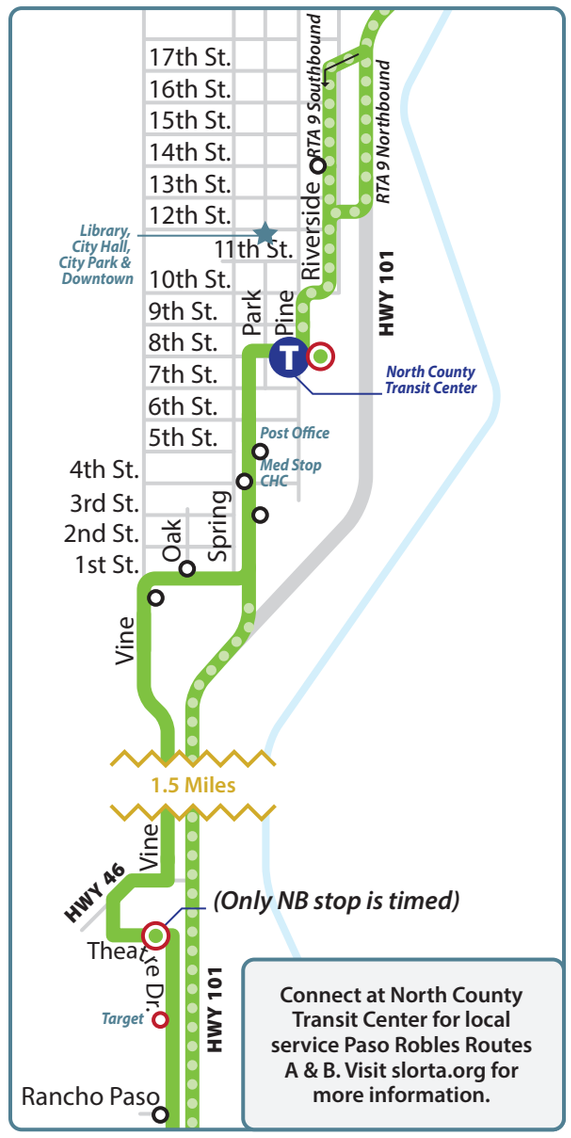
Santa Margarita
Santa Margarita *Country Care*
El Camino Real
Maria Ave.
Encina Ave.

Santa Margarita to
San Luis Obispo
Approx. 10 miles

Atascadero

San Luis Obispo

CAL POLY STATE UNIVERSITY
N. Perimeter Rd.
Cal Poly Performing Arts Center
Kennedy Library
Highland Dr.
Grand Ave.
McCollum St.
Foothill Blvd.
Murray Ave.
HWY 1
HWY 101 *Northbound*
Wilson St.
Abbott St.
Peach Tree Inn (Express NB only)
Monterey St. *Southbound*
Grand Ave.
Palm St.
Osos St.
Santa Rosa St.
HWY 101



Legend

- **Bus Stop** single direction — *Parada de autobus/ una dirección*
- **Bus Stop** bus stops both directions Northbound & Southbound — *Parada de autobus/ ambas direcciones Hacia el norte y sur*
- **Timed Stop** — *Parada de tiempo*
- **Route 9: Daily** — *Ruta 9, diaria*
- **Route 9: Limited Service / Express Trips** — *Ruta 9: Servicio limitado / viajes exprés*
- **Weekdays Only Select Trips** — *Solo entre semana, viajes seleccionados*
- **Transfer Hub** — *Centro de transferencias*

MAP NOT TO SCALE

GOVERNMENT CENTER OSOS & PALM

All routes begin and end here. For connections to RTA Routes 10, 12, & 14, visit slorta.org for more information.

- **RTA 10** To Santa Maria
- **RTA 12** To Morro Bay & Los Osos
- **RTA 14** To Cuesta College SLO

RTA Buses connect at :33 past each hour.

SLO City bus system SLO Transit is across the street

RTA Route 10 Timed Stops

NORTHBOUND SANTA MARIA TO SLO

MONDAY – FRIDAY LUNES A VIERNES

SANTA MARIA		NIPOMO	ARROYO GRANDE	PISMO BEACH	SAN LUIS OBISPO	
Santa Maria Transit Center	Hancock College	Tefft @ Carrillo	El Camino Real @ Halcyon	Pismo Premium Outlets	S. Higuera @ Suburban	Government Center Osos & Palm
6:14	6:18	6:35	6:49	7:00	7:12	7:28*
7:14	7:18	7:35	7:49	8:00	8:12	8:28
8:14	8:18	8:35	8:49	9:00	9:12	9:28
9:14	9:18	9:35	9:49	10:00	10:12	10:28
10:14	10:18	10:35	10:49	11:00	11:12	11:28
11:14	11:18	11:35	11:49	**12:00p**	**12:12p**	**12:28p**
12:14p	**12:18p**	**12:35p**	**12:49p**	**1:00p**	**1:12p**	**1:28p**
1:14p	**1:18p**	**1:35p**	**1:49p**	**2:00p**	**2:12p**	**2:28p**
2:14p	**2:18p**	**2:35p**	**2:49p**	**3:00p**	**3:12p**	**3:28p**
3:14p	**3:18p**	**3:35p**	**3:49p**	**4:00p**	**4:12p**	**4:28p**
4:14p	**4:18p**	**4:35p**	**4:49p**	**5:00p**	**5:12p**	**5:28p**
5:14p	**5:18p**	**5:35p**	**5:49p**	**6:00p**	**6:12p**	**6:28p**
6:14p	**6:18p**	**6:35p**	**6:49p**	**7:00p**	**7:12p**	**7:28p**
7:14p	**7:18p**	**7:35p**	**7:49**	**8:00p**	**8:12p**	**8:28p**
SATURDAY SABADO						
7:14	7:18	7:35	7:49	8:00	8:12	8:28
10:14	10:18	10:35	10:49	11:00	11:12	11:28
12:14p	**12:18p**	**12:35p**	**12:49p**	**1:00p**	**1:12p**	**1:28p**
3:14p	**3:18p**	**3:35p**	**3:49p**	**4:00p**	**4:12p**	**4:28p**
6:14p	**6:18p**	**6:35p**	**6:49p**	**7:00p**	**7:12p**	**7:28p**
SUNDAY DOMINGO						
8:14	8:18	8:35	8:49	9:00	9:12	9:28
12:14	**12:18p**	**12:35p**	**12:49p**	**1:00p**	**1:12p**	**1:28p**
4:14p	**4:18p**	**4:35p**	**4:49p**	**5:00p**	**5:12p**	**5:28p**

** Passengers can transfer at the Government Center to Rt 14 to Cal Poly arriving at 7:40*

SOUTHBOUND SLO TO SANTA MARIA

MONDAY – FRIDAY LUNES A VIERNES

SAN LUIS OBISPO		PISMO BEACH	ARROYO GRANDE	NIPOMO	SANTA MARIA	
Government Center Osos & Palm	S. Higuera @Suburban	Pismo Premium Outlets	El Camino Real @ Halcyon	Tefft @ Carrillo	Hancock College	Santa Maria Transit Center
6:33	6:41	7:00	7:06	7:19	7:31	7:43
7:33	7:41	8:00	8:06	8:19	8:31	8:43
8:33	8:41	9:00	9:06	9:19	9:31	9:43
9:33	9:41	10:00	10:06	10:19	10:31	10:43
10:33	10:41	11:00	11:06	11:19	11:31	11:43
11:33	11:41	**12:00p**	**12:06p**	**12:19p**	**12:31p**	**12:43p**
12:33p	**12:41p**	**1:00p**	**1:06p**	**1:19p**	**1:31p**	**1:43p**
1:33p	**1:41p**	**2:00p**	**2:06p**	**2:19p**	**2:31p**	**2:43p**
2:33p	**2:41p**	**3:00p**	**3:06p**	**3:19p**	**3:31p**	**3:43p**
3:33p	**3:41p**	**4:00p**	**4:06p**	**4:19p**	**4:31p**	**4:43p**
4:33p	**4:41p**	**5:00p**	**5:06p**	**5:19p**	**5:31p**	**5:43p**
5:33p	**5:41p**	**6:00p**	**6:06p**	**6:19p**	**6:31p**	**6:43p**
6:33p	**6:41p**	**7:00p**	**7:06p**	**7:19p**	**7:31p**	**7:43p**
7:33p	**7:41p**	**8:00p**	**8:06p**	**8:19p**	**8:31p**	**8:43p**
8:33p	**8:41p**	**9:00p**	**9:06p**	**9:19p**	**9:31p**	**9:43p**
SATURDAY SABADO						
8:33a	8:41a	9:00a	9:06a	9:19a	9:31a	9:43a
11:33a	11:41a	**12:00p**	**12:06p**	**12:19p**	**12:31p**	**12:43p**
1:33p	**1:41p**	**2:00p**	**2:06p**	**2:19p**	**2:31p**	**2:43p**
4:33p	**4:41p**	**5:00p**	**5:06p**	**5:19p**	**5:31p**	**5:43p**
7:33p	**7:41p**	**8:00p**	**8:06p**	**8:19p**	**8:31p**	**8:43p**
SUNDAY DOMINGO						
9:33a	9:41a	10:00a	10:06a	10:19a	10:31a	10:43a
1:33p	**1:41p**	**2:00p**	**2:06p**	**2:19p**	**2:31p**	**2:43p**
5:33p	**5:41p**	**6:00p**	**6:06p**	**6:19p**	**6:31p**	**6:43p**

Cash Fares	San Luis Obispo	Pismo/ Arroyo Grande	Nipomo	Santa Maria/ Orcutt
San Luis Obispo	**$1.75**	$2.25	$2.75	$3.25
Pismo/ Arroyo Grande	$2.25	**$1.75**	$2.25	$2.75
Nipomo	$2.75	$2.25	**$1.75**	$2.25
Santa Maria/ Orcutt	$3.25	$2.75	$2.25	**$1.75**

REGIONAL DAY PASS: $5.50
Purchase on board from driver

SAVE MONEY, BUY A PASS
Ahorre dinero, compra un pase

Regional Day Pass	$5.50
RTA 31-Day Pass	$47 Regular/$23.50 Discount
Regional 31-Day Pass	$68 Regular/$34 Discount
Stored Value Card	$15 Value
7-Day Pass	$16.00

See the Ride Guide for detailed pass & fare information.
Vea el guia de pasajero para detalles sobre pases y informacion sobre tarifas.

Discount Fares: half the regular cash fares for Seniors (65-79), Disabled and Medicare Card Holders, Students (K-12, RTA Only)
Precios descuentos: Mayores (65-79), Estudiantes (K-12), Discapacitados y personas con tarjeta de Medicare.

Children 44" and under ride free with paying adult
Niños debajo de 44 pulgadas viajan gratis al ser acompañados por un pasajero pagando la tarifa regular.

All Route 10 Stops

Northbound *Hacia al Norte*

Santa Maria Transit Center, *SMAT*
S. Bradley at Jones (Hancock College)
Nicholson at E. Cypress: Amtrak Bus
E. Church at Palisade: Marian Medical Center
Tefft at Carillo
Thompson at Branch
Nipomo High School
E. Grand at El Camino Real: ARCO AM-PM
El Camino Real at Halcyon Park and Ride
James Way
Pismo Premium Outlets, *South County Transit*
S. Higuera at Suburban (Trader Joes/Food 4 Less)
S. Higuera at Prado: Social Services
S. Higuera at Margarita: DMV
S. Higuera at South
Marsh at Broad
Santa Rosa at Higuera
Government Center (Osos and Palm)
Connect to SLO city bus system SLO Transit across the street

Southbound *Hacia al Sur*

Cal Poly Library, Limited Service
Cal Poly Performing Arts Center
Limited Service
Government Center - Osos and Palm
Connect to the SLO city bus system SLO Transit across the street
Nipomo at Higuera
S. Higuera at South
S. Higuera at Margarita - DMV
S. Higuera at Prado - Social Services
S. Higuera at Suburban: Trader Joes & Food 4 Less
Pismo Premium Outlets ***Connect to South County Transit***
E. Grand at El Camino Real - ARCO AM-PM
El Camino Real at Halcyon Park and Ride
Thompson at Windmill Farm
Nipomo High School
Thompson at Branch
Tefft at Carillo
S. Bradley at Jones - Hancock College
Nicholson at E. Cypress - Amtrak Bus
E. Church at Palisade - Marian Medical Center
Santa Maria Transit Center - *Connect to SMAT*

RTA Holidays / *Dias festivos*

No Service / No Servicio:
Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day, and New Year's Day.

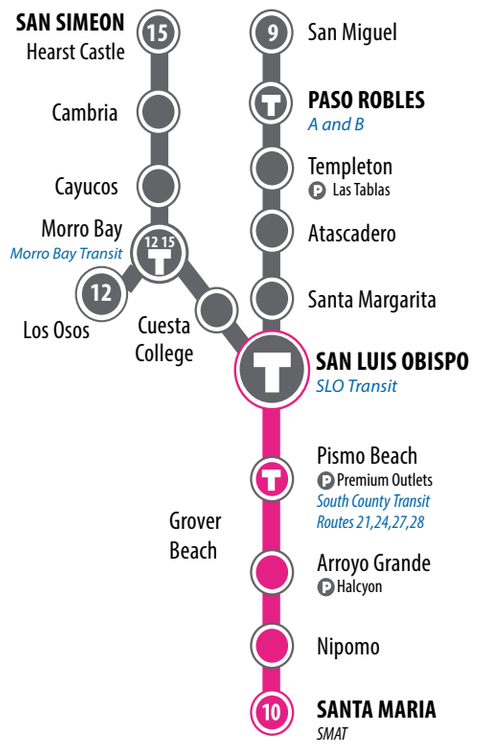
HOLIDAY SCHEDULES
Check the slorta.org website for reduced schedules during the weeks of Thanksgiving, Christmas and New Year's

Please carry exact fare. No change is given.
Favor de traer la tarifa exacta.

More info / Más información
slorta.org
(805) 541-2228

EFFECTIVE AUGUST 2022

10 SANTA MARIA to SAN LUIS OBISPO



REGIONAL TRANSIT AUTHORITY

(805) 541-2228 or slorta.org

Purchase and Save Bus Passes on Your Phone!

Download the Token Transit App from the Google Play or Apple App store

Purchase your RTA pass through the App

Show your pass when you board the bus!

The Dial-A-Ride Shuttle offer riders curb-to-curb transportation within local communities. With this customized service, you decide where and when to be picked-up. With no set timetables, and destinations of your choice, Dial-A-Ride offers affordable travel designed around your needs. These services typically require reservations made 2-3 days in advance of your ride. Please call and talk to your service provider before your trip to see what time frame they will need to make a reservation:

Nipomo Dial a Ride: Mon-Fri 7AM - 6:30PM. $2.25 Adults, $1.75 seniors, disabled & children per one way trip. (805) 929-2881

REGIONAL TRANSIT AUTHORITY

San Luis Obispo to Santa Maria

Legend

- **Bus Stop** — single direction. *Parada de autobus/ una dirección*
- **Bus Stop** — bus stops both directions Northbound & Southbound. *Parada de autobus/ ambas direcciones Hacia el norte y sur*
- **Timed Stop** — *Parada de tiempo*
- **Route 10: Daily** — *Ruta 10, diaria*
- **Route 10: Express Bus Monday - Friday only** — *Ruta 10: Viajes exprés lunes a Viernes*
- **Direction of Service** — *Dirección de servicio*
- **Transfer Hub** — *Centro de transferencias*

MAP NOT TO SCALE

Bus Pass Sales Locations

Hours at outlets are subject to change

Regional Day Pass: Sold onboard the bus: $5.50 / day. Cash only, driver has no change.

www.slorta.org: Sells all passes. Pay with your PayPal account and passes are mailed to your address.

RTA Admininstration Office:
179 Cross Street, SLO. Sells all passes.
Open Mon - Fri 8:30AM - 4:30PM
Cash, check & credit/debit cards.

SLO Government Center Ticket Vending Machine: Accepts cash and credit/debit cards. Sells RTA and SLO Transit passes.

Santa Maria Transit Center
Open Mon-Fri 8AM – 10AM, & 2PM to 4PM

Arroyo Grande City Hall
300 E Branch Street
Open Mon-Thurs 8AM - 5PM

Grover Beach City Hall
154 S 8th Street
Open Mon-Thurs 8AM - 12PM

Oceano CSD
1655 Front Street
Open Mon-Fri 8AM - 4:30PM

Pismo Beach Visitor Center
581 Dolliver Street
Open Mon-Sat 9AM - 5PM
Sunday 10AM - 4PM

North Coast & San Luis Obispo

2020 ADJUSTED SCHEDULE*

12 San Luis Obispo, Cuesta, Morro Bay & Los Osos

14 SLO to Cuesta College
- NOT IN SERVICE -

15 Morro Bay to San Simeon

Legend

- **Bus Stop** single direction — *Parada de autobus/ una dirección*
- **Bus Stop** bus stops both directions Northbound & Southbound — *Parada de autobus/ ambas direcciones Hacia el norte y sur*
- **Timed Stop** — *Parada de tiempo*
- **"Call in Only" Stop Route 12**
- **Direction of Service** — *Dirección de servicio*
- **Transfer Hub** — *Centro de transferencias*

- **Full Route 12, Daily** — *Ruta 12 completa diaria*
- **Route 12X, Cal Poly M-F** — *Ruta 12X, Cal Poly lunes -viernes*

RTA 12 & 14 SOUTH
Towards San Luis Obispo: Weekday Hourly Service • Weekday Peak: Every 30 Minutes • Limited Weekend Service

RTA 12 NORTH
Towards Morro Bay & Los Osos • Weekday Hourly Service • Limited Weekend Service

- **Route 14: M-F During Cuesta College Fall & Spring Sessions Only** — *Sesiones de otono y primavera solamente*
- **Route 15: Daily to Cayucos, Cambria & San Simeon • Hearst Castle Sat/Sun Only** — *Ruta 15, diaria*; *Cayucos - Morro Bay High School Tripper only*
- **Route 9: Daily** — *Ruta 9, diaria*
- **Route 9: Select Trips to Cal Poly** — *Ruta 9: viajes selectivos a Cal Poly*
- **Route 10: Daily** — *Ruta 10, diaria*
- **Route 10: Select Trips to Cal Poly** — *Ruta 10: viajes selectivos a Cal Poly*

MAP NOT TO SCALE

San Simeon
Hearst Castle Visitor Center (Sat. & Sun. only)
Hearst Castle Rd.
San Simeon (SB)
Otter Way (NB)
Hearst Dr.
Castillo Dr.
Moonstone Bch. Dr.
Oceanpoint Ranch
Fireside Inn (NB)
Castle Inn (SB)
Mariners Inn
Windsor Blvd.
Cornwall St. (NB)
Arlington St. (SB)
Main St.
Tamson St.
Cambria Library (NB)
Veteran's Hall (SB)
HWY 1
Bluebird Inn
Cambria
Main St.
Burton Dr.
Burton Circle
Burton Dr.
Cambria Pines Lodge
Yorkshire Dr.
Ardath Dr.
Ardath Dr.
Cambria to Cayucos
Approx. 13 miles
HWY 1
RTA 15
Cayucos Dr. (NB)
Cayucos Pier (SB)
Ocean Ave.
3rd St.
8th St. (NB)
9th St. (SB)
13th St.
Cayucos
Old Creek Rd.
Ocean Blvd.
Hwy. 41
Main St.
San Jacinto St. (SB)
Morro Bay High School
Morro Bay Blvd.
Harbor St.
Morro Bay Blvd.
Morro Bay City Park
Piney Way
Morro Bay
HWY 1
Quintana Rd.
RTA 12
South Bay Blvd.
El Chorro Regional Park
SLO Botanical Gardens
CUESTA COLLEGE
Achievement House
Chorro Valley Rd.
Calif. Men's Colony (Call in Only)
Kansas Ave. - County Services (Call in Only)
CAL POLY STATE UNIVERSITY
Highland Dr.
N. Perimeter Rd.
Kennedy Library
S. Perimeter Rd.
California Blvd.
Cal Poly Performing Arts Center
Grand Ave.
McCollum St.
Foothill Blvd.
Murray Ave.
HWY 1
RTA 14
Wilson St.
Abbott St.
Peach Tree Inn
Grand Ave.
HWY 101
HWY 101
Monterey St.
San Luis Obispo
Palm St.
Higuera St.
Marsh St.
Santa Rosa St.
Osos St.
Broad St.
Nipomo St.
HWY 101
Higuera St.
South St.
DMV
Margarita Ave.
Social Services
Trader Joe's & Food 4 Less
Suburban Rd.
RTA 10 TO SANTA MARIA
Madonna Rd
Los Osos to HWY 101
Approx. 10 miles
Los Osos Valley Rd.
Baywood Park
Santa Ysabel Ave.
Santa Maria Ave.
El Morro Ave.
2nd St.
7th St.
9th St.
10th St.
11th St.
15th St.
Baywood Elementary
Los Osos Middle School
Ramona Ave.
Pine Ave.
Loma St.
Santa Ynez Ave.
Miners Ace Ralphs
Los Osos Post Office
Palisades Ave
Los Osos
RTA 15
Cayucos Pier (SB)
TO PASO ROBLES
RTA 9

GOVERNMENT CENTER OSOS & PALM
RTA Buses connect at :33 past each hour. The SLO Transit stop is across the street.

San Simeon — Hearst Castle — 15
Cambria — 15
Cayucos — 15
Morro Bay — *Morro Bay Transit* — 15, 14
Los Osos — 12
Cuesta College — 14
San Luis Obispo — *SLO Transit* — 15, 14, 9, 12
San Miguel — 9
Paso Robles — *Paso Express A & B* — 9
Templeton — Las Tablas — 9
Atascadero — 9
Santa Margarita — 9

South County Transit
Routes 21-24-27-28
Avila Trolley
Shell Beach
Pismo Beach — Premium Outlets
Grover Beach
Arroyo Grande — Halcyon
Oceano
Transfer Point
Park & Ride
Santa Maria — *SMAT* — 10
Orcutt — *SB Clean Air Express* — 10

rta REGIONAL TRANSIT AUTHORITY

Effective/*Comenzando* August 2020
***Schedule change during COVID-19 response. No weekday Express Trips**

slorta.org
(805) 541-2228

Holidays / *Dias festivos*
No Service / *No Servicio:*
Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day, & New Year's Day

Route 12 Time Stops: NO EXPRESS TRIPS AT THIS TIME

BOLD = PM

ROUTE	Northbound				Los Osos Loop			Southbound			
	San Luis Obispo			Morro Bay	Marked Times Connect To RTA 15			Morro Bay	San Luis Obispo		
	Gov't Center	Cal Poly Library	Cuesta College	Morro Bay Park	Santa Ysabel at 15th	Pine at LOVR	Santa Ysabel at 15th	Morro Bay Park	Cuesta College	Cal Poly Library	Gov't Center
Monday - Friday *Lunes A Viernes*	-	-	-	-	6:23	6:32	6:43	6:55	7:06	-	7:20
	6:33		6:46	6:59	7:07	7:16	7:27	7:39	7:50		8:06
	7:33		7:46	7:59	8:07	8:16	8:27	8:39	8:50		9:06
	8:33		8:46	8:59	9:07	9:16	9:27	9:39	9:50		10:06
	9:33		9:46	9:59	10:07	10:16	10:27	10:39	10:50		11:06
	10:33		10:46	10:59	11:07	11:16	11:27	11:39	11:50		**12:06**
	11:33		11:46	11:59	**12:07**	**12:16**	**12:27**	**12:39**	**12:50**		**1:06**
	12:33		**12:46**	**12:59**	**1:07**	**1:16**	**1:27**	**1:39**	**1:50**		**2:06**
	1:33		**1:46**	**1:59**	**2:07**	**2:16**	**2:27**	**2:39**	**2:50**		**3:06**
	2:33		**2:46**	**2:59**	**3:07**	**3:16**	**3:27**	**3:39**	**3:50**		**4:06**
	3:33		**3:46**	**3:59**	**4:07**	**4:16**	**4:27**	**4:39**	**4:50**		**5:06**
	4:33		**4:46**	**4:59**	**5:07**	**5:16**	**5:27**	**5:39**	**5:50**		**6:06**
	5:33		**5:46**	**5:59**	**6:07**	**6:16**	**6:27**	**6:39**	**6:50**		**7:06**
	6:33		**6:46**	**6:59**	**7:07**	**7:16**	**7:27**	**7:39**	**7:50**		**8:06**
	7:33		**7:46**	**7:59**	**8:07**	**8:16**	**8:27**	**8:39**	**8:50**		**9:06**
	8:33		**8:46**	**8:59**	**9:07**	**9:16**	**9:27**	**9:39**	**9:50**		**10:06**
Saturday *Sabado*	-		-	-	7:30	7:39	7:50	8:00	CALL		8:25
	8:33		CALL	9:00	9:08	9:17	9:28	-	-		-
	-		-	-	10:30	10:39	10:50	11:00	CALL		11:25
	11:33		CALL	12:00	**12:08**	**12:17**	**12:28**	-	-		-
	-		-	-	**12:30**	**12:39**	**12:50**	**1:00**	**CALL**		**1:25**
	1:33		**CALL**	**2:00**	**2:08**	**2:17**	**2:28**	-	-		-
	-		-	-	**3:30**	**3:39**	**3:50**	**4:00**	**CALL**		**4:25**
	4:33		**CALL**	**5:00**	**5:08**	**5:17**	**5:28**	-	-		-
	-		-	-	**6:30**	**6:39**	**6:50**	**7:00**	**CALL**		**7:25**
	7:33		**CALL**	**8:00**	**8:08**	**8:17**	**8:28**	-	-		-
Sunday *Domingo*	-		-	-	8:30	8:39	8:50	9:00	CALL		9:25
	9:33		CALL	10:00	10:08	10:17	10:28	10:38	CALL		11:00
	11:50		CALL	12:17	**12:25**	**12:34**	**12:45**	**1:00**	**CALL**		**1:25**
	1:33		**CALL**	**2:00**	**2:08**	**2:17**	**2:28**	**2:38**	**CALL**		**3:00**
	3:50		**CALL**	**4:17**	**4:25**	**4:34**	**4:45**	**5:00**	**CALL**		**5:25**
	5:33		**CALL**	**6:00**	**6:08**	**6:17**	**6:28**	-	-		-

Route 14

Weekdays during Cuesta Fall & Spring Sessions Only*

To Cuesta			From Cuesta		
Gov't Center	The SLO Appts	Cuesta College	Cuesta College	Santa Rosa & Foothill	Gov't Center
7:30*	7:33	7:41	-	-	-
8:03	8:06	8:14	-	-	-
-	8:33	8:41	8:44	8:55	8:59
9:03	9:06	9:14	-	-	-
-	9:33	9:41	9:44	9:55	9:59
10:03	10:06	10:14	-	-	-
-	10:33	10:41	10:44	10:52	11:00
-	-	-	11:40	11:51	11:55
11:55	11:58	12:07	12:10	12:21	12:25
12:25	12:28	12:37	12:40	12:51	12:55
12:55	12:58	1:07	1:10	1:21	1:25
1:25	1:28	1:37	1:40	1:51	1:55
1:55	1:58	2:07	2:10	2:21	2:25
2:25	2:29	-	3:10*	3:21	3:25
-	-	-	4:10*	4:21	4:25

NOT IN SERVICE

The bus stops at the Achievement House on the Cuesta College campus on the 7:30 AM trip and on the 3:10 PM and 4:10 PM trips which run all year.

Route 15 Morro Bay High School / Cayucos Tripper

Cayucos Pier	3rd @ Ocean	9th @ Ocean	Ocean @ Old Creek	MBHS
MONDAY-Late Start				
9:15a	9:15a	9:15a	9:25a	9:30a
TUESDAY - FRIDAY				
7:45a	7:45a	7:45a	7:50a	8:00a
AFTERNOON- MONDAY-FRIDAY				
MBHS	Ocean @ Old Creek	8th @ Ocean	3rd @ Ocean	Cayucos @ Ocean
3:10p	3:20p	3:21p	3:22p	3:25p

NOT IN SERVICE

The bus stop for MBHS is on Atascadero Road at the bus circle entrance. **The tripper operates M-F during regularly scheduled school days only.**

Full Route 12 Stop List

NORTHBOUND
- SLO Government Center
  -Connects with RTA 9 & 10
- Santa Rosa at Murray
- Santa Rosa at The SLO Housing-NB
- *Cal Poly Kennedy Library* *12X only*
- CA Men's Colony Call in only
- Kansas at Hwy. 1 Call in only
- Achievement House Limited Service
- Cuesta College Call in on weekends
- Morro Bay Park Connects to RTA 15

LOS OSOS LOOP
- Southbay at Quintana
- Santa Ysabel at 15th
- 11th at El Moro: Baywood
- 11th at Ramona
- 10th at Santa Ynez
- 10th at LOVR
- LOVR at Palisades
- Pine at LOVR

LOS OSOS LOOP CONTINUED
- Pine at Loma
- Ramona at 7th
- 7th at El Morro
- 2nd at Santa Maria
- Santa Ysabel at 7th
- Santa Ysabel at 15th
- South Bay at Quintana
- Morro Bay Park

SOUTHBOUND
- Morro Bay Park-Depart
- Cuesta College Call in on weekends
- Achievement House Limited Service
- Kansas at Hwy 1 Call in only
- CA Men's Colony Call in only
- *Cal Poly Kennedy Library*-*12X only*
- Santa Rosa at Foothill -SB
- Santa Rosa at Murray
- SLO Government Center

CASH FARES *TARIFAS*	San Luis Obispo	Cuesta Kansas St. CMC	Morro Bay Los Osos Cayucos	Cambria San Simeon
San Luis Obispo	**$1.75**	**$2.25**	**$2.75**	**$3.25**
Cuesta College Kansas / CMC	**$2.25**	**$1.75**	**$2.25**	**$2.75**
Morro Bay Los Osos, Cayucos	**$2.75**	**$2.25**	**$1.75**	**$2.25**
Cambria San Simeon	**$3.25**	**$2.75**	**$2.25**	**$1.75**

Regional Day Pass: $5.50

SAVE MONEY, BUY A PASS
Ahorre dinero, compra un pase

Regional Day Pass	$5.50
RTA 31-Day Pass	$47 Regular/$23.50 Discount
Regional 31-Day Pass	$68 Regular/$34 Discount
Stored Value Card	$15 Value
7-Day Pass	$16.00

See the Ride Guide for detailed pass & fare information.
Vea el guia de pasajero para detalles sobre pases y informacion sobre tarifas.

Discount Fares: half the regular cash fares for Seniors (65-79), Disabled and Medicare Card Holders, Students (K-12, RTA Only)
Precios descuentos: Mayores (65-79), Estudiantes (K-12), Discapacitados y personas con tarjeta de Medicare.

Children 44" and under ride free with paying adult
Niños debajo de 44 pulgadas viajan gratis al ser acompañados por un pasajero pagando la tarifa regular.

Please carry exact fare. No change is given.
Favor de traer la tarifa exacta.

At the time of this printing, fares are 50¢ Regular and 25¢ Discounted. Fare rates are subject to change and fares will revert back to the listed cash pass prices at any time.

BOLD = PM

ROUTE 15 NORTHBOUND
TIMED STOPS: MORRO BAY TOWARDS SAN SIMEON

MORRO BAY	CAYUCOS	CAMBRIA	SAN SIMEON	
Morro Bay Park - *Depart*	Cayucos Dr. @ Ocean	Burton @ Main St.	Castillo @ Otter Way	Hearst Castle Visitor Center
7:00	7:12	7:34	7:44	----
10:00	10:12	10:34	10:44	----
12:00	**12:12**	**12:34**	**12:44**	----
3:00	**3:12**	**3:34**	**3:44**	----
6:00	**6:12**	**6:34**	**6:44**	----
9:00	9:14	9:34	9:47	9:54
12:00	**12:14**	**12:34**	**12:47**	**12:54**
2:00	**2:14**	**2:34**	**2:47**	**2:54**
5:00	**5:14**	**5:34**	**5:47**	**5:54**
8:00	**8:14**	**8:34**	**8:47**	----
10:00	10:14	10:34	10:47	10:54
2:00	**2:14**	**2:34**	**2:47**	**2:54**
6:00	**6:14**	**6:34**	**6:47**	----

Mon- Fri *Lunes A Viernes*
Saturday *Sabado*
Sunday *Domingo*

12 & 15 Connect at Morro Bay Park

ROUTE 15 SOUTHBOUND
TIMED STOPS: SAN SIMEON TOWARDS MORRO BAY

SAN SIMEON		CAMBRIA	CAYUCOS	MORRO BAY
Hearst Castle Visitors Center	Hearst Dr. @ San Simeon	Burton @ Main St.	Ocean @ Cayucos Pier	Morro Bay Park
----	6:00	6:12	6:30	6:43
----	7:50	8:00	8:20	8:33
----	10:50	11:00	11:20	11:33
----	**1:50**	**2:00**	**2:20**	**2:33**
----	**4:50**	**5:00**	**5:20**	**5:33**
----	7:05	7:17	7:40	7:55
10:00	10:05	10:17	10:40	10:55
12:00	**12:05**	**12:17**	**12:40**	**12:55**
3:00	**3:05**	**3:17**	**3:40**	**3:55**
6:00	**6:05**	**6:17**	**6:40**	**6:55**
----	8:05	8:17	8:40	8:55
12:00	**12:05**	**12:17**	**12:40**	**12:55**
4:00	**4:05**	**4:17**	**4:40**	**4:55**

See map to view all Route 15 bus stops

Time Stops

21

Runs Clockwise

	Pismo Beach	Arroyo Grande		Grover Beach	Pismo Beach		
	Premium Outlets	Town Center Walmart	Grand @ Elm	Ramona Garden	Dolliver @ Pomeroy	Mattie @ PB City Hall	Premium Outlets
	Monday - Friday						
Start				6:29a	6:35a	6:39a	6:51a
Hourly	:05	:13	:21	:29	:35	:39	:51
End	7:05p	7:13p	7:21p	7:29p	--	--	--
	Saturday						
Start				7:29a	7:35a	7:39a	7:51a
Hourly	:05	:13	:21	:29	:35	:39	:51
End	7:05p	7:13p	7:21p	7:29p	--	--	--
	Sunday						
Start				7:29a	7:35a	7:39a	7:51a
Hourly	:05	:13	:21	:29	:35	:39	:51
End	6:05p	6:13p	6:21p	6:29p	--	--	--

Runs Counter-Clockwise

24

	Pismo Beach	Grover Beach	Arroyo Grande		Pismo Beach
	Premium Outlets	Ramona Garden	AG City Hall	Town Center Walmart	Premium Outlets
	Monday - Friday				
Start		6:29a	6:40a	6:46a	6:55a
Hourly	:10	:29	:40	:46	:55
End	7:10p	7:29p	--	--	--
	Saturday				
Start		7:29a	7:40a	7:46a	7:55a
Hourly	:10	:29	:40	:46	:55
End	7:10p	7:29p	--	--	--
	Sunday				
Start		7:29a	7:40	7:46	7:55
Hourly	:10	:29	:40	:46	:55
End	6:10p	6:29p	--	--	--

Runs Clockwise

27

	Grover Beach	Arroyo Grande		Oceano			Grover Beach
	Ramona Garden	Town Center Walmart	Arroyo Grande High School	Elm @ The Pike	19th @ Wilmar	Air Park Drive Oceano Airport	Ramona Garden
	Runs Monday - Friday Only						
Start	-	-	-	6:03	6:07	6:11	6:20
	6.:32a	6:43a	6:50a	6:56a	7:00a	7:04a	7:13a
Hourly	:32	:43	:50	:56	:00	:04	:13
End	7:32p	7:43p	7:50p	7:56p	8:00p	8:04p	8:13p
AG High School Afternoon Tripper*							
Mon-Fri	-	-	3:10p	3:16p	3:20p	3:24p	3:33p

Runs Counter-Clockwise

28

	Grover Beach	Oceano			Arroyo Grande		Grover Beach
	Ramona Garden	Air Park Drive Oceano Airport	Wilmar @ 19th	Elm @ The Pike	Arroyo Grande High School	Town Center Walmart	Ramona Garden
	Monday - Friday**						
Start	6:20a	6:29a	6:33a	6:37a	6:43a	6:51a	6:59a
	7:32a	7:41a	7:45a	7:50a	7:56a	8:04a	8:14a
Hourly	:32	:41	:45	:50	:56	:04	:14
End	7:32p	7:41p	7:45p	7:50p	7:56p	8:04p	8:14p
	Saturday						
Start	7:32a	7:41a	7:45a	7:50a	7:56a	8:04a	8:14a
Hourly	:32	:41	:45	:50	:56	:04	:14
End	7:32p	7:41p	7:45p	7:50p	7:56p	8:04p	8:14p
	Sunday						
Start	7:32a	7:41a	7:45a	7:50a	7:56a	8:04a	8:14a
Hourly	:32	:41	:45	:50	:56	:04	:14
End	6:32p	6:41p	6:45p	6:50p	6:56p	7:04p	7:14p
AG High School Morning Tripper*							
Monday	8:52a	9:01a	9:05a	9:09a	9:15a	-	-
Tues-Fri	7:07a	7:16a	7:20a	7:24a	7:30a	-	-

*** AG High School Tripper is not currently running. Please check with RTA to find out if we are able to restart this trip.**

**** Due to traffic Route 28 does not stop at AG High at 2:56 PM Monday-Friday and misses the 3 following stops until Halcyon Park and Ride where it continues its run.**

All Route Stops

ROUTE 21

* On the first trip of the day, SCT 21 service starts at Ramona Garden at 6:29AM. The last trip ends at Ramona. All other SCT 21 trips depart the Pismo Outlets at :05 past the hour.

Premium Outlets :05
James Way @ 4th Street
James Way @ Ridge
James Way @ Oak Park Boulevard
Town Center / Walmart :13
E. Grand @ El Camino Real (AM/PM)
East Grand @ Halcyon Road
East Grand @ Alder
East Grand @ Elm Street :21
West Grand @ Courtland
West Grand @ 16th Street
West Grand @ 13th Street
Ramona Garden Park :29
West Grand Avenue @ 6th
W. Grand Ave. @ 2nd St. (Amtrak)
Highway 1 @ Le Sage Drive
South Dolliver Street @ Frady Lane
Dolliver @ Pomeroy-Pismo Pier :35
Dolliver Street @ San Luis Avenue
Price @ Harbor View
Price Street @ Lighthouse Suites
Mattie Road @ Foothill Road
Mattie Rd. @ PB City Hall :39
Mattie Road @ Calle Valencia
Shell Beach Blvd @ Spyglass Village
Shell Beach Road @ Terrace Avenue
Shell Beach Road @ Cuyama Avenue
Shell Beach Road @ Cliff Avenue
Price Street @ Stimson Avenue
Premium Outlets :51
-Connects with RTA Route 10

ROUTE 24

* On the first trip of the day, SCT 24 service starts at Ramona Garden at 6:29 AM. Last run ends at Ramona. All other SCT 24 trips depart Pismo Outlets at :10 past the hour.

Premium Outlets :10
Price Street @ Hinds Ave
Price Street @ Wadsworth
Dolliver @ Bay
Dolliver @ Hinds
Dolliver @ Pismo Coast Village
Highway 1 @ Butterfly Trees
Highway 1 @ Le Sage Drive
W. Grand @ 3rd Street (Amtrak)
W. Grand @ 7th Street
Ramona Garden Park :29
West Grand Avenue @ 13th Street
West Grand Avenue @ 16th Street
East Grand @ Oak Park
East Grand Avenue @ Elm Street
East Grand Avenue @ Alder Street
East Grand Ave. @ West Branch St.
East Branch @ AG City Hall :40
West Branch Street @ Vernon
W. Branch @ South County Library
Town Center/ Walmart :46
West Branch @ Oak Park
James Way @ Oak Park Boulevard
James Way @ Ridge Road
James Way @ 4th Street
James Way @ Ventana
James Way @ Highland Drive
Premium Outlets :55
-Connects with RTA Route 10

ROUTE 27

* On the first trip of the day, SCT 27 service starts at Elm @ The Pike at 6:03AM. Last run ends at Ramona. All other SCT 27 trips depart Ramona Garden at :32 past the hour.

Ramona Garden Park :32
West Grand @ 13th
West Grand @ 16th
Oak Park @ Grand
Oak Park @ Newport
Town Center/ Walmart :43
E. Grand @ West Branch
Fair Oaks @ Traffic Way
Fair Oaks @ Valley/AG High :50
Fair Oaks @ Halcyon/ AG Hospital
Elm Street @ Fair Oaks
Elm @ The Pike :56
South Elm @ Paul Place
Cienega/Hwy 1 @ 25th
Cienega/Hwy 1 @ 21st
19th @ Wilmar :00
Wilmar @13th
Air Park - Oceano Airport :04
13th @ Front/Highway 1
13th @ Wilmar
13th @ Farroll
13th @ Trouville
Grand @ 13th
Ramona Garden Park :13

ROUTE 28

* Due to traffic Monday-Friday, Route 28 does not stop at AG High School at 2:56PM and also misses the following 3 stops until Halcyon Park and Ride where it continues its run.

Ramona Garden Park :32
Grand Ave @ 13th
13th @ Longbranch
13th @ Mentone
13th @ Messina
13th @ Belridge
Air Park -Oceano Airport :41
13th @ Front St/Highway 1
Wilmar @ 19th :45
Cienega/Hwy1 @ 21st
Cienega/Hwy1 @ 25th
Elm @ The Pike :50
Elm @ Fair Oaks
Fair Oaks @ Halcyon/ AG Hospital
****Fair Oaks @ Valley Rd/AG High :56**
**Traffic Way @ Firefighters Park
**East Branch @ Branch (AM/PM)
**E. Grand @ El Camino Real
El Camino Real/Halcyon P&R
Town Center/Walmart :04
West Branch @ Oak Park
Oak Park @ Newport
Oak Park @ Ramona
Oak Park @ Longbranch
W. Grand @ 16th
W. Grand @ 13th
Ramona Garden Park :14

Purchase your bus passes on your smart phone!
Download the Token Transit App for RTA & South County Transit passes

SoCoTransit

South County Transit

Routes 21 24 27 28

Shell Beach * Pismo Beach
Grover Beach * Arroyo Grande
Oceano * AG High School

Operated by rta REGIONAL TRANSIT AUTHORITY

Effective December 2023

(805) 541-2228 / www.slorta.org

Pass and Fare Information

(subject to change)

Regional Day Pass	$5.50 Purchase on Board Bus
SoCo Transit Day Pass	$3/$1.50 Discount- Purchase on Bus
7-Day Pass	$16 RTA & SoCo Transit
SoCo Transit 31-Day Pass	$37 Regular/ $18.50 Discount
SoCo Transit20-Ride Pass: Sold at AG High	$24 Regular/ $12 Senior Discount
RTA Only 31-Day Pass	$47 Regular/ $23.50 Discount
Regional 31-Day Pass	$68 Regular/ $34 Discount
Stored Value Card	$15 Value SoCo Transit & RTA

Discount Passes and Cash Fares are Half Price for Seniors (65-79) and Disabled & Medicare Card Holders

Cash Fares	SoCo	RTA
Regular	$1.50	$1.75 -$3.25
Senior Citizens (Age 65+) Disabled and Medicare Card Holders	$0.75	$0.85 - $1.60
Children 44" and under ride for free with paying adult	Ninos debajo de 44 pulgadas viajan gratis al ser acompanados por un pasajero pagando la tarifa regular	

Regional Day Pass $5.50
SoCo Transit Day Pass $3.00
Purchase from your driver

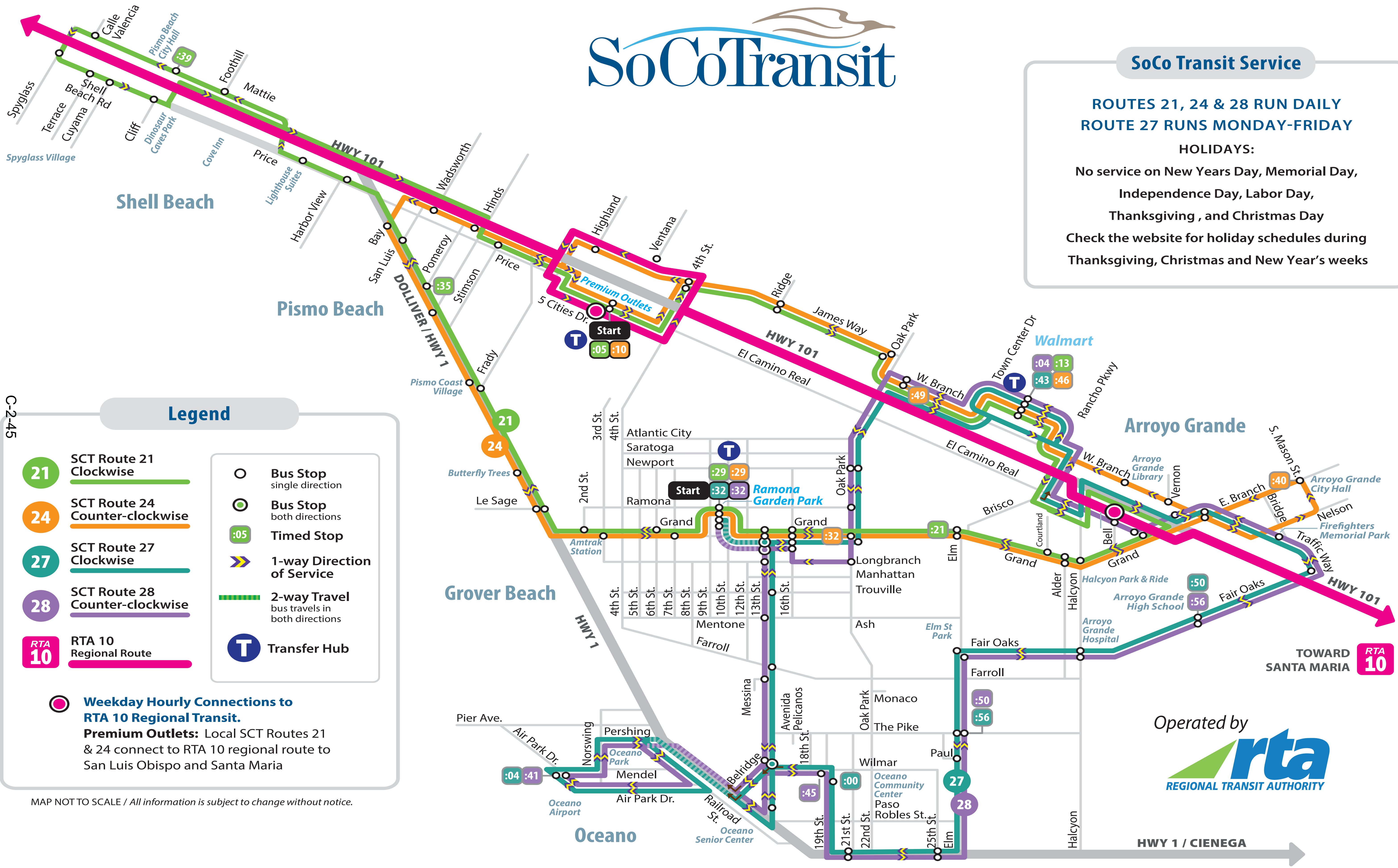
Passes and schedules available at these locations:

~ RTA Main Office, 253 Elks Lane, San Luis Obispo
~ Arroyo Grande City Hall, 300 E. Branch Street
~ Oceano CSD, 1355 Front Street
~ Grover Beach City Hall, 154 S. 8th Street
~ Arroyo Grande High School - Students only **(South County Transit 20-Ride Passes Only)**
~ *More locations listed at www.slorta.org*

Online pass sales at www.slorta.org

Please Carry Exact Fare
Drivers Do Not Make Change

Need to transfer to another bus?
Let the driver know upon boarding the bus



SoCo Transit Service

ROUTES 21, 24 & 28 RUN DAILY
ROUTE 27 RUNS MONDAY-FRIDAY

HOLIDAYS:

No service on New Years Day, Memorial Day, Independence Day, Labor Day, Thanksgiving , and Christmas Day

Check the website for holiday schedules during Thanksgiving, Christmas and New Year's weeks

Legend

- 21 SCT Route 21 Clockwise
- 24 SCT Route 24 Counter-clockwise
- 27 SCT Route 27 Clockwise
- 28 SCT Route 28 Counter-clockwise
- RTA 10 Regional Route

- Bus Stop
  - single direction
- Bus Stop
  - both directions
- :05 Timed Stop
- 1-way Direction of Service
- 2-way Travel
  - bus travels in both directions
- Transfer Hub

Weekday Hourly Connections to RTA 10 Regional Transit.
Premium Outlets: Local SCT Routes 21 & 24 connect to RTA 10 regional route to San Luis Obispo and Santa Maria

MAP NOT TO SCALE / *All information is subject to change without notice.*

RTA Route 9 Time Stops

SOUTHBOUND *Hacia al sur* Paso Robles to San Luis Obispo

	SAN MIGUEL	PASO ROBLES			TEMPLETON		ATASCADERO		SANTA MARGARITA	SAN LUIS OBISPO	
	Mission at 14th	Cuesta College North	Pine at 8th	Target Shopping Center	Twin Cities Hospital	Las Tablas Park & Ride	Atascadero Transit Center	Viejo Camino at Bocina	ECR at Encina	Cal Poly Library	Government Center (Osos at Palm)
MONDAY – FRIDAY *LUNES A VIERNES*	5:47	-	6:01	6:10	6:16	6:18	6:33	6:45	6:54	7:11	7:24
EXP	-	-	6:35	-	-	6:43	6:53	-	-	7:18	7:27
	-	-	7:01	7:10	7:16	7:18	7:33	7:45	7:54	8:11	8:24
	-	8:00	8:10	8:19	8:25	8:27	8:42	8:54	9:03	-	9:23
	-	-	-	-	-	-	-	-	-	-	-
	-	9:00	9:10	9:19	9:25	9:27	9:42	9:54	10:03	-	10:23
	-	10:00	10:10	10:19	10:25	10:27	10:42	10:54	11:03	-	11:23
	-	11:00	11:10	11:19	11:25	11:27	11:42	11:54	12:03	-	12:23
	11:56	-	**12:10**	**12:19**	**12:25**	**12:27**	**12:42**	**12:54**	**1:03**	-	**1:23**
	-	**12:00**	**12:10**	-	-	-	-	-	-	-	-
	-	**1:00**	**1:10**	**1:19**	**1:25**	**1:27**	**1:42**	**1:54**	**2:03**	-	**2:23**
	-	**2:00**	**2:10**	**2:19**	**2:25**	**2:27**	**2:42**	**2:54**	**3:03**	-	**3:23**
	-	-	**2:57**	**3:06**	**3:12**	**3:14**	**3:29**	**3:41**	**3:50**		**4:10**
	-	-	-	-	-	-	-	-	-	-	-
	-	**3:00**	**3:10**	**3:19**	**3:25**	**3:27**	**3:42**	**3:54**	**4:03**	-	**4:23**
	-	**4:00**	**4:10**	**4:19**	**4:25**	**4:27**	**4:42**	**4:54**	**5:03**	-	**5:23**
	-	**5:00**	**5:10**	**5:19**	**5:25**	**5:27**	**5:42**	**5:54**	**6:03**	-	**6:23**
	-	**6:00**	**6:10**	**6:19**	**6:25**	**6:27**	**6:42**	**6:54**	**7:03**	-	**7:23**
	6:28		**6:42**	**Southbound shuttle from San Miguel to Paso Transit Center***							
	-	**7:00**	**7:10**	**7:19**	**7:25**	**7:27**	**7:42**	**7:54**	**8:03**	-	**8:23**
SATURDAY *sabado*	6:56	-	7:10	7:19	7:25	7:27	7:42	7:54	8:03	-	8:23
	-	-	10:10	10:19	10:25	10:27	10:42	10:54	11:03	-	11:23
	11:56	-	**12:10**	**12:19**	**12:25**	**12:27**	**12:42**	**12:54**	**1:03**	-	**1:23**
	-	-	**3:10**	**3:19**	**3:25**	**3:27**	**3:42**	**3:54**	**4:03**	-	**4:23**
	5:56	-	**6:10**	**6:19**	**6:25**	**6:27**	**6:42**	**6:54**	**7:03**	-	**7:23**
SUNDAY *domingo*	7:56	-	8:10	8:19	8:25	8:27	8:42	8:54	9:03	-	9:23
	11:56	-	**12:10**	**12:19**	**12:25**	**12:27**	**12:42**	**12:54**	**1:03**	-	**1:23**
	3:56	-	**4:10**	**4:19**	**4:25**	**4:27**	**4:42**	**4:54**	**5:03**	-	**5:23**

NORTHBOUND *Hacia al norte* San Luis Obispo to Paso Robles

	SAN LUIS OBISPO			SANTA MARGARITA	ATASCADERO		TEMPLETON		PASO ROBLES			SAN MIGUEL
	Cal Poly Library	Government Center (Osos at Palm)	Cal Poly Library	ECR at Encina	Viejo Camino at Bocina	Atascadero Transit Center	Twin Cities Hospital	Las Tablas Park & Ride	Theatre @ Target	Pine at 8th	Cuesta College North	Mission at 14th
	-	-	-	-	-	-	-	-	-	-		
	-	6:33	-	6:47	6:55	7:08	7:23	7:26	7:31	7:40	7:53	-
	-	7:33	-	7:47	7:55	8:08	8:23	8:26	8:31	8:40	8:53	-
	-	8:33	-	8:47	8:55	9:08	9:23	9:26	9:31	9:40	9:53	-
	-	9:33	-	9:47	9:55	10:08	10:23	10:26	10:31	10:40	10:53	-
	-	-	-	-	-	-	-	-	-	11:40	-	11:54
	-	10:33	-	10:47	10:55	11:08	11:23	11:26	11:31	11:40	11:53	-
	-	11:33	-	11:47	11:55	**12:08**	**12:23**	**12:26**	**12:31**	**12:40**	**12:53**	-
	-	**12:33**	-	**12:47**	**12:55**	**1:08**	**1:23**	**1:26**	**1:31**	**1:40**	**1:53**	-
	-	**1:33**	-	**1:47**	**1:55**	**2:08**	**2:23**	**2:26**	**2:31**	**2:40**	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	2:21	**2:33**	-	**2:47**	**2:55**	**3:08**	**3:23**	**3:26**	**3:31**	**3:40**	**3:53**	-
	3:21	**3:33**	-	**3:47**	**3:55**	**4:08**	**4:23**	**4:26**	**4:31**	**4:40**	**4:53**	-
	-	-	-	-	-	-	-	-	-	-	-	-
	4:21	**4:33**	-	**4:47**	**4:55**	**5:08**	**5:23**	**5:26**	**5:31**	**5:40**	**5:53**	-
	Northbound shuttle from Paso Transit Center to San Miguel*									**6:12**		**6:26**
	5:21	**5:33**	-	**5:47**	**5:55**	**6:08**	**6:23**	**6:26**	**6:31**	**6:40**	**6:53**	-
	6:21	**6:33**	-	**6:47**	**6:55**	**7:08**	**7:23**	**7:26**	**7:31**	**7:40**	-	-
	-	**7:33**	-	**7:47**	**7:55**	**8:08**	**8:23**	**8:26**	**8:31**	**8:40**	-	-
	-	**8:33**	**8:40**	**8:56**	**9:04**	**9:15**	**9:30**	**9:33**	**9:38**	**9:47**	-	-
	-	8:33	-	8:47	8:55	9:08	9:23	9:26	9:31	9:40	-	-
	-	11:33	-	11:47	**11:55**	**12:08**	**12:23**	**12:26**	**12:31**	**12:40**	-	**12:54**
	-	**1:33**	-	**1:47**	**1:55**	**2:08**	**2:23**	**2:26**	**2:31**	**2:40**	-	-
	-	**4:33**	-	**4:47**	**4:55**	**5:08**	**5:23**	**5:26**	**5:31**	**5:40**	-	**5:54**
	-	**7:33**	**7:41**	**7:57**	**8:07**	**8:17**	**8:31**	**8:35**	**8:40**	**8:49**	-	**9:03**
	-	9:33	-	9:47	9:55	10:08	10:23	10:26	10:31	10:40	-	10:54
	-	**1:33**	-	**1:47**	**1:55**	**2:08**	**2:23**	**2:26**	**2:31**	**2:40**	-	**2:54**
	-	**5:33**	**5:41**	**5:57**	**6:07**	**6:17**	**6:31**	**6:35**	**6:40**	**6:49**	-	**7:03**

BOLD = PM

*** Please call 805-541-2228 an hour before or ASAP to ride the San Miguel Shuttle**

Holidays / *Dias festivos*
No Service / *No Servicio:*
Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day and New Year's Day

At the time of this printing, fares are 50¢ Regular and 25¢ Discounted. Fare rates are subject to change and fares will revert back to the listed cash pass prices at any time.

CASH FARES

CASH FARES *TARIFAS*	San Luis Obispo	Santa Margarita Atascadero	Templeton	Paso Robles	San Miguel
San Luis Obispo	$1.75	$2.25	$2.75	$3.25	$3.25
Santa Margarita Atascadero	$2.25	$1.75	$1.75	$2.25	$2.75
Templeton	$2.75	$1.75	$1.75	$1.75	$2.25
Paso Robles	$3.25	$2.25	$1.75	$1.75	$2.25
San Miguel	$3.25	$2.75	$2.25	$2.25	$1.75

Regional Day Pass: $5.50

SAVE MONEY, BUY A PASS
Ahorre dinero, compra un pase

Regional Day Pass	$5.50
RTA 31-Day Pass	$47 Regular/$23.50 Discount
Regional 31-Day Pass	$68 Regular/$34 Discount
Stored Value Card	$15 Value
7-Day Pass	$16.00

See the Ride Guide for detailed pass & fare information.
Vea el guia de pasajero para detalles sobre pases y informacion sobre tarifas.

Discount Fares: half the regular cash fares for Seniors (65-79), Disabled and Medicare Card Holders, Students (K-12, RTA Only)
Precios descuentos: Mayores (65-79), Estudiantes (K-12), Discapacitados y personas con tarjeta de Medicare.

Children 44" and under ride free with paying adult
Niños debajo de 44 pulgadas viajan gratis al ser acompañados por un pasajero pagando la tarifa regular.

Please carry exact fare. No change is given.
Favor de traer la tarifa exacta.

More info / Más información
slorta.org
(805) 541-2228

All RTA Route 9 Stops

Southbound *Hacia al Sur*

Mission at 14th Limited Service
Cuesta College North Limited Service
Riverside at 14th
North County Transportation Center -(Pine at 8th, Amtrak Station)
Spring at 4th
1st at Oak
Theatre at Alexa (Chili's)
Target Shopping Center
Theatre at Rancho Paso
Twin Cities Hospital
TempletonPark and Ride
ECR (El Camino Real) at Atalaya
ECR at Del Rio (Mission Oaks Plaza)
ECR at San Benito
ECR at Maya (Kennedy Club)
ECR at San Anselmo (Kmart)
ECR at Rosario
ECR at Entrada
Atascadero Transit Center
ECR at Hwy 41 (Carwash)
ECR at Pueblo
ECR at Junipero (Smart and Final)
ECR at Plata (D K's Donuts)
ECR at Santa Rosa
ECR at El Bordo (Post Office)
ECR at Maple
ECR at Patria Circle
Viejo Camino at Bocina (Bordeaux Apts)
Viejo Camino at Santa Barbara
ECR at Santa Clara
ECR at Carmel
ECR at Santa Margarita
ECR at Pine (Garden Farms)
ECR at Encina
ECR (El Camino Real) at Maria
Monterey at Grand
Grand at Abbott Limited Service
Grand at McCollum Limited Service
Cal Poly PAC, Limited Service
Cal Poly Library, Limited Service
Santa Rosa at Foothill, Limited Service
Government Center (Osos and Palm)

Northbound *Hacia al Norte*

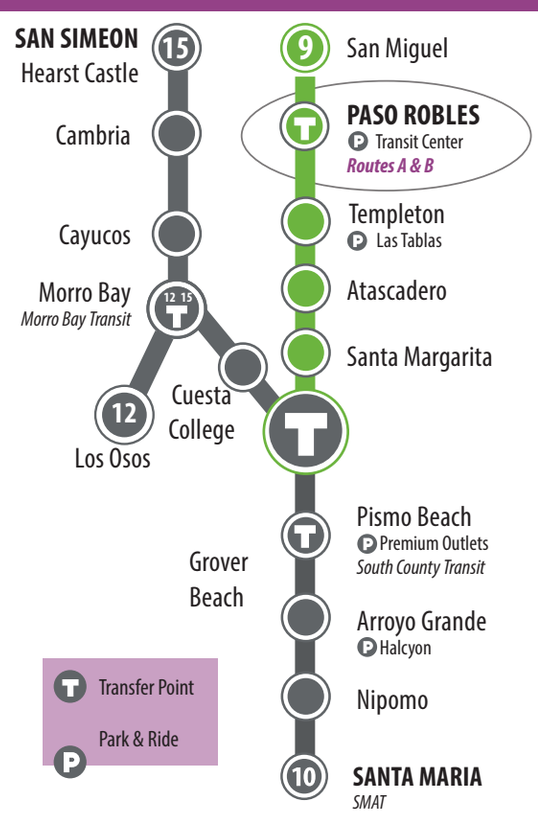
Cal Poly Library Limited Service
Government Center (Osos and Palm)
Santa Rosa at Murray Limited Service
Santa Rosa at Foothill (The SLO Housing) Limited Service
Cal Poly Library Limited Service
Cal Poly PAC Limited Service
Grand at McCollum Limited Service
Grand at Wilson Limited Service
Monterey at Peach Tree Inn Express Runs Only
ECR (El Camino Real) at Maria
ECR at Encina
ECR at Pine (Garden Farms)
ECR at Santa Margarita
ECR at Carmel
ECR at Santa Clara
Viejo Camino at Santa Barbara
Viejo Camino at Bocina (Bordeaux Apts)
ECR at Buena Fortuna (Hidden Oaks Village)
ECR at Musselman
ECR at El Bordo (Post Office)
ECR at Principal
ECR at Solano
ECR at Palomar
ECR at Pueblo
ECR at Highway 41 (Vons)
Atascadero Transit Center
ECR at Traffic Way
ECR at Rosario (Police Station)
ECR at San Jacinto
ECR at San Anselmo (Kmart)
ECR at Maya (Kennedy Club)
ECR at San Benito
ECR at Del Rio (Mission Oaks Plaza)
ECR at Atalaya
ECR (El Camino Real) at Santa Cruz
Twin Cities Hospital
Templeton Park and Ride
Theatre at Gahan (Chili's)
South Vine at 1st (Gateway Center)
Spring at 3rd
Spring at 5th
North County Transportation Center (Pine at 8th, Amtrak Station)
Cuesta College North Limited Service
Mission at 14th Limited Service

Time stops in Bold

2021 ADJUSTED SCHEDULE*

North County

Paso Robles Routes A B



Effective/*Comenzando* June 2021

***Schedule change during COVID-19 response. Reduced Express Trips**

Information/*Información*:
(805) 541-2228 or slorta.org

DIAL-A-RIDE SERVICES

Dial-A-Ride provides curb-to-curb service to the General Public within Paso Robles and Templeton city limits. All vehicles are lift-equipped for mobility impaired passengers. Requests may be made up to a week in advance.
Same-day service is available on a first-come, first-served basis. Advance scheduling is recomended.
When scheduling a ride, give the dispatcher your address, destination, pick-up times and whether you need special accommodations. If you need to cancel a scheduled ride, please call the dispatch office as soon as possible.

SERVICIOS DIAL-A-RIDE

El servicio Dial-A-Ride proporciona servicios de banqueta al público dentro de los límites de la ciudad. Todos los vehículos están equipados para asistir a pasajeros con límites de movilidad. Reservaciones pueden ser hechas empezando una semana antes de la fecha querida.
Servicio de mismo día está disponible en orden de primero llegado, primero servido.
Reservaciones so recomendadas. Cuando reservando un paseo, tiene que dar su domicilio, destinación, tiempo de recojo, y si necesitara acomodaciones especiales al despachador. Si es necesario cancelar su paseo, por favor llame a la oficina de despacho lo más pronoto posible.

PASO ROBLES DIAL-A-RIDE: 239-8747

Hours of Operation: Mon - Fri 7 am to 1 pm

General Public Fare	$5.00
Discounted Fare:	$2.50
Senior (65+) and Disabled with eligibility pass, Medicare card holders	

TEMPLETON DIAL-A-RIDE: 541-2544

Hours of Operation: Tuesday & Thursday 8 am to 5 pm

General Public Fare, Zone #1	$2.50

SHANDON/PASO DIAL-A-RIDE: 541-2544

Hours of Operation: Mon - Weds -Fri, 8:00 am to 5:00 pm

General Public Fare	$5.00

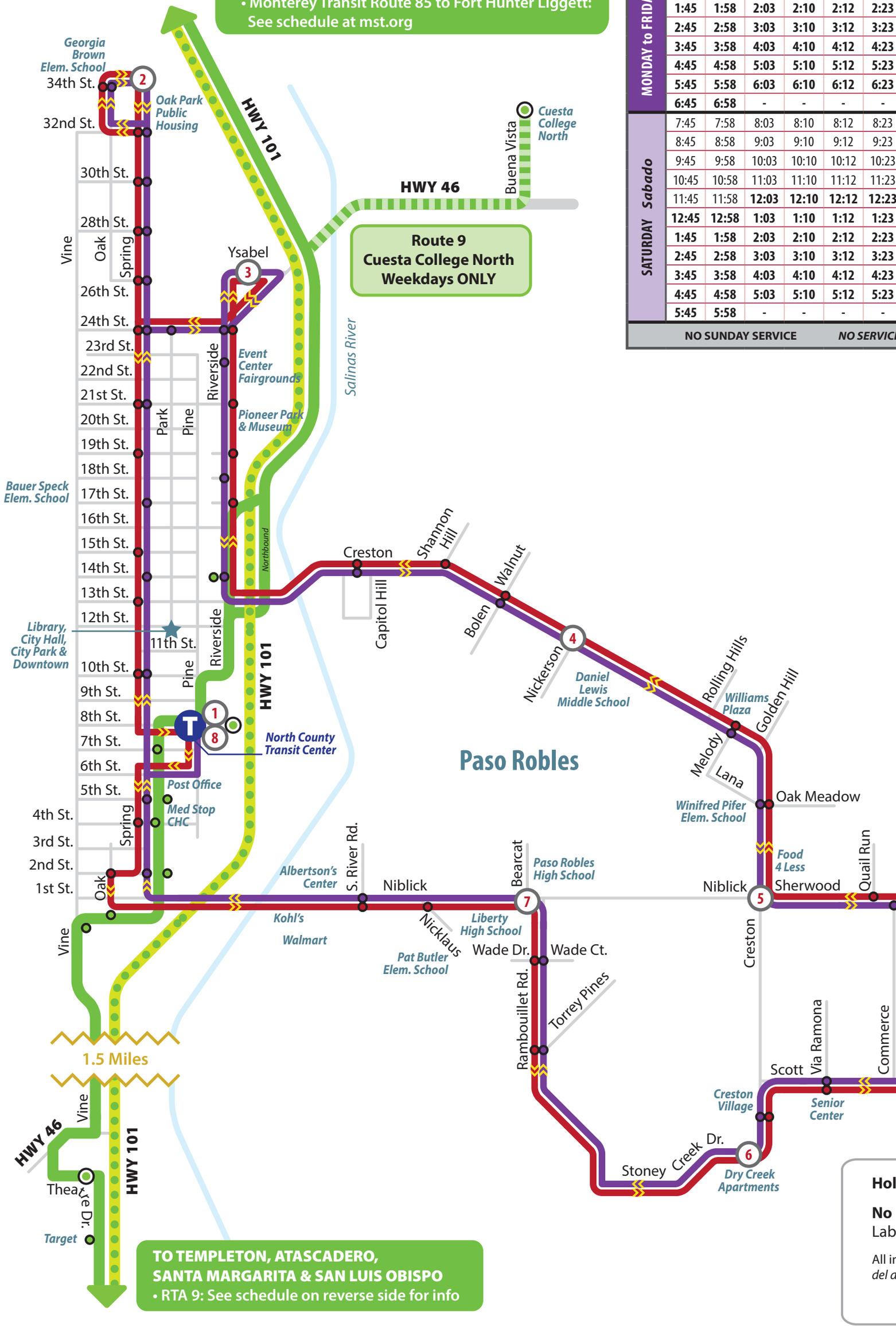
For personalized trip planning assistance call 511 or www.rideshare.org

rta REGIONAL TRANSIT AUTHORITY

Paso Robles Routes A & B

Effective June 2021

TO SAN MIGUEL & FORT HUNTER LIGGETT
- RTA 9 to San Miguel: See schedule on reverse side for info(LIMITED SERVICE)
- Monterey Transit Route 85 to Fort Hunter Liggett: See schedule at mst.org



Bold = PM

Routes A & B Timed Stops

Bold = PM

A — Route A Clockwise Timed Stops

MONDAY to FRIDAY *Lunes a Viernes*	1 Pine at 8th	2 Spring at 34th	3 Ysabel	4 Creston at Nickerson	5 Creston at Sherwood	6 Stoney Creek at Creston	7 Niblick at Bearcat	8 Pine at 8th
	6:45	6:58	7:03	7:10	7:12	7:23	7:28	7:35
	7:45	7:58	8:03	8:10	8:12	8:23	8:28	8:35
	8:45	8:58	9:03	9:10	9:12	9:23	9:28	9:35
	9:45	9:58	10:03	10:10	10:12	10:23	10:28	10:35
	10:45	10:58	11:03	11:10	11:12	11:23	11:28	11:35
	11:45	11:58	**12:03**	**12:10**	**12:12**	**12:23**	**12:28**	**12:35**
	12:45	**12:58**	**1:03**	**1:10**	**1:12**	**1:23**	**1:28**	**1:35**
	1:45	**1:58**	**2:03**	**2:10**	**2:12**	**2:23**	**2:28**	**2:35**
	2:45	**2:58**	**3:03**	**3:10**	**3:12**	**3:23**	**3:28**	**3:35**
	3:45	**3:58**	**4:03**	**4:10**	**4:12**	**4:23**	**4:28**	**4:35**
	4:45	**4:58**	**5:03**	**5:10**	**5:12**	**5:23**	**5:28**	**5:35**
	5:45	**5:58**	**6:03**	**6:10**	**6:12**	**6:23**	**6:28**	**6:35**
	6:45	**6:58**	-	-	-	-	-	-
SATURDAY *Sabado*	7:45	7:58	8:03	8:10	8:12	8:23	8:28	8:35
	8:45	8:58	9:03	9:10	9:12	9:23	9:28	9:35
	9:45	9:58	10:03	10:10	10:12	10:23	10:28	10:35
	10:45	10:58	11:03	11:10	11:12	11:23	11:28	11:35
	11:45	11:58	**12:03**	**12:10**	**12:12**	**12:23**	**12:28**	**12:35**
	12:45	**12:58**	**1:03**	**1:10**	**1:12**	**1:23**	**1:28**	**1:35**
	1:45	**1:58**	**2:03**	**2:10**	**2:12**	**2:23**	**2:28**	**2:35**
	2:45	**2:58**	**3:03**	**3:10**	**3:12**	**3:23**	**3:28**	**3:35**
	3:45	**3:58**	**4:03**	**4:10**	**4:12**	**4:23**	**4:28**	**4:35**
	4:45	**4:58**	**5:03**	**5:10**	**5:12**	**5:23**	**5:28**	**5:35**
	5:45	**5:58**	-	-	-	-	-	-

NO SUNDAY SERVICE — *NO SERVICIO DOMINGO*

B — Route B Counterclockwise Timed Stops

MONDAY to FRIDAY *Lunes a Viernes*	8 Pine at 8th	7 Niblick at Bearcat	6 Stoney Creek at Creston	5 Creston at Sherwood	4 Creston at Nickerson	3 Ysabel	2 Spring at 34th	1 Pine at 8th
	-	-	-	-	-	-	6:48	6:58
	7:15	7:23	7:27	7:37	7:40	7:47	7:55	8:05
	8:15	8:23	8:27	8:37	8:40	8:47	8:55	9:05
	9:15	9:23	9:27	9:37	9:40	9:47	9:55	10:05
	10:15	10:23	10:27	10:37	10:40	10:47	10:55	11:05
	11:15	11:23	11:27	11:37	11:40	11:47	11:55	**12:05**
	12:15	**12:23**	**12:27**	**12:37**	**12:40**	**12:47**	**12:55**	**1:05**
	1:15	**1:23**	**1:27**	**1:37**	**1:40**	**1:47**	**1:55**	**2:05**
	2:15	**2:23**	**2:27**	**2:37**	**2:40**	**2:47**	**2:55**	**3:05**
	3:15	**3:23**	**3:27**	**3:37**	**3:40**	**3:47**	**3:55**	**4:05**	
	4:15	**4:23**	**4:27**	**4:37**	**4:40**	**4:47**	**4:55**	**5:05**
	5:15	**5:23**	**5:27**	**5:37**	**5:40**	**5:47**	**5:55**	**6:05**
	6:15	**6:23**	**6:27**	**6:37**	**6:40**	**6:47**	**6:55**	**7:05**
SATURDAY *Sabado*	-	-	-	-	-	-	7:55	8:05
	8:15	8:23	8:27	8:37	8:40	8:47	8:55	9:05
	9:15	9:23	9:27	9:37	9:40	9:47	9:55	10:05
	10:15	10:23	10:27	10:37	10:40	10:47	10:55	11:05
	11:15	11:23	11:27	11:37	11:40	11:47	11:55	**12:05**
	12:15	**12:23**	**12:27**	**12:37**	**12:40**	**12:47**	**12:55**	**1:05**
	1:15	**1:23**	**1:27**	**1:37**	**1:40**	**1:47**	**1:55**	**2:05**
	2:15	**2:23**	**2:27**	**2:37**	**2:40**	**2:47**	**2:55**	**3:05**
	3:15	**3:23**	**3:27**	**3:37**	**3:40**	**3:47**	**3:55**	**4:05**
	4:15	**4:23**	**4:27**	**4:37**	**4:40**	**4:47**	**4:55**	**5:05**
	5:15	**5:23**	**5:27**	**5:37**	**5:40**	**5:47**	**5:55**	**6:05**

NO SUNDAY SERVICE — *NO SERVICIO DOMINGO*

Legend

RTA Paso Robles Routes A & B

- **Route A Bus Stop Clockwise**
  single direction
  Parada de Ruta A: Misma dirección de reloj
- **Route B Bus Stop Counterclockwise**
  single direction
  Parada de Ruta B: Sentido contrario de reloj
- **Timed Stop**
  Parada de tiempo
- **Direction of Service**
  Dirección de servicio

RTA 9 Route 9

- **Regional Route**
  Ruta regional
- **Weekdays Only**
  Select Trips
  Solo entre semana, viajes seleccionados
- **Express**
  Express
- **Bus Stop**
  single direction
  Parada de autobus/ una dirección
- **Bus Stop**
  bus stops both directions
  Northbound & Southbound
  Parada de autobus/ ambas direcciones Hacia el norte y sur
- **Transfer Hub**
  Centro de transferencias

MAP NOT TO SCALE

Holidays / Dias Festivos

No Service / No Servicio: Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day, and New Year's Day

All information is subject to change at any time. / *Informaciones, incluyen las paradas del autobus, horarios, tarifas y tipos de pases, están sujetos a cambio.*

All Trolley Stops

NORTHBOUND to Avila Beach

- Pismo Premium Outlets
- Avila Beach Drive @ Ontario, at the Avila Hot Springs Resort parking lot
- Bob Jones Bike Trailhead @ Ontario Road
- Avila Beach Drive @ 1st - at the stoplight
- San Luis Bay Inn @ Avila Beach Drive
- Port San Luis - near Fat Cats restaurant

SOUTHBOUND to Pismo Beach

- Avila Beach Drive @ 1st Street
- Cave Landing Road
- Bob Jones Bike Trailhead on Ontario Road
- Avila Beach Drive @ Ontario Road
- Pismo Premium Outlets

Connect to South County Transit Routes 21 & 24 and RTA Route 10 at the Pismo Premium Outlets

rta
REGIONAL TRANSIT AUTHORITY

Please Note:

Due to heavy road traffic during holidays, events, and high visitor season, the trolley often runs behind schedule.

You can locate the trolley using the Transit Tracker system. Just text your trolley stop number found on the Transit Tracker sign at every stop to: 805-541-4782 and an arrival-time estimate will be sent to your phone.

ride the beach trolley FREE

Trolley Tips:

No smoking, eating or drinking onboard. Only pets in carriers or service animals are allowed. Please remain seated while vehicle is in motion. No loud music. No standing or sitting in front of the white line. Disturbing other passengers is cause for removal.

Donations are cheerfully accepted and help support ongoing trolley operations. The Avila to Pismo Beach Trolley remains FREE thanks to generous support of the Avila Beach Community Foundation, donations and our trolley advertisers.

AVILA-PISMO TROLLEY

2022 SCHEDULE

FREE!

May - August

SUMMER 2022
May 6 - September 4

Friday 4 PM - 9 PM
Saturday 10 AM - 9 PM
Sunday 10 AM - 6 PM

Take the trolley to the Avila Beach Friday Farmers Market! Skip the weekend parking crowds and be dropped off and picked up at key Avila locations.

Call 541-2228 or visit www.slorta.org

Pismo Beach to Avila Beach Schedule

Pismo Beach	Northbound			Avila Port	Southbound		Pismo Beach
	Avila Beach				Avila Beach		
Pismo Beach Outlets *Connect with RTA 10 and SCT*	Avila Beach Dr. @ Ontario *Avila Hot Springs Resort*	Bob Jones Bike Trailhead @ Ontario *Entrance of Parking Lot*	Avila Beach Dr. *@ 1st Street Near golf course*	Port San Luis *Near Fat Cats*	Avila Beach Dr. *@ 1st Street*	Avila Beach Dr. @ Ontario *Avila Hot Springs Resort*	Pismo Beach Premium Outlets *Connect with RTA 10 and SCT*
10:00a	10:11	10:13	10:21	10:26	10:31	10:41	10:50
11:00a	11:11	11:13	11:21	11:26	11:31	11:41	11:50
12:00p	12:11	12:13	12:21	12:26	12:31	12:41	12:50
1:00p	1:11	1:13	1:21	1:26	1:31	1:41	1:50
- Trolley Break -							
3:00p	3:11	3:13	3:21	3:26	3:31	3:41	3:50
4:00p	4:11	4:13	4:21	4:26	4:31	4:41	4:50
5:00p	5:11	5:13	5:21	5:26	5:31	5:41	5:50
6:00p	6:11	6:13	6:21	6:26	6:31	6:41	6:50
7:00p Fri-Sat	7:11	7:13	7:21	7:26	7:31	7:41	7:50
8:00p Fri-Sat	8:11	8:13	8:21	8:26	8:31	8:41	8:50

Please Note: Due to heavy traffic during holidays, events, and high visitor season, the trolley often runs behind schedule.

You can locate the trolley using the **Transit Tracker** *system. Just text your trolley stop number found on the Transit Tracker sign at every stop to: 805-541-4782 and an estimated arrival time will be sent to your phone.*

SAN LUIS OBISPO REGIONAL TRANSIT AUTHORITY
NOVEMBER 2, 2022
STAFF REPORT

AGENDA ITEM: **A-6**

TOPIC: **Transit Asset Management Plan Update**

PRESENTED BY: **Geoff Straw, Executive Director**
Melissa C. Mudgett, Grants and Finance Manager

STAFF RECOMMENDATION: **Receive and File FY22 TAM Plan Update**

BACKGROUND/DISCUSSION:
In accordance with Federal Transit Administration (FTA) regulations, every transit agency must develop and periodically update a Transit Asset Management (TAM) plan if it owns, operates, or manages capital assets used to provide public transportation and receives federal financial assistance under 49 U.S.C. Chapter 53 as a recipient or subrecipient. The RTA falls under the FTA's Tier II designation, and is a group sponsor for our subrecipient of Federal funds (the City of Atascadero). As a Tier II agency, the RTA must meet the following four elements:

1. An inventory of assets – A register of capital assets and information about those assets.

2. A condition assessment of inventoried assets – A rating of the assets' physical state; to be completed for assets an agency has direct capital responsibility for; should be at a level of detail sufficient to monitor and predict performance of inventoried assets.

3. Description of a decision support tool – An analytic process or tool that (1) assists in capital asset investment prioritization and/or (2) estimates capital needs over time *does not necessarily mean software.*

4. A prioritized list of investments – A prioritized list of projects or programs to manage or improve the State of Good Repair (SGR) of capital assets.

Transit Asset Management Plan
The RTA's Strategic Business Plan set our goal for all revenue vehicles to be no more than **40%** beyond the FTA-defined useful life standard in terms of years or miles. Non-Revenue support vehicles replacement goals is set at **25%** as these vehicles typically incur fewer annual miles and therefore their useful life can be extended until funding is made available. The truck and equipment goal is set at **20%** and is based on current age and when the replacement is tentatively scheduled to take place.

In January 2022 construction was completed on the new Bus Maintenance Facility located at 253 Elks Lane in San Luis Obispo. This facility supports maintenance, operations and the administrative functions for the RTA and is a new facility addition to the FY2022 TAM Plan. In accordance with federal requirements, a facility condition assessment of the Bus Maintenance Facility shall be reported to the National Transit Database (NTD) every four (4) years.

In FY22, the RTA remains on target to meet or exceed the vehicle replacement and facility condition performance measures as set forth in the TAM Plan. Performance details are reported annually to the NTD and are summarized in the table below.

Performance Measure	2022 Target (%)	2022 Performance (%)	Variance	Description
Heavy Duty Bus	40%	14%	26%	On Target to replace two (2) heavy-duty diesel-powered buses with zero-emission electric buses in FY23 and five (5) more zero-emission electric buses in FY24.
Cutaway	40%	28%	12%	On Target with two (2) Cutaway replacements for rural Route 15 and three (3) Medium-Duty Minibuses for South County in FY23.
ADA Minivan	40%	36%	4%	On Target with replacements of seven (7) ADA minivans in FY23.
Support Vehicles (Non-Revenue)	25%	58%	-33%	Revenue Vehicles remain top priority for replacement over non-revenue support vehicles. Support Vehicles (non-revenue vehicles) incur less miles and therefore useful life can be extended until funding is made available. On Target to replace one (1) hybrid support vehicle with an all electric support vehicle in FY23.
Trucks and Other Rubber Tire Vehicles & Equipment (Non-Revenue)	20%	0%	20%	On Target with two (2) non-revenue support maintenance truck replacements projected in FY24. On Target for replacement of one (1) non-revenue support equipment forklift in FY28.

Facilities (Bus Maintenance Facility)	40%	0%	40%	Construction was completed in January 2022. The facility condition assessment rates the facility as a "5 - Excellent Condition" with no visible defects, in new condition and under warranty. The RTA's facility condition assessment standard is to repair a facility assets that receive a condition rating of marginal (2) or poor (1) at a rate that will allow for no more than 40% of the facility assets beyond the NTD and FTA-defined condition five-point scale.

Staff recommendation
Receive and file the FY22 TAM Plan.

San Luis Obispo Regional Transit Authority Transit Asset Management Plan

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Last modified by Melissa C. Mudgett on 11 Oct 22 at 15:31

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Introduction

The RTA is a Joint Powers Authority that was formed in 1989 that serves to connect various communities within San Luis Obispo County and nearby cities. Regional fixed-route and paratransit services throughout the region (including paratransit within the City of San Luis Obispo) are managed by the RTA. In addition, the RTA is contracted by the County of San Luis Obispo to operate community-based services in unincorporated areas (primarily in Nipomo, Shandon and Templeton), and by the City of Paso Robles to operate the Paso Express fixed-route services and the Paso Robles Dial-A-Ride service. The RTA also provides administrative oversight of the South County Transit's (SCT) fixed-route services in the Five Cities area. The RTA Board of Directors consists of a representative from all of the cities in which transportation services are provided, as well as all five San Luis Obispo County Supervisors. The Regional Transportation Advisory Committee (RTAC) meets quarterly and provides advice to the RTA Board. Services have been directly operated by the RTA employees since 2009, when the previously contracted services were brought in-house. The RTA's fleet standard is to replace 100% of all revenue vehicles with no more than 40% beyond the FTA-defined useful life standard in terms of years or miles. This is a Tier II Group Plan that also includes the City of Atacadero as a subrecipient to the RTA. The City of Atascadero provides only Dial-A-Ride services to their community.

Performance Targets & Measures

Asset Category - Performance Measure	Asset Class	2023 Target	2024 Target	2025 Target	2026 Target	2027 Target
REVENUE VEHICLES						
Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	**AB - Articulated Bus**	N/A				
	AO - Automobile	N/A				
	BR - Over-the-road Bus	N/A				
	BU - Bus	40%	40%	40%	40%	40%
	CU - Cutaway Bus	40%	40%	40%	40%	40%
	DB - Double Decked Bus	N/A				
	FB - Ferryboat	N/A				
	MB - Mini-bus	N/A				
	MV - Mini-van	40%	40%	40%	40%	40%
	RT - Rubber-tire Vintage Trolley	40%	40%	40%	40%	40%
	SB - School Bus	N/A				
	SV - Sport Utility Vehicle	N/A				
	TB - Trolleybus	N/A				
	VN - Van	N/A				
	Custom 1	N/A				
	Custom 2	N/A				
	Custom 3	N/A				
EQUIPMENT						
Age - % of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	**Non Revenue/Service Automobile**	25%	25%	30%	40%	40%
	Steel Wheel Vehicles	N/A				
	Trucks and other Rubber Tire Vehicles	25%	25%	30%	40%	40%
	Forklift	20%	20%	25%	30%	30%
	Custom 2	N/A				
	Custom 3	N/A				
FACILITIES						
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	**Administration**	N/A				
	Maintenance	N/A				
	Parking Structures	N/A				
	Passenger Facilities	N/A				
	Custom 1	N/A				
	Custom 2	N/A				
	Custom 3	N/A				

Target Setting Methodology

Based on the RTA's Strategic Business Plan, the goal for all revenue vehicles is to not exceed more than 40% beyond the FTA-defined useful life standard in terms of years or miles. The equipment goal is set based on the current age and when the replacement is tentatively scheduled to take place.

Capital Asset Inventory

Please see Appendix A (Asset Register) for the asset inventory listing.

Asset Inventory Summary

Asset Category	Total Number	Avg Age	Avg Mileage	Avg Value
RevenueVehicles	**67**	**6.0**	**221,420**	**$535,373.13**
AB - Articulated Bus	0	-	-	-
AO - Automobile	0	-	-	-
BR - Over-the-road Bus	0	-	-	-
BU - Bus	33	7.8	344,948	$950,606.06
CU - Cutaway Bus	18	4.3	128,794	$150,000.00
DB - Double Decked Bus	0	-	-	-
FB - Ferryboat	0	-	-	-
MB - Mini-bus	0	-	-	-
MV - Mini-van	14	3.6	43,543	$80,000.00
RT - Rubber-tire Vintage Trolley	2	8.5	76,738	$340,000.00
SB - School Bus	0	-	-	-
SV - Sport Utility Vehicle	0	-	-	-
TB - Trolleybus	0	-	-	-
VN - Van	0	-	-	-
Custom 1	0	-	-	-
Custom 2	0	-	-	-
Custom 3	0	-	-	-
Equipment	**17**	**6.9**	**91,329**	**$58,823.53**
Non Revenue/Service Automobile	12	7.1	108,271	$52,500.00
Steel Wheel Vehicles	0	-	-	-
Trucks and other Rubber Tire Vehicles	4	5.8	63,283	$80,000.00
Forklift	1	9.0	203	$50,000.00
Custom 2	0	-	-	-
Custom 3	0	-	-	-
Facilities	**0**	**-**	**N/A**	**-**
Administration	0	-	N/A	-
Maintenance	0	-	N/A	-
Parking Structures	0	-	N/A	-
Passenger Facilities	0	-	N/A	-
Custom 1	0	-	N/A	-
Custom 2	0	-	N/A	-
Custom 3	0	-	N/A	-

Condition Assessment

Please see Appendix B (Asset Condition Data) for individual asset condition listing.

Asset Condition Summary

Asset Category	Total Number	Avg Age	Avg Mileage	Avg TERM Condition	Avg Value	% At or Past ULB
RevenueVehicles	**67**	**6.0**	**208,201**	**N/A**	**$535,373.13**	**24%**
AB - Articulated Bus	0	-	-	N/A	-	-
AO - Automobile	0	-	-	N/A	-	-
BR - Over-the-road Bus	0	-	-	N/A	-	-
BU - Bus	33	7.8	344,948	N/A	$950,606.06	15%
CU - Cutaway Bus	18	4.3	100,173	N/A	$150,000.00	28%
DB - Double Decked Bus	0	-	-	N/A	-	-
FB - Ferryboat	0	-	-	N/A	-	-
MB - Mini-bus	0	-	-	N/A	-	-
MV - Mini-van	14	3.6	43,543	N/A	$80,000.00	36%
RT - Rubber-tire Vintage Trolley	2	8.5	76,738	N/A	$340,000.00	50%
SB - School Bus	0	-	-	N/A	-	-
SV - Sport Utility Vehicle	0	-	-	N/A	-	-
TB - Trolleybus	0	-	-	N/A	-	-
VN - Van	0	-	-	N/A	-	-
Custom 1	0	-	-	N/A	-	-
Custom 2	0	-	-	N/A	-	-
Custom 3	0	-	-	N/A	-	-
Equipment	**17**	**6.9**	**91,329**	**N/A**	**$58,823.53**	**18%**
Non Revenue/Service Automobile	12	7.1	108,271	N/A	$52,500.00	8%
Steel Wheel Vehicles	0	-	-	N/A	-	-
Trucks and other Rubber Tire Vehicles	4	5.8	63,283	N/A	$80,000.00	50%
Forklift	1	9.0	203	N/A	$50,000.00	0%
Custom 2	0	-	-	N/A	-	-
Custom 3	0	-	-	N/A	-	-
Facilities	**0**	**-**	**N/A**	**-**	**-**	**N/A**
Administration	0	-	N/A	-	-	N/A
Maintenance	0	-	N/A	-	-	N/A
Parking Structures	0	-	N/A	-	-	N/A
Passenger Facilities	0	-	N/A	-	-	N/A
Custom 1	0	-	N/A	-	-	N/A
Custom 2	0	-	N/A	-	-	N/A
Custom 3	0	-	N/A	-	-	N/A

Decision Support

Investment Prioritization

The RTA uses the Fleet Replacement Module to identify replacements and to justify the investment priority process.

Decision Support Tools

The following tools are used in making investment decisions:

Process/Tool	Brief Description
Fleet Replacement Module	Fleet replacement module was used to generate the projected replacement of the fleet based on thier useful life and condition of the fleet over the next five years (2022-2027). The RTA Fleet Software system uses asset inventory and condition information to support the fleet replacement schedule.

Investment Prioritization

The list of prioritized investment projects is provided in Appendix C.

Appendices

Appendix A	Asset Register
Appendix B1	Revenue Vehicle (Rolling Stock) Condition Data
Appendix B2	Equipment Condition Data
Appendix B3	Facilities Condition Data
Appendix C	Proposed Investment Project List
Appendix D	Fleet Replacement Module Output

Appendix A: Asset Register

Asset Category	Asset Class	Asset Name	Make	Model	Count	ID/Serial No.	Asset Owner	Acquisition Year	Vehicle Mileage	Replacement Cost/Value
Equipment	Forklift	523	Toyota	forklift	1	67498	SLO RTA	2013	203	$50,000.00
Equipment	Non Revenue/Service Automobile	506	HONDA	CIVIC HYBRID	1	JHMFA3F27AS000891	SLO RTA	2009	97,258	$60,000.00
Equipment	Non Revenue/Service Automobile	516	DODGE	GRAND CARAVAN	1	2C7WDGBG4ER427019	SCT	2014	108,195	$65,000.00
Equipment	Non Revenue/Service Automobile	517	DODGE	GRAND CARAVAN	1	2C7WDGBG0ER432170	SCT	2014	80,307	$65,000.00
Equipment	Non Revenue/Service Automobile	518	FORD	ESCAPE	1	1FMCU0F79FUA82166	SLO RTA	2015	142,032	$45,000.00
Equipment	Non Revenue/Service Automobile	519	FORD	ESCAPE	1	1FMCU07F0FUA82167	SLO RTA	2015	181,703	$45,000.00
Equipment	Non Revenue/Service Automobile	520	FORD	ESCAPE	1	1FMCU0F72FUA82168	SLO RTA	2015	46,700	$45,000.00
Equipment	Non Revenue/Service Automobile	521	FORD	ESCAPE	1	1FMCU0F71HUB03417	SLO RTA	2017	125,587	$45,000.00
Equipment	Non Revenue/Service Automobile	1601	DODGE	BRAUN	1	2C7WDGBG8FR642808	SLO RTA	2016	82,865	$52,000.00
Equipment	Non Revenue/Service Automobile	1602	DODGE	BRAUN	1	2C7WDGBG6FR652138	SLO RTA	2016	99,039	$52,000.00
Equipment	Non Revenue/Service Automobile	1603	DODGE	BRAUN	1	2C7WDGBG6FR652141	SLO RTA	2016	110,599	$52,000.00
Equipment	Non Revenue/Service Automobile	1604	DODGE	BRAUN	1	2C7WDGBG7FR652150	SLO RTA	2016	108,431	$52,000.00
Equipment	Non Revenue/Service Automobile	1607	DODGE	BRAUN	1	2C7WDGBG8FR642792	SLO RTA	2016	116,535	$52,000.00
Equipment	Trucks and other Rubber Tire Vehicles	511	FORD	F-250	1	1FT7X2A60EEB27771	SLO RTA	2014	94,488	$80,000.00
Equipment	Trucks and other Rubber Tire Vehicles	512	FORD	F-250	1	1FD7X2A62EEB27850	SLO RTA	2014	60,759	$80,000.00
Equipment	Trucks and other Rubber Tire Vehicles	522	FORD	F-250	1	1FD7X2A66GED42246	SLO RTA	2016	81,738	$80,000.00
Equipment	Trucks and other Rubber Tire Vehicles	524	FORD	F-250	1	1FTFX1C50MKD87727	SLO RTA	2021	16,147	$80,000.00
RevenueVehicles	BU - Bus	167	GILLIG	PHANTOM	1	15GCD271181112915	SLO RTA	2008	626,329	$960,000.00
RevenueVehicles	BU - Bus	168	GILLIG	PHANTOM	1	15GCD271381112916	SLO RTA	2008	564,864	$960,000.00
RevenueVehicles	BU - Bus	204	GILLIG	PHANTOM	1	15GCB201731112331	SCT	2003	550,809	$960,000.00
RevenueVehicles	BU - Bus	1011	THOR	EZ RIDER	1	1N9MMACL2AC084310	SCT	2010	324,303	$960,000.00
RevenueVehicles	BU - Bus	1012	THOR	EZ RIDER	1	1N9MMACL4AC084311	SCT	2010	257,152	$960,000.00
RevenueVehicles	BU - Bus	1101	EL DORADO	BRT	1	1N9APACL6AC084207	SLO RTA	2011	254,159	$650,000.00
RevenueVehicles	BU - Bus	1301	GILLIG	LOW FLOOR	1	15GGD2714D1182291	SLO RTA	2013	471,410	$960,000.00
RevenueVehicles	BU - Bus	1302	GILLIG	LOW FLOOR	1	15GGD2716D1182292	SLO RTA	2013	420,968	$960,000.00
RevenueVehicles	BU - Bus	1303	GILLIG	LOW FLOOR	1	15GGD2718D1182293	SLO RTA	2013	500,326	$960,000.00
RevenueVehicles	BU - Bus	1304	GILLIG	LOW FLOOR	1	15GGD271XD1182294	SLO RTA	2013	475,848	$960,000.00
RevenueVehicles	BU - Bus	1305	GILLIG	LOW FLOOR	1	15GGD2711D1182295	SLO RTA	2013	445,246	$960,000.00
RevenueVehicles	BU - Bus	1306	GILLIG	LOW FLOOR	1	15GGD2713D1182296	SLO RTA	2013	481,242	$960,000.00
RevenueVehicles	BU - Bus	1307	GILLIG	LOW FLOOR	1	15GGD2715D1182297	SLO RTA	2013	491	$960,000.00
RevenueVehicles	BU - Bus	1308	GILLIG	LOW FLOOR	1	15GGB271XD1182298	SCT	2013	491,647	$960,000.00
RevenueVehicles	BU - Bus	1309	GILLIG	LOW FLOOR	1	15GGB2711D1182299	SCT	2013	403,567	$960,000.00
RevenueVehicles	BU - Bus	1310	GILLIG	LOW FLOOR	1	15GGB2714D1182300	SCT	2013	405,989	$960,000.00
RevenueVehicles	BU - Bus	1501	GILLIG	LOW FLOOR	1	15GGD2719F1184847	SLO RTA	2015	441,104	$960,000.00
RevenueVehicles	BU - Bus	1502	GILLIG	LOW FLOOR	1	15GGD2710F1184848	SLO RTA	2015	408,591	$960,000.00
RevenueVehicles	BU - Bus	1503	GILLIG	LOW FLOOR	1	15GGD2712F1184849	SLO RTA	2015	395,418	$960,000.00
RevenueVehicles	BU - Bus	1504	GILLIG	LOW FLOOR	1	15GGD2719F1184850	SLO RTA	2015	409,094	$960,000.00
RevenueVehicles	BU - Bus	1505	GILLIG	LOW FLOOR	1	15GGD2710F1184851	SLO RTA	2015	402,720	$960,000.00
RevenueVehicles	BU - Bus	1506	GILLIG	LOW FLOOR	1	15GGD2712F1184852	SLO RTA	2015	400,087	$960,000.00
RevenueVehicles	BU - Bus	1507	GILLIG	LOW FLOOR	1	15GGD2714F1184853	SLO RTA	2015	329,000	$960,000.00
RevenueVehicles	BU - Bus	1508	GILLIG	LOW FLOOR	1	15GGD2716F1184854	SLO RTA	2015	427,266	$960,000.00

Asset Category	Asset Class	Asset Name	Make	Model	Count	ID/Serial No.	Asset Owner	Acquisition Year	Vehicle Mileage	Replacement Cost/Value
RevenueVehicles	BU - Bus	1509	GILLIG	LOW FLOOR	1	15GGB2710F1184855	SCT	2015	316,886	$960,000.00
RevenueVehicles	BU - Bus	1801	GILLIG	LOW FLOOR	1	15GGD2715J3190447	SLO RTA	2018	225,393	$960,000.00
RevenueVehicles	BU - Bus	1802	GILLIG	LOW FLOOR	1	15GGD2717J3190448	SLO RTA	2018	215,551	$960,000.00
RevenueVehicles	BU - Bus	1803	GILLIG	LOW FLOOR	1	15GGD2719J3190449	SLO RTA	2018	201,192	$960,000.00
RevenueVehicles	BU - Bus	1910	GILLIG	LOW FLOOR	1	15GGD2710K3191300	SLO RTA	2019	182,421	$960,000.00
RevenueVehicles	BU - Bus	1911	GILLIG	LOW FLOOR	1	15GGD2712K3191301	SLO RTA	2019	171,391	$960,000.00
RevenueVehicles	BU - Bus	1912	GILLIG	LOW FLOOR	1	15GGD2714K3191302	SLO RTA	2019	173,297	$960,000.00
RevenueVehicles	BU - Bus	2101	GILLIG	LOW FLOOR	1	15GGD2711M3197061	SLO RTA	2021	784	$960,000.00
RevenueVehicles	BU - Bus	2102	GILLIG	LOW FLOOR	1	15GGD2713M3197062	SLO RTA	2021	8,742	$960,000.00
RevenueVehicles	CU - Cutaway Bus	27	FORD	STARCRAFT E450	1	1FDFE4FSXEDB20055	ATASCADERO	2015		$150,000.00
RevenueVehicles	CU - Cutaway Bus	28	FORD	STARCRAFT E450	1	1FDFE4FS3HDC33737	ATASCADERO	2017		$150,000.00
RevenueVehicles	CU - Cutaway Bus	29	FORD	STARCRAFT E450	1	1FDFE4FS1HDC78904	ATASCADERO	2018		$150,000.00
RevenueVehicles	CU - Cutaway Bus	30	FORD	STARCRAFT E450	1	1FDFE4FS5HDC78906	ATASCADERO	2018		$150,000.00
RevenueVehicles	CU - Cutaway Bus	1510	FORD	STARCRAFT E450	1	1FDFE4FS0GDC08468	SLO RTA	2015	392,353	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1511	FORD	STARCRAFT E450	1	1FDFE4FS4GDC09025	SLO RTA	2015	141,183	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1512	FORD	STARCRAFT E450	1	1FDFE4FS5GDC08448	SLO RTA	2015	390,083	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1608	FORD	STARCRAFT E450	1	1FDFE4FS3GDC45434	SLO RTA	2016	139,502	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1901	FORD	STARCRAFT E450	1	1FDFE4FS5KDC21600	SLO RTA	2019	84,751	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1902	FORD	STARCRAFT E450	1	1FDFE4FS7KDC26300	SLO RTA	2019	83,030	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1903	FORD	STARCRAFT E450	1	1FDFE4FS9KDC26301	SLO RTA	2019	88,145	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1904	FORD	STARCRAFT E450	1	1FDFE4FS9KDC26302	SLO RTA	2019	85,711	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1905	FORD	STARCRAFT E450	1	1FDFE4FS9KDC26303	SLO RTA	2019	72,672	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1906	FORD	STARCRAFT E450	1	1FDFE4FS9KDC26304	SLO RTA	2019	77,223	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1907	FORD	STARCRAFT E450	1	1FDFE4FS9KDC26305	SLO RTA	2019	80,753	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1908	FORD	STARCRAFT E450	1	1FDFE4FS9KDC26306	SLO RTA	2019	76,671	$150,000.00
RevenueVehicles	CU - Cutaway Bus	1909	FORD	STARCRAFT E450	1	1FDFE4FS9KDC26299	SCT	2019	65,321	$150,000.00
RevenueVehicles	CU - Cutaway Bus	2031	FORD	STARCRAFT E450	1	1FDFE4FN6MDC15074	SLO RTA	2019	25,717	$150,000.00
RevenueVehicles	MV - Mini-van	1701	DODGE	BRAUN	1	2C7WDGBG7GR396495	SLO RTA	2017	97,507	$80,000.00
RevenueVehicles	MV - Mini-van	1703	DODGE	BRAUN	1	2C7WDGBG4GR396504	SLO RTA	2017	103,303	$80,000.00
RevenueVehicles	MV - Mini-van	1704	DODGE	BRAUN	1	2C7WDGBG1GR396508	SLO RTA	2017	102,333	$80,000.00
RevenueVehicles	MV - Mini-van	1705	DODGE	BRAUN	1	2C7WDGBG7GR396514	SLO RTA	2017	95,519	$80,000.00
RevenueVehicles	MV - Mini-van	1706	DODGE	BRAUN	1	2C7WDGBG6GR396519	SLO RTA	2017	81,538	$80,000.00
RevenueVehicles	MV - Mini-van	2051	DODGE	BRAUN ENTRAVAN	1	2C7WDGBG0KR798819	SLO RTA	2019	16,590	$80,000.00
RevenueVehicles	MV - Mini-van	2052	DODGE	BRAUN ENTRAVAN	1	2C7WDGBG9KR798818	SLO RTA	2019	15,983	$80,000.00
RevenueVehicles	MV - Mini-van	2053	DODGE	BRAUN ENTRAVAN	1	2C7WDGBG9KR798835	SLO RTA	2019	17,174	$80,000.00
RevenueVehicles	MV - Mini-van	2054	DODGE	BRAUN ENTRAVAN	1	2C7WDGBG9KR801121	SLO RTA	2019	17,972	$80,000.00
RevenueVehicles	MV - Mini-van	2055	DODGE	BRAUN ENTRAVAN	1	2C7WDGBGXKR799394	SLO RTA	2019	14,298	$80,000.00
RevenueVehicles	MV - Mini-van	2056	DODGE	BRAUN ENTRAVAN	1	2C7WDGBGXKR801077	SLO RTA	2019	11,933	$80,000.00
RevenueVehicles	MV - Mini-van	2057	DODGE	BRAUN ENTRAVAN	1	2C7WDGBG1KR808323	SLO RTA	2019	14,236	$80,000.00
RevenueVehicles	MV - Mini-van	2151	DODGE	BRAUN ENTRAVAN	1	2C7WDGBG7KR800808	Paso DAR	2020	12,401	$80,000.00
RevenueVehicles	MV - Mini-van	2152	DODGE	BRAUN ENTRAVAN	1	2C7WDGBG3KR800918	Paso DAR	2020	8,811	$80,000.00
RevenueVehicles	RT - Rubber-tire Vintage Trolley	1013	DOUBLE K	VILLAGER	1	1F66F5DY7B0A04333	SLO RTA	2010	110,123	$340,000.00
RevenueVehicles	RT - Rubber-tire Vintage Trolley	1707	DOUBLE K	VILLAGER	1	1F66F5DY0H0A10659	SLO RTA	2017	43,352	$340,000.00

Appendix B: Asset Condition Data

B1: Revenue Vehicle Assets

Asset Category	Asset Class	Asset Name	Count	ID/Serial No.	Age (Yrs)	Vehicle Mileage	Replacement Cost/Value	Useful Life Benchmark (Yrs)	Past Useful Life Benchmark
RevenueVehicles	BU - Bus	167	1	15GCD271181112915	14	626,329	$960,000.00	12	Yes
RevenueVehicles	BU - Bus	168	1	15GCD271381112916	14	564,864	$960,000.00	12	Yes
RevenueVehicles	BU - Bus	204	1	15GCB201731112331	19	550,809	$960,000.00	12	Yes
RevenueVehicles	BU - Bus	1011	1	1N9MMACL2AC084310	12	324,303	$960,000.00	12	Yes
RevenueVehicles	BU - Bus	1012	1	1N9MMACL4AC084311	12	257,152	$960,000.00	12	Yes
RevenueVehicles	BU - Bus	1101	1	1N9APACL6AC084207	11	254,159	$650,000.00	12	No
RevenueVehicles	BU - Bus	1301	1	15GGD2714D1182291	9	471,410	$960,000.00	12	No
RevenueVehicles	BU - Bus	1302	1	15GGD2716D1182292	9	420,968	$960,000.00	12	No
RevenueVehicles	BU - Bus	1303	1	15GGD2718D1182293	9	500,326	$960,000.00	12	No
RevenueVehicles	BU - Bus	1304	1	15GGD271XD1182294	9	475,848	$960,000.00	12	No
RevenueVehicles	BU - Bus	1305	1	15GGD2711D1182295	9	445,246	$960,000.00	12	No
RevenueVehicles	BU - Bus	1306	1	15GGD2713D1182296	9	481,242	$960,000.00	12	No
RevenueVehicles	BU - Bus	1307	1	15GGD2715D1182297	9	491	$960,000.00	12	No
RevenueVehicles	BU - Bus	1308	1	15GGB271XD1182298	9	491,647	$960,000.00	12	No
RevenueVehicles	BU - Bus	1309	1	15GGB2711D1182299	9	403,567	$960,000.00	12	No
RevenueVehicles	BU - Bus	1310	1	15GGB2714D1182300	9	405,989	$960,000.00	12	No
RevenueVehicles	BU - Bus	1501	1	15GGD2719F1184847	7	441,104	$960,000.00	12	No
RevenueVehicles	BU - Bus	1502	1	15GGD2710F1184848	7	408,591	$960,000.00	12	No
RevenueVehicles	BU - Bus	1503	1	15GGD2712F1184849	7	395,418	$960,000.00	12	No

Asset Category	Asset Class	Asset Name	Count	ID/Serial No.	Age (Yrs)	Vehicle Mileage	Replacement Cost/Value	Useful Life Benchmark (Yrs)	Past Useful Life Benchmark
RevenueVehicles	BU - Bus	1504	1	15GGD2719F1184850	7	409,094	$960,000.00	12	No
RevenueVehicles	BU - Bus	1505	1	15GGD2710F1184851	7	402,720	$960,000.00	12	No
RevenueVehicles	BU - Bus	1506	1	15GGD2712F1184852	7	400,087	$960,000.00	12	No
RevenueVehicles	BU - Bus	1507	1	15GGD2714F1184853	7	329,000	$960,000.00	12	No
RevenueVehicles	BU - Bus	1508	1	15GGD2716F1184854	7	427,266	$960,000.00	12	No
RevenueVehicles	BU - Bus	1509	1	15GGB2710F1184855	7	316,886	$960,000.00	12	No
RevenueVehicles	BU - Bus	1801	1	15GGD2715J3190447	4	225,393	$960,000.00	12	No
RevenueVehicles	BU - Bus	1802	1	15GGD2717J3190448	4	215,551	$960,000.00	12	No
RevenueVehicles	BU - Bus	1803	1	15GGD2719J3190449	4	201,192	$960,000.00	12	No
RevenueVehicles	BU - Bus	1910	1	15GGD2710K3191300	3	182,421	$960,000.00	12	No
RevenueVehicles	BU - Bus	1911	1	15GGD2712K3191301	3	171,391	$960,000.00	12	No
RevenueVehicles	BU - Bus	1912	1	15GGD2714K3191302	3	173,297	$960,000.00	12	No
RevenueVehicles	BU - Bus	2101	1	15GGD2711M3197061	1	784	$960,000.00	12	No
RevenueVehicles	BU - Bus	2102	1	15GGD2713M3197062	1	8,742	$960,000.00	12	No
RevenueVehicles	CU - Cutaway Bus	27	1	1FDFE4FSXEDB20055	7		$150,000.00	5	Yes
RevenueVehicles	CU - Cutaway Bus	28	1	1FDFE4FS3HDC33737	5		$150,000.00	5	Yes
RevenueVehicles	CU - Cutaway Bus	29	1	1FDFE4FS1HDC78904	4		$150,000.00	5	No
RevenueVehicles	CU - Cutaway Bus	30	1	1FDFE4FS5HDC78906	4		$150,000.00	5	No
RevenueVehicles	CU - Cutaway Bus	1510	1	1FDFE4FS0GDC08468	7	392,353	$150,000.00	7	Yes
RevenueVehicles	CU - Cutaway Bus	1511	1	1FDFE4FS4GDC09025	7	141,183	$150,000.00	5	Yes
RevenueVehicles	CU - Cutaway Bus	1512	1	1FDFE4FS5GDC08448	7	390,083	$150,000.00	7	Yes
RevenueVehicles	CU - Cutaway Bus	1608	1	1FDFE4FS3GDC45434	6	139,502	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	1901	1	1FDFE4FS5KDC21600	3	84,751	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	1902	1	1FDFE4FS7KDC26300	3	83,030	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	1903	1	1FDFE4FS9KDC26301	3	88,145	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	1904	1	1FDFE4FS9KDC26302	3	85,711	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	1905	1	1FDFE4FS9KDC26303	3	72,672	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	1906	1	1FDFE4FS9KDC26304	3	77,223	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	1907	1	1FDFE4FS9KDC26305	3	80,753	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	1908	1	1FDFE4FS9KDC26306	3	76,671	$150,000.00	7	No

Asset Category	Asset Class	Asset Name	Count	ID/Serial No.	Age (Yrs)	Vehicle Mileage	Replacement Cost/Value	Useful Life Benchmark (Yrs)	Past Useful Life Benchmark
RevenueVehicles	CU - Cutaway Bus	1909	1	1FDFE4FS9KDC26299	3	65,321	$150,000.00	7	No
RevenueVehicles	CU - Cutaway Bus	2031	1	1FDFE4FN6MDC15074	3	25,717	$150,000.00	7	No
RevenueVehicles	MV - Mini-van	1701	1	2C7WDGBG7GR396495	5	97,507	$80,000.00	5	Yes
RevenueVehicles	MV - Mini-van	1703	1	2C7WDGBG4GR396504	5	103,303	$80,000.00	5	Yes
RevenueVehicles	MV - Mini-van	1704	1	2C7WDGBG1GR396508	5	102,333	$80,000.00	5	Yes
RevenueVehicles	MV - Mini-van	1705	1	2C7WDGBG7GR396514	5	95,519	$80,000.00	5	Yes
RevenueVehicles	MV - Mini-van	1706	1	2C7WDGBG6GR396519	5	81,538	$80,000.00	5	Yes
RevenueVehicles	MV - Mini-van	2051	1	2C7WDGBG0KR798819	3	16,590	$80,000.00	5	No
RevenueVehicles	MV - Mini-van	2052	1	2C7WDGBG9KR798818	3	15,983	$80,000.00	5	No
RevenueVehicles	MV - Mini-van	2053	1	2C7WDGBG9KR798835	3	17,174	$80,000.00	5	No
RevenueVehicles	MV - Mini-van	2054	1	2C7WDGBG9KR801121	3	17,972	$80,000.00	5	No
RevenueVehicles	MV - Mini-van	2055	1	2C7WDGBGXKR799394	3	14,298	$80,000.00	5	No
RevenueVehicles	MV - Mini-van	2056	1	2C7WDGBGXKR801077	3	11,933	$80,000.00	5	No
RevenueVehicles	MV - Mini-van	2057	1	2C7WDGBG1KR808323	3	14,236	$80,000.00	5	No
RevenueVehicles	MV - Mini-van	2151	1	2C7WDGBG7KR800808	2	12,401	$80,000.00	5	No
RevenueVehicles	MV - Mini-van	2152	1	2C7WDGBG3KR800918	2	8,811	$80,000.00	5	No
RevenueVehicles	RT - Rubber-tire Vintage Trolley	1013	1	1F66F5DY7B0A04333	12	110,123	$340,000.00	10	Yes
RevenueVehicles	RT - Rubber-tire Vintage Trolley	1707	1	1F66F5DY0H0A10659	5	43,352	$340,000.00	10	No

Appendix B: Asset Condition Data

B2: Equipment Assets

Asset Category	Asset Class	Asset Name	Count	ID/Serial No.	Age (Yrs)	Vehicle Mileage	Replacement Cost/Value	Useful Life Benchmark (Yrs)	Past Useful Life Benchmark
Equipment	Forklift	523	1	67498	9	203	$50,000.00	15	No
Equipment	Non Revenue/Service Automobile	506	1	JHMFA3F27AS000891	13	97,258	$60,000.00	10	Yes
Equipment	Non Revenue/Service Automobile	516	1	2C7WDGBG4ER427019	8	108,195	$65,000.00	9	No
Equipment	Non Revenue/Service Automobile	517	1	2C7WDGBG0ER432170	8	80,307	$65,000.00	9	No
Equipment	Non Revenue/Service Automobile	518	1	1FMCU0F79FUA82166	7	142,032	$45,000.00	8	No
Equipment	Non Revenue/Service Automobile	519	1	1FMCU07F0FUA82167	7	181,703	$45,000.00	8	No
Equipment	Non Revenue/Service Automobile	520	1	1FMCU0F72FUA82168	7	46,700	$45,000.00	8	No
Equipment	Non Revenue/Service Automobile	521	1	1FMCU0F71HUB03417	5	125,587	$45,000.00	8	No
Equipment	Non Revenue/Service Automobile	1601	1	2C7WDGBG8FR642808	6	82,865	$52,000.00	8	No
Equipment	Non Revenue/Service Automobile	1602	1	2C7WDGBG6FR652138	6	99,039	$52,000.00	8	No
Equipment	Non Revenue/Service Automobile	1603	1	2C7WDGBG6FR652141	6	110,599	$52,000.00	8	No
Equipment	Non Revenue/Service Automobile	1604	1	2C7WDGBG7FR652150	6	108,431	$52,000.00	8	No
Equipment	Non Revenue/Service Automobile	1607	1	2C7WDGBG8FR642792	6	116,535	$52,000.00	8	No
Equipment	Trucks and other Rubber Tire Vehicles	511	1	1FT7X2A60EEB27771	8	94,488	$80,000.00	8	Yes
Equipment	Trucks and other Rubber Tire Vehicles	512	1	1FD7X2A62EEB27850	8	60,759	$80,000.00	8	Yes
Equipment	Trucks and other Rubber Tire Vehicles	522	1	1FD7X2A66GED42246	6	81,738	$80,000.00	8	No
Equipment	Trucks and other Rubber Tire Vehicles	524	1	1FTFX1C50MKD87727	1	16,147	$80,000.00	8	No

Appendix B: Asset Condition Data

B3: Facilities Assets

Asset Category	Asset Class	Asset Name	Count	ID/Serial No.	Age (Yrs)	TERM Scale Condition	Replacement Cost/Value

Appendix C: Proposed Investment Project List

Project Year	Project Name	Asset/Asset Class	Cost	Priority
2018	40ft Transit Buses	RevenueVehicles	$1,591,200.00	High
2018	Cutaway bus	RevenueVehicles	$81,600.00	High
2019	40ft Transit Buses	RevenueVehicles	$1,591,200.00	High
2019	MiniVans	RevenueVehicles	$106,080.00	High
2020	35ft Transit Buses	RevenueVehicles	$2,121,600.00	High
2020	Vintage trolley bus	RevenueVehicles	$214,200.00	Low
2020	Cutaway bus	RevenueVehicles	$652,800.00	Medium
2021	Cutaway bus	RevenueVehicles	$244,800.00	Medium
2021	MiniBus	RevenueVehicles	$816,000.00	High
2021	MiniVans	RevenueVehicles	$371,280.00	Medium
2022	40ft Transit Buses	RevenueVehicles	$530,400.00	Medium
2022	Cutaway bus	RevenueVehicles	$81,600.00	Medium
2022	MiniVans	RevenueVehicles	$318,240.00	Medium

Appendix D: Fleet Replacement Module Output

Total in Current Year $	$9,040,000.00		$1,100,000.00		$820,000.00		$160,000.00		$2,220,000.00	
Total in Year of Expenditure $	$9,220,800.00		$1,122,000.00		$836,400.00		$163,200.00		$2,264,400.00	
	2023		2024		2025		2026		2027	
Fleet Type (Year/Make/Model)	Number	Cost in 2022 $	Number	Cost in 2022 $	Number	Cost in 2022 $	Number	Cost in 2022 $	Number	Cost in 2022 $
2003 GILLIG PHANTOM	2	$1,920,000.00								
2008 GILLIG PHANTOM	2	$1,920,000.00								
2010 DOUBLE K VILLAGER										
2017 DOUBLE K VILLAGER					1	$340,000.00				
2010 THOR EZ RIDER										
2011 EL DORADO BRT	1	$650,000.00	1	$650,000.00						
2013 GILLIG LOW FLOOR									2	$1,920,000.00
2015 GILLIG LOW FLOOR	1	$960,000.00								
2015 FORD STARCRAFT E450	9	$1,350,000.00								
2016 FORD STARCRAFT E450	2	$300,000.00	1	$150,000.00						
2017 DODGE BRAUN										
2018 GILLIG LOW FLOOR										
2019 GILLIG LOW FLOOR										
2019 FORD STARCRAFT E450									2	$300,000.00
2017 FORD STARCRAFT E450	2	$300,000.00								
2018 FORD STARCRAFT E450	4	$600,000.00	2	$300,000.00						
2019 DODGE BRAUN ENTRAVAN					6	$480,000.00				
2020 DODGE BRAUN ENTRAVAN	1	$80,000.00					2	$160,000.00		
2021 GILLIG LOW FLOOR	1	$960,000.00								

POSSIBLE FUTURE USE OF HYDROGEN FUEL CELL TECHNOLOGIES

Executive Summary

As noted in the RTA's *ICT Roll-Out Plan*, the use of battery-electric buses (BEBs) is the recommended path to achieve a zero-emission fleet by 2040 as required under the *ICT Fleet Rule*. This recommendation is based on: 1) the relative maturity of BEB use across the transit industry in comparison to hydrogen fuel cell electric buses (HFCEBs), 2) the BEB recharging infrastructure already in place at the RTA Bus Maintenance Facility, and 3) the region's current lack of experience/expertise with compressed fuels for transportation purposes. Importantly, the RTA operates 13 bus blocks that travel over 300 miles per day. However, the lack of range for current higher-capacity BEBs (roughly 140 to 260 miles per charge) and for current HFCEBs (up to 300 miles) will require either a greater number of buses to operate the same service levels and/or a wholesale change in the way we provide and support public transportation services in and around our county.

This appendix lays out advantages and disadvantages of the current BEB and HFCEB technologies, as well as possible "tipping point" decision points that the RTA Board can evaluate as we gain experience with BEBs, as HFCEB technologies mature, and as hydrogen fueling capabilities expand in our county.

Discussion

Battery-electric and hydrogen fuel cell vehicles have similar propulsion systems: both store energy on board the vehicle to power an electric motor(s). In a battery-electric vehicle, energy is stored in a rechargeable battery, while energy stored as hydrogen is converted to electricity by the fuel cell. More specifically, a hydrogen fuel cell generates electricity through an electrochemical reaction in which hydrogen and oxygen are combined to generate electricity, heat, and water. The fuel cell is composed of an anode, cathode, and an electrolyte membrane. Hydrogen enters the fuel cell through the anode, where it's spilt into electrons and protons. Hydrogen ions pass through the electrolyte which forces the electrons through a circuit, generating an electric current and excess heat. Oxygen entering at the cathode combines with electrons from the electrical circuit and the hydrogen ions that have passed through the electrolyte from the anode, creating a harmless emission – water. It should be noted that modern hydrogen fuel cell propulsion systems include a "buffer" battery that is used to power the electric motor(s), with the fuel cell designed to maintain the battery's state of charge at or around 70%.

On the consumer side, zero-emission cars and light-duty trucks do not require an enormous battery pack or a large hydrogen fuel storage tank. Hydrogen fuel cell cars currently available on the market (Toyota Mirai and Hyundai Nexo, for example) are more expensive than their battery-electric counterparts and are currently more difficult to fuel: hydrogen is costly to buy, and there are far fewer refueling stations than recharging points in most places in the United States. But when it comes to larger vehicles, the picture is not quite so clear: as vehicles get bigger and heavier, it becomes harder to electrify them, with increasingly larger and heavier battery packs needed. For energy-intensive applications like long-haul trucks, some experts say hydrogen may be the best option. Buses lie somewhere in between cars and trucks on this spectrum.

In May 2022, the RTA issued a purchase order to Gillig Corporation for our first two BEBs, and these two buses have the largest battery system available – 686 Kilowatt/Hour (kWh). This, of course, comes at a cost, since BEBs with largest-available battery packs require wider and higher-capacity front tires, as well as lighter-weight materials throughout the bus, to accommodate the greater weight in comparison to standard diesel buses or HFCEBs. The RTA's first two BEBs are slated for delivery in late 2023.

The lithium batteries used in battery-electric vehicles have a low energy density in comparison to their liquid hydrocarbon fuel counterparts (gasoline and diesel). Lithium batteries also are far lower in energy density than hydrogen. Depending on the source/manufacturer, lithium batteries have an energy density that is between 1.0% and 2.5% of the energy density of a liquid hydrocarbon fuel. Hydrogen also has a relatively low energy density – around four to five times lower than hydrocarbon fuels, but far higher than lithium batteries. Due to hydrogen's low energy density by volume, as a gaseous fuel it must be compressed to 350 bar (roughly 5,100 pounds per square inch) for buses and it must be cryogenically chilled.

Our transit agency neighbors to the north (Santa Cruz Metro) and to the east (Golden Empire Transit in Bakersfield) currently use a combination of diesel-powered and compressed natural gas (CNG) powered buses. As such, they already have experience with CNG-related safety protocols as well as with maintaining complex fuel compression infrastructure to maintain 220 to 250 bar in the CNG fueling station's storage tanks. The methane in CNG is also a feedstock that is relatively easy to convert to hydrogen on-site, and hydrogen refueling can use much of the same distribution equipment as used for CNG systems. As a result, both transit agencies have chosen HFCEB technologies as their long-term zero-emissions solution. It should be noted that both transit agencies operate greater than 100 buses in peak service and operate in or into larger urbanized areas, so they can afford to fund internal staffing resources necessary to support the transition and can attract an appropriate level of

external/vendor resources to ensure reliable continuation of service in the face of a possible technological crisis.

Nearby transit agencies that also operate longer/intercity services similar to the RTA's but have not gained experience with compressed fuel (notably Santa Barbara MTD and Monterey-Salinas Transit) are following the same course as RTA staff's recommendation – launch BEB technologies in the near term, and closely monitor HFCEB projects that are being implemented elsewhere to determine when and if their agencies should transition to HFCEB technologies.

One of the primary advantages of HFCEBs over BEBs is a much shorter refueling time – an HFCEB can be fully refueled in 10 to 15 minutes. Depending on the layout of the bus yard and other space constraints, a hydrogen refueling station can also require a smaller footprint and is more easily scaled up as more HFCEBs are added to the fleet. Conversely, assuming the RTA's new BEB with a 686 kWh battery pack is discharged down to its 20% state of charge limit, our new direct-current 200 kWh fast-chargers recently installed at the RTA Bus Maintenance Facility would need more than 3 hours to safely/fully recharge the batteries (modern "smart" charging systems slow down the charging rate as the battery pack approaches full charge in order to avoid damaging the cells).

The primary disadvantages of hydrogen technology are that the vehicles themselves, as well as the refueling infrastructure for smaller scale implementations, are more expensive than for BEBs. The hydrogen fuel itself is also more expensive on a per-mile basis than either BEBs or diesel-powered buses. In addition, a concern about hydrogen involves its perceived safety. Hydrogen by its nature expands as it naturally heats up, so it is difficult to keep in a pressurized container without it leaking/venting.

Another issue is how hydrogen is produced, as well as the "energy loss conundrum." The following was taken from a recent Lexology article.[1]

> *The production of hydrogen requires significant amounts of energy, so the way it's produced is critical to its environmental impact. Despite hydrogen being a colorless gas, it's referred to by a range of colors that indicate the environmental impact of its production, for example:*
>
> - *Grey hydrogen is produced from fossil fuels in a process that releases CO_2 into the atmosphere. This is currently the cheapest and most common form of hydrogen.*

[1] "Battery Electric vs. Hydrogen – Which is the Future for Electric Vehicles," Dr. Alan Jones and Dr. Martin Neilson, September 3, 2021.

- *Blue hydrogen is also produced using fossil fuels, but the resulting CO_2 is captured to limit greenhouse gas emissions. The carbon capture process means that blue hydrogen is more expensive than its grey counterpart. The UK government's recently announced investment in the hydrogen economy leans heavily on blue hydrogen production. However, there are doubts over just how clean the process truly is, with some figures suggesting that 5-15% of the CO_2 produced is emitted, which could lead to millions of tons of CO_2 being released into the atmosphere annually.*

- *Green hydrogen is produced using electricity from renewable energy sources such as wind and solar, making it the cleanest form of hydrogen. One of the most promising options for green hydrogen uses electricity from renewable resources to power the electrolysis of water. Chemistry plays a critical role in this process, which splits water into hydrogen and oxygen. Electrolyzers are differentiated by the electrolyte material and operating temperature. Some examples include alkaline electrolyzers, proton exchange membrane electrolyzers and ion exchange membrane electrolyzers. The cost of green hydrogen is ultimately much greater than blue or grey due to the cost of the electrolyzers and the electricity required to operate them.*

If one of your main goals is to save the planet, battery electric vehicles are considerably more energy efficient than hydrogen fuel cell vehicles when you consider the series of steps between power generation and propulsion. With a battery electric vehicle, once the electricity is generated (hopefully from a renewable source) the process of supplying this to your vehicle charging location means that around 5% of it is lost. The process of charging and discharging the battery loses another 10%. Finally, the motor wastes another 5% when the vehicle is being driven. That makes for a total loss of 20%.

With a hydrogen fuel cell, you must first convert the electricity to hydrogen via electrolysis, which is only 75% efficient. The gas then must be compressed, chilled and transported, losing another 10%. The fuel cell process of converting hydrogen back to electricity is only 60% efficient, after which you have the same 5% loss from driving the vehicle motor as for a battery electric vehicle. The grand total is a 62% loss – more than three times as much.

To put it another way, for every kW of electricity supply, you get 800W of energy for a battery electric vehicle but only 380W for a hydrogen fuel cell vehicle – less than half as much. That's a huge inefficiency if you're hoping

for a greener future and this doesn't even account for the fact that 95% of hydrogen is currently generated from fossil fuel sources.

AC Transit in Oakland, CA is a highly-regarded pioneer in the transit industry for operating various transit vehicle power systems. AC Transit recently worked with researchers at Stanford University to develop its *Zero Emission Transit Bus Technology Analysis* report that closely tracked five sub-fleets of five vehicles each using five different propulsion technologies: baseline diesel, diesel-electric hybrid, modern HFCEB, BEB, and legacy HFCEB. The report builds on AC Transit's experience operating zero-emission buses over the past two decades. The report focused on operating results between January and June 2021, and it listed five key takeaways:

1. Workforce development moving forward will need a "mixed reality system" that reinvents and reinvigorates the District's training program and engages staff with a real-time learning process.

2. Information on the battery charging communication issues needs further attention.

3. Capacity will need to be increased from 65 to 85 buses per fueling window for future hydrogen station investments.

4. Expired Low Fuel Carbon Standard credits have offset the hydrogen fuel costs savings previously realized.

5. Increased costs for the diesel, hydrogen, and electricity energy sources have impacted the agency's budget.

The AC Transit report also found that the BEB sub-fleet had the lowest per mile cost of the five technologies, when Low-Carbon Fuel Standards credits are applied (in 2020, AC Transit collected $115,391 in LCFS credits). Below are the results:

AC Transit 5x5 Vehicle Matrix					
Fleet	**Diesel (Baseline)**	**Diesel Hybrid**	**HFCEB**	**BEB**	**Legacy HFCEB**
Manufacturer	Gillig	Gillig	New Flyer	New Flyer	Van Hool
Year	2018	2016	2019	2019	2010
Fleet Mileage	116,627	79,250	79,666	62,107	39,347
Cost/Mile	$1.72	$2.08	$2.14	$1.60	$4.75
Cost/Mile (w/credits)	$1.70	$2.05	$1.42	$0.57	$4.75
Emissions (CO_2 metric tons)	295	151	0	0	0
Fleet Availability	90%	62%	64%	61%	50%
Reliability (MBCRC)	7,775	7,205	4,193	5,646	1,457

It is important to note that the HFCEB and BEB vehicles were still under warranty during the analysis period, so the cost/mile figures do not reflect the true operating cost going forward.

Of concern are the results for *Fleet Availability* and for *Reliability (Miles between Chargeable Road Calls)*. As presented, the five baseline diesel-powered buses scored the highest for both categories, while the five Van Hool legacy HFCEBs scored the worst of the entire fleet in all categories – which is expected given the age of the vehicles and the "stale" technology. However, one other result stands out: the *Fleet Availability* score for the five BEBs is alarmingly low. Digging into the report further, AC Transit reported the majority of BEB "bad orders" related to High Voltage System and Charging Problems that caused the buses to not be available for scheduled operation. In the *Reliability* section, the five HFCEBs experienced 11 of its 19 roadcalls due to the High Voltage System, while the BEBs reported 5 of 11 roadcalls due to the High Voltage System. Since transit agencies are allowed a 20% bus spare ratio, an availability rating of 85% or higher would not impact service delivery. However, an availability rating of 90% or higher is desirable and expected.

Tipping Point Decisions

By all accounts, HFCEB technologies are more complex than BEB technologies, which are more complex than hydrocarbon fuel (diesel and gasoline) technologies. Unfortunately, San Luis Obispo can be considered a "technology desert" regarding heavy-duty vehicle repairs, since there is a lack of vendor-supplied warranty and/or qualified repair providers nearby. The RTA must tow our current diesel- and gasoline-powered vehicles to Fresno or Bakersfield for warranty work or for more complex repairs, since local vendors are unable or unwilling to provide those services. We do not anticipate that local vendor support for BEB or HFCEB technologies will be improved as we transition away from diesel and gasoline technologies.

The most important factor that the RTA Board must consider as we continue to transition to a zero-emission fleet is the total number of miles that a BEB can feasibly operate in our service area on a single charge. Other important factors include overall cost per mile, the safety of the battery packs, and overall reliability – both in terms of miles between roadcalls/service interruptions, and for the recharging infrastructure itself. If any of the performance results suggest that BEB technologies will not sustainably work in our operating environment, then the RTA Board should consider transitioning some or all of our fleet to HFCEB technologies in order to meet the CARB *ICT Fleet Rule* requirement to be fully zero-emissions by 2040. Any decision on transitioning toward HFCEB technologies should align with the bus replacement schedule presented in Table 3 in Section D above. To help inform a possible shift, staff will closely monitor, analyze and report findings to the RTA Board to provide real-world BEB results across the range of fixed-route services operated by the RTA over the next few years.

Staff expects that BEBs will perform best on the local fixed-routes operated in Paso Robles and in the Five Cities Area, as well as the academic year-only RTA Route 14 SLO-Cuesta College service. All of these fixed-routes can likely be operated for a full service day without recharging. Services "on the cusp" include RTA Route 12 SLO - Morro Bay and possibly the RTA Route 10 SLO - Santa Maria, since the terrain is relatively flat; the challenge (especially for Route 10) is that the average speed is relatively high. The RTA Route 9 SLO - Paso Robles will challenge the range of any currently-available ZEB due to the Cuesta Grade's steep and long incline, and the seasonally extreme temperatures often experienced in North County. Staff will closely monitor each BEB's state of charge at the beginning and end of each bus trip, and also record information related to time of day, day of week, Bus Operator, the ambient temperature, passenger loads, and all factors that affect travel speeds (traffic, wheelchair boardings/alightings, passenger-related delays, etc.).

The RTA's *ICT Roll-Out Plan* assumes that BEB opportunity recharging will be pursued at strategic bus layover points – most notably at the route ends for RTA Route 9 and RTA Route 10. Should those opportunity charging efforts prove too challenging or expensive, the RTA Board might reconsider its zero-emission fleet strategy.

Presuming the RTA might in the future pursue HFCEB technologies to meet our intercity transit operating needs, the best refueling option would be to contract with a third-party vendor to install a temporary/mobile fueling facility at the RTA's Bus Maintenance Facility in SLO. Under this temporary/mobile on-site scenario, the RTA would provide the necessary space (roughly 20' x 50' for the trailer) and electrical connections, and the vendor would refill the liquid hydrogen tanks as often as necessary to meet our operating needs.

Although it is impossible to predict exactly how many months will be required to transition to a hydrogen refueling solution, a reasonable lead time is to allow 24 months from the time the RTA Board authorizes procurement of a temporary/mobile hydrogen fueling solution until the system is on-line. That 24-month lead-time is also reasonable to assume from the time a HFCEB bus purchase is authorized by the RTA Board until vehicles are delivered. An additional six months should be allowed for testing/commissioning, workforce development, and implementation of the HFCEB and fueling system. The fact that SLO County can be considered a "technology desert" when it comes to transportation technologies will likely make it difficult to recruit technicians already trained on high-pressure fueling systems and fuel cell technologies – so internally developed talent is likely the only path forward. The new Bus Maintenance Facility would also need to be modified to install hydrogen leak detection sensors and to replace existing electrical equipment with explosion-proof units; a rough estimate is it will require $1 million to make those changes.

The "Hydrogen Fueling Whitepaper for Fuel Cell Bus Fleets in North America" referenced in the bibliography at the end of this appendix provides a good overview of a temporary/mobile fueling station as well as other longer-term fueling options. The whitepaper suggests that a Phase I temporary/mobile refueling solution would cost on the order of $1million, along with a monthly rental fee of $12,000 for the tube storage container system. The liquid fuel itself would be delivered at roughly $8 to $9 per kilogram[2], resulting in per mile fuel costs of roughly $1.25. These costs do not include the electrical costs to compress or vaporize the fuel, nor are fueling station maintenance costs by a third-party vendor included. The nearest hydrogen supplier is located in Ontario, CA (Linde, 225 miles one-way) and the next nearest is in Sacramento (Air Products, 300 miles one-way). Another vendor is currently in the permitting phase to produce green hydrogen[3], and the facility will be located in Fresno (Plug Power, 140 miles one-way).

Optimally, another hydrogen station would also be available in our county to provide redundancy. No hydrogen fueling station currently exists in our county, and HFCEB vendors are not aware of any public stations in the planning queue. Staff has approached a local card-lock fuel vendor that also supplies diesel fuel to our "wet hose" refueler, but that private company stated that it has no plans to install hydrogen refueling infrastructure at this time. The cost to implement two

[2] Santa Cruz METRO in January 2023 was quoted an as-delivered cost of $14 per kilogram. Similar to the volatility of other energy (diesel, gasoline, electricity, natural gas, etc.) pricing, the RTA should expect hydrogen pricing to also remain volatile.

[3] https://www.ir.plugpower.com/press-releases/news-details/2021/Plug-Power-to-Build-Largest-Green-Hydrogen-Production-Facility-on-the-West-Coast-2021-9-20/default.aspx

temporary/mobile hydrogen refueling facilities would be prohibitively expensive if they were to only serve the RTA's fleet, and would pose a significant challenge since our two park-out facilities in Arroyo Grande and Paso Robles are leased.

In the same vein, it would be economically infeasible to construct a fully redundant BEB recharging yard that could be used in the event that the entire recharging infrastructure at the Bus Maintenance Facility were to fail. To some degree, some level of redundancy could be provided once the recharging infrastructure at the Arroyo Grande and/or Paso Robles park-out yards are completed, and several direct current fast-chargers currently exist in our service area (two EVgo dispensers at the Marigold Shopping Center, and seven Electrify America dispensers on Betteravia in Santa Maria). Our transit partners (SLO Transit and Santa Maria Transit) are also in the design phase of developing fast-charger systems for their planned transition to BEBs. It is also likely that additional fast-chargers will be developed as more and more vehicle fleets electrify in our region.

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FTA Zero-Emission Transition Plan

The RTA has committed to transitioning away from using internal combustion engines to zero-emission bus (ZEB) technologies. This Innovative Clean Transit (ICT) Zero-Emission Bus Rollout Plan and related FTA Zero-Emission Transition Plan provides recommendations on how the San Luis Obispo Regional Transit Authority (RTA) will achieve full compliance with recent legislation, and to do our part to provide environmentally and economically sustainable public transportation that will meet the needs of future generations.

The RTA's Zero-Emission Fleet Transition Plan, which is consistent with the San Luis Obispo Council of Governments Regional Zero- Emissions Bus Implementation Plan, has been prepared for the purpose of compliance with the Federal Transit Administration Dear Colleague Letter dated December 1, 2021, requiring such a plan for continued eligibility under certain federal funding sources. This requirement was codified in the Infrastructure Investment and Jobs Act (IIJA), also known as the "Bipartisan Infrastructure Law," signed by the President on November 15, 2021. The IIJA amended the statutory provisions for the Buses and Bus Facilities Competitive Program (49 U.S.C. § 5339(b)) and the Low or No Emission Program (49 U.S.C. § 5339(c)) to include the requirement that any application for projects related to zero-emission vehicles include a Zero-Emission Transition Plan. This plan also serves as the foundation of the RTA's ICT ZEB Roll-Out Plan under the California Air Resources Board Rule.

An FTA Zero-Emission Transition Plan must, at a minimum:

1. Demonstrate a long-term fleet management plan with a strategy for how the applicant intends to use the current request for resources and future acquisitions. *(Refer to ICT ZEB Rollout Plan Section B: Rollout Plan General Information and Section I: Start-up and Scale-up Challenges)*
2. Address the availability of current and future resources to meet costs for the transition and implementation. *(Refer to ICT ZEB Rollout Plan Section H: Potential Funding Sources)*
3. Consider policy and legislation impacting relevant technologies. *(Addressed Below)*
4. Include an evaluation of existing and future facilities and their relationship to the technology transition. *(Refer to ICT ZEB Rollout Plan Section C: Technology Portfolio and Section E: Facility and Infrastructure Modifications)*
5. Describe the partnership of the applicant with the utility or alternative fuel provider. *(Addressed Below)*
6. Examine the impact of the transition on the applicant's current workforce by identifying skill gaps, training needs, and retraining needs of the existing workers of

the applicant to operate and maintain zero-emission vehicles and related infrastructure and avoid displacement of the existing workforce.
(Refer to ICT ZEB Rollout Plan Section G: Workforce Development)

Note that all of these federal requirements mirror those of the ICT ZEB Rollout Plan as referenced above with the exception of two: policy/legislation consideration, and partnership with the utility or alternative fuel provider, which are addressed below:

Policy and Legislation Consideration

Innovative Clean Transit (December 2018)

The *Innovative Clean Transit* (ICT) regulation was adopted by the California Air Resources Board in December 2018. It requires all public transit agencies to gradually transition to a 100-percent zero-emission bus fleet, and encourages us to provide innovative first- and last-mile connectivity and improve mobility for transit riders. Under the ICT regulation, small transit agencies such as the RTA must submit its governing body approved *ICT ZEB Rollout Plan* along with its approval to the CARB Executive Officer by July 1, 2023.

An *ICT ZEB Rollout Plan* describes how a transit agency is planning to achieve a full transition to zero-emission bus technologies by 2040. It includes essential elements for a smooth transition, including information on the types of zero-emission buses to be purchased, their purchase schedule, timing of their placement in Disadvantaged Communities, a schedule for related infrastructure build out, potential funding sources, and training plans.

An *ICT ZEB Rollout Plan* also has an informative function. It allows a transit agency to plan ahead of time and to familiarize itself with available zero-emission bus technologies before starting with purchases. It allows transit agencies to learn about potential challenges and available solutions for a smooth transition. Information gathered from the Rollout Plans will also guide the State in developing incentive funding plans, inform utilities on potential electrical and infrastructure needs, and educate the general public on environmental benefits of zero-emission bus technologies.

RTA Zero-Emission Vehicle Purchase Policy (March 2019)

At the March 2019 meeting, the RTA Board adopted the *Zero-Emission Vehicle Purchasing Policy*, and directed staff to: 1) work with SLOCOG to develop a regional transit electrification study, and 2) seek to develop a Joint Zero-Emissions Bus Group agreement. These actions provided two important first steps by laying out the commitments that the RTA must make to meet the ICT, and in establishing methodologies for determining if anticipated technologies meet our needs when the first round of zero-emission buses statutorily must be considered when purchasing vehicles beginning in 2026.

RTA Electrification-Readiness Plan and Deployment of Battery-Electric Buses (April 2019)

This planning document was developed by our architect/engineer as part of the master planning of the new RTA Bus Maintenance Facility (BMF). The *RTA Electrification-Readiness Plan* report found that transitioning all battery-electric buses (BEB) and non-revenue vehicles at the BMF in San Luis Obispo will require 2,230 kilowatts per hour of recharging infrastructure, assuming a 1% annual growth in annual miles traveled. Separately, the Paso Robles park-out facility will require 790 kWh (including 80 for the Route 15 vans) and the Arroyo Grande facility will require 340 kWh. In terms of total kilowatts used per weekday, the SLO BMF will use 18,480 kW, followed by 4,360 in Paso Robles and 1,790 in Arroyo Grande. Total usage will be approximately 24,630 kW for all future revenue and non-revenue vehicles.

Interestingly, assuming a current PG&E rate $0.18/kW, this equates to approximately $1.25M annually in transportation-related electricity costs.[1] In comparison, the FY22-23 budget for all RTA-operated transit is $1,519,610. The *RTA Electrification-Readiness Plan* report was used as a basis for our SLO APCD grant proposal that partially funded the BEB recharging infrastructure at our new BMF.

SLOCOG Regional Zero Emissions Bus Implementation Plan (August 2020)

SLOCOG worked with transit agencies within SLO County, as well as partner agencies with whom our county's transit agencies interact, to develop a *Regional ZEB Implementation Plan*. These other agencies include Monterey-Salinas Transit that operates inter-regional fixed-route service down to Templeton, and Santa Maria Area Transit that provides connections to RTA Route 10 service at the Santa Maria Transportation Center.

Unlike the RTA's previous actions focusing solely on BEB technologies, the *Regional ZEB Implementation Plan* also evaluates hydrogen fuel cell electric bus (HFCEB) technologies. The plan also provides a deeper dive into the many laws and regulations that preceded the ICT, which helps provide a framework for other municipal fleets in transitioning away from internal combustion engines.

The *Regional ZEB Implementation Plan* essentially used the same methodology used in the *RTA Electrification-Readiness Plan* discussed above, although it provided a range of kW usage by agency. Below is a summary table of kW that would be used on a typical weekday for each participating agency upon full implementation of zero-emission vehicles.

SLOCOG Regional ZEB Electricity Usage		
	kW per Weekday	
Transit Agency	Low	Maximum
Monterey-Salinas Transit	49,130	153,460
Morro Bay Transit	1,340	2,020
RTA / Paso Express / SoCo Transit	25,100	44,210
SLO Transit	6,340	
Santa Maria Area Transit	14,210	21,120
Regional Total	**96,120**	**227,150**

[1] For simplicity sake, we arrived at this amount by multiplying the weekday usage by 280 days to account for lower service levels on weekends. Weekday usage alone would be 250 days x 24,360 kW x $0.18/kW = $1,096,200.

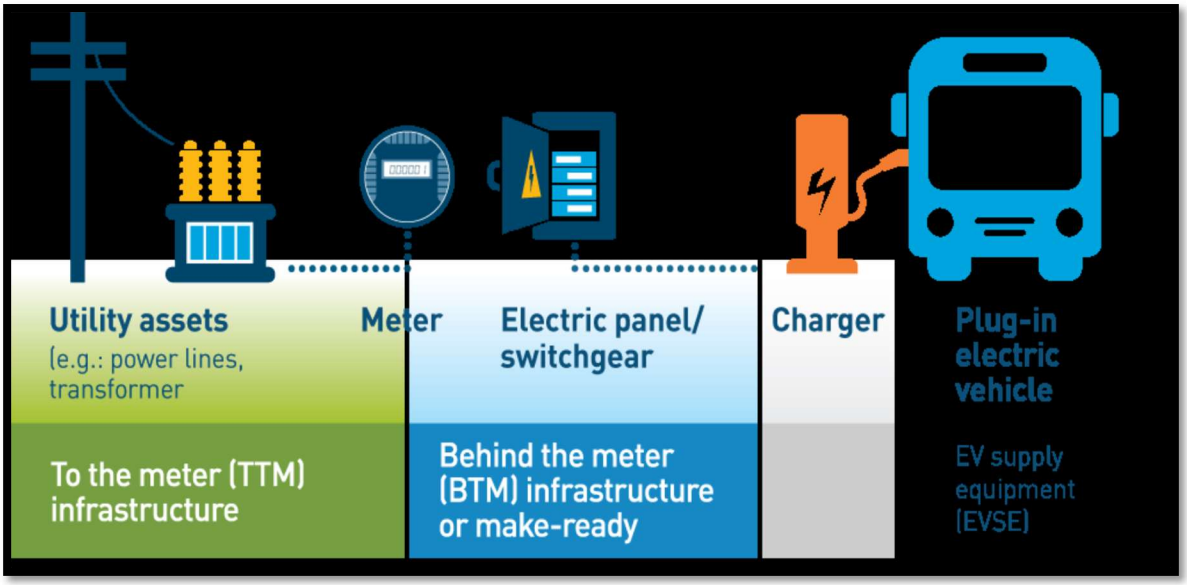
Although not included in the *Regional ZEB Implementation Plan*, the Morro Bay Transit figures are presumed to be representative of Atascadero Dial-A-Ride energy usage. Using that figure, SLO County only electricity usage for public transportation needs would be on the order of 34,120 kW to 54,590 kW on a typical weekday.

The *Regional ZEB Implementation Plan* also recommended development of a regional Zero-Emissions Bus Group that could pave the way for joint vehicle/equipment purchases, joint planning/use of recharging infrastructure, and joint/consolidated reporting.

Local Energy Partnerships

The RTA service area is served by the investor-owned public utility company Pacific Gas and Electric (PG&E) for both electric and gas service. The PG&E EV Fleet Program helps fleets easily and cost-effectively install charging infrastructure to save money, eliminate tailpipe emissions, and power large fleets. This comprehensive program provides incentives and rebates for EV infrastructure (depending on facility location and vehicle types), construction, and mainline power delivery upgrades. Under this program, PG&E covers the cost to bring the anticipated power needed to the site from the nearest substation. The program also can provide substantial construction and logistical support, including site design and permitting assistance. The RTA intends to participate in the program when further along in the study and design process.

Figure 1: PG&E Graphic of program to help implement heavy duty electric vehicles into fleets.



The RTA staff has been in contact with our assigned PG&E Electric Vehicle Onboarding Specialist to express interest in participating in the fleet ready program. This program could potentially remove a major obstacle to fleet transition by providing a substantial financial investment to upgrade the electrical grid to provide sufficient power for future bus fleet charging.

Previously, the RTA worked with PG&E to install solar infrastructure during construction of the Bus Maintenance Facility to help offset facility energy costs and reduce energy needed for BEB charging. PG&E has also provided “Take Charge: A Guidebook to Fleet Electrification and Infrastructure” which contains a significant amount of decision-making information to assist in the coordination with PG&E.

ICT ZEB ROLLOUT PLAN GLOSSARY - LIST OF ACRONYMS

AB	Assembly Bill
ADA	Americans with Disabilities Act
APCD	Air Pollution Control District
BEB	Battery Electric Bus
BMF	Bus Maintenance Facility
CalEPA	California Environmental Protection Agency
CARB	California Air Resource Board
CO	Carbon Monoxide
DC	Direct Current
FTA	Federal Transit Administration
FCEB	Fuel Cell Electric Bus
GHG	Greenhouse Gases
GVW	Gross Vehicle Weight
HFC	Hydrogen Fuel Cell
ICT	Innovative Clean Transit (Fleet Rule)
kW	Kilowatt
MPO	Metropolitan Planning Organization
MTC	Mass Transit Committee
NOx	Nitrogen oxides
RTA	San Luis Obispo Regional Transit Authority
RTAC	Regional Transit Advisory Committee
SCC/BCC	South Central Coast Basin-Wide Air Pollution Control Council
SLOCOG	San Luis Obispo Council of Governments
UZA	Urbanized Zone Area
VOC	Volatile Organic Compounds
ZEB	Zero Emissions Bus

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