

Attachment 6



June 1, 2023

Ms. Alicia Yang
Orange County Transportation Authority (OCTA)
Regional Modeling and Traffic Operations
Planning Division
P.O. Box 14184
Orange, CA 92863-1584

Mayor
Doug Cirbo

Mayor Pro Tem
Mark Tetterer

Council Members
Robert Pequeño
Scott Voigts
Benjamin Yu

City Manager
Debra DeBruhl Rose

Subject: Local Signal Synchronization Plan Submittal as Part of the Measure M2 Eligibility Process

Dear Ms. Yang:

The City of Lake Forest is pleased to submit its updated Local Signal Synchronization Plan as part of the Measure M2 eligibility process. The submittal includes the following components:

1. A completed "Local Signal Synchronization Plan Consistency Review Checklist" form establishing consistency between the Local Signal Synchronization Plan and the Regional Traffic Signal Synchronization Master Plan.
2. An updated Local Signal Synchronization Plan for Fiscal Years 2023/2024 to 2025/26 including all required elements as identified in the "Guidelines for the Preparation of Local Signal Synchronization Plans".

The City of Lake Forest looks forward to continuing the implementation of the beneficial programs and construction projects required and made possible by Measure M2. If you have any questions, please feel free to call me at (949) 461-3480.

Sincerely,

Thomas E. Wheeler, P.E.
Director of Public Works / City Engineer

Enclosures:

- A. Local Signal Synchronization Plan Consistency Review Checklist
- B. Local Signal Synchronization Plan

Lake Forest, Remember the Past ~ Challenge the Future.



www.lakeforestca.gov
Lake Forest City Hall
100 Civic Center Drive
Lake Forest, CA 92630
General: (949) 461-3400
Fax: (949) 461-3511



LOCAL SIGNAL SYNCHRONIZATION PLAN CONSISTENCY REVIEW CHECKLIST

The Local Agency Name: CITY OF LAKE FOREST Plan Date: JUNE 30, 2023

Local agencies must submit a copy of their Local Signal Synchronization Plan, and any supporting documentation, including the completed consistency review checklist below.

Local Agency Statement	Page(s) in LSSP	Provided or N/A
1) Signal synchronization goals of the agency are consistent with those outlined as part of the Regional Traffic Signal Synchronization Master Plan.	PAGES 2-4	Provided
2) Traffic signal synchronization street routes are identified, including all corridors along the regional signal synchronization network located within the local agency.	PAGES 5-7	Provided
3) Traffic signal inventory for all traffic signal synchronization street routes.	PAGES 8-11	Provided
4) Three-year plan separately showing costs, available funding, and phasing for capital, operations, and maintenance of signal synchronization along the traffic signal synchronization street routes and traffic signals which may include unconstrained and build-out scenarios.	PAGES 12-15	Provided
5) Signal synchronization review, revision, and assessment of synchronization activities along the traffic signal synchronization street routes and traffic signals.	PAGES 16-21	Provided

I certify that the above statements are true to the best of my knowledge.


Signature

5/31/23
Date

Thomas E. Wheeler, P.E., Director of Public Works/City Engineer
Printed Name, Title



LOCAL SIGNAL SYNCHRONIZATION PLAN



SECTION ONE
TRAFFIC SIGNAL SYNCHRONIZATION
GOALS, POLICIES, AND OBJECTIVES



GOALS

OCTA's Regional Traffic Signal Synchronization Program (Project P) is included as part of the approved Measure M2. Project P is a multi-agency, corridor-based approach that optimizes the performance of traffic signals based on existing traffic patterns. The goals of the program are to improve the flow of traffic on Orange County streets and roads by implementing multi-agency signal synchronization.

The City of Lake Forest is in concurrence with these goals, and will continue to work cooperatively with OCTA and adjacent jurisdictions to synchronize signals throughout the City on a corridor basis. This cooperation will serve to provide safe, efficient traffic circulation for our local needs as well as future demands, by continuing to improve travel times and reducing stops. The City is currently part of a joint multi-agency 'central' system that includes the following five (5) local agencies:

- 1) Aliso Viejo
- 2) Laguna Hills
- 3) Laguna Niguel
- 4) Laguna Woods
- 5) **Lake Forest**

As traffic signal synchronization corridor projects have been completed, the City of Lake Forest's traffic signals that were on the Econolite Aries system have been transitioned to the central Econolite Centracs system. This central Econolite Centracs traffic management system allows for street routes to be more easily coordinated across jurisdictional boundaries.

By the end of 2023, it is anticipated that the City would complete construction of its own Traffic Management Center (TMC) in the new City Hall office buildings. With our own TMC, the City can more effectively address and serve its traffic needs.

Since July 2020, the City has participated in and completed the El Toro Road TSSP and Los Alisos Boulevard TSSP projects which, in addition to the timing improvements, included upgrading the City's controllers. The City is currently participating in the Alton Parkway, Bake Parkway and Rockfield Boulevard, Lake Forest Drive, and Portola Parkway/Santa Margarita Parkway TSSP projects.



POLICIES

The City of Lake Forest has already adopted an initial Local Signal Synchronization Plan (LSSP), and understands it must provide updates every three years to remain eligible for Measure M2 funding. As the initial LSSP adoption occurred in December 2010, this is the fourth cycle of the 3-year updates. The purpose of the LSSP is to implement and maintain coordination of traffic signals along corridors within our City and beyond its borders to regionally maintain safe and efficient flow of vehicular traffic.

Project P also provides the opportunity to work with neighboring agencies in order to accomplish mutually-beneficial goals. It is the City of Lake Forest's desire and policy to continue participating in and supporting Project P. The City maintains local control and responsibility of all traffic signals within our jurisdiction, and will continue to be responsible for any changes to our signals, equipment, and policies.

OBJECTIVES

The City of Lake Forest has implemented and maintained corridor-based signal coordination timing via daily traffic signal operations and engineering support services. Through these on-going consultant support services, the City periodically evaluates and optimizes coordination signal timing in response to changing traffic volumes and patterns.

The City concurs that Project P is beneficial and needed in order to effectively move people and goods locally and regionally through efficient signal timing. By participating in Project P, the City recognizes the benefits gained from local signal timing and synchronization, as well as from eligible traffic signal and interconnect equipment upgrades. Moreover, the City recognizes this program as a valuable, corridor-based measure for improving air quality by reducing green-house gas emissions. In participating in Project P, as well as using the on-going signal operations support services, it is the City's objective to continue to address regional goals while serving constituents in a reasonable manner.



SECTION TWO
TRAFFIC SIGNAL SYNCHRONIZATION STREET ROUTES
(EXISTING AND PLANNED)



TRAFFIC SIGNAL SYNCHRONIZATION STREET ROUTES

EXISTING:

Regional Network:

Priority Corridor Network

- 1) Bake Parkway
- 2) El Toro Road, from Bridger Road to SR-241 Freeway
- 3) Lake Forest Drive
- 4) Trabuco Road

Signal Synchronization Network

- 5) Barranca Parkway / Muirlands Boulevard
- 6) Jeronimo Road
- 7) Los Alisos Boulevard
- 8) Portola Parkway / Santa Margarita Parkway

Local Network:

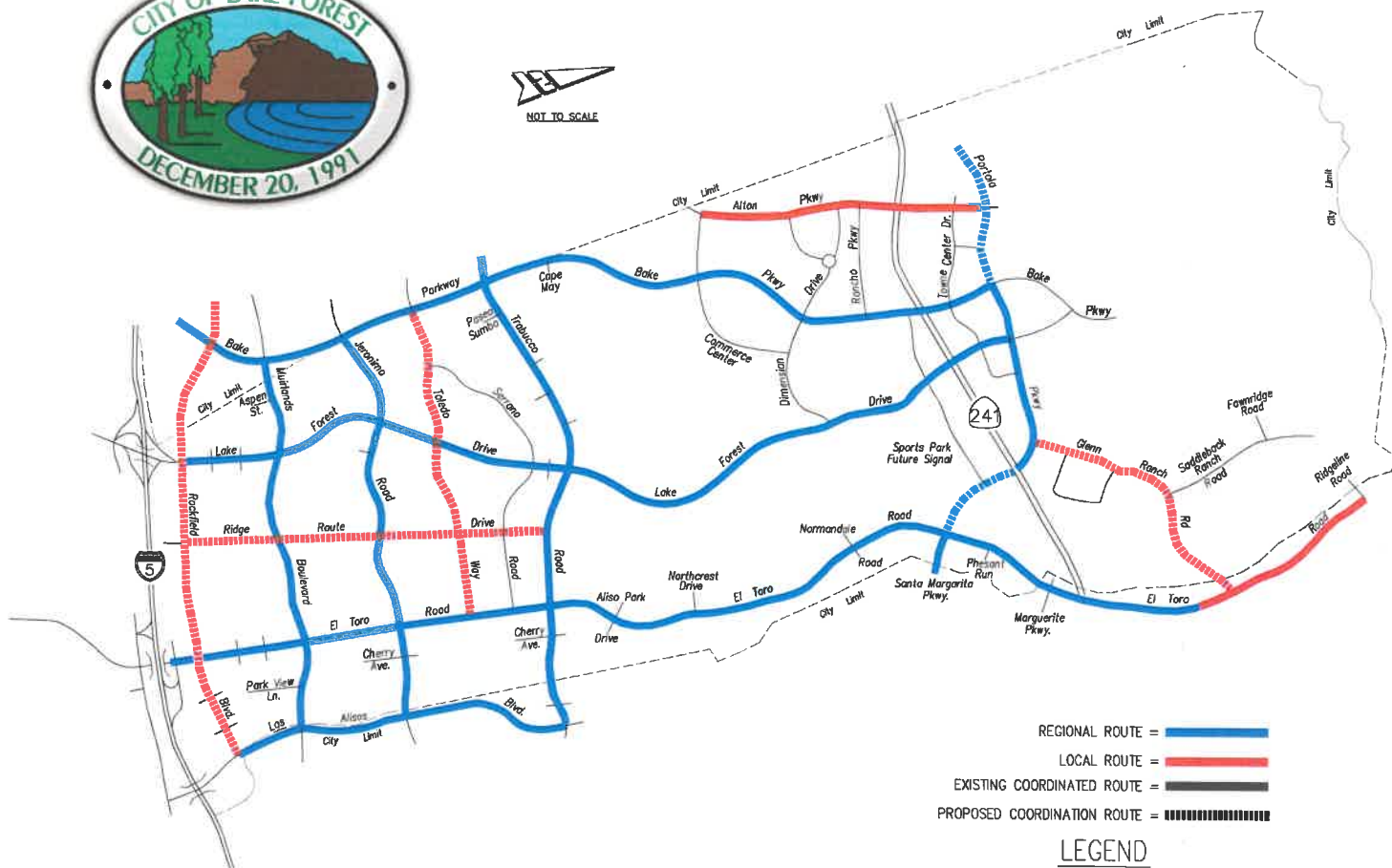
Local Signal Synchronization Network

- 9) Alton Parkway, from Commerce Center to Portola Parkway
- 10) El Toro Road, from SR-241 Freeway to Ridgeline Road

PLANNED:

Local Signal Synchronization Network

- 11) Glenn Ranch Road, from Portola Parkway to El Toro Road
- 12) Ridge Route Drive, from Rockfield Boulevard to Trabuco Road
- 13) Rockfield Boulevard, from Bake Parkway to Los Alisos Boulevard
- 14) Toledo Way, from Bake Parkway to El Toro Road



- REGIONAL ROUTE = ———
- LOCAL ROUTE = ———
- EXISTING COORDINATED ROUTE = ———
- PROPOSED COORDINATION ROUTE = - - - - -

LEGEND

LOCAL SIGNAL SYNCHRONIZATION MAP 2023



SECTION THREE

TRAFFIC SIGNAL INVENTORY

Traffic Synchronization Inventory
City of Lake Forest

Corridor	Cross Street Intersection	Cycle Length				Maintenance Responsibility	Equipment										Status
		AM	MID	PM	WKND		Cabinet	Type	Software	Detection	Bike Detection	CCTV	Power Backup	Comm	Other ITS	ATMS	
Bake Parkway	Artists Way (Old Cape May)	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Offline
	South Pointe Drive	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	North Pointe Drive	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Commercentre Drive	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Dimension Drive	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Rancho Parkway South	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Hybrid Video/Radar	No	N/A	BBS	Copper		Centracs	Online
	Rancho Parkway	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Towne Centre Drive	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Rue de Fortuna	Free	Free	Free	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Radar	No	N/A	BBS	Copper		Centracs	Online
El Toro Road	Bridger Road / I-5	140	150	150	150	Lake Forest	P (TS2 Type 1)	Cobalt	ASC/3	Video	No	N/A	BBS	Copper		Centracs	Online
	Rockfield Boulevard	140	150	150	150	Lake Forest	P (TS2 Type 1)	Cobalt	ASC/3	Video	No	N/A	BBS	Copper		Centracs	Online
	Arbor Way	140	150	150	150	Lake Forest	P (TS2 Type 1)	Cobalt	ASC/3	Video	No	N/A	BBS	Copper		Centracs	Online
	Raymond Way	140	150	150	150	Lake Forest	P (TS2 Type 1)	Cobalt	ASC/3	Video	No	N/A	BBS	Copper		Centracs	Online
	Muirlands Boulevard	140	150	150	150	Lake Forest	P (TS1)	Cobalt	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Jeromino Road	140	150	150	150	Lake Forest	P (TS2 Type 1)	Cobalt	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Toledo Way	140	150	150	150	Lake Forest	P (TS1)	Cobalt	ASC/3	Radar	No	N/A	BBS	Copper		Centracs	Online
	Serrano Road	140	150	150	150	Lake Forest	P (TS2 Type 2)	Cobalt	ASC/3	Loops	No	N/A	BBS	Fiber		Centracs	Online
	Trabuco Road	140	150	150	150	Lake Forest	P (TS1)	Cobalt	ASC/3	Loops	No	N/A	BBS	Fiber		Centracs	Online
	Aliso Park Drive	90	Free	100	Free	Lake Forest	P (TS2 Type 2)	Cobalt	ASC/3	Loops	No	N/A	BBS	Fiber		Centracs	Online
	Northcrest Drive	90	Free	100	Free	Lake Forest	P (TS2 Type 2)	Cobalt	ASC/3	Loops	No	N/A	BBS	Fiber		Centracs	Online
	Normandale Drive	90	Free	100	Free	Lake Forest	P (TS2 Type 1)	Cobalt	ASC/3	Loops	No	N/A	BBS	Fiber		Centracs	Online
	Pheasant Run	70	Free	65	Free	Lake Forest	P (TS1)	Cobalt	ASC/3	Loops	No	N/A	BBS		GPS Clock		Offline
	Ridgeline	70	Free	65	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS		GPS Clock		Offline
Lake Forest Drive	I-5 N Ramp	Free	Free	Free	Free	Caltrans	332	2070		Loops	No	N/A	BBS				
	Rockfield Boulevard	130	120	140	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Aspen Street	140	140	140	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Lake Forest Town Center	140	140	140	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Muirlands Boulevard	140	120	140	140	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Jeromino Road	140	140	140	Free	Lake Forest	P (TS1)	Cobalt	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Toledo Way	140	140	140	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Serrano Road	140	130	140	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online
	Chinook Drive	140	130	140	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centracs	Online

Traffic Synchronization Inventory
City of Lake Forest

Corridor	Cross Street Intersection	Cycle Length				Maintenance Responsibility	Cabinet	Type	Software	Detection	Equipment				Other ITS	ATMS	Status
		AM	MID	PM	WKND						Bike Detection	CCTV	Power Backup	Comm			
	Trabuco Road	140	130	140	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Canada Road / Newvale Drive	140	Free	140	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Pittsford Drive	100	Free	100	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Vintage Woods Road	100	Free	100	Free	Lake Forest	P (TS2 Type 1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Dimension Drive	100	Free	100	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Regency Lane	100	Free	100	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Vista Terrace	100	Free	100	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Rancho Parkway	100	Free	100	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	SR 241 N&S Ramps	Free	Free	Free	Free	Caltrans	332	2070		Loops	No	N/A	BBS				
	Towne Centre Drive	100	Free	100	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
Muirlands Boulevard	Aspen Street / Oakwood Lane	70	70	70	70	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Wireless		Centrac	Online
	Dylan Avenue	70	70	70	140	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Ridge Route Drive	140	140	140	140	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Parkview Lane	70	70	65	140	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
Portola Parkway	El Toro Road	140	Free	130	Free	Lake Forest	P (TS2 Type 2)	Cobalt	ASC/3	Hybrid Video/Radar	No	N/A	BBS	Fiber		Centrac	Online
	Saddleback Parkway	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Purpose Drive	Free	Free	Free	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	SR 241 N&S Ramps	Free	Free	Free	Free	Caltrans	332	2070		Loops	No	N/A	BBS				
	Glenn Ranch Road	140	Free	120	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Towne Centre Drive / Pauling	140	Free	120	Free	Lake Forest	P (TS1)	ASC/2S	ASC/2	Loops	No	N/A	BBS	Copper		Centrac	Online
	Lake Forest Drive	140	Free	120	Free	Lake Forest	P (TS1)	ASC/2S	ASC/2	Loops	No	N/A	BBS	Copper		Centrac	Online
	Auto Center Drive	70	Free	120	Free	Lake Forest	P (TS1)	ASC/2S	ASC/2	Loops	No	N/A	BBS	Copper		Centrac	Online
	Bake Parkway	140	120	130	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Market Place	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/2S	ASC/2	Loops	No	N/A	BBS	Copper		Centrac	Online
	Paloma	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
Trabuco Road	Paseo Sombra	70	Free	65	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Paseo Tranquillo	70	Free	70	60	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Via Del Rio	70	Free	70	60	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Peachwood	140	Free	140	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Ridge Route Drive	140	130	140	120	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Cherry Avenue	70	75	75	75	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
Jeronimo Road	Ridge Route Drive	105	105	140	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Serrano School	70	70	70	Free	Lake Forest	M	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper	TS1 Cabinet	Centrac	Online
	Cherry Avenue	140	100	75	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online

Traffic Synchronization Inventory
City of Lake Forest

Corridor	Cross Street Intersection	Cycle Length				Maintenance Responsibility	Equipment										Status
		AM	MID	PM	WKND		Cabinet	Type	Software	Detection	Bike Detection	CCTV	Power Backup	Comm	Other ITS	ATMS	
Toledo Way	Serrano Road	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Ridge Route Drive	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
Glenn Ranch Road	Ellipse	Free	Free	120	Free	Lake Forest	P (TS1)	ASC/2S	ASC/2	Loops	No	N/A	BBS	Copper		Centrac	Online
	Definition	Free	Free	120	Free	Lake Forest	P (TS1)	ASC/2S	ASC/2	Loops	No	N/A	BBS	Copper		Centrac	Online
	Saddleback Ranch Rd	Free	Free	Free	Free	Lake Forest	P (TS2 Type 2)	Cobalt	ASC/3	Radar	No	N/A	BBS	Copper		Centrac	Online
	Viejo Ridge	Free	Free	Free	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Hybrid Video/Radar	No	N/A	BBS	Copper		Centrac	Online
Rockfield Boulevard	Centre	Free	120	Free	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Radar	No	N/A	BBS	Copper		Centrac	Online
	Boeing	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Ridge Route Drive	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Harvest	Free	Free	Free	Free	Lake Forest	P (TS2 Type 1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Orchard	Free	Free	Free	Free	Lake Forest	P (TS2 Type 1)	Cobalt	ASC/3	Radar	No	N/A	BBS	Copper		Centrac	Online
	Landisview	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Los Alisos	130	Free	130	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Radar	No	N/A	BBS	Copper		Centrac	Online
Alton Parkway	Commercenter	110	Free	110	Free	Lake Forest	P (TS2 Type 1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Aries	Online
	Monarch	110	Free	110	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Aries	Online
	Catalina	110	Free	110	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Aries	Online
	Rancho South	110	Free	110	Free	Lake Forest	P (TS2 Type 1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Aries	Online
	Sunflower	110	Free	110	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Aries	Online
	SR 241 N&S Ramps	Free	Free	Free	Free	Caltrans	332	2070		Loops	No	N/A	BBS				
	Towne Centre	110	Free	110	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Portola	110	Free	110	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
Dimension	Commercentre Drive	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Canada Road	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
Commercentre	Serrano Summit	Free	Free	Free	Free	Lake Forest	P (TS2 Type 2)	Cobalt	ASC/3	Radar	No	N/A	BBS	Copper		Centrac	Online
	Civic Centre	Free	Free	Free	Free	Lake Forest	P (TS2 Type 2)	Cobalt	ASC/3	Radar	No	N/A	BBS	Copper		Centrac	Online
Towne Centre	Market Place	Free	Free	Free	Free	Lake Forest	P (TS1)	Cobalt	ASC/3	Radar	No	N/A	BBS	Copper		Centrac	Online
	Entertainment	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
Rancho	Sports Park	Free	Free	Free	Free	Lake Forest	P (TS2 Type 2)	ASC/3	ASC/3	Loops	No	N/A	BBS	Copper		Centrac	Online
	Corridor Plaza	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/3	ASC/3	Hybrid Video/Radar	No	N/A	BBS	Coppe		Centrac	Online
Saddleback Ranch Rd	Fawn Ridge	Free	Free	Free	Free	Lake Forest	P (TS1)	ASC/2	ASC/2	Loops	No	N/A	BBS		GPS Clock		Offline



SECTION FOUR
TRAFFIC SIGNAL SYNCHRONIZATION SYSTEM
AND THREE YEAR PLAN



3-YEAR OUTLOOK TRAFFIC SIGNAL SYNCHRONIZATION

Funding Needs for Synchronized Operation (*Constrained*)

Reporting Jurisdiction Expenditures: **City of Lake Forest**

Type of Traffic Signal Synchronization Expenditures in Year of Expenditure Dollars

MAINTENANCE

PROJECT	FY23/24	FY24/25	FY25/26	TOTAL
Traffic Signal, Communication, and Software Maintenance (Includes Preventative Maintenance)	\$84,000	\$84,000	\$84,000	\$252,000
Subtotal Maintenance	\$84,000	\$84,000	\$84,000	\$252,000

CONSTRUCTION

PROJECT	FY23/24	FY24/25	FY25/26	TOTAL
Lake Forest Drive TSSP	\$151,500	\$151,500	\$0	\$303,000
Alton Pkwy TSSP	\$62,500	\$62,500	\$0	\$125,000
Portola Pkwy/Santa Margarita Pkwy TSSP	\$83,500	\$83,500	\$0	\$167,000
Bake Pkwy and Rockfield Blvd TSSP	\$0	\$144,500	\$144,500	\$289,000
Subtotal Construction	\$297,500	\$442,000	\$144,500	\$884,000

OPERATIONS

PROJECT	FY23/24	FY24/25	FY25/26	TOTAL
Citywide Signal Timing/Operations Monitoring	\$50,000	\$50,000	\$50,000	\$150,000
Subtotal Operations	\$50,000	\$50,000	\$50,000	\$150,000
	\$461,500	\$606,000	\$308,500	\$1,376,000



3-YEAR OUTLOOK TRAFFIC SIGNAL SYNCHRONIZATION

Funding Needs for Synchronized Operation (*Unconstrained*)

Reporting Jurisdiction Expenditures: City of Lake Forest

Type of Traffic Signal Synchronization Expenditures in Year of Expenditure Dollars

MAINTENANCE

PROJECT	FY23/24	FY24/25	FY25/26	TOTAL
Traffic Signal, Communication, and Software Maintenance (Includes Preventative Maintenance)	\$84,000	\$84,000	\$84,000	\$252,000
Subtotal Maintenance	\$84,000	\$84,000	\$84,000	\$252,000

CONSTRUCTION (*City's share of costs*)

PROJECT	FY23/24	FY24/25	FY25/26	TOTAL
Lake Forest Drive TSSP	\$151,500	\$151,500	\$0	\$303,000
Alton Pkwy TSSP	\$62,500	\$62,500	\$0	\$125,000
Portola Pkwy/Santa Margarita Pkwy TSSP	\$83,500	\$83,500	\$0	\$167,000
Bake Pkwy and Rockfield Blvd TSSP	\$0	\$144,500	\$144,500	\$289,000
Muirlands Boulevard TSSP	\$0	\$0	\$88,000	\$88,000
Jeronimo Road TSSP	\$0	\$0	\$66,000	\$66,000
<i>(please see table on next page for details)</i>				
Subtotal Construction	\$297,500	\$442,000	\$298,500	\$1,038,000

OPERATIONS

PROJECT	FY23/24	FY24/25	FY25/26	TOTAL
Citywide Signal Timing/Operations Monitoring	\$80,000	\$80,000	\$80,000	\$240,000
Subtotal Operations	\$80,000	\$80,000	\$80,000	\$240,000
	\$461,500	\$606,000	\$462,500	\$1,530,000



LSSP IMPLEMENTATION – CANDIDATE SIGNAL SYNCHRONIZATION PROJECTS WITH ESTIMATED COSTS

Reporting Jurisdiction Expenditures: City of Lake Forest

Following are corridor improvements, with a summary description and cost, which are considered candidate projects that the City of Lake Forest desires to pursue upon available funding:

CORRIDOR	IMPROVEMENT SUMMARY	ESTIMATED COST
Muirlands Boulevard: Bake Parkway to Los Alisos Boulevard	Upgrade communication equipment and controllers, replace existing cabinets with P44 cabinets, install signal interconnect facilities, install pull boxes and appurtenances, prepare and install timing programs, provide maintenance and support, prepare before and after studies, etc.	\$440,000.00
Jeronimo Road: Bake Parkway to Los Alisos Boulevard	Upgrade communication equipment and controllers, replace existing cabinets with P44 cabinets, install signal interconnect facilities, install pull boxes and appurtenances, prepare and install timing programs, provide maintenance and support, prepare before and after studies, etc.	\$330,000.00
Trabuco Road: Bake Parkway to Cherry Avenue	Upgrade communication equipment and controllers, replace existing cabinets with P44 cabinets, install signal interconnect facilities, install pull boxes and appurtenances, prepare and install timing programs, provide maintenance and support, prepare before and after studies, etc.	\$660,000.00
Glenn Ranch Road: Portola Parkway to El Toro Road	Upgrade communication equipment and controllers, replace existing cabinets with P44 cabinets, install signal interconnect facilities, install pull boxes and appurtenances, prepare and install timing programs, provide maintenance and support, prepare before and after studies, etc.	\$220,000.00
Toledo Way: Bake Parkway to El Toro Road	Upgrade communication equipment and controllers, replace existing cabinets with P44 cabinets, install signal interconnect facilities, install pull boxes and appurtenances, prepare and install timing programs, provide maintenance and support, prepare before and after studies, etc.	\$220,000.00
Ridge Route Drive: Rockfield Boulevard to Trabuco Road	Upgrade communication equipment and controllers, replace existing cabinets with P44 cabinets, install signal interconnect facilities, install pull boxes and appurtenances, prepare and install timing programs, provide maintenance and support, prepare before and after studies, etc.	\$440,000.00
Total Estimated Cost:		\$2,310,000.00



SECTION FIVE

**TRAFFIC SIGNAL SYNCHRONIZATION ASSESSMENT
REVIEW AND REVISE, AS NECESSARY,
THE TIMING OF TRAFFIC SIGNALS**

**Significant timing plan updates and projects
completed FY 2020/2021 through 2022/2023**

**(Periodic refinements performed as part of
routine monthly reviews are not included)**



Corridor Assessment

OCTA's current 2023 Corridor Synchronization Performance Index (CSPI) map for the City of Lake Forest corridors shows the following signal synchronization results:

• Bake Parkway	Tier I (More than 80) CSPI - Very Good
• Barranca Parkway/Muirlands Blvd	Tier IV (50 – 60) CSPI - Below Average
• El Toro Road	Tier III (60.01 – 70) CSPI - Average
• Jeronimo Road	Tier IV (50 – 60) CSPI - Below Average
• Lake Forest Drive	Tier III (60.01 – 70) CSPI - Average
• Los Alisos Boulevard	Tier II (70.01 – 80) CSPI - Good
• Portola Parkway/Santa Margarita Pkwy	Tier III (60.01 – 70) CSPI - Average
• Trabuco Road	Tier III (60.01 – 70) CSPI - Average

The City of Lake Forest recently participated in the following two (2) 'completed' Traffic Signal Synchronization Projects in cooperation with our neighboring cities:

- 1) El Toro Road (administered by OCTA)
- 2) Los Alisos Boulevard (administered by OCTA)

The implemented synchronized corridors now effectively move vehicles between and among the City of Lake Forest and its adjacent jurisdictions with minimum stops and delays (and improved CSPI results). Not only did the corridors benefit through overall synchronization, they were also improved with traffic signal and interconnect equipment upgrades allowing for signal timing efficiencies and optimization of operations.



Specific Corridor Project Assessment

As mentioned, the City of Lake Forest most recently participated in two (2) 'completed' Traffic Signal Synchronization Projects, in cooperation with our neighboring cities. The two completed corridors with specific CSPI results include the following:

<u>El Toro Road:</u>	<u>Before</u>	<u>After</u>
• CSPI score for this corridor (average for <i>PM</i>)	84.0	95.5
<u>Los Alisos Boulevard:</u>	<u>Before</u>	<u>After</u>
• CSPI score for this corridor (average for <i>PM</i>)	76.9	82.5

The El Toro Road CSPI After score represents very good synchronization (Tier I).

The Los Alisos Boulevard CSPI After score represents very good synchronization (Tier I).

The overall corridor results are tabulated in Table 5 (next page).

Table 6 (following) presents the timing revisions information in the requested tabular format.



Priorities, Approach, and System Plan

It is important to note that the City has implemented and maintained corridor-based signal coordination timing through daily traffic signal operations and consultant support services. These on-going services include the Centrac traffic signal management system collecting data on a 24/7 basis, as well as the daily review/monitoring of the collected data via Centrac, especially looking at detector and communication events. These events are immediately forwarded to the City's traffic signal maintenance company for trouble-shooting and repair.

The City strives to move traffic regionally in a safe manner along our corridors, reducing commuter travel times and stops, while minimizing side-street delays that serve our citizens. These support services include daily review of all coordination timing with every city arterial driven bi-monthly. Through these support services, the City assures that the signal timing is maintained on a daily basis, and is periodically evaluated and fine-tuned in response to changing traffic volumes and patterns. The review of other consultants' signal synchronization timing is also included when applicable.

The City's traffic signal system plan includes upgrades to intersections that are currently being run by older controllers that are over fifteen (15) years old and no longer manufactured to the latest Advanced Transportation Controller (ATC) type controllers. The City does desire to continue participating in future Project P corridor projects.



TABLE 5
REGIONAL TRAFFIC SIGNAL SYNCHRONIZATION ASSESSMENT, REVIEW, & REVISIONS

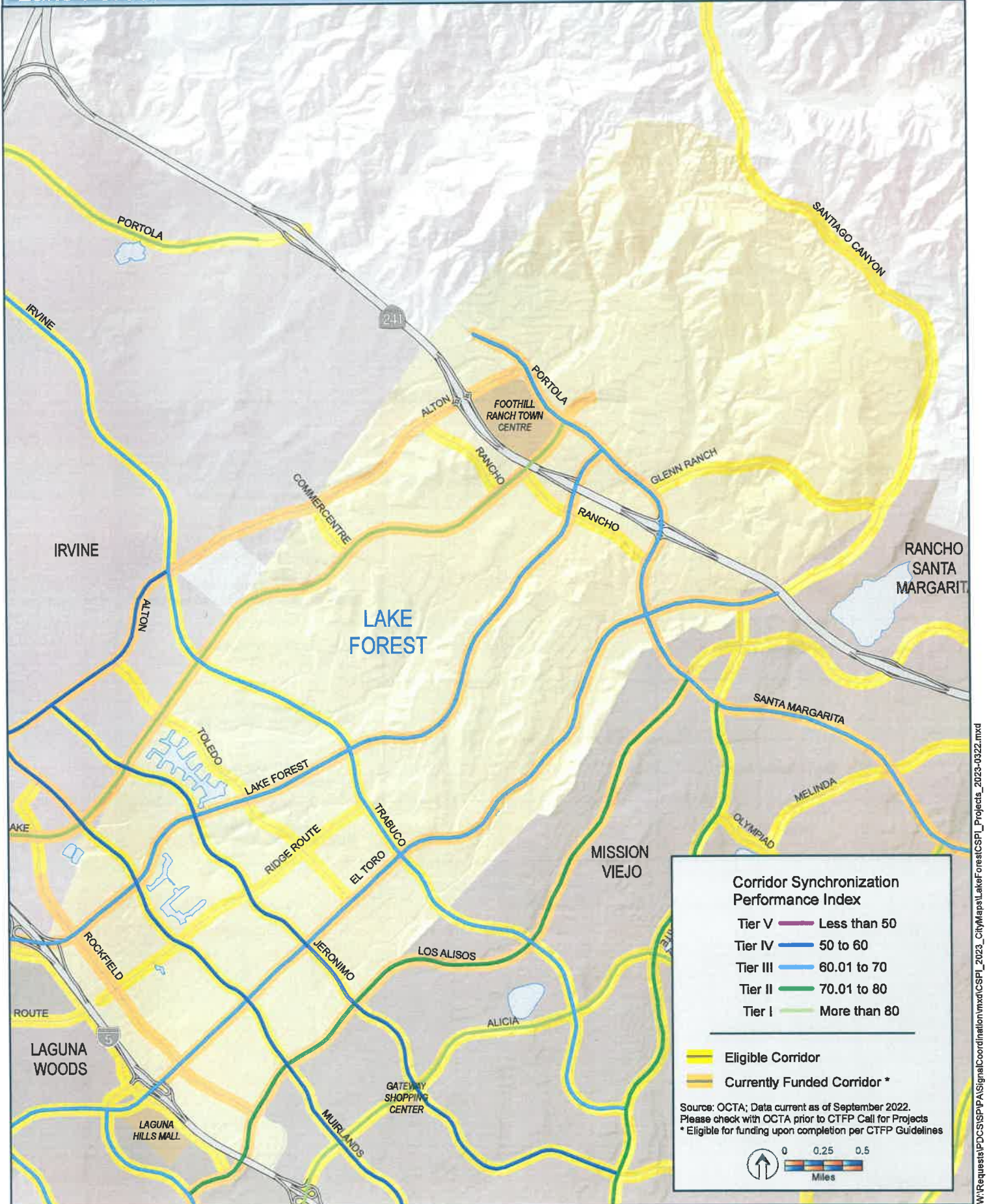
LOCAL AGENCY CORRIDOR	TIMING REVIEWED (Past 3 Years)	DID TIMING REQUIRE AN UPDATE?	TIMING UPDATE RESULTS (if available)							
			Speed Travel		Stops per mile		Greens per red		CSPI Score*	
			Before	After	Before	After	Before	After	Before	After
El Toro Road	Yes	Yes	27.2 (PM)	31.7 (PM)	0.85 (PM)	0.95 (PM)	3.3 (PM)	3.95 (PM)	84.0 (PM)	95.5 (PM)
Los Alisos Boulevard	Yes	Yes	29.5 (PM)	30.8 (PM)	0.95 (PM)	0.9 (PM)	2.15 (PM)	2.55 (PM)	76.9 (PM)	82.5 (PM)
Alton Parkway	<i>Currently Underway</i>	<i>Data Not Yet Available</i>								
Bake Parkway	<i>Currently Underway</i>	<i>Data Not Yet Available</i>								
Lake Forest Drive	<i>Currently Underway</i>	<i>Data Not Yet Available</i>								
Portola Parkway	<i>Currently Underway</i>	<i>Data Not Yet Available</i>								
Rockfield Boulevard	<i>Currently Underway</i>	<i>Data Not Yet Available</i>								



**TABLE 6
SIGNAL TIMING REVISIONS**

PROJECT CORRIDOR	CROSS STREET	CYCLE LENGTH (Before/After)
El Toro Road		Timing was reviewed. At Aliso Park Drive, Northcrest Drive and Normandle Drive, implemented 90-second cycle during the AM peak and 100-second cycle during the PM peak
Muirlands Boulevard		Timing was reviewed. No significant changes warranted.
Jeronimo Road		Timing was reviewed. No significant changes warranted.
Trabuco Road		Timing was reviewed. No significant changes warranted.
Glenn Ranch Road		Timing was reviewed. No significant changes warranted.
Toledo Way		Timing was reviewed. No significant changes warranted.

2023 Corridor Operational Performance Lake Forest



ATTACHMENT A

EL TORO ROAD TRAFFIC SIGNAL SYNCHRONIZATION PROJECT

CORRIDOR SYNCHRONIZATION PERFORMANCE INDEX (CSPI) RESULTS

Table 15: CSPI Summary "Before" and "After" Conditions

Peak Period	EB/ WB	Performance Measures										
		Average Speed		Greens Per Red		Stops Per Mile		CSPI				
		Before	After	Before	After	Before	After	Before		After		Percentage Change
		(mph)	(mph)					Score	Tier	Score	Tier	
AM Peak	EB	28.6	30.6	3.5	3.2	0.8	0.8	88.1	Tier I	88.4	Tier I	0%
	WB	25.6	34.0	2.3	4.6	1.0	0.7	71.7	Tier II	105.2	Tier I	47%
Midday Peak	EB	30.5	34.0	3.6	4.6	0.8	0.7	92.1	Tier I	105.0	Tier I	14%
	WB	31.9	34.0	3.8	4.9	0.7	0.7	93.9	Tier I	108.0	Tier I	15%
PM Peak	EB	28.3	34.0	4.2	4.7	0.7	0.7	94.1	Tier I	104.7	Tier I	11%
	WB	26.1	29.4	2.4	3.2	1.0	0.8	73.8	Tier II	86.3	Tier I	17%
Weekend Peak	EB	28.1	34.0	3.6	5.0	0.8	0.7	88.0	Tier I	109.0	Tier I	24%
	WB	29.1	34.0	4.0	4.9	0.7	0.7	93.5	Tier I	108.2	Tier I	16%

As shown in **Table 15**, the CSPI score improved for all peak periods and direction of travel after implementation of new signal timing plans. All After Condition CSPI scores are above 80, which indicates very good progression. The CSPI score during the Midday and Weekend peaks improved dramatically despite already operating with very good progression prior to this project. The eastbound direction during the weekend peak period has the maximum possible CSPI score and the westbound direction during the weekend peak and westbound direction during the Midday peak are within one point of the maximum possible CSPI score.

ATTACHMENT B

LOS ALISOS BOULEVARD TRAFFIC SIGNAL SYNCHRONIZATION PROJECT

CORRIDOR SYNCHRONIZATION PERFORMANCE INDEX (CSPI) RESULTS

5.4 CSPI Comparison

OCTA developed the Corridor Synchronization Performance Index (CSPI) to compare and prioritize corridors having different characteristics for signal synchronization. The index is obtained from data recorded during 'floating car' runs. A corridor is scored based on recorded travel parameters including average speed, number of greens made vs. number of reds stopped, and stops per mile. The sum of the scores from each of the categories gives the total of the index. A 70 is considered the baseline for good operational performance. CSPI value ranging between 50 to 69 indicates a problem generally fixable with low-cost solutions or signal timing modification. A CSPI below 50 however, indicates a poor corridor performance thereby necessitating larger scale investigation into corridor operations. **Table 5.3** provides the CSPI for 'Before' and 'After' conditions for AM, Midday, PM and Weekend Peak periods.

Table 5.3 - Before - After Study CSPI Comparison for Peak Periods

Study Period		Average Speed (mph)		Greens/Red		Stops/Mile		CSPI Score		CSPI Tier	
		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
AM	Before	32.5	33.8	2.6	3.0	0.8	0.8	86.4	91.9	I	I
	After	35.2	35.2	4.9	3.9	0.6	0.6	108.4	100.2	I	I
	Improvement	8%	4%	88%	30%	25%	25%				
MD	Before	33.2	33.4	2.3	2.5	0.9	0.9	83.6	85.4	I	I
	After	32.3	33.6	3.7	3.5	0.7	0.7	96.1	96.4	I	I
	Improvement	-3%	1%	61%	40%	22%	22%				
PM	Before	29.5	29.4	2.1	2.2	1.0	0.9	76.1	77.6	II	II
	After	30.3	31.3	2.5	2.6	0.9	0.9	81.1	83.9	I	I
	Improvement	3%	6%	19%	18%	10%	0%				
WKND	Before	36.1	32.4	3.5	2.0	0.7	1.0	96.8	79.2	I	II
	After	34.9	33.5	4.5	2.7	0.6	0.8	105.1	88.8	I	I
	Improvement	-3%	3%	29%	35%	14%	20%				

From **Table 5.3**, it is evident that the CSPI score improved for both directions during all peak periods after implementation of the new timing plans at the intersections along Los Alisos Boulevard Route. All scenarios resulted in CSPI Tier I.

5.5 Fuel Consumption and Emissions

Additional MOEs analyzed were fuel consumption and emission production. These parameters were calculated using three different methodologies via add-on modules to Tru-Traffic software.