CVAG
Regional Traffic Signal Synchronization Program
OPTIMIZING MOBILITY

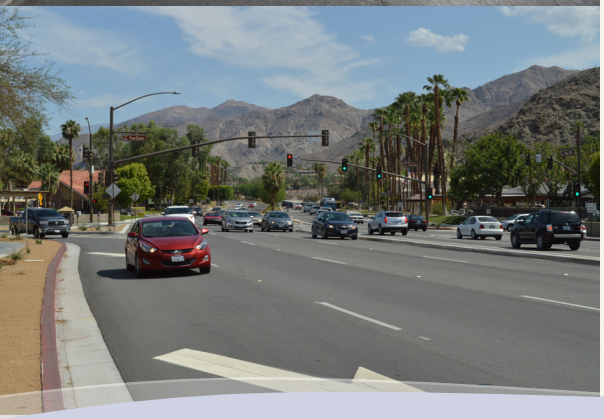
COACHELLA VALLEY ASSOCIATION OF GOVERNMENTS (CVAG)
REGIONAL TRAFFIC SIGNAL SYNCHRONIZATION PROJECT

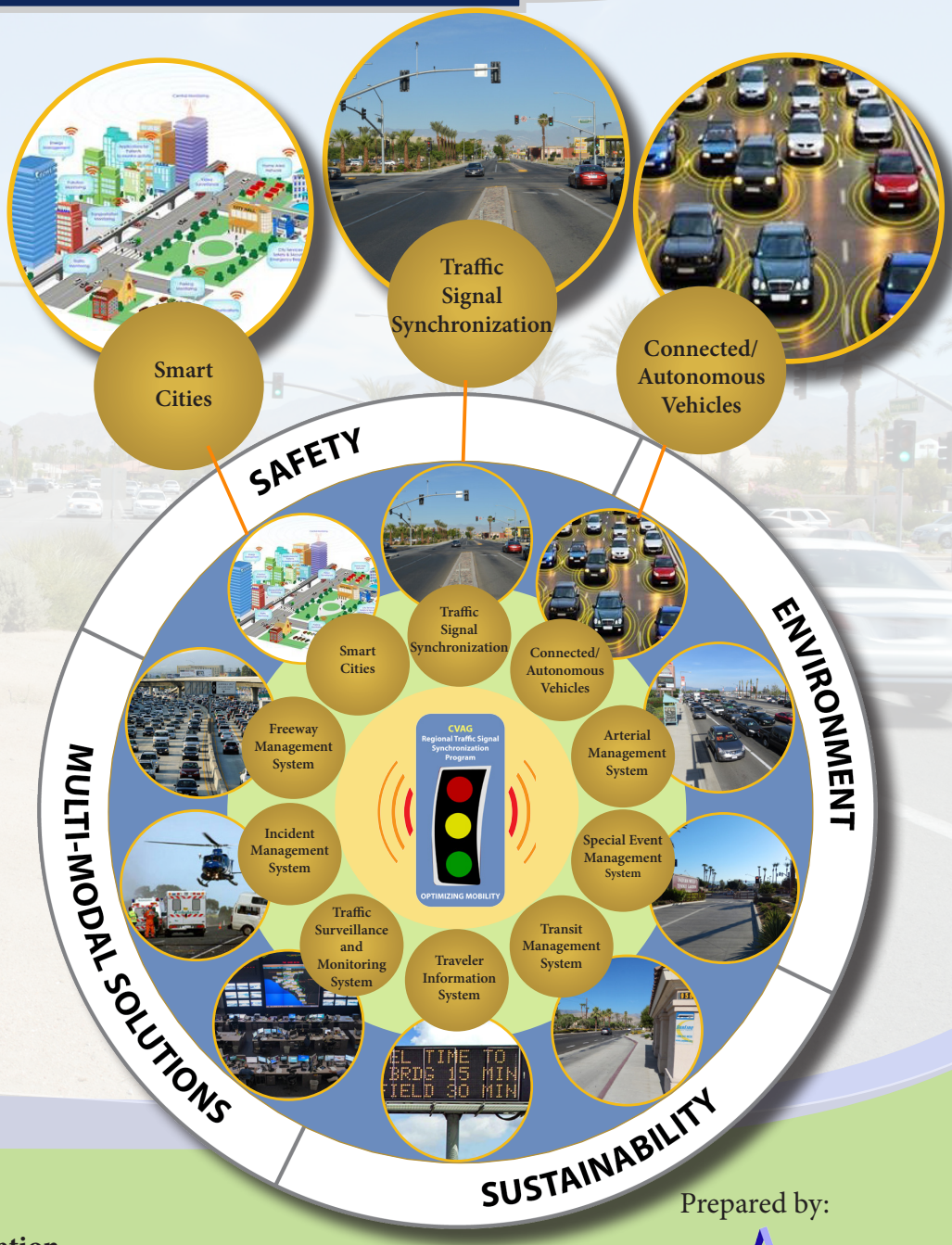
TRAFFIC SIGNAL INTERCONNECT MASTER PLAN

EXISTING SYSTEM INVENTORY AND EVALUATION









Prepared for:

Coachella Valley Association of Governments

CVAG

Prepared by:

ADVANTEC
Consulting Engineers

COACHELLA VALLEY ASSOCIATION OF GOVERNMENTS (CVAG)

REGIONAL TRAFFIC SIGNAL SYNCHRONIZATION PROJECT

TRAFFIC SIGNAL INTERCONNECT MASTER PLAN

Existing System Inventory and Evaluation



Prepared for:

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Prepared by:

ADVANTEC Consulting Engineers

1200 Roosevelt
Irvine, CA 92620

January 11, 2017

COACHELLA VALLEY ASSOCIATION OF GOVERNMENTS (CVAG)

REGIONAL TRAFFIC SIGNAL SYNCHRONIZATION PROJECT

TRAFFIC SIGNAL INTERCONNECT MASTER PLAN

Existing System Inventory and Evaluation

Prepared by:

ADVANTEC Consulting Engineers

Under the Supervision of:

_____Date: _____

Carlos A. Ortiz, P.E., T.E., P.T.O.E.

January 11, 2017



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- A1.6 - La Quinta
- A1.7 - Palm Desert
- A1.8 - Palm Springs
- A1.9 - Rancho Mirage
- A1.10 - Caltrans
- A1.11 - County of Riverside

Appendix B: Intersection Field Survey Checklist Forms

- B1.1 – Controller Cabinet and Intersection Field Survey Checklist
- B1.2 – Signal Timing Field Survey Sheet

REVISION HISTORY

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PROJECT WEBSITE

An electronic copy of this report can be found at: http://cvag-regionaltssp.com/

ACKNOWLEDGMENTS

CVAG:

Eric Cowle, Project Manager
Martin Magana, Director of Transportation
Tom Kirk, Executive Director

Project Stakeholders:

Bill Simons, City of Cathedral City
John Corella, City of Cathedral City
Jonathan Hoy, City of Coachella
Oscar Espinoza, City of Coachella
Daniel Porras, City of Desert Hot Springs
Timothy Jonasson, City of La Quinta
Edward Wimmer, City of La Quinta
Nazir Lalani, City of La Quinta
Kris Gunterson, City of La Quinta
Bondie Baker, City of Indian Wells
Ken Seumalo, City of Indian Wells
Tim Wassil, City of Indio
Tom Brohard, City of Indio
Mark Greenwood, City of Palm Desert
Mark Diercks, City of Palm Desert
Marcus Fuller, City of Palm Springs
Gianfranco Laurie, City of Palm Springs
Mark Sambito, City of Rancho Mirage
Lawrence Tai, County of Riverside
Dowling Tsai, County of Riverside
Tony Sarmiento, Caltrans District 8
Sergio Perez, Caltrans District 8

ADVANTEC Consulting, Inc (ADVANTEC):

Carlos Ortiz, Consultant Project Manager
Leo Lee, Consultant Project Director
John Dorado
Mark Esposito
Jose Guedes
Alfredo Cabrera
John Cox
Nader Alqam
Calvin Hansen
Ryan Miller

LIST OF ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ARTIC	Anaheim Regional Transportation Intermodal Center
ATC	Advanced Transportation Controller
ATMS	Advanced Traffic Management System
C2C	Center-to-Center communications
C2F	Center-to-Field communications
CAD	Computer Aided Dispatch
Caltrans	California State Department of Transportation
CCTV	Closed-Circuit Television
CMS	Changeable Message Sign
DOT	Department of Transportation
DSRC	Dedicated Short Range Communication
EAS	Ethernet Access Switch
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
ICM	Integrated Corridor Management
IP	Internet Protocol
IT	Information Technology
IoT	Internet of Things
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
MAP-21	Moving Ahead for Progress in the 21st Century Act
MOU	Memorandum of Understanding
MPAH	Master Plan of Arterial Highways
NEMA	National Electrical Manufacturers Association
NTCIP	National Transportation Communications for ITS Protocol
SDP	Strategic Deployment Plan
SR	State Route
TLSC	Traffic Light Synchronization Program
TMC	Traffic Management Center
TMS	Traffic Management System
TSS	Traffic Signal Synchronization
V2I	Connected Vehicle to Infrastructure
V2V	Connected Vehicle to Vehicle
VMS	Video Management System

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1-1. INTRODUCTION

This section of The Regional Traffic Signal Interconnect (TSI) Master Plan is a comprehensive planning and "living" document that establishes our foundation and implements best practices and processes in order to achieve the region's goals and objectives. The purpose of this section is to provide an inventory and evaluation of existing traffic signal systems, Intelligent Transportation Systems (ITS), traffic management systems (TMS), communications, and synchronized corridors of the participating agencies within the Coachella Valley's regional arterial network for the Regional Traffic Signal Synchronization Project. This information will be used to develop our baseline conditions in order to provide recommended improvements and prioritize improvements on a per agency per corridor basis.

ADVANTEC conducted the existing system inventory and evaluation from the data collection provided by each agency, and performed a detailed field review at every signalized intersection and traffic operations center at each agency.

The follow sections summarize the project area, project traffic signals, and regional arterial network including a detailed inventory and evaluation of each agencies traffic management systems, ITS field elements and communication systems.

1-1.1. Project Area

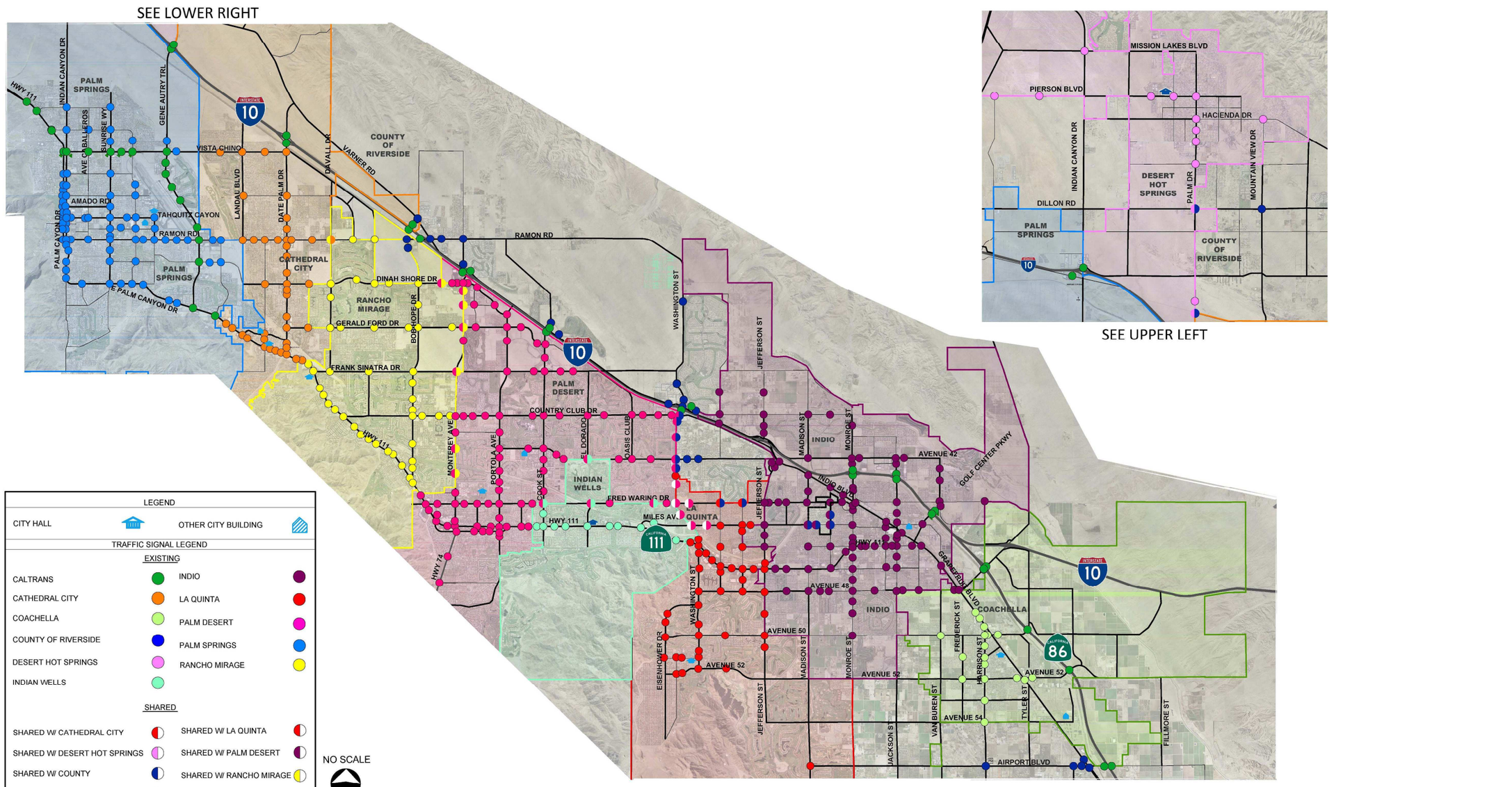
The project area consists of the regional arterial roadway network identified by CVAG within the Coachella Valley. It consists of the following local agencies, County and State:

- City of Cathedral City
- City of Coachella
- City of Desert Hot Springs
- City of Indian Wells
- City of Indio
- City of La Quinta
- City of Palm Desert
- City of Palm Springs
- City of Rancho Mirage
- Caltrans District 8
- County of Riverside

Figure 1.1 illustrates the **existing regional arterial roadway network and project intersection locations** within the study area.

Existing System Inventory and Evaluation

Figure 1.1 Existing Regional Arterial Network and Project Intersections



EXISTING CONDITIONS

PROJECT TRAFFIC SIGNAL LOCATIONS

1-1.2. Regional Arterial Roadway Network

Table 1.1 summarizes the Coachella Valley's regional arterial roadway network including the roadway/highway name, roadway classification, roadway limits and jurisdictions the roadway passes through. The roadway classification for the limits of each roadway segment is based on the County of Riverside's General Plan Circulation Element dated December 2015. The County's General Plan for the Coachella Valley is divided into two separate sections: The Western Coachella Valley Area Plan and the Eastern Coachella Valley Area Plan.

Table 1.1 Regional Arterial Roadway Network

No.	Roadway/ Highway	Roadway Classification	Limits	Jurisdictions
1	Interstate 10 (I-10)	Freeway	East and west through the Coachella Valley	Cathedral City, Coachella, Desert Hot Springs, Indio, Palm Desert, Palm Springs, Rancho Mirage, Caltrans District 8, County of Riverside
2	State Route 86 (SR-86)	Freeway	I-10 to the south of Coachella Valley	Coachella, County of Riverside, Caltrans District 8
3	State Route 111 (SR-111)	Expressway	I-10 to the east into Palm Springs at Gateway Drive	Palm Springs, County of Riverside
4	Palm Canyon Dr	Major	Gateway Drive to Golf Club Dr	Palm Springs
5	Palm Canyon Dr/Highway 111	Urban Arterial	Golf Club Dr to Clinton St/Dr Carreon Blvd	Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, La Quinta, Indio
6	Highway 111	Arterial	Clinton St/Dr Carreon Blvd to Rubidoux St	Indio
		Secondary	Rubidoux St to Indio Center Dr	Indio
7	State Route 62 (SR-62)	Expressway	I-10 to the north through Coachella Valley	Desert Hot Springs, Caltrans District 8, County of Riverside
8	Indian Canyon Dr/Indian Ave	Arterial	Sunrise Wy to SR-62	Desert Hot Springs, Palm Springs, Caltrans District 8, County of Riverside
9	Indian Canyon Dr	Major	Palm Canyon Dr to Sunrise Wy	Palm Springs
10	Worsley Rd	Major	20th Avenue to Mission Creek Rd	Desert Hot Springs, County of Riverside
11	Mission Lakes Blvd	Major	Worsley Rd to Palm Dr	Desert Hot Springs, County of Riverside

No.	Roadway/ Highway	Roadway Classification	Limits	Jurisdictions
12	Mission Creek Rd	Major	SR-62 to Worsley Rd	Desert Hot Springs, Caltrans District 8, County of Riverside
13	Pierson Blvd	Arterial	SR-62 to Karen Ave	Desert Hot Springs, Caltrans District 8, County of Riverside
		Major	Karen Ave to Miracle Hill Rd	Desert Hot Springs, County of Riverside
14	Hacienda Ave	Major	Indian Ave to Palm Dr	Desert Hot Springs, County of Riverside
		Secondary	Palm Dr to Long Canyon Rd	Desert Hot Springs
15	Dillon Rd	Arterial	SR-62 to Avenue 44	Desert Hot Springs, Indio, Caltrans District 8, County of Riverside
		Arterial	Avenue 44 to Cabazon Rd	Coachella, Caltrans District 8
		Secondary	Cabazon Rd to Avenue 48	Coachella, Caltrans District 8
16	Palm Dr	Arterial	I-10 to Dillon Road, Camino Aventura to Two Bunch Palm Trl	Desert Hot Springs, Palm Springs, Caltrans District 8, County of Riverside
		Major	Dillon Road to Camino Aventura, Two Bunch Palm Trl to Mission Lakes Blvd	Desert Hot Springs, County of Riverside
17	Varner Rd	Arterial	Palm Dr to Ramon Rd	Cathedral City, Desert Hot Springs, County of Riverside
		Secondary	Ramon Rd to Cook St	Caltrans District 8, County of Riverside
		Major	Cook St to Adams St	Indio, Caltrans District 8, County of Riverside
		Secondary	Adams St to Jefferson St	Indio
18	Varner Rd/Avenue 42	Arterial	Jefferson St to E/O Monroe St	Indio
19	Avenue 42	Urban Arterial	E/O Monroe St to Jackson St	Indio
		Arterial	Jackson St to Golf Center Pkwy	Indio
20	Little Morongo Rd	Major	20th Avenue to 14th Ave	Desert Hot Springs, County of Riverside
		Urban Arterial	14th Avenue to August Ave	Desert Hot Springs, County of Riverside
21	Mountain View Rd	Arterial	Varner Rd to Brunner Ln	Cathedral City, County of Riverside
		Secondary	Brunner Ln to Hacienda Ave	Desert Hot Springs

No.	Roadway/ Highway	Roadway Classification	Limits	Jurisdictions
22	Long Canyon Rd	Major	20th Avenue to Hacienda Ave	County of Riverside
23	20th Ave	Major	Indian Canyon Dr to Bennet Rd	Desert Hot Springs, Palm Springs, Caltrans District 8, County of Riverside
24	Bennet Rd	Arterial	20th Avenue to Hacienda Ave	County of Riverside
25	Vista Chino	Arterial	Palm Canyon Dr to Palm Springs City Limits (E/O Clubhouse View Dr)	Palm Springs, Caltrans District 8
		Urban Arterial	Palm Springs City Limits (E/O Clubhouse View Dr) to Date Palm Dr	Cathedral City, Caltrans District 8
26	Tahquitz Canyon Wy	Major	Palm Canyon Dr to El Cielo Rd	Palm Springs
27	Amado Rd	Major	Palm Canyon Dr to Sunrise Wy	Palm Springs
28	El Paseo	Arterial	Hwy 111 to Cabrillo Ave	Palm Desert
29	Ramon Rd	Major	Palm Canyon Dr to Sunrise Wy	Palm Springs
		Arterial	Sunrise Wy to Gene Autry Trl	Palm Springs
		Urban Arterial	Gene Autry Trl to Bob Hope Dr	Cathedral City, Palm Springs, Rancho Mirage, County of Riverside
		Arterial	Bob Hope Dr to Washington St	Palm Springs, Caltrans District 8, County of Riverside
30	Sunrise Wy	Major	Palm Canyon Dr to San Rafael Dr	Palm Springs
31	El Cielo Rd	Major	Ramon Rd to Tahquitz Canyon Wy	Palm Springs
32	Gene Autry Trl	Major	Palm Canyon Dr to Ramon Rd	Palm Springs
		Arterial	Ramon Rd to Vista Chino	Palm Springs
		Major	Vista Chino to I-10	Palm Springs, Caltrans District 8
33	Landau Blvd	Major	Ramon Rd to Verona Rd (N/O Vista Chino)	Cathedral City
34	Dinah Shore Dr	Urban Arterial	Cathedral Canyon Dr to Plumley Rd	Cathedral City, Rancho Mirage
		Arterial	Plumley Rd to Los Alamos Rd	Rancho Mirage
		Urban Arterial	Los Alamos Rd to Monterey Ave	Palm Desert, Rancho Mirage
		Arterial	Monterey Ave to Portola Ave	Palm Desert
35	Perez Rd	Major	Palm Canyon Dr to Date Palm Dr	Cathedral City

No.	Roadway/ Highway	Roadway Classification	Limits	Jurisdictions
36	Gerald Ford Dr	Major	Date Palm Dr to Plumley Rd	Cathedral City
		Arterial	Plumley Rd to Cook St	Palm Desert, Rancho Mirage
		Secondary	Cook St to Frank Sinatra Dr	Palm Desert
37	Frank Sinatra Dr	Arterial	Highway 111 to Monterey Ave	Rancho Mirage
		Urban Arterial	Monterey Ave to El Dorado Dr	Palm Desert
38	Tamerisk Row Dr	Major	El Dorado Dr to Hovley Ln	Palm Desert
39	Date Palm Dr	Urban Arterial	Palm Canyon Dr to Varner Rd	Cathedral City
40	Da Vall Dr	Arterial	Frank Sinatra Dr to 30th Ave (N/O Ramon Rd)	Cathedral City, Rancho Mirage
41	Morningside Dr	Major	Country Club Dr to Frank Sinatra Dr	Rancho Mirage
42	Bob Hope Dr	Arterial	Highway 111 to Frank Sinatra Dr	Rancho Mirage
		Urban Arterial	Frank Sinatra Dr to Varner Rd	Rancho Mirage, County of Riverside
43	Highway 74 (Pines to Palms Highway)	Arterial	Palm Desert City Limits South to Highway 111	Palm Desert
44	Monterey Ave	Urban Arterial	Highway 111 to Varner Rd	Palm Desert, Rancho Mirage, County of Riverside
		Major	Varner Rd to Ramon Rd	County of Riverside
45	Country Club Dr	Major	Highway 111 to Bob Hope Dr	Rancho Mirage
		Arterial	Bob Hope Dr to Monterey Ave	Rancho Mirage
		Urban Arterial	Monterey Ave to Washington St	Palm Desert
		Major	Washington St to Avenue 42	Indio, County of Riverside
46	Fred Waring Dr	Arterial	Painters Path to Highway 111	Palm Desert
		Urban Arterial	Highway 111 to Jefferson St	Indian Wells, La Quinta, Palm Desert
		Arterial	Jefferson St to Indio Blvd	Indio
47	Mesa View Dr	Major	Highway 74 (Pines to Palms Highway) to Portola Ave	Palm Desert
48	Portola Ave	Major	Mesa View Dr to Haystack Rd	Palm Desert
		Arterial	Haystack Rd to Magnesia Falls Dr	Indian Wells, Palm Desert

No.	Roadway/ Highway	Roadway Classification	Limits	Jurisdictions
		Urban Arterial	Magnesia Falls Dr to Dinah Shore Dr	Palm Desert
49	San Pablo Ave	Arterial	Highway 111 to Fred Waring Dr	Palm Desert
50	Deep Canyon Rd	Major	Highway 111 to Fred Waring Dr	Palm Desert
51	Cook St	Major	Fairway Dr to Fred Waring Dr	Indian Wells, Palm Desert
		Urban Arterial	Fred Waring Dr to Varner Rd	Palm Desert, County of Riverside
		Arterial	Varner Rd to Ramon Rd	County of Riverside
52	El Dorado Dr	Arterial	Fairway Dr to Fred Waring Dr	Indian Wells, Palm Desert
		Arterial	Hovley Ln to Frank Sinatra Dr	Indian Wells, Palm Desert
53	Hovley Ln	Arterial	Portola Ave to Washington St	Indian Wells, Palm Desert
54	Avenue 42	Major	Washington St to Glass Dr	County of Riverside
		Secondary	Glass Dr to Burr St	Indio
55	Miles Ave	Major	Highway 111 to Washington St	Indian Wells
		Arterial	Washington St to Madison St	Palm Desert
56	Washington St	Urban Arterial	Avenue 52 to Avenue 38	La Quinta, Palm Desert, County of Riverside
		Arterial	Avenue 38 to Ramon Rd	County of Riverside
57	Jefferson St	Urban Arterial	Avenue 54 to Indio Blvd	Indio, La Quinta
		Arterial	I-10 to Avenue 40	Indio
58	Madison St	Arterial	Avenue 62 to Avenue 48	Indio, La Quinta
59	Monroe	Secondary	Avenue 52 to Avenue 44	Indio
		Urban Arterial	Avenue 44 to Avenue 42	Indio
		Arterial	Avenue 42 to Avenue 40	Indio
60	Jackson St	Secondary	Avenue 52 to Highway 111	Indio
		Arterial	Highway 111 to Avenue 45	Indio
		Secondary	Avenue 45 to Avenue 44	Indio
		Urban Arterial	Avenue 44 to Avenue 42	Indio

No.	Roadway/ Highway	Roadway Classification	Limits	Jurisdictions
		Secondary	Avenue 42 to Avenue 41	Indio
61	Indio Blvd	Arterial	I-10 (W/O Jefferson St) to Van Buren St	Indio
62	Grapefruit Blvd (Highway 111)	Arterial	Van Buren St to Dillon Rd	Indio
		Expressway	Dillon Rd to Harrison St	Coachella
		Arterial	Harrison St to Coachella City limits	Coachella
63	Eisenhower Dr	Arterial	Avenida Bermudas to Washington St	La Quinta
64	Adams St	Arterial	Avenue 48 to Highway 111	La Quinta
65	Dune Palms Rd	Arterial	Avenue 48 to Highway 111	La Quinta
66	Avenue 48	Arterial	Washington St to Madison St	Indio, La Quinta
		Secondary	Madison St to Oasis St	Indio
		Arterial	Oasis St to Dillon Rd	Coachella, Indio
67	Avenue 50	Arterial	Eisenhower Dr to Jefferson St	La Quinta
		Major	Jefferson St to Madison St	Indio
		Secondary	Madison St to Jackson St	Indio
		Arterial	Jackson St to Harrison St	Coachella, County of Riverside
		Urban Arterial	Harrison St to Filmore St	Coachella
68	Tyler St	Arterial	Avenue 54 to Grapefruit Blvd (Highway 111)	Coachella
		Urban Arterial	Avenue 50 to I-10	Coachella
69	Polk St	Urban Arterial	Avenue 50 to Avenue 48	Coachella
70	Avenue 51	Major	Van Buren St to Harrison St	Coachella
71	Avenue 52	Arterial	Eisenhower Dr to Washington St	La Quinta
		Urban Arterial	Washington St to Jefferson St	La Quinta
		Arterial	Jefferson St to Jackson St	Indio, La Quinta
		Urban Arterial	Jackson St to Grapefruit Blvd (Highway 111)	Coachella, Indio, County of Riverside
		Expressway	Grapefruit Blvd (Highway 111) to SR-86	Coachella
		Urban Arterial	SR-86 to Pierce St	Coachella
72	Avenue 53	Major	Van Buren St to Tyler St	Coachella

No.	Roadway/ Highway	Roadway Classification	Limits	Jurisdictions
73	Avenue 54	Urban Arterial	Van Buren St to Grapefruit Blvd (Highway 111)	Coachella
		Major	Grapefruit Blvd (Highway 111) to Fillmore St	Coachella
74	Van Buren St	Major	Avenue 54 to Avenue 48	Coachella
75	Frederick St	Major	Avenue 54 to Avenue 50	Coachella
76	Harrison St	Expressway	Avenue 54 to Grapefruit Blvd (Highway 111)	Coachella
77	Golf Center Pkwy	Arterial	Highway 111 to Avenue 42	Indio
78	Airport Blvd	Arterial	Madison St to W/O Van Buren St	La Quinta, Coachella
		Urban Arterial	W/O Van Buren to Grapefruit Blvd	Coachella, County of Riverside
		Major	Grapefruit Blvd to Fillmore St	Coachella, County of Riverside

As shown in **Table 1.1**, there are **78 corridors** within the project area and are the primary candidates for traffic signal equipment/Ethernet/IP-based communications/ITS elements/equipment installation and/or upgrades, and traffic signal synchronization. The majority of these corridors are classified as Expressways, Arterials, Urban Arterials, and Major roadway per the County of Riverside's General Plan Circulation Element dated December 2015. The Secondary Roadways that are provided in this list are extensions of roadways mentioned.

Table 1.2 summarizes the roadways that are classified as Secondary Roadways within the Coachella Valley's regional arterial roadway network per the County of Riverside's General Plan Circulation Element dated December 2015. This list is provided in order to balance the number of candidate corridors per agency for traffic signal equipment/Ethernet/IP-based communications/ITS elements/ equipment installation and/or upgrades, and traffic signal synchronization. It should be noted that the cities of Desert Hot Springs and Indio have far less Major and/or Arterial roadways within their jurisdictions. Therefore, these corridors will be considered as candidates for traffic signal equipment/Ethernet communication/ ITS elements/ equipment installation and/or upgrades, and traffic signal synchronization in addition to the Major and Arterial roadways identified in **Table 1.1**.

Table 1.2 Regional Arterial Roadway Network – Secondary Roadways

No.	Arterial Roadway	Roadway Classification	Limits	Jurisdictions
1	Desert View Ave	Secondary	Cholla Dr to Miracle Hill Rd	Desert Hot Springs
2	West Dr	Secondary	Mission Lakes to Two Bunch Palms Trl	Desert Hot Springs
3	Cactus Dr	Secondary	Hacienda Ave to Two Bunch Palms Trl	Desert Hot Springs

No.	Arterial Roadway	Roadway Classification	Limits	Jurisdictions
4	Cholla Dr	Secondary	Desert View Ave to Hacienda Ave	Desert Hot Springs
5	Verbena Dr	Secondary	Pierson Blvd to Two Bunch Palms Trl	Desert Hot Springs
6	Two Bunch Palms Trl	Secondary	Little Morongo to Verbena Dr	Desert Hot Springs
7	15th Ave	Secondary	Little Morongo to Long Canyon Rd	Desert Hot Springs
8	Miracle Hill Rd	Secondary	Pierson Blvd to Two Bunch Palms Trl	Desert Hot Springs
9	Bubbling Wells Dr	Secondary	Dillon Dr to 20th Ave	Desert Hot Springs
10	Avenida Manzana	Secondary	15th Ave to 18th Ave	Desert Hot Springs
11	San Rafael Rd	Secondary	E Palm Canyon Dr to Sunrise Wy	Palm Springs
12	Racquet Club Rd	Secondary	E Palm Canyon Dr to Farrell	Palm Springs
13	Tamarisk Rd	Secondary	Indian Canyon Dr to Farrell	Palm Springs
14	Arenas Rd	Secondary	Tahquitz Dr to Calle El Segundo	Palm Springs
15	Baristo Rd	Secondary	Avenida Caballeros to El Cielo Rd	Palm Springs
16	Mesquite Ave	Secondary	Sunrise Wy to El Cielo Rd	Palm Springs
	Mesquite Ave	Secondary	El Cielo to Gene Autry Trl	Palm Springs
17	Avenida Caballeros	Secondary	San Rafael Dr to Ramon Rd	Palm Springs
18	Farrell Dr	Secondary	Racquet Club Dr to E Palm Canyon Dr	Palm Springs
19	El Cielo Rd	Secondary	Aviation Rd to Tahquitz Canyon, Ramon Rd to Escoba Dr	Palm Springs
20	Crossley Rd	Secondary	Ramon Rd to E Palm Canyon Dr	Palm Springs
21	Cathedral Canyon Dr	Secondary	Ramon Rd to Terrace Rd	Cathedral City
22	Terrace Rd	Secondary	Paradise Wy to Cathedral Canyon Dr	Cathedral City
23	30th Ave	Secondary	Landau Blvd to Da Vall Dr	Cathedral City
24	Dick Kelly Dr	Secondary	Monterey Ave to Dinah Shore Dr	Palm Desert
25	Gateway Dr	Secondary	Dinah Shore Dr to Gerald Ford	Palm Desert
26	Haystack Rd	Secondary	Highway 74 to Portola Ave	Palm Desert
27	Calle Tampico	Secondary	Eisenhower Dr to Washington St	Indio
28	Avenida Bermudas	Secondary	Calle Tampico to Eisenhower Dr	Indio
29	Avenue 43	Secondary	Adams St to Madison St	Indio
30	Avenue 40	Secondary	Adams St to Monroe St	Indio
31	Avenue 41	Secondary	Monroe St to Jackson St	Indio
32	Gore St	Secondary	Avenue 41 to Showcase Pkwy	Indio
33	Showcase Pkwy	Secondary	Gore St to Jackson St	Indio

No.	Arterial Roadway	Roadway Classification	Limits	Jurisdictions
34	Avenue 44	Secondary	Monroe St to Dillon Rd	Indio
35	Clinton St	Secondary	Indio Blvd to Highway 111	Indio
36	Dr Carreon Blvd	Secondary	Highway 111 to Calhoun St	Indio
37	Avenue 48	Secondary	Madison St to Oasis St	Indio
38	Avenue 50	Secondary	Madison St to Jackson St	Indio
39	Oasis St	Secondary	Indio Blvd to Avenue 48	Indio
40	Calhoun St	Secondary	Highway 111 to Avenue 48	Indio
41	Avenue 45/ Van Buren St	Secondary	Jackson St to Dillon St	Indio
42	Alejo Rd	Secondary	Palm Canyon Dr to Farrell Dr	Palm Springs

As shown in **Table 1.2**, there are **42 corridors** that will be included in this project and are the secondary candidates for traffic signal equipment/Ethernet/IP-based communications/ITS elements/equipment installation and/or upgrades, and traffic signal synchronization.

1-1.3. Project Traffic Signals

Table 1.3 summarizes the number of project traffic signals for each agency located on CVAG's regional arterial roadway network, and the total number to traffic signals per local agency.

Table 1.3 Project Traffic Signals

No.	City / Agency	No. of Existing Project Signalized Intersections	No. of Proposed Signalized Intersections (As of 2017)
1	Cathedral City	41	
2	Coachella	21	5
3	Desert Hot Springs	13	
4	Indian Wells	12	
5	Indio	100	
6	La Quinta	54	
7	Palm Desert	108	
8	Palm Springs	84	
9	Rancho Mirage	45	
10	Caltrans District 8	51	
11	County of Riverside	28	
	Total	**557**	**5**

These signalized intersections are candidates for traffic signal equipment/Ethernet/IP-based communications/ ITS elements/ equipment installation and/or upgrades, and traffic signal synchronization for the Regional Traffic Signal Synchronization Project.

1-1.4. Existing Regional Traffic Management System, ITS Field Elements & Communication Systems

The types of traffic management systems (TMS) within the Coachella Valley vary from agency to agency. The current TMS manufacturers that serve the local agencies within the Coachella Valley include McCain, Econolite and Transcore. Each partner agency in the Coachella Valley agency owns, operates, and maintains their respective TMS and traffic signals with exception of traffic signals located at city boundaries. In these cases, one agency may own the traffic signal while the other agency operates and maintains it; these are considered as being "shared" traffic signals. Caltrans has developed their own Advanced Traffic Management System (ATMS) that allows monitoring and control of their traffic monitoring stations, ramp metering systems, and closed circuit television (CCTV). Their existing TMS that was developed in-house called CTNET, and their new TMS called TransSuite, which is manufactured by TransCore. Caltrans is currently in transition of migrating all of their traffic signals to the new TMS.

The types of communication systems within the Coachella Valley also vary from agency to agency as well. The current types of communications include fiber optic cable, twisted-pair/hardwired signal interconnect cable (SIC), Ethernet-over-copper, wireless radio communication, wireless broadband, leased line/dial-up, cellular modem and various Ethernet IP based communications. The purpose of these communications is to connect the local traffic signal intersections to a central system, and from the central TMS to all roadside ITS field elements, which includes traffic signal controllers, video detection cameras, close circuit television (CCTV) cameras, arterial management systems, etc.

Table 1.4 summarizes the **type of traffic management systems, traffic signal controller hardware and software types, ITS field elements, and communication system types** per agency within the Coachella Valley.

Existing System Inventory and Evaluation

Table 1.4 Regional Traffic Management Systems, ITS Field Elements & Communication Systems

No.	City / Agency	Type of TMS		Traffic Management System						Traffic Signal Controller Type							Local Traffic Signal Controller Software								Exist TMC	ITS Elements				Communication System			
		Centralized	Distributed with Masters	McCain Transparity	McCain QuicNet	McCain QuicNet Pro 2	Econolite Aries	Econolite Centracs	TransCore TransSuite	170/170E	170 ATC	2070	Econolite ASC/2	Econolite ASC/3	Econolite Cobalt	Traconex	McCain Program 2033	McCain BI Tran 233	McCain BI Tran 200	Econolite ASC/2	Econolite ASC/3	Econolite Cobalt	CTNET	Traconex		EVP	CCTV System	Weather Monitoring	Video Detection	Telephone	Twisted Pair/ Hardwired	Fiber Optic	Wireless
1	Cathedral City		✓							✓	✓					✓		✓						✓		✓			✓		✓		✓
2	Coachella		✓	✓	✓					✓		✓					✓		✓							✓			✓		✓		
3	Desert Hot Springs		✓							✓			✓	✓					✓	✓	✓					✓			✓		✓		✓
4	Indian Wells	✓					✓						✓	✓						✓	✓					✓			✓	✓	✓		
5	Indio	✓			✓					✓								✓								✓			✓		✓		✓
6	La Quinta	✓					✓						✓	✓	✓				✓	✓	✓				✓	✓			✓		✓		✓
7	Palm Desert	✓					✓						✓	✓	✓					✓	✓	✓			✓	✓			✓	✓	✓	✓	✓
8	Palm Springs	✓				✓				✓									✓						✓	✓	✓	✓	✓		✓		✓
9	Rancho Mirage	✓					✓						✓	✓	✓					✓	✓	✓				✓			✓	✓	✓		✓
10	Caltrans District 8	✓							✓	✓		✓											✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
11	County of Riverside		✓							✓								✓	✓							✓			✓		✓		

1-1.5. Existing Synchronized Corridors/Corridors with Time of Day Plans

The purpose of this section to provide an overall understanding of the existing synchronized corridors and corridors that currently have time of day plans (TOD) throughout the Coachella Valley. This information was either provided by agency staff or from the traffic signal timing plans provided by each agency. This information will be used to develop our baseline conditions for the candidate corridors to be synchronized using current traffic patterns and conditions. It should be noted that just because an agency has time of day plans it does not mean that the corridors have been synchronized optimally or that they are up to date to meet current multimodal traffic demands and/or standards. Based on our review of the signal timing plans, some timing plans were updated over 10 years ago.

Table 1.5 summarizes each agency, corridor, and the corridor limits that are currently synchronized and/or have time of day plans.

Table 1.5 Existing Synchronized Corridors/Corridors with Time of Day Plans

No.	City / Agency	Corridor	Corridor Limits
1	Cathedral City	Date Palm Dr	Palm Canyon Dr to 30th Ave
		Palm Canyon Dr	Within City limits
2	Coachella	*Grapefruit Blvd	Park Ln to Avenue 49
		*Harrison St	Avenue 54 to Park Ln
3	Desert Hot Springs	Palm Dr	Two Bunch Palms Trl to Pierson Blvd
4	Indian Wells	Highway 111	Within City limits
5	Indio	Highway 111	Clinton St to Golf Center Pkwy
		Jefferson St	Westward Ho to Indio Blvd
		Highway 111	Clinton St to Indio Blvd
		Avenue 48	Shields Rd to Calhoun St
		Jefferson Street	Westward Ho to Indio Blvd
		Monroe Street	Avenue 50 to Country Club Dr
		Monroe Street	Avenida Del Mar to Requa Ave
6	La Quinta	Highway 111	Plaza La Quinta to Jefferson St
		Washington St	Avenue 52 to Palm Royal Dr/Mountain View Rd
		Calle Tampico	Avenida Bermudas to Desert Club Dr
		Adams St	Avenue 48 to Fred Waring Dr
		Dune Palms Rd	Avenue 48 to Fred Waring Dr
		Jefferson St	Pomelo to Avenue 48

7	Palm Desert	Highway 111	Parkview Dr to Hospitality Row
		Fred Waring Dr	Highway 111 to Washington St
		Country Club Dr	El Dorado Dr to Harris Ln
		Monterey Ave	Parkview Dr to Dinah Shore Dr
		Dinah Shore Dr	Miriam Wy to Shoppers Ln
		Washington St	Miles Ave to Country Club Dr
8	Palm Springs	Palm Canyon Dr	Techevah Dr to Cherokee Wy
		Indian Canyon Dr	Techevah Dr to Ramon Rd
		Tahquitz Canyon Wy	Avenida Caballeros to El Cielo
		Tahquitz Canyon Wy	Calle El Segundo to Palm Canyon Dr
		Ramon Rd	Avenida Caballeros to Crossley Rd
		Sunrise Wy	Mesquite Ave to Techevah Dr
9	Rancho Mirage	Highway 111	One Mirage Pl to Magnesia Falls Dr
		Bob Hope Dr	Avenida La Palmas to Dinah Shore Dr
		Monterey Ave	Magnesia Falls Dr to Dinah Shore Dr
		Dinah Shore Dr	Miriam Wy to Shoppers Ln
10	Caltrans District 8	Jackson St	I-10 WB On/Off Ramp to I-10 EB On/Off Ramp
		Monroe St	I-10 WB On/Off Ramp to I-10 EB On/Off Ramp
11	County of Riverside	-	-

*Future synchronized corridor.

Based on our understanding, the corridors that have been recently synchronized include:

- Highway 111 from Frank Sinatra Drive to Jefferson Street, which crosses jurisdictional boundaries including the cities of Rancho Mirage, Indian Wells, Palm Desert, and La Quinta.
- Bob Hope Drive from Highway 111 to Dinah Shore Drive in the City of Rancho Mirage
- Monterey Avenue from Highway 111 to Dinah Shore Drive, which borders the cities of Rancho Mirage and Palm Desert.
- Washington Street from Avenue 52 to Dinah Shore Drive which borders the cities of La Quinta, Indian Wells and Palm Desert.

The other corridors provided in **Table 1.5** are currently synchronized and/or have time of day plans within their own jurisdiction.

1-2. EXISTING SYSTEM INVENTORY

The purpose of this section is to provide each agency with an inventory and evaluation of their existing traffic signal system, communication system, ITS elements, and Traffic Management Center (TMC) equipment, including hardware and software, in order to identify each system's capabilities, deficiencies, and opportunities; and ultimately to recommend state-of-the-art communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the Regional TSI Master Plan. The recommended communication technologies and recommended equipment installation/upgrades will be provided through-out this report and in subsequent chapters.

Existing System Inventory is based on collecting existing reference documentation from each agency in the Coachella Valley and by verifying this information in the field. The data collection includes traffic signal matrices, traffic signal plans, signal communication plans, citywide traffic signal city maps, citywide communication maps, ITS and Traffic Signal Master Plans, and other applicable data. The data collection also includes traffic signals/CCTV systems/ITS/communication projects currently underway or planned projects by each agency. A detailed field review was performed to confirm and document existing traffic signal system, communication systems, and ITS systems for each agency.

1-2.1. City of Cathedral City



The City of Cathedral City is located westerly in the Coachella Valley adjacent to the City of Palm Springs, City of Rancho Mirage and the County of Riverside. Interstate 10 (I-10) freeway traverses east-west through the north side of the city. Major routes/roadways include E. Palm Canyon Drive that traverses east-west through the City. Other major roadways include Date Palm Drive, Cathedral Canyon Drive, Dinah Shore Drive, Vista Chino and Ramon Road. Traffic signals along Highway 111 have been relinquished from Caltrans authority and are owned, operated, and maintained by the City. Selected traffic signals along the City border are owned, operated, and co-maintained by City of Palm Springs, City of Rancho Mirage or County of Riverside. All other traffic signals are owned, operated, and maintained by the City of Cathedral City.

The existing traffic signal system within the City of Cathedral City consists of the following:

- 41 traffic signals with one (1) on-street master controller.
- Local communications occur mainly over twisted-pair/copper signal interconnect cable (SIC) and 900Mhz wireless radio where no underground conduit exists.
- There is currently no communication established at City Hall for remote command and control to the City's traffic signals. However, an abandoned twisted-pair/copper signal interconnect cable (SIC) enters City Hall.
- There is no central traffic management system.
- All signal timing operations/time-of-day (TOD) parameters are handled via the one (1) on-street master controller. All other local traffic signal controllers not connected to the on-street master system operate in free mode.
- Eight (8) existing traffic signals are "stand-alone" and have no communication hardware.

Figure 1.2 illustrates the **existing traffic signal locations, communications, ITS components and City Hall**.

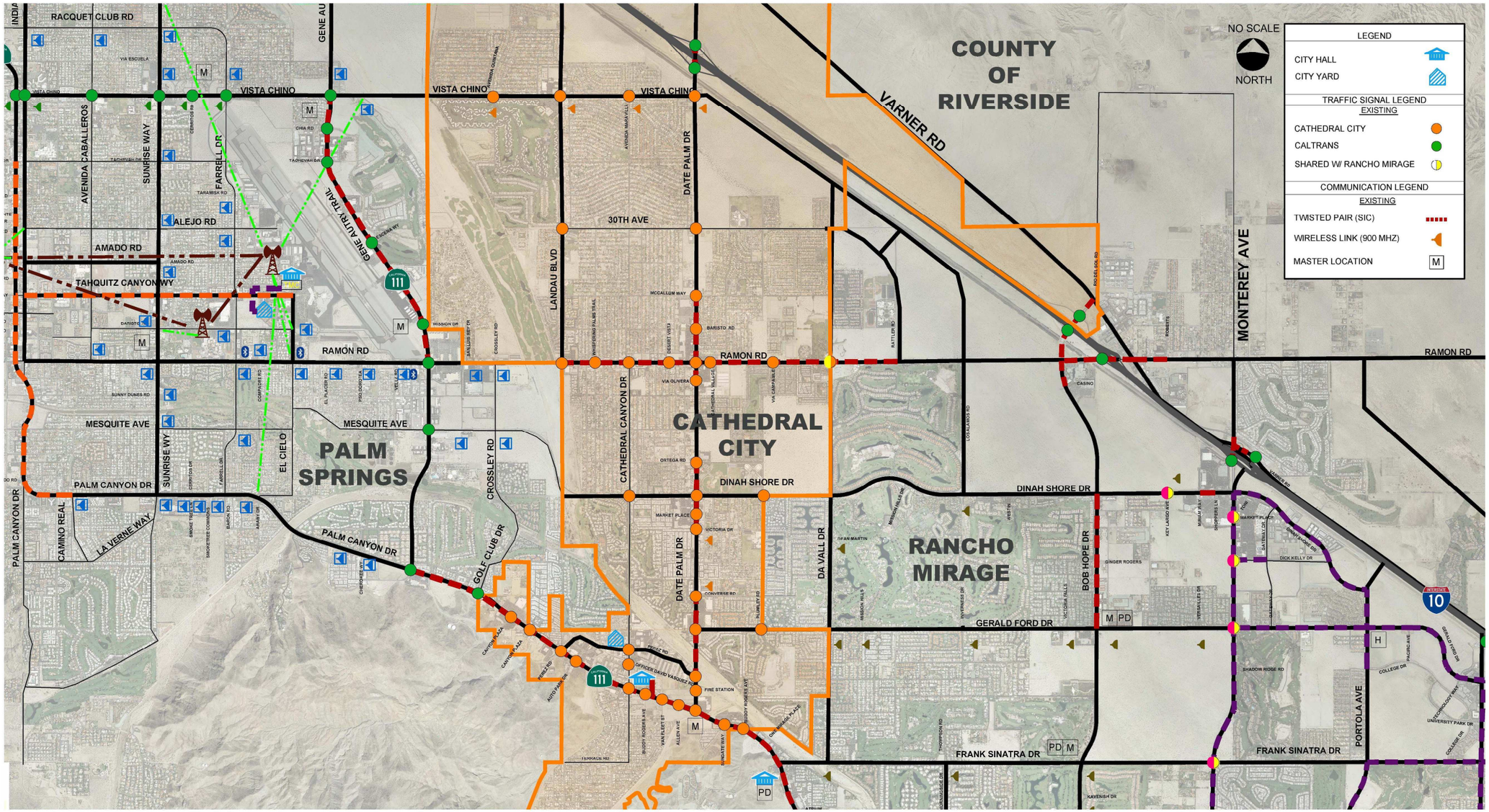
Figure 1.3 illustrates the **existing system architecture** configuration.

Table 1.6 summarizes the **number of existing traffic signals** within the City of Cathedral City for the Regional TSI Project.

Table 1.7 summarizes the **number of project corridors** within the City of Cathedral City for the Regional TSI Project.

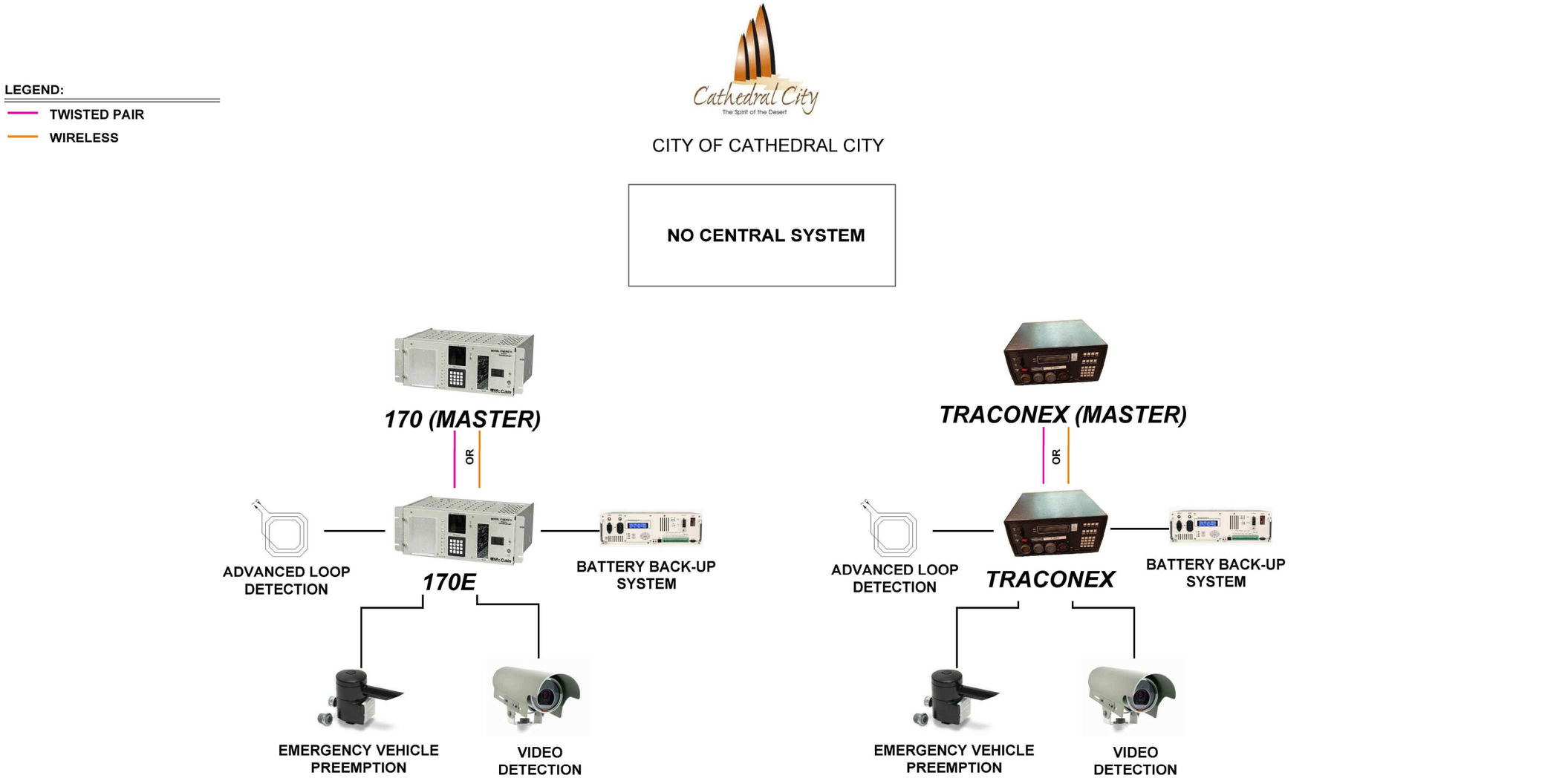
Existing System Inventory and Evaluation

Figure 1.2 City of Cathedral City Existing Conditions



Existing System Inventory and Evaluation

Figure 1.3 City of Cathedral City Existing System Architecture



ADVANTEC Consulting Engineers

CVAG

CITY OF CATHEDRAL CITY

EXISTING SYSTEM ARCHITECTURE

Cathedral City

Table 1.6 City of Cathedral City – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Date Palm Dr & Perez Rd	**22**	Palm Canyon Dr & Perez Rd
2	Date Palm Dr & Gerald Ford Dr	**23**	Palm Canyon Dr & Auto Park Dr
3	Date Palm Dr & Converse Rd	**24**	Palm Canyon Dr & Bankside Dr
4	Date Palm Dr & Victoria Dr	**25**	Palm Canyon Dr & Cathedral Canyon Dr
5	Date Palm Dr & Market Place	**26**	Palm Canyon Dr & Buddy Rogers Ave
6	Date Palm Dr & Dinah Shore Dr	**27**	Palm Canyon Dr & Van Fleet St/ Monty Hall Dr
7	Date Palm Dr & Dave Kelly Rd / Ortega Rd	**28**	Palm Canyon Dr & Allen Ave
8	Date Palm Dr & Cathedral Village	**29**	Palm Canyon Dr & Date Palm Dr
9	Date Palm Dr & Ramon Rd	**30**	Palm Canyon Dr & Sungate Wy
10	Date Palm Dr & Baristo Rd	**31**	Palm Canyon Dr & Officer Jermaine Gibson / Buddy Rogers Ave
11	Date Palm Dr & McCallum Wy	**32**	Vista Chino & Avenida Quintana
12	Date Palm Dr & 30th Ave	**33**	Vista Chino & Landau Blvd
13	Date Palm Dr & Vista Chino	**34**	Vista Chino & Avenida Maravilla
14	Ramon Rd & Landau Blvd	**35**	Dinah Shore & Cathedral Canyon Dr
15	Ramon Rd & Whispering Palms Trl	**36**	Dinah Shore & Plumley Rd
16	Ramon Rd & Avenida Maravilla	**37**	Perez Rd & Cathedral Canyon Dr
17	Ramon Rd & Desert Vista Rd	**38**	Gerald Ford Dr & Plumley Rd /Ave Del Sol
18	Ramon Rd & Cathedral Village	**39**	Date Palm Dr & Buddy Rogers Ave /Fire Station
19	Ramon Rd & Via Companile	**40**	Cathedral Canyon Dr & Officer David Vasquez Rd / Civic Center
20	Palm Canyon Dr & Canyon Plaza (North)	**41**	30th Ave & Landau Blvd
21	Palm Canyon Dr & Canyon Plaza (South)		

Table 1.7 City of Cathedral City – Project Corridors

No.	Corridor	Project Corridor Type	Limits
1	Palm Canyon Dr/ Highway 111	Primary Corridor	Canyon Plaza (North) to Buddy Rodgers Ave
2	Varner Rd	Primary Corridor	Mountain View Rd to Date Palm Dr
3	Mountain View Rd	Primary Corridor	Varner Rd to City Limits
4	Vista Chino	Primary Corridor	Avenida Quintana to Da Vall Dr
5	Ramon Rd	Primary Corridor	Landau Blvd to Da Vall Dr
6	Landau Blvd	Primary Corridor	Ramon Rd to Verona Rd
7	Dinah Shore Rd	Primary Corridor	Cathedral Canyon Dr to Plumley Rd
8	Perez Rd	Primary Corridor	Palm Canyon Dr to Date Palm Dr
9	Gerald Ford Dr	Primary Corridor	Date Palm Dr to Plumley Rd
10	Date Palm Dr	Primary Corridor	Palm Canyon Dr to Varner Rd
11	Da Vall Dr	Primary Corridor	Dinah Shore Dr to 30th Ave
12	Cathedral Canyon Dr	Secondary Corridor	Terrace Rd to Ramon Rd
13	Terrace Rd	Secondary Corridor	Paradise Way to Cathedral Canyon Dr
14	30th Ave	Secondary Corridor	Landau Blvd to Da Vall Rd

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 41 signalized intersections
- ✓ 14 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.1.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.



The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal

communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed of the city's existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

  The City has a mixture of NEMA Type-P and Type 333 Jumbo P (JP) traffic signal controller cabinets throughout the City.



Type 333JP



Type-P

  For new traffic signal installation or modifications, the City is transitioning from the Type-P cabinet style cabinets to Type 333JP cabinets. Typically, the Type 333JP cabinets can be installed on an existing Type-P cabinet foundation with minimal to no modifications. This is primarily due to their transition from their NEMA controllers (Tranconex) to the Type 170 style controllers. Both NEMA Type-P and Type 333JP cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements.

- **Traffic Signal Controllers**

  The City has mixture of 170E, 170 ATC Coldfire and Traconex 390 traffic signal controllers manufactured by different vendors.



Type 170E



Type 170 ATC



Traconex

  In general, traffic signal controllers should be uniform throughout the City in order to be compatible and communicate with each other. The mixture of Caltrans standard Type 170/2070 and NEMA based controllers create an incompatibility issue between TMS vendors. Therefore, a singular controller standard should be established for future improvements, such as ATC

specification. In addition, traffic signal controllers that have been discontinued (Traconex) should be replaced with latest ATC signal controllers.

- **Loop Detection**

The City has loop detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.



Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier, if applicable.

- **Video Detection System**

The City has video detection at signalized locations. The video detection systems within the City are manufactured by Iteris. The City is using model Vantage Plus and Vantage Edge 2 system.



Video Detection Camera



Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at a future TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M and Global Traffic Technologies (GTT).



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at most signalized locations. The BBS within the City are manufactured by Dimensions, Myers & Clary.



Dimensions Battery Backup



Myers Battery Backup



Clary Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has twisted pair/hardwired signal interconnect cable (SIC) and 900 MHZ wireless radio local communications.



Twisted Pair (SIC)



Wireless Radio Antenna (900 MHZ)

All local communication via SIC cable or 900MHz radio is legacy analog type, that require modems to communicate. Typically, analog communications are no longer supported for new installations. Therefore, it is recommended a new Ethernet IP based communication system is established, that incorporates new Ethernet IP technologies. This includes considering upgrades of existing 900MHz wireless to new 5.8GHz wireless communications or higher, such as 5.9GHz DSRC wireless communications. There are also opportunities to utilize the City's existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable.

- **Communication Hubs**

The City does not have communication hubs located in the field.

Field communication hubs are beneficial for aggregation of local traffic signal controllers and ITS elements on a private local area wide network. They are typically installed at a centralized location in the field as a collection point for the ITS elements, and for creating redundant sites for communication back to central. When considering new Ethernet/IP communications

systems, primarily using fiber optic cable, it is best practice to include field communication hubs in the planning and design of the new Ethernet communication network.

- **CCTV Cameras**

  The City does not have CCTV camera systems.

  New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This includes the type of camera (top mounted or dome) and the preferred type of installation; typically, they are mounted to an existing pole or on a standalone pole. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

Table 1.8 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.8 Existing Traffic Signal, Communication & ITS Inventory - City of Cathedral City

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Date Palm Dr & Perez Rd	333 JP	McCain	170 ATC	Loops	2 CH	Twisted Pair	N/A	m262	Dimensions	III-BF	
2	Date Palm Dr & Gerald Ford Dr	333	McCain	170 ATC	Loops	2 CH	Twisted Pair	N/A	m262	Dimensions	III-CF	
3	Date Palm Dr & Converse Rd	333L	McCain	170 ATC	Loops	2 CH	Twisted Pair	N/A	m262	Dimensions	III-CF	
4	Date Palm Dr & Victoria Dr	333L	McCain	170 ATC	Loops	2 CH	Twisted Pair	N/A	m262	Dimensions	III-CF	
5	Date Palm Dr & Market Place	333L	McCain	170 ATC	Video	Vantage Edge 2	Twisted Pair	N/A	m262	Dimensions	III-CF	
6	Date Palm Dr & Dinah Shore Dr	333L	McCain	170 ATC	Video	Vantage Edge 2	Twisted Pair	N/A	m262	Dimensions	III-CF	
7	Date Palm Dr & Dave Kelly Rd / Ortega Rd	333L	McCain	170 ATC	Loops	2 CH	Twisted Pair	N/A	562	Dimensions	III-CF	
8	Date Palm Dr & Cathedral Village	333L	McCain	170 ATC	Loops	2 CH	Twisted Pair	N/A	762	Dimensions	III-CF	
9	Date Palm Dr & Ramon Rd	333 JP	McCain	170 ATC	Video	Vantage Edge 2	Twisted Pair	N/A	562 & m262	Dimensions	III-CF	
10	Date Palm Dr & Baristo Rd	333 JP	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	m262	Dimensions	III-CF	
11	Date Palm Dr & McCallum Wy	333 JP	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	762	Dimensions	III-CF	
12	Date Palm Dr & 30th Ave	333 JP	McCain	170E Quad	Loops	2 CH	N/A	N/A	562	Dimensions	III-CF	Stand-Alone
13	Date Palm Dr & Vista Chino	333 JP	McCain	170E Quad	Video	Vantage Edge 2	N/A	N/A	764	Dimensions	III-CF / BF	Wireless disconnected
14	Ramon Rd & Landau Blvd	333 JP	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	454	Dimensions	III-BF	
15	Ramon Rd & Whispering Palms Trl	333 JP	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	562 / 762	Dimensions	III-CF	
16	Ramon Rd & Avenida Maravilla	333 JP	McCain	170E Quad	Video	Vantage Edge 2	Twisted Pair	N/A	m262	Dimensions	III-CF	
17	Ramon Rd & Desert Vista Rd	333 JP	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	562	Dimensions	III-BF	
18	Ramon Rd & Cathedral Village	P-44	Traconex	390 CJ	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	m262	Dimensions	III-CF	
19	Ramon Rd & Via Companile	P-44	Traconex	390 CJ	Loops	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
20	Palm Canyon Dr & Canyon Plaza (North)	P-44	Traconex	390 CJ	Loops	2 CH	Twisted Pair	N/A	762	Dimensions	III-CF	
21	Palm Canyon Dr & Canyon Plaza South)	P-44	Traconex	390 CJ	Loops	2 CH	Twisted Pair	N/A	562	Dimensions	III-CF	
22	Palm Canyon Dr & Perez Rd	333	McCain	170E Quad	Video	Vantage Edge 2	Twisted Pair	N/A	764	Dimensions	III-CF	Twisted-pair not in use
23	Palm Canyon Dr & Auto Park Dr	P-44	Traconex	390 CJ	Video	Vantage Plus	Twisted Pair	N/A	562	Myers	III-CF	
24	Palm Canyon Dr & Bankside Dr	332	McCain	170 ATC	Video	Vantage Edge 2	Twisted Pair	N/A	752	Clary	III-CF	
25	Palm Canyon Dr & Cathedral Canyon Dr	P-44	McCain	170E Quad	Video	Vantage Plus	Twisted Pair	N/A	562	Dimensions	III-CF	
26	Palm Canyon Dr & Buddy Rogers Ave	P-44	McCain	170E Quad	Video	Vantage Plus	Twisted Pair	N/A	562	Dimensions	III-CF	



No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
27	Palm Canyon Dr & Van Fleet St/ Monty Hall Dr	P-44	McCain	170E Quad	Loops & Video	Vantage Plus	Twisted Pair	N/A	562	Dimensions	III-CF	
28	Palm Canyon Dr & Allen Ave	333	McCain	170 ATC	Video	Vantage Edge 2	Twisted Pair	N/A	562	Dimensions	III-CF	
29	Palm Canyon Dr & Date Palm Dr	333	McCain	170 ATC	Video	Vantage Edge 2	Twisted Pair	N/A	562	Dimensions	III-CF	Master Location
30	Palm Canyon Dr & Sungate Wy	333	McCain	170 ATC	Video	Vantage Edge 2	Twisted Pair	N/A	562	Dimensions	III-CF	
31	Palm Canyon Dr & Officer Jermaine Gibson / Buddy Rogers Ave	333	McCain	170 ATC	Loops	2 CH	Twisted Pair	N/A	562	Dimensions	III-CF	
32	Vista Chino & Avenida Quintana	P-44	Traconex	390 CJ	Loops	2 CH	Wireless	N/A	m262	N/A	III-CF	
33	Vista Chino & Landau Blvd	333 JP	McCain	170E Quad	Loops	2 CH	Wireless	N/A	m262	Dimensions	III-BF	
34	Vista Chino & Avenida Maravilla	P-44	Traconex	390 CJ	Loops	2 CH	Wireless	N/A	562	Dimensions	III-CF	
35	Dinah Shore Dr & Cathedral Canyon Dr	333 JP	McCain	170E Quad	Video	Vantage Edge 2	N/A	N/A	m262	Dimensions	III-CF	Stand Alone
36	Dinah Shore Dr & Plumley Rd	P-44	Traconex	390 CJ	Loops	2 CH	N/A	N/A	562	Myers	III-CF	Stand Alone
37	Perez Rd & Cathedral Canyon Dr	333 JP	McCain	170E Quad	Loops	2 CH	N/A	N/A	m262	Dimensions	III-CF	Stand Alone
38	Gerald Ford Dr & Plumley Rd/ Ave Del Sol	P-44	Traconex	390 CJ	Video	Vantage Plus	N/A	N/A	752	Dimensions	III-BF	Stand Alone
39	Date Palm Dr & Buddy Rogers Ave/ Fire Station	2TC24F2EX	N/A	F Tray Electro Mechanical	N/A	N/A	N/A	N/A	N/A	N/A	III-BF	Stand Alone
40	Cathedral Canyon Dr & Officer David Vasquez Rd/ Civic Center	P-44	Traconex	390 CJ	Video	Vantage Plus	N/A	N/A	752	Dimensions	III-CF	Stand Alone
41	30th Ave & Landau Blvd	333 JP	McCain	170E Quad	Loops	2 CH	N/A	N/A	m262	Dimensions	III-CF	Stand Alone

1-2.1.2. Traffic Management Center (TMC)



The City of Cathedral City does not have a Traffic Management Center (TMC) for remote command and control of traffic signal operations. However, an abandoned twisted-pair/copper interconnect cable (SIC) was identified at City Hall. This provides an opportunity to connect to the field controllers from City Hall if a central system is installed.

There is one (1) on-street master controller that supplies all the traffic signal timing/Time-of-Day (TOD) timing parameters to the local controllers that are tied to the on-street master system. All other timing changes/updates must be performed locally by a technician at the controller cabinet. The existing conditions are as follows (**Table 1.9**):

Table 1.9 Existing Traffic Management System Equipment

Traffic Management System	No centralized TMS system
Traffic Server	No dedicated traffic server
Workstation PC	No workstation PC for remote command and control
Communications Equipment	No communications equipment
Hardwire Communications	(1) 12pr #19 twisted-pair SIC cable located in City Hall (abandoned)
Wireless Communications	No wireless communications equipment
Video Management System	No centralized VMS system

1-2.1.3. Future Projects

At this time, the City of Cathedral City has not identified/planned future ITS or traffic signal related improvements.

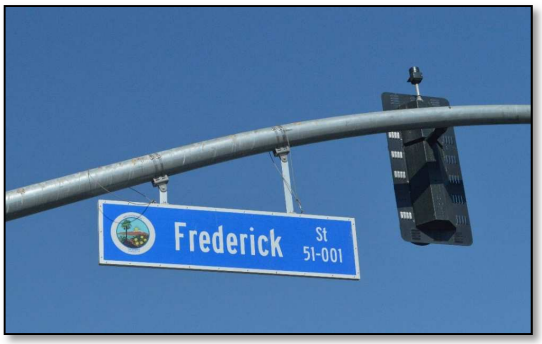
1-2.1.4. Conclusion

Based on our inventory and evaluation of the City's existing traffic signal system, ITS elements, and communication system, there are existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

If the City considers future ITS or traffic signal related improvements; due to the mixture of both state standard 170E/170 ATC and NEMA based Tranconex traffic signal controllers, the City should begin by selecting a singular traffic signal controller type as a standard for interoperability and alliance with a new centralized traffic control system. It should be noted that the City's current traffic signal controllers are mixture of current and outdated technologies that are not all compatible with each other. Then, the City should consider upgrading communications over a fiber optic and/or a wireless network. There are also opportunities to utilize the City's existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable. Once the core TMS and communication systems are determined; then other ITS elements should also be considered to enhance traffic operations, maintenance, and mobility within and across jurisdictional boundaries.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and equipment installation/upgrades will be provided in subsequent sections.

1-2.2. City of Coachella



The City of Coachella is located easterly in the Coachella Valley bounded by the City of Indio to the west and by other surrounding communities/areas in the County of Riverside. Interstate 10 (I-10) freeway traverses east-west through the northerly side of the city. Other major routes/roadways include State Route 86 (SR-86) and Grapefruit Boulevard (formerly Highway 111), both routes traverse north-south through the City. Traffic signals at the I-10 and SR-86 on/off ramps are owned, operated and maintained by Caltrans. Selected traffic signals along the City border are owned, operated and maintained by either the City of Indio or Caltrans; and all other traffic signals are owned, operated and maintained by the City of Coachella.

The existing traffic signal system within the City of Coachella consists of the following:

- 21 traffic signals with two (2) on-street master controllers.
- Local communications occur over twisted-pair/copper interconnect cable (SIC). Cell modems have been installed at two intersections, but are offline.
- Two (2) on-street master controllers exist but are currently off-line.
- There is currently no communication established at City Hall for remote traffic surveillance and operation.
- All traffic signal timing/time-of-day (TOD) timing parameters are handled via the local controllers.
- Three (3) existing traffic signals are "stand-alone" and have no communication hardware.

Currently, the City has five (5) new traffic signals under design and major upgrades are planned for their communication system including: new fiber optic communications; Ethernet/IP-based communications; wireless communications (5.8GHz wireless Ethernet radios); new closed circuit television (CCTV) HD IP camera systems; new hybrid video/radar detection for vehicles and bicycles; new 2070 advanced transportation controllers (ATC), new centralized advanced traffic management system (ATMS); and a new Traffic Management Center (TMC) will be constructed at the City Yard for remote command and control of the entire traffic network.

Figure 1.4 illustrates the **project traffic signal locations, existing communication systems and City Hall**.

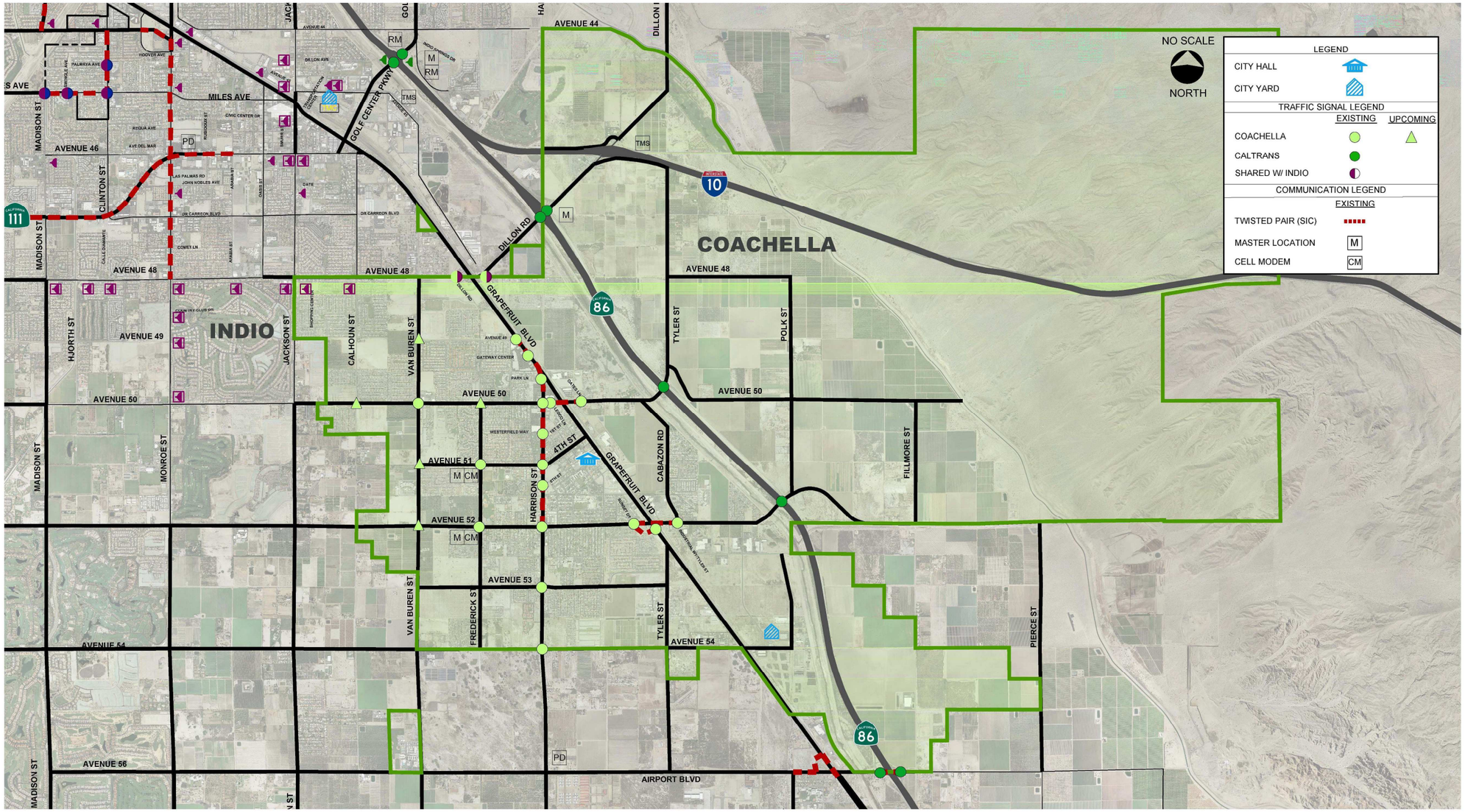
Figure 1.5 illustrates the **existing system architecture** configuration.

Table 1.10 summarizes the **number of project traffic signals** within the City of Coachella for the Regional TSI Project.

Table 1.11 summarizes the **number of project corridors** within the City of Coachella for the Regional TSI Project.

Existing System Inventory and Evaluation

Figure 1.4 City of Coachella Existing Conditions



Existing System Inventory and Evaluation

Figure 1.5 City of Coachella Existing System Architecture

CITY OF COACHELLA
CITY YARD

LEGEND:

- TWISTED PAIR
- CELL MODEM (OFFLINE)

NO CENTRAL SYSTEM

MCCAIN TRANSPARITY TRAFFIC MANAGEMENT SYSTEM (IN PROGRESS)

(OFFLINE)

170E (MASTER)

170E

LOOP DETECTION

EMERGENCY VEHICLE PREEMPTION

VIDEO DETECTION

BATTERY BACK-UP SYSTEM

2070E

VIDEO DETECTION

BATTERY BACK-UP SYSTEM

STAND ALONE (NO COMMUNICATION)

170E

LOOP DETECTION

EMERGENCY VEHICLE PREEMPTION

VIDEO DETECTION

BATTERY BACK-UP SYSTEM

ASC/2-2100

VIDEO DETECTION

Table 1.10 City of Coachella – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Grapefruit Blvd & Avenue 49	**11**	Van Buren St & Avenue 50
2	Grapefruit Blvd & Gateway Center Dr	**12**	Frederick St & Avenue 51
3	Grapefruit Blvd & Park Ln/Harrison St	**13**	Frederick St & Avenue 52
4	Harrison St & Avenue 50	**14**	Avenue 50 & Leoco Ln
5	Harrison St & Westerfield Wy/1st St	**15**	Avenue 50 & Oates Ln
6	Harrison St & Avenue 51	**16**	Grapefruit Blvd & Sunset Dr
7	Harrison St & 6th St	**17**	Avenue 52 & Sunset Dr
8	Harrison St & Avenue 52	**18**	Avenue 52 & Industrial Wy/Tyler St
9	Harrison St & Avenue 53	**19**	Dillon Rd & Harrison Pl
10	Harrison St & Avenue 54	**20**	Avenue 48 & Dillon Rd
		21	Dillon Rd & Cabazon Rd
New Traffic Signal Locations			
1	Avenue 50 & Calhoun St	**4**	Avenue 52 & Van Buren St
2	Avenue 49 & Van Buren St	**5**	Avenue 50 & Frederick St
3	Avenue 51 & Van Buren St		

Table 1.11 City of Coachella – Project Corridors

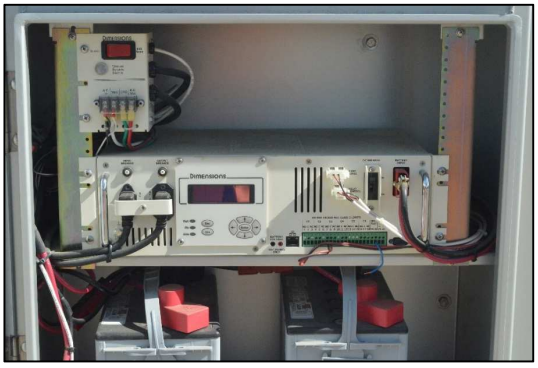
No.	Corridor	Project Corridor Type	Limits
1	Dillon Rd	Primary Corridor	Avenue 48 to Avenue 44
2	Grapefruit Blvd	Primary Corridor	Dillon Rd to City Limits
3	Avenue 48	Primary Corridor	Jackson St to Dillon Rd
4	Avenue 50	Primary Corridor	Calhoun St to Fillmore St
5	Tyler St	Primary Corridor	Avenue 54 to I-10
6	Avenue 51	Primary Corridor	Van Buren St to Harrison St
7	Avenue 52	Primary Corridor	Calhoun St to Pierce St
8	Avenue 53	Primary Corridor	Van Buren St to Tyler St
9	Avenue 54	Primary Corridor	Van Buren St to Tyler St
10	Van Buren St	Primary Corridor	Avenue 54 to Avenue 48
11	Fredrick St	Primary Corridor	Avenue 54 to Avenue 50
12	Harrison St	Primary Corridor	Avenue 54 to Grapefruit Blvd

13	Airport Blvd	Primary Corridor	E/O and W/O the SR-86

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 21 signalized intersections
- ✓ 13 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory (City Yard)
- ✓ Research of current/future projects that are under design and/or funded

1-2.2.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation



In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.

The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

  The City has Type 332 traffic signal controller cabinets throughout the City.



Type 332

The City's Type 332 cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type 332 cabinets. The City is currently in the process updating their city standard to using Type 352i ATC (traffic controller cabinets).

- **Traffic Signal Controllers**

The City has several types of traffic signal controllers including type 170's, 170E's, 2070's and ASC/2's provided by various traffic signal controller manufacturers.



Type 170E



Type 2070E


ASC/2-2100

In general, traffic signal controllers should be uniform throughout the City in order to be compatible and communicate with each other. The mixture of Caltrans standard Type 170/2070 Type 170/2070 and NEMA based controllers create an incompatibility issue between TMS vendors. Recently, the City has adopted a new specification for their traffic signal controllers: Type 2070 ATC controllers with Omni eX software. This is the latest off-the-shelf equipment and software.

- **Loop Detection**

The City has loop detection at various signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.


Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier, if applicable.

- **Video Detection System**

The City has video detection at various signalized locations. The video detection systems within the City are manufactured by Iteris. The City is using model Vantage Edge 2 system.



Video Detection Camera



Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at their new TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification. Recently, the City has adopted a new specification to include a hybrid video/radar vehicle detection system for all new and modified traffic signal improvements.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M and Global Traffic Technologies (GTT).



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at various signalized locations. The BBS within the City are manufactured by Clary and Dimensions.



Clary Battery Backup



Dimensions Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has twisted pair/hardwired signal interconnect cable (SIC) communications.



Twisted Pair (SIC)

All local communication via SIC cable is legacy analog type, that require modems to communicate. The City is currently constructing an entirely new Ethernet IP based communication system, that incorporates new Ethernet IP technologies. The newly constructed Ethernet/IP communication system will replace the existing SIC with fiber optic cable to all traffic signals citywide.

- **Communication Hubs**

The City does not have communication hubs located in the field. The City is currently installing communication hubs as part of their Citywide ITS upgrade project.

Field communication hubs are beneficial for aggregation of local traffic signal controllers and ITS elements on a private local area wide network. They are typically installed at a centralized location in the field as a collection point for the ITS elements, and for creating redundant sites for communication back to central. When considering new Ethernet/IP communications systems, primarily using fiber optic cable, it is best practice to include field communication hubs in the planning and design of the new Ethernet communication network.

- **CCTV Cameras**

The City currently does not CCTV camera systems.

New HD IP CCTV cameras are planned to be installed as part of the City's Traffic Signal Synchronization project and 5 New Traffic Signals project, see the Future Projects section for more details. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system.

Table 1.12 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted

pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.12 Existing Traffic Signal, Communication & ITS Inventory - City of Coachella

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Grapefruit Blvd & Avenue 49	332	PSI	170E	Video & Loops	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
2	Grapefruit Blvd & Gateway Center Dr	332	Econolite	ASC/2-2000	Video	Vantage Edge 2	Twisted Pair	N/A	N/A	N/A	III-CF	
3	Grapefruit Blvd & Park Ln/Harrison St	332	PSI	170E	Loops	2 CH	Twisted Pair	N/A	N/A	N/A	Type I	
4	Harrison St & Avenue 50	332	Signal Control Co	170	Video	Vantage Edge 2	Twisted Pair	N/A	752	N/A	III-CF	
5	Harrison St & Westerfield Wy/1st St	332	DTS	170E	Loops	2 CH	Twisted Pair	N/A	m262	N/A	III-CF	
6	Harrison St & Avenue 51	332	Signal Control Co	170 Dual	Video	Vantage Edge 2	Twisted Pair	N/A	N/A	N/A	III-CF	
7	Harrison St & 6th St	332	Signal Control Co	170E	Loops	2 CH	Twisted Pair	N/A	562	N/A	III-CF	
8	Harrison St & Avenue 52	332	IDC	170E	Video	Vantage Edge 2	Twisted Pair	N/A	N/A	N/A	III-BF	
9	Harrison St & Avenue 53	332	IDC	170E	Video	Vantage Edge 2	N/A	N/A	752	Dimensions	III-CF	Stand-Alone
10	Harrison St & Avenue 54	332	McCain	170E	Loops	2 CH	N/A	N/A	N/A	Clary	III-CF	Stand-Alone
11	Van Buren St & Avenue 50	332	Signal Control Co	170	Video	Vantage Edge 2	N/A	N/A	754	Dimensions	III-CF	Stand-Alone
12	Frederick St & Avenue 51	332	McCain	2070E	Video	Vantage Edge 2	(Cell Modem)	N/A	764	Dimensions	III-BF	Master Location
13	Frederick St & Avenue 52	332	McCain	2070E	Video	Vantage Edge 2	(Cell Modem)	N/A	764	Dimensions	III-BF	Master Location
14	Avenue 50 & Leoco Ln	332	PSI	170E	Loops	2 CH	Twisted Pair	N/A	752	N/A	III-CF	
15	Avenue 50 & Oates Ln	332	IDC	170E	Loops	2 CH	Twisted Pair	N/A	N/A	N/A	III-CF	
16	Grapefruit Blvd & Sunset Dr	332	McCain	170E	Video & Loops	Vantage Edge 2	Twisted Pair	N/A	764	Clary	III-CF	
17	Avenue 52 & Sunset Dr	332	McCain	170E	Video & Loops	Vantage Edge 2	Twisted Pair	N/A	764	Clary	III-CF	
18	Avenue 52 & Industrial Wy/Tyler St	332	McCain	170E	Video & Loops	Vantage Edge 2	Twisted Pair	N/A	764	Clary	III-CF	
19	Dillon Rd & Harrison Pl	332	DTS	170E	Loops	2 CH	Twisted Pair	N/A	N/A	Dimensions	III-CF	
20	Avenue 48 & Dillon Rd	332	McCain	170E	Video	Vantage Edge 2	N/A	N/A	754	Dimensions	III-CF	Stand-Alone
21	Dillon Rd & Cabazon Rd	332	Signal Control Co	170SC	Loops	2 CH	N/A	N/A	454	Dimensions	III-CF	Stand-Alone

1-2.2.2. Traffic Management Center (TMC)

The City of Coachella does not have a Traffic Management Center (TMC) for remote command and control of traffic signal operations. However, the City is currently in the middle of a Citywide ITS upgrade project that will establish a new TMC room at the City Yard with fiber optic communications from the field. This will allow signal technicians and City staff to remotely monitor and maintain traffic signal operations in real-time. The City has chosen to implement McCain's new ATMS system, Transparity. The existing TMC conditions are as follows (**Table 1.13**):

Table 1.13 Existing Traffic Management System Equipment

Traffic Management System	No centralized TMS system
Traffic Server	No dedicated traffic server
Workstation PC	No workstation PC for remote command and control
Communications Equipment	No communications equipment
Hardwire Communications	No hardwire communications equipment
Wireless Communications	No wireless communications equipment
Video Management System	No centralized VMS system

1-2.2.3. Future Projects

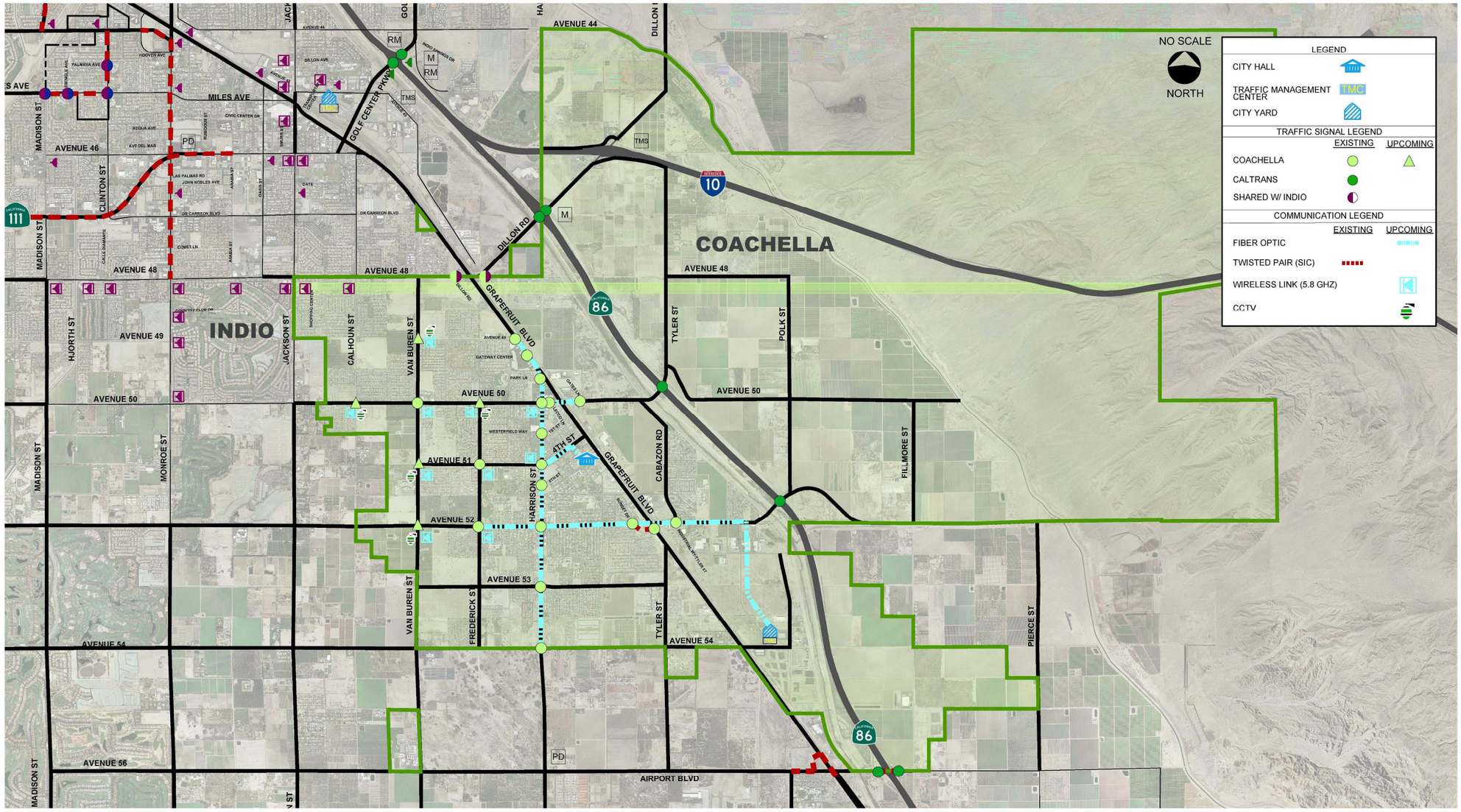
In addition to the previously mentioned citywide ITS upgrade project, the City is also currently under the construction phase of a five (5) new traffic signal installation project that will bring the total number of signalized intersections to 26. These two projects together will include many ITS improvements including new 2070 ATC traffic controllers, centralized Advanced Traffic Management System (ATMS), fiber optic improvements, 5.8GHz wireless Ethernet radios, Ethernet/IP-based communications, hybrid video/radar detection, and closed circuit television (CCTV) surveillance cameras at selected intersections. These upgrades build the foundation for the City to tie future ITS related components to the new ATMS system for further advancement.

Figure 1.6 illustrates the **existing and future traffic signals, proposed communication systems, CCTV cameras, other ITS components and the new TMC at the City Yard**.

These future projects are currently under construction and/or will be constructed in the near term. Therefore, it will be considered as our base conditions if further upgrades are considered under this project.

Existing System Inventory and Evaluation

Figure 1.6 City of Coachella Future Conditions



1-2.2.4. Conclusion

Based on our inventory and evaluation of the City's existing and future traffic signal system, ITS elements, communication system, and TMC, there are existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

The City's future projects include many ITS improvements such as: new 2070 ATC (traffic controllers), centralized Advanced Traffic Management System (ATMS), TMC, fiber optic improvements, 5.8GHz wireless Ethernet radios, Ethernet/IP-based communications, hybrid video/radar detection, and closed circuit television (CCTV) surveillance cameras at selected intersections. These upgrades build the foundation for the City to tie future ITS related components to the new ATMS system for further advancement. It is recommended to upgrade remaining traffic signal controllers and communications to the latest City standard including other ITS elements such hybrid video/radar detection, and additional closed circuit television (CCTV) surveillance.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.3. City of Desert Hot Springs



The City of Desert Hot Springs is located north-westerly in the Coachella Valley located adjacent to the City of Palm Springs and the County of Riverside. Interstate 10 (I-10) freeway traverses east-west on the southerly border of the city. Other major routes/roadways include Palm Drive and Pierson Boulevard. Traffic signals on the I-10 on/off ramps are owned, operated, and maintained by Caltrans. Selected traffic signals along the City border are owned, operated and co-maintained County of Riverside. All other traffic signals are owned, operated, and maintained by the City of Desert Hot Springs.

The existing traffic signal system within the City of Desert Hot Springs consists of the following:

- 13 traffic signals with one (1) on-street master controller.
- Local communications occur mainly over 900MHz wireless radio. Twisted-pair/copper interconnect cable (SIC) is located between two (2) signals on Pierson Boulevard.
- There is currently no communication established at City Hall for remote command and control.
- Subsequently all traffic signal timing/time-of-day (TOD) parameters are handled via the one (1) on-street master controller for all local controllers tied to the on-street master system.
- Four (4) existing traffic signals are "stand-alone" and have no communication hardware.

Figure 1.7 illustrates the **existing traffic signal locations, communications, ITS components and City Hall**.

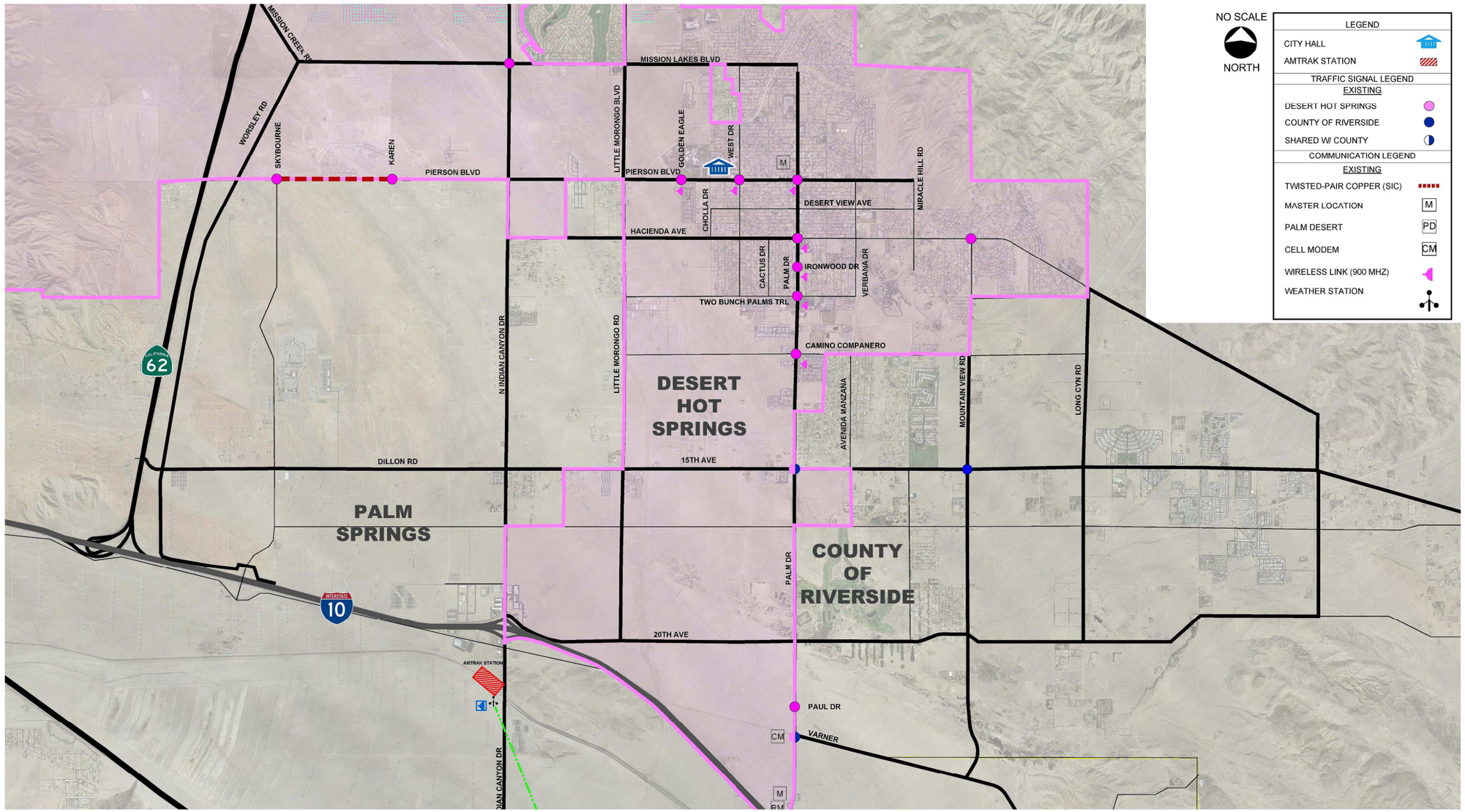
Figure 1.8 illustrates the **existing system architecture** configuration.

Table 1.14 summarizes the **number of project traffic signals** within the City of Desert Hot Springs for the Regional TSI Project.

Table 1.15 summarizes the **number of project corridors** within the City of Desert Hot Springs for the Regional TSI Project.

Existing System Inventory and Evaluation

Figure 1.7 City of Desert Hot Springs Existing Conditions



Existing System Inventory and Evaluation

Figure 1.8 City of Desert Hot Springs Existing System Architecture

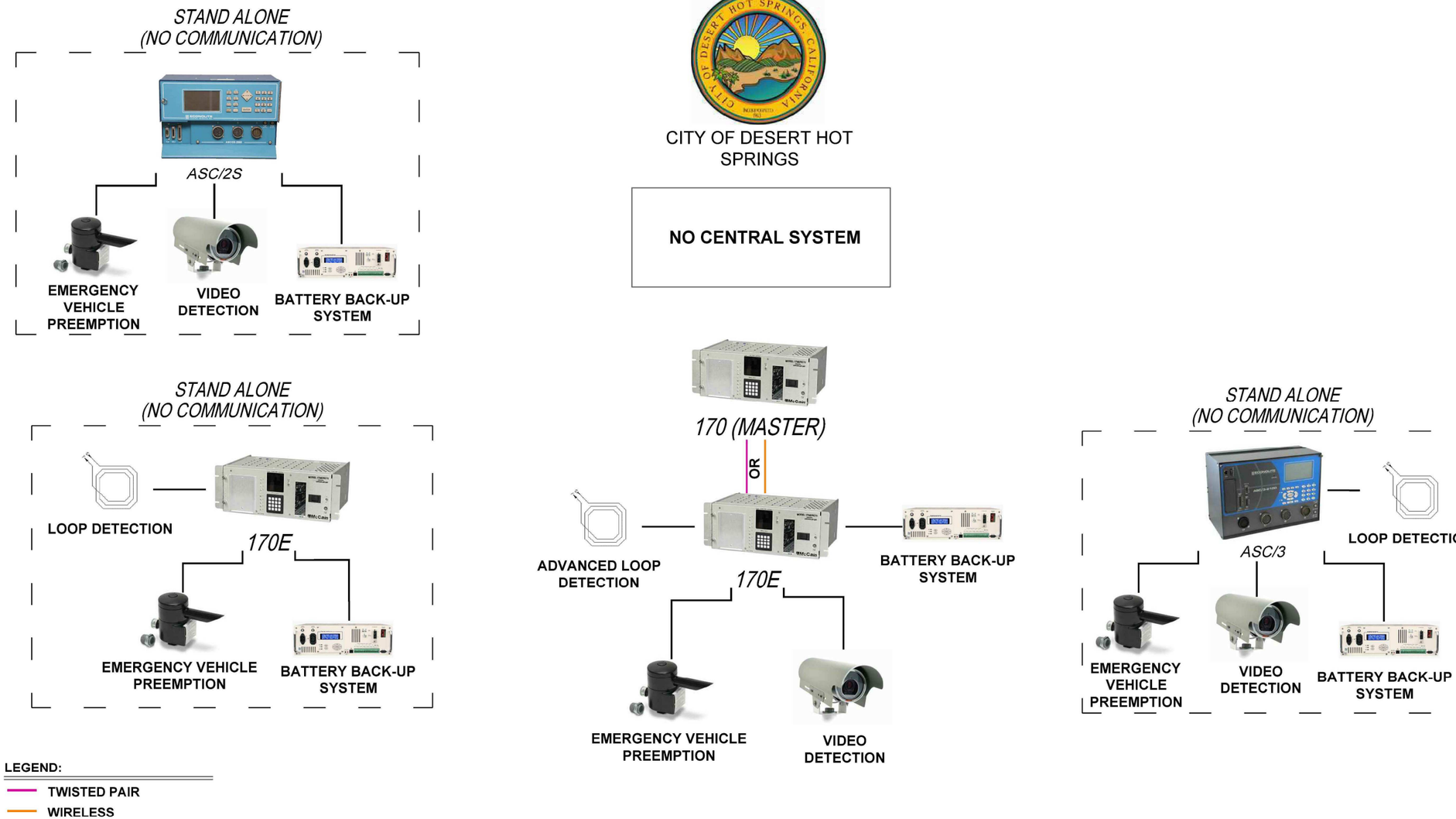


Table 1.14 City of Desert Hot Springs – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Hacienda Ave & Mountain View Rd	**8**	Palm Dr & Two Bunch Palms Trl
2	Indian Canyon Dr & Mission Lakes Blvd	**9**	Pierson Blvd & Golden Eagle Wy /Atlantic Ave
3	Palm Dr & Camino Campanero	**10**	Pierson Blvd & Karen Ave
4	Palm Dr & Dillon Rd	**11**	Pierson Blvd & Skyborne Dr
5	Palm Dr & Hacienda Ave	**12**	Pierson Blvd & West Dr
6	Palm Dr & Ironwood Dr	**13**	Palm Dr & Paul Dr
7	Palm Dr & Pierson Blvd		

Table 1.15 City of Desert Hot Springs – Project Corridors

No.	Corridor	Project Corridor Type	Limits
1	State Route 62 (SR-62)	Primary Corridor	N/O I-10 to City Limits (North)
2	Indian Canyon Dr	Primary Corridor	I-10 to SR-62
3	Worsley Rd	Primary Corridor	Pieron Blvd to S/O Indian Canyon Dr
4	Mission Lakes Blvd	Primary Corridor	Worsley Rd to Palm Dr
5	Mission Creek Rd	Primary Corridor	SR-62 to Worsley Rd
6	Pierson Blvd	Primary Corridor	SR-62 to Miracle Hill Rd
7	Hacienda Ave	Primary Corridor	Indian Canyon Dr to Long Canyon Rd
8	Palm Dr	Primary Corridor	Salvia Rd to Mission Lakes Blvd
9	Little Morongo Rd	Primary Corridor	20th Ave to Augusta Ave
10	Mountain View Rd	Primary Corridor	Camino Campanero to Hacienda Ave
11	20th Ave	Primary Corridor	Indian Canyon Dr to Bennet Rd
12	Desert View Ave	Secondary Corridor	Cholla Dr to Miracle Hill Rd
13	West Dr	Secondary Corridor	Two Bunch Palms Trl to Mission Lakes Blvd
14	Cactus Dr	Secondary Corridor	Two Bunch Palms Trl to Hacienda Ave
15	Cholla Dr	Secondary Corridor	Hacienda Ave to Desert View Ave
16	Verbana Dr	Secondary Corridor	Two Bunch Palms Trl to Pierson Blvd
17	Two Bunch Palms Trl	Secondary Corridor	Little Morongo Rd to Verbana Dr
18	15th Ave	Secondary Corridor	Little Morongo Rd to Palm Dr
19	Miracle Hill Rd	Secondary Corridor	Two Bunch Palms Trl to Pierson Blvd
20	Avenida Manzana	Secondary Corridor	15th Ave to Dillon Rd

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 13 signalized intersections
- ✓ 20 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.3.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.

The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

The City has a mixture of Type 332, Type 333 Jumbo P (JP), NEMA Type-P, and NEMA Type-R traffic signal controller cabinets throughout the City.


Type 332


Type 333JP


Type-P


Type-R

Both NEMA Type-P, Type-R and Jumbo Type 333 cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type P and Type 332 cabinets. Typically, the type of cabinet is based on the type of controller that is installed (NEMA controllers for the Type P and R cabinets, and Type 170/2070 style controllers for the Type 332 and Type 333JP cabinets).

- **Traffic Signal Controllers**

The City has mixture of 170E traffic signal controllers and NEMA ASC/2, ASC/3 traffic signal controllers.


Type 170E


ASC/2-2100


ASC/3-2100

In general, traffic signal controllers should be uniform throughout the City in order to be compatible and communicate with each other. The mixture of Caltrans standard Type 170/2070 and NEMA based controllers create an incompatibility issue between TMS vendors. Therefore, a singular controller standard should be established for future improvements, such as ATC specification. While the ASC/3 controller is still supported and IP capable, the ASC/2 controller is outdated in terms of support and integration into new ATMS systems.

- **Loop Detection**

The City has loop detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.


Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier, if applicable.

- **Video Detection System**

The City has video detection at four signalized locations. The video detection systems within the City are manufactured by Iteris. The City is using model Vantage Edge 2 system.



Video Detection Camera



Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at a future TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M, Global Traffic Technologies (GTT) and Tomar.



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at various signalized locations. The BBS within the City are manufactured by Dimensions and Myers.



Dimensions Battery Backup



Myers Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has 900 MHz wireless radio and twisted pair/hardwired signal interconnect cable (SIC) local communications.



Twisted Pair (SIC)



Wireless Radio Antenna (900 MHZ)

All local communication via SIC cable or 900MHz radio is legacy analog type, that require modems to communicate. Typically, analog communications are no longer supported for new installations. Therefore, it is recommended a new Ethernet IP based communication system is established, that incorporates new Ethernet IP technologies. This includes considering upgrades of existing 900MHz wireless to new 5.8GHz wireless communications or higher, such as 5.9GHz DSRC wireless communications. There are also opportunities to utilize the City's existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable.

- **Communication Hubs**

The City does not have communication hubs.

Field communication hubs are beneficial for aggregation of local traffic signal controllers and ITS elements on a private local area wide network. They are typically installed at a centralized location in the field as a collection point for the ITS elements, and for creating redundant sites for communication back to central. When considering new Ethernet/IP communications systems, primarily using fiber optic cable, it is best practice to include field communication hubs in the planning and design of the new Ethernet communication network.

- **CCTV Cameras**

The City does not have CCTV camera systems.

New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This

includes the type of camera (top mounted or dome) and the preferred type of installation; typically, they are mounted to an existing pole or on a standalone pole. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

Table 1.16 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.16 Existing Traffic Signal, Communication & ITS Inventory - City of Desert Hot Springs

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Hacienda Ave & Mountain View Rd	R	Econolite	ASC/2S-2100	Video	Vantage Edge 2	N/A	N/A	454	Dimensions	III-CF	Stand-Alone
2	Indian Canyon Dr & Mission Lakes Blvd	R	Econolite	ASC/3-2100	Video	Vantage Edge 2	N/A	N/A	752	Dimensions	III-CF	Stand-Alone
3	Palm Dr & Camino Campanero	332	McCain	170E Quad	Loops	2 CH	Wireless	N/A	762	N/A	III-BF	Wireless not in use
4	Palm Dr & Dillon Rd	333 JP	McCain	170E Quad	Loops	2 CH	N/A	N/A	m262	Dimensions	III-CF	Stand-Alone
5	Palm Dr & Hacienda Ave	332	McCain	170E Quad	Loops	2 CH	Wireless	N/A	Strobecom II	N/A	III-CF	
6	Palm Dr & Ironwood Dr	332	Safetran	170E Quad	Loops	2 CH	Wireless	N/A	Strobecom II	Dimensions	III-CF	Wireless not in use
7	Palm Dr & Pierson Blvd	322	McCain	170E Quad	Loops	2 CH	Wireless	N/A	Strobecom II	N/A	III-BF / CF	Master Location. Wireless not in use
8	Palm Dr & Two Bunch Palms Trl	332	McCain	170E Quad w	Loops	2 CH	Wireless	N/A	m262	N/A	III-CF	Wireless not in use
9	Pierson Blvd & Golden Eagle Wy / Atlantic Ave	P44	Econolite	ASC/3-2100	Loops	2 CH	Wireless	N/A	Strobecom II	Myers	III-CF	Wireless not in use
10	Pierson Blvd & Karen Ave	332	McCain	170E Quad	Video	Vantage Edge 2	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	TWP not in use
11	Pierson Blvd & Skyborne Dr	332	McCain	170E	Video	Vantage Edge 2	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	TWP not in use
12	Pierson Blvd & West Dr	332	IDC	170E	Loops	2 CH	Wireless	N/A	Strobecom II	Myers	III-CF	Wireless not in use
13	Palm Dr & Paul Dr	332	McCain	170E Quad	Loops	2 CH	N/A	N/A	Strobecom II	N/A	III-CF	Stand-Alone

1-2.3.2. Traffic Management Center (TMC)

The City of Desert Hot Springs does not have a Traffic Management Center (TMC) for remote command and control of traffic signal operations. The one (1) on-street master controller supplies all traffic signal timing/Time-of-Day (TOD) timing parameters to the local controllers tied to the system. All other timing changes/updates must be performed locally by a technician at the controller cabinet. The existing conditions are as follows **(Table 1.17**):

Table 1.17 Existing Traffic Management System Equipment

Traffic Management System	No centralized TMS system
Traffic Server	No dedicated traffic server
Workstation PC	No workstation PC for remote command and control
Communications Equipment	No communications equipment
Hardwire Communications	No hardwire communications equipment
Wireless Communications	No wireless communications equipment
Video Management System	No centralized VMS system

1-2.3.3. Future Projects

The City has not identified ITS or traffic signal related improvements planned in the near future.

1-2.3.4. Conclusion

Based on our inventory and evaluation of the City's existing traffic signal system, ITS elements, and communication system, there are existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

If the City considers future ITS or traffic signal related improvements; due to the mixture of both state standard 170E and NEMA based ASC/2, ASC/3 traffic signal controllers, the City should begin by selecting a singular traffic signal controller type as a standard for interoperability and alliance with a new centralized traffic control system. It should be noted that the City's current traffic signal controllers are mixture of current and outdated technologies that are not all compatible.

Then, the City should consider upgrading communications over a fiber optic and/or a wireless Ethernet network. There are also opportunities to utilize the City's existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable and provide new

wireless Ethernet communications. Once the core TMS and communication systems are determined; then other ITS elements should also be considered to enhance traffic operations, maintenance, and mobility within and across jurisdictional boundaries.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.4. City of Indian Wells



The City of Indian Wells is located centrally in the Coachella Valley bounded by the City of Palm Desert, City of La Quinta and the County of Riverside. Major routes/roadways include Highway 111 that traverses east-west through the City. Other major roadways include Cook Street, Fred Waring Drive, Miles Avenue, and Washington Street. Traffic signals along Highway 111 have been relinquished from Caltrans authority and are owned, operated, and maintained by the City. Selected traffic signals along the City border are owned, operated, and co-maintained by either the City of Palm Desert or the City of La Quinta, all other traffic signals are owned, operated, and maintained by the City of Indian Wells.

The existing traffic signal system within the City of Indian Wells consists of the following:

- 12 traffic signals with one (1) on-street master controller.
- Local communications occur over twisted-pair/copper interconnect cable (SIC) along Highway 111.
- At City Hall, a workstation has a leased line/dial-up connection to the on-street master and is configured with a Traffic Management System (TMS) for remote real-time traffic surveillance and monitoring.
- Communication to City Hall occurs by use of leased line/dial-up connection located at the centralized master location.
- Two (2) existing traffic signals are "stand-alone" and have no communication hardware.

There is one (1) intersection of Fred Waring Drive at El Dorado Drive located along City of Palm Desert's Fiber Optic system that intercepts the fiber backbone, therefore controller operations & status can be performed remotely by Palm Desert staff.

Figure 1.9 illustrates the **existing traffic signal locations, communications, ITS components and City Hall**.

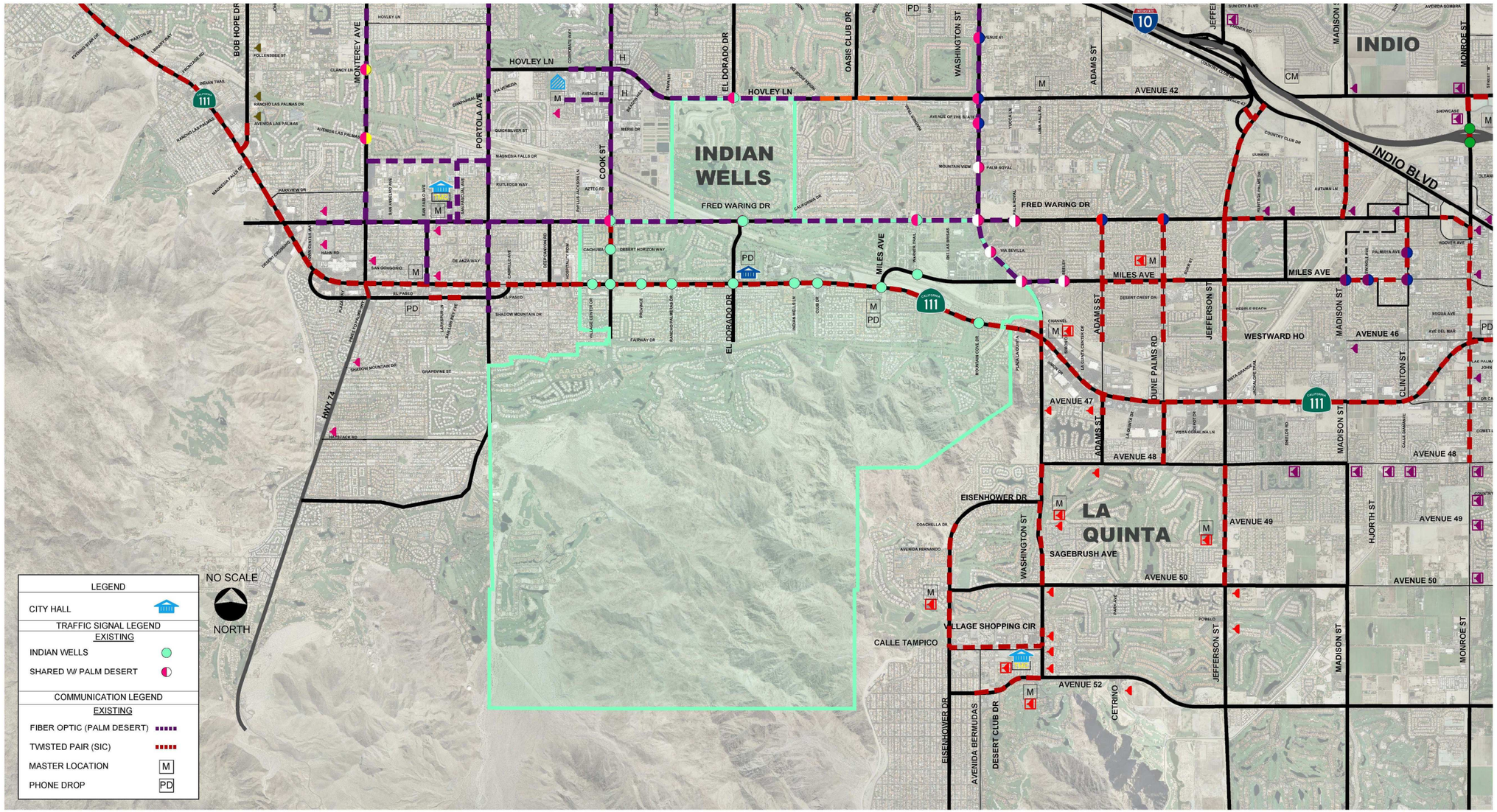
Figure 1.10 illustrates the **existing system architecture** configuration.

Table 1.18 summarizes the **number of project traffic signals** within the City of Indian Wells for the Regional TSI Project.

Table 1.19 summarizes the **number of project corridors** within the City of Indian Wells for the Regional TSI Project.

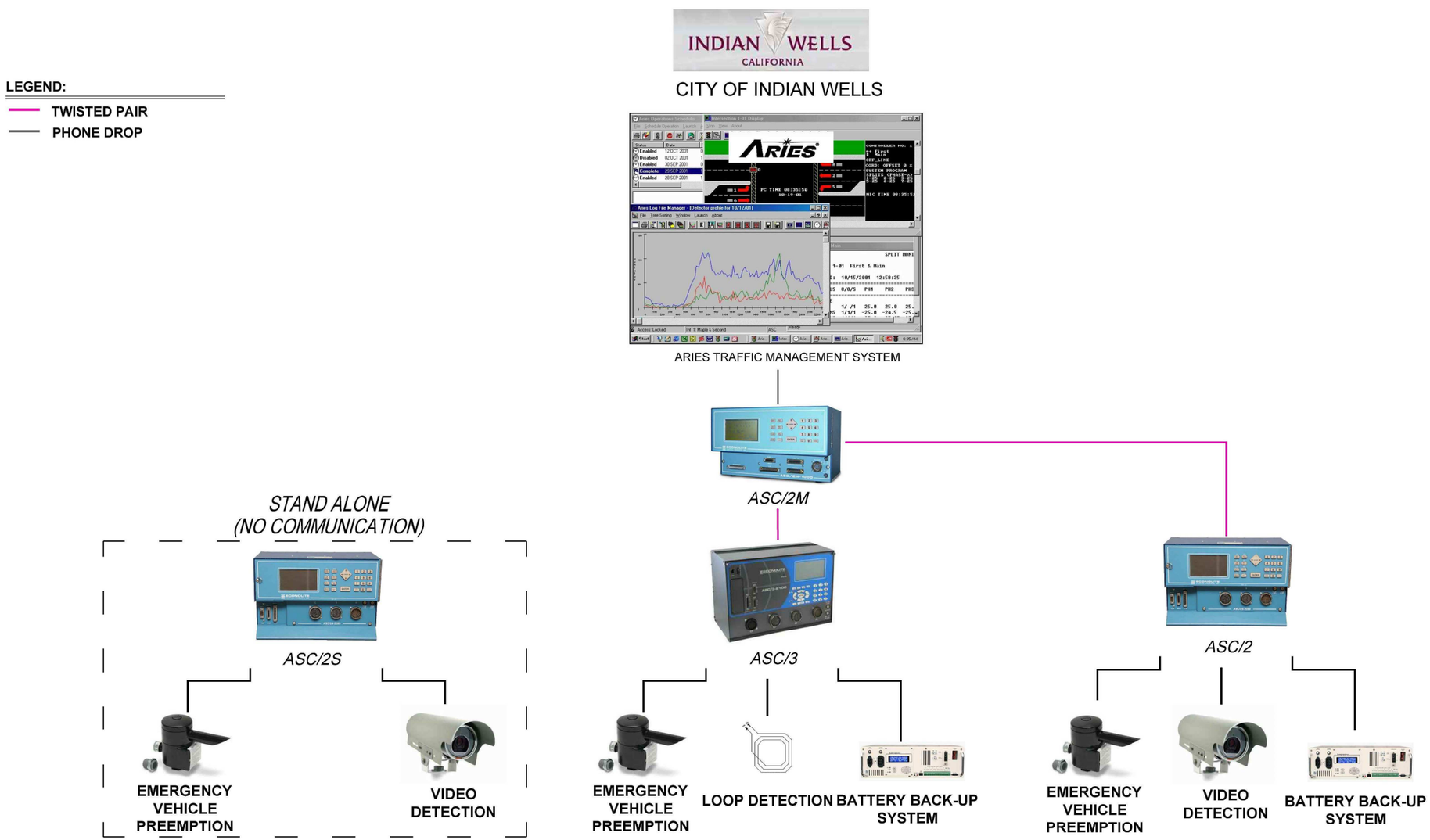
Existing System Inventory and Evaluation

Figure 1.9 City of Indian Wells Existing Conditions



Existing System Inventory and Evaluation

Figure 1.10 City of Indian Wells Existing System Architecture



ADVANTEC Consulting Engineers

CVAG

CITY OF INDIAN WELLS

EXISTING SYSTEM ARCHITECTURE

INDIAN WELLS CALIFORNIA

Table 1.18 City of Indian Wells – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Highway 111 & Village Center Dr	**7**	Highway 111 & Club Dr
2	Highway 111 & Cook St	**8**	Highway 111 & Miles Ave
3	Highway 111 & Province Wy	**9**	Highway 111 & Mountain Cove Dr
4	Highway 111 & Palmeras Rd	**10**	Cook St & Cachuma Rd
5	Highway 111 & El Dorado Dr	**11**	El Dorado Dr & Fred Waring Dr
6	Highway 111 & Indian Wells Ln	**12**	Miles Ave & Warner Trl

Table 1.19 City of Indian Wells – Project Corridors

No.	Corridor	Project Corridor Type	Limits
1	Highway 111	Primary Corridor	Village Center Dr to Mountain Cove Dr
2	Fred Waring Dr	Primary Corridor	Cook St to Washington St
3	Portola Ave	Primary Corridor	Haystack Rd to Grapevine St
4	Cook St	Primary Corridor	Fairway Dr to Fred Waring Dr
5	Hovley Ln	Primary Corridor	E/O Cook St to E/O El Dorado Dr
6	Miles Ave	Primary Corridor	Highway 111 to Washington St
7	El Dorado Dr	Primary Corridor	Highway 111 to Fred Waring Dr

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 12 signalized intersections
- ✓ 7 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.4.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.

The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

  The City has a mixture of Type 332, NEMA Type-P, and NEMA Type-R traffic signal controller cabinets throughout the City.



Type 332



Type-P



Type-R

  All NEMA Type-P, Type-R cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type P, Type 332 cabinets.

- **Traffic Signal Controllers**

  The City has mainly ASC/3 traffic signal controllers and ASC/2, both in rack and shelf mount configurations.



ASC/2-2100



ASC/3-2100

  The City uses a NEMA based controller standard. While the ASC/3 controller is still supported and IP capable, the ASC/2 controller is outdated in terms of support and integration into new ATMS systems. All new controller installations should adhere to ATC specification; such as Econolite Cobalt ATC.

- **Loop Detection**

The City has loop detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.



Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier, if applicable.

- **Video Detection System**

The City has video detection at two signalized locations. The video detection systems within the City are manufactured by Iteris. The City is using model Vantage Edge 2 system.



Video Detection Camera



Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at a future TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M and Global Traffic Technologies (GTT).



Optical Detector

Updated EVP system utilize GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at various signalized locations. The BBS within the City are manufactured by Myers.



Myers Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has twisted pair/hardwired signal interconnect cable (SIC) and Leased Line/Dial-up communications.



Twisted Pair (SIC)



Leased Line/Dial-up

All local communication via SIC cable or Leased Line/Dial-up is legacy analog type, that require modems to communicate. Typically, analog communications are no longer supported for new installations. Therefore, it is recommended a new Ethernet IP based communication system is established, that incorporates new Ethernet IP technologies. This includes considering upgrades to fiber optic cable and upgrading leased line/dial-up connections to DSL or Metro-E connections. There are also opportunities to utilize the City's existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable.

- **Communication Hubs**

The City does not have communication hubs located in the field.

Field communication hubs are beneficial for aggregation of local traffic signal controllers and ITS elements on a private local area wide network. They are typically installed at a centralized location in the field as a collection point for the ITS elements, and for creating redundant sites for communication back to central. When considering new Ethernet/IP communications systems, primarily using fiber optic cable, it is best practice to include field communication hubs in the planning and design of the new Ethernet communication network.

- **CCTV Cameras**

  The City does not have CCTV cameras systems.

  New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This includes the type of camera (top mounted or dome) and the preferred type of installation; typically, they are mounted to an existing pole or on a standalone pole. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

Table 1.20 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (unused twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.20 Existing Traffic Signal, Communication & ITS Inventory - City of Indian Wells

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Highway 111 & Village Center Dr	P-44, PNG	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	762	Myers	III-CF	
2	Highway 111 & Cook St	P-44, PNG	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	764	Myers	III-CF	
3	Highway 111 & Province Wy	R, PNG	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Myers	III-CF	
4	Highway 111 & Palmeras Rd	P-44, PNG	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Myers	III-CF	
5	Highway 111 & El Dorado Dr	332	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Myers	III-BF	
6	Highway 111 & Indian Wells Ln	332	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Myers	III-BF	
7	Highway 111 & Club Dr	332	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Myers	III-BF	
8	Highway 111 & Miles Ave	332	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Myers	III-BF	Master Location. Phone Drop
9	Highway 111 & Mountain Cove Dr	332	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Myers	III-BF	
10	Cook St & Cachuma Rd	P-44	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	N/A	III-CF	Stand-Alone. TWP not in use
11	El Dorado Dr & Fred Waring Dr	R, PNG	Econolite	ASC 3-2100	Video	Iteris Edge 2	Fiber Optic	N/A	752	N/A	III-BF	Controller on Palm Desert system
12	Miles Ave & Warner Trl	R, PNG	Econolite	ASC 2S-2100	Video / Loop	Iteris Edge 2	N/A	N/A	752	N/A	III-BF	Stand-Alone

1-2.4.2. Traffic Management Center (TMC)

The City of Indian Wells has a workstation configured with a Traffic Management System (TMS) located within City Hall. The workstation is configured and utilizes an Econolite "ARIES" central system for command and control of all traffic signal operations. ARIES communicates to the one (1) on-street master controller via leased line/dial-up connection that supplies traffic signal timing/Time-of-Day (TOD) operation and provides real-time display through the system's Graphic User Interface (GUI). The existing conditions are as follows (**Table 1.21**):

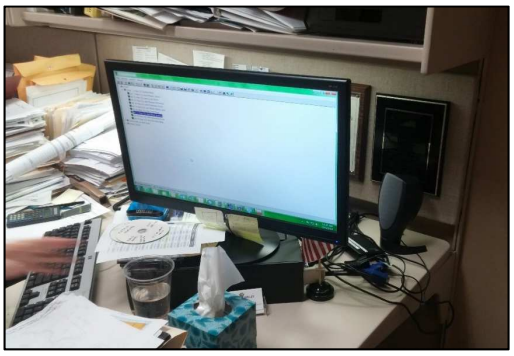


Table 1.21 Existing Traffic Management System Equipment

Traffic Management System	Econolite ARIES system
Traffic Server	No dedicated traffic server
Workstation PC	City owned PC for remote command and control (hosting Econolite ARIES)
Communications Equipment	Startech 56K fax modem
Hardwire Communications	Leased Line/Dial-up connection (Verizon)
Wireless Communications	No wireless communications equipment
Video Management System	No centralized VMS system

1-2.4.3. Future Projects

The City currently has a one (1) traffic signal modification project under the design phase at Highway 111 and El Dorado Drive.

1-2.4.4. Conclusion

Based on our inventory and evaluation of the City's existing traffic signal system, ITS elements, and communication system, there are existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

If the City considers future ITS or traffic signal related improvements; it is recommended to begin with selecting a singular standard traffic signal controller cabinet type that is environmentally friendly, use

the latest ATC, upgrade their TMS to the latest technology and upgrade their communications Citywide to an Ethernet/IP based system. Currently, the City has three types of traffic signal controller cabinets, and for maintenance and operations purposes, there should only be one standard traffic signal controller cabinet.

The City currently has two types of NEMA based traffic signal controllers, ASC/2, ASC/3 traffic signal controllers manufactured by Econolite. ASC/2 controllers are considered as a legacy system, and ASC/3 controller have the capability for Ethernet/IP based communications. Although, both controllers are no longer manufactured by Econolite; all new controllers that are supplied by Econolite are Cobalt ATC. These controllers have the latest advanced technologies and should be installed with any new or modified traffic signal. The City's current TMS is Econolite's ARIES system; this is also considered a legacy system. If the City considers upgrading this system, it is recommended to upgrade to Econolite's latest ATMS system CENTRACS.

In regards to the communications system, the City should consider upgrading communications over a fiber optic and/or a new wireless Ethernet IP based network. Once the core traffic signal controller, ATMS and communication systems are determined; then other ITS elements should also be considered to enhance traffic operations, maintenance, and mobility within and across jurisdictional boundaries.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.5. City of Indio



The City of Indio is located easterly in the Coachella Valley and borders the neighboring cities of Coachella, La Quinta and the County of Riverside. Interstate 10 (I-10) freeway traverses east-west through the northerly side of the city. Other major routes/roadways include Highway 111 that traverses east-west through the City, Miles Avenue, Fred Waring Drive, Avenue 48, Westward Ho, Madison Street, Monroe Street, and Jackson Street. Traffic signals on the I-10 on/off ramps are owned, operated, and maintained by Caltrans. Traffic signals along Highway 111 have been relinquished from Caltrans authority and are owned, operated, and maintained by the City. Selected traffic signals along the City border are owned, operated, and co-maintained by either the City of La Quinta or City of Coachella; all other traffic signals are owned, operated, and maintained by the City of Indio.

The existing traffic signal system within the City of Indio consists of the following:

- 100 traffic signals with no master controllers.
- Local communications occur over mixture of twisted-pair/copper interconnect cable (SIC), 900MHz wireless and 5.8GHz wireless Ethernet radio located along most City arterial corridors.
- The 5.8GHz wireless communication occurs in a point-to-point configuration and is utilized where no underground conduit exists, such as the outlying areas of the City along Avenue 40, Avenue 42, and Avenue 48.
- At City Yard, a dedicated traffic server hosts a centralized TMS for remote real-time traffic surveillance and monitoring of the citywide network.
- Communication to City Yard occurs by use of wireless 900MHz / 5.8GHz back-haul connections.
- Eighteen (18) existing traffic signals are "stand-alone" and have no communication hardware.

While a portion of the City of Indio uses IP based communications through its 5.8GHz wireless Ethernet radio system, it is important to note the communications protocol to the City's existing 170E controllers is still legacy analog, not digital. This is accomplished by use of a 170 controller terminal server that needs to be configured separately to establish communication. Therefore, the traffic signal system is not considered a true IP based Ethernet network.

Figure 1.11 illustrates the **existing traffic signal locations, communications, ITS components and the TMC**.

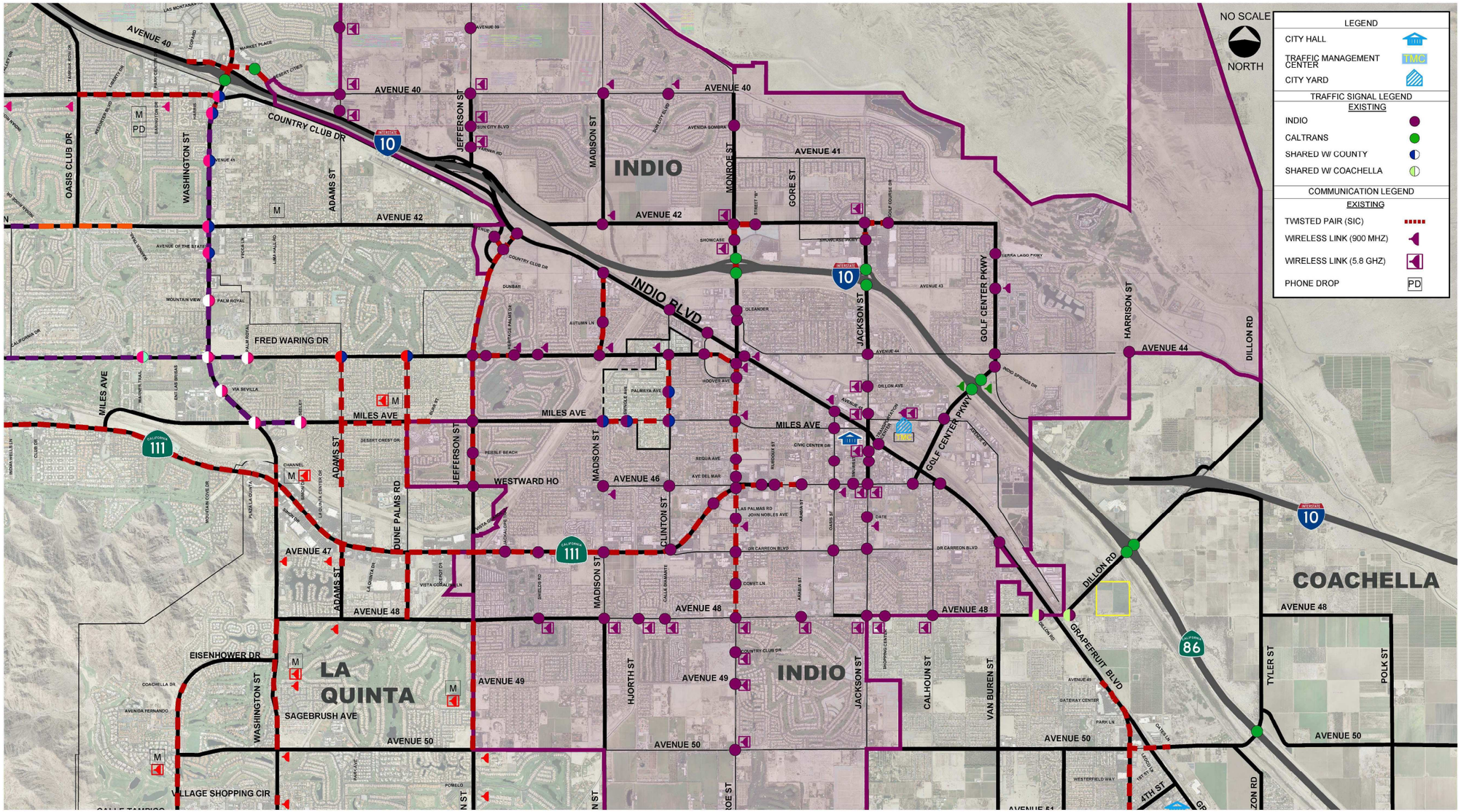
Figure 1.12 illustrates the **existing system architecture** configuration.

Table 1.22 summarizes the **number of project traffic signals** within the City of Indio for the Regional TSI Project.

Table 1.23 summarizes the **number of project corridors** within the City of Indio for the Regional TSI Project.

Existing System Inventory and Evaluation

Figure 1.11 City of Indio Existing Conditions



Existing System Inventory and Evaluation

Figure 1.12 City of Indio Existing System Architecture

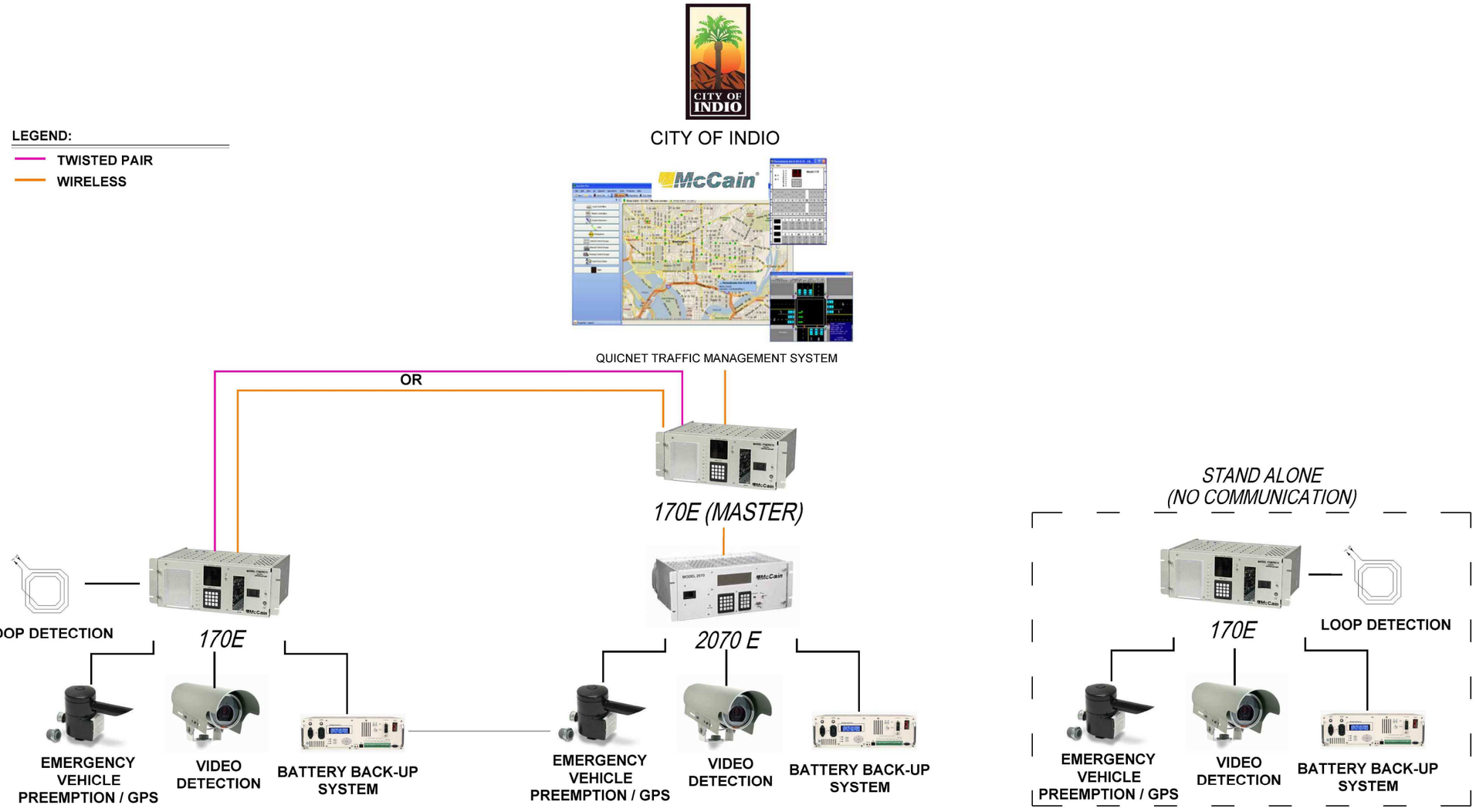


Table 1.22 City of Indio – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Avenue 42 & Country Club Dr	**27**	Fred Waring Dr & Madison St
2	Avenue 42 & Golf Course Dr	**28**	Fred Waring Dr & Shopping Center (E/O Jefferson St)
3	Avenue 42 / Country Club Dr & Jefferson St	**29**	Fred Waring Dr & Indio Blvd
4	Adams St & Avenue 39	**30**	Fred Waring Dr &Heritage Court Ctr
5	Adams St & Avenue 40	**31**	Golf Center Pkwy & Avenue 43
6	Avenue 40 & Sun City Blvd	**32**	Golf Center Pkwy & Avenue 44
7	Avenue 42 & B St	**33**	Golf Center Pkwy & Avenue 45
8	Avenue 48 & Arabia St	**34**	Golf Center Pkwy & Indio Springs Dr
9	Avenue 48 & Calhoun St	**35**	Golf Center Pkwy & Terra Largo Pkwy
10	Avenue 48 & Calle Conejo	**36**	Highway 111 & Arabia St
11	Avenue 48 & Dillon Rd	**37**	Highway 111 & Clinton St
12	Avenue 48 & Hjorth St	**38**	Highway 111 & Golf Center Pkwy
13	Avenue 48 & Indio Blvd	**39**	Highway 111 & Jackalope Trl
14	Avenue 48 & Jackson St	**40**	Highway 111 & Jackson St
15	Avenue 48 & Madison St	**41**	Highway 111 & Las Palmas Rd
16	Avenue 48 & Shields Rd	**42**	Highway 111 & Madison St
17	Avenue 48 & Shopping Ctr	**43**	Highway 111 & Mall Dr
18	Clinton St & Avenue 46	**44**	Highway 111 & Monroe St
19	Clinton St & Fred Waring Dr	**45**	Highway 111 & Oasis St
20	Clinton St & Indio Blvd	**46**	Highway 111 & Rubidoux St
21	Clinton St & Miles Ave	**47**	Highway 111 & Smurr St
22	Clinton St & Palmyra Ave	**48**	Highway 111 & Shields Rd
23	Dillon Rd & Cabazon Rd	**49**	Indio Blvd & Access Dwy
24	Fred Waring Dr & Burr St	**50**	Indio Blvd & Civic Center Dr
25	Fred Waring Dr & Heritage Palms Dr	**51**	Indio Blvd & Hoover Ave
26	Fred Waring Dr & Hoover Ave	**52**	Indio Blvd & Highway 111

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
53	Indio Blvd & Van Buren St	**78**	Miles Ave & Swingle Ave
54	Jackson St & Avenue 42	**79**	Monroe St & Avenida Del Mar
55	Jackson St & Avenue 44	**80**	Monroe St & Ave Sombra
56	Jackson St & Avenue 45	**81**	Monroe St & Avenue 42
57	Jackson St & Civic Center Dr	**82**	Monroe St & Avenue 44
58	Jackson St & Date Ave	**83**	Monroe St & Avenue 48
59	Jackson St & Dillon Rd	**84**	Monroe St & Avenue 49
60	Jackson St & Dr. Carreon Blvd	**85**	Monroe St & Avenue 50
61	Jackson St & Requa Ave	**86**	Monroe St & Country Club Dr
62	Jackson St & Showcase Pkwy	**87**	Monroe St & Comet Ln
63	Jefferson St & Avenue 39	**88**	Monroe St & Dr. Carreon Blvd
64	Jefferson St & Avenue 40	**89**	Monroe St & Fred Waring Dr
65	Jefferson St & Dunbar Dr	**90**	Monroe St & Hoover Ave
66	Jefferson St & Fred Waring Dr	**91**	Monroe St & John Nobles Ave
67	Jefferson St & Indio Blvd	**92**	Monroe St & Miles Ave
68	Jefferson St & Miles Ave	**93**	Monroe St & Oleander Ave
69	Jefferson St & Pebble Beach Dr	**94**	Monroe St & Requa Ave
70	Jefferson St & Sun City Blvd	**95**	Monroe St & Showcase Pkwy
71	Jefferson St & Varner Rd	**96**	Oasis St & Dr. Carreon Blvd
72	Jefferson St & Westward Ho	**97**	Oasis St & Indio Blvd
73	Madison St & Avenue 40	**98**	Oasis St & Miles Ave
74	Madison St & Autumn Ln	**99**	Oasis St & Requa Ave
75	Madison St & Avenue 46	**100**	Varner Rd & Adams St
76	Madison St & Indio Blvd		
77	Miles Ave & Madison St		

Table 1.23 City of Indio – Project Corridors

No.	Corridor	Project Corridor Type	Limits
1	Highway 111	Primary/ Secondary Corridor	Cook St to Rubidoux St / to Indio Blvd
2	Dillon Rd	Primary Corridor	N/O Avenue 44 to City Limits
3	Varner Rd/ Avenue 42	Primary Corridor	Jefferson St to E/O Monroe St
4	Avenue 42	Primary Corridor	E/O Monroe St to Golf Center Pkwy
5	Country Club Dr	Primary Corridor	E/O Washington St to Avenue 42
6	Fred Waring Dr	Primary Corridor	Jefferson St to Indio Blvd
7	Jefferson St	Primary Corridor	Avenue 50 to Indio Blvd/ I-10 to Avenue 40
8	Madison St	Primary/ Secondary Corridor Primary Corridor	Avenue 52 to Avenue 48 / to Highway 111, Fred Waring Dr to Indio Blvd, Avenue 42 to Avenue 40
9	Monroe St	Primary Corridor Secondary Corridor	Avenue 44 to Avenue 40 Avenue 40 to Avenue 52
10	Jackson St	Secondary Corridor Primary Corridor Secondary Corridor Primary Corridor Secondary Corridor	Avenue 52 to Highway 111 Highway 111 to Avenue 45 Avenue 45 to Avenue 44 Avenue 44 to Avenue 42 Avenue 42 to Avenue 41
11	Miles Ave	Primary Corridor Secondary Corridor	Jefferson St to Madison St Madison St to Smurr St
12	Indio Blvd	Primary Corridor	I-10 (W/O Jefferson St) to Van Buren St
13	Grapefruit Blvd (Highway 111)	Primary Corridor	Van Buren St to Dillon Rd
14	Golf Center Pkwy	Primary Corridor	Highway 111 to Avenue 42
15	Avenue 48	Primary Corridor Secondary Corridor Primary Corridor	Washington St to Madison St Madison St to Oasis St Oasis St to Grapefruit Blvd
16	Avenue 50	Primary Corridor Secondary Corridor	Jefferson St to Madison St Madison St to Jackson St
17	Avenue 52	Primary Corridor	Jackson St to Jefferson St
18	Varner Rd	Secondary Corridor	Adams St to Jefferson St
19	Avenue 40	Secondary Corridor	Adams St to Monroe St
20	Avenue 41	Secondary Corridor	Monroe St to Jackson St
21	Avenue 42	Secondary Corridor	Glass Dr to Burr St

No.	Corridor	Project Corridor Type	Limits
22	Avenue 44	Secondary Corridor	Monroe St to Dillon Rd
23	Avenue 45	Secondary Corridor	Jackson St to Dillon St
24	Avenue 46	Secondary Corridor	Madison St to Monroe St
25	Gore St	Secondary Corridor	Showcase Pkwy to Avenue 41
26	Showcase Pkwy	Secondary Corridor	Gore St to Jackson St
27	Clinton St	Secondary Corridor	Highway 111 to Indio Blvd
28	Dr. Carreon Blvd	Secondary Corridor	Highway 111 to Calhoun St
27	Oasis St	Secondary Corridor	Avenue 48 to Indio Blvd
28	Calhoun St	Secondary Corridor	Avenue 48 to Highway 111

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 100 signalized intersections
- ✓ 28 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.5.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.

The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

The City has Type 332 traffic signal controller cabinets throughout the City.



Type 332

The City's Type 332 cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type 332 cabinets. Recently, the City has adopted a new specification for future traffic signal cabinet installations: Type 352i ATC (traffic controller cabinets). This is the latest off-the-shelf hardware.

- **Traffic Signal Controllers**

The City uses 170E model traffic signal controllers manufactured by different vendors.



Type 170E

The existing Caltrans standard 170E controller is a cost effective solution to standardized intersection control. However, the 170 controller is now considered legacy system as it does not support Ethernet IP, and cannot support other various advanced ITS functions. Recently, the City has adopted a new specification for future traffic signal controller installations: Type 2070 ATC controllers with Omni eX software. This is the latest off-the-shelf equipment and software.

- **Loop Detection**

The City has loop vehicle detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.



Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier, if applicable.

- **Video Detection System**

The City has video detection at selected signalized locations. The video detection systems within the City are manufactured by Iteris. The City is using model Vantage Edge 2 system(s).



Video Detection Camera



Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at a future TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification. Recently, the City has adopted a new specification to include a hybrid video/radar vehicle detection system for all new and modified traffic signal improvements.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has a GPS based EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M and Global Traffic Technologies (GTT).



Optical Detector



GPS Sensor

The City uses an updated EVP system that utilizes GPS sensors for advanced detection. Wi-Fi technology is another option for integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at most signalized locations. The BBS within the City are manufactured by Dimensions, Myers, and Clary.



Myers Battery Backup



Dimensions Battery Backup



Clary Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has a mixture of twisted pair/hardwired signal interconnect cable (SIC), 900 MHz wireless and 5.8 GHz Ethernet wireless radio communications.



Twisted Pair (SIC)



Wireless Radio Antenna (900 MHz)



Wireless Radio Antenna (5.8GHz)

All local communication via SIC cable or 900MHz radio is legacy analog type, that require modems to communicate. The 5.8GHz wireless system utilizes Ethernet IP, however, the City's 170 controllers still communicate serially (analog). Typically, analog communications are no longer supported for new installations. Therefore, it is recommended a new Ethernet IP based communication system is established, that incorporates new Ethernet IP switching equipment. This includes considering upgrades of existing 900MHz wireless to new 5.8GHz wireless communications or higher, such as 5.9GHz DSRC wireless communications. There are also opportunities to utilize the City's existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable.

- **Communication Hubs**

The City does not have communication hubs located in the field.

Field communication hubs are beneficial for aggregation of local traffic signal controllers and ITS elements on a private local area wide network. They are typically installed at a centralized location in the field as a collection point for the ITS elements, and for creating redundant sites for communication back to central. When considering new Ethernet/IP communications systems, primarily using fiber optic cable, it is best practice to include field communication hubs in the planning and design of the new Ethernet communication network.

- **CCTV Cameras**

The City does not have CCTV camera systems.

New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This includes the type of camera (top mounted or dome) and the preferred type of installation;

typically, they are mounted to an existing pole or on a standalone pole. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

Table 1.24 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.24 Existing Traffic Signal, Communication & ITS Inventory - City of Indio

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Avenue 42 & Country Club Dr	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	454	Dimensions	III-CF	TWP Not In Use
2	Avenue 42 & Golf Course Dr	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	TWP Not In Use
3	Avenue 42 / Country Club Dr & Jefferson St	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	454	Dimensions	III-CF	
4	Adams St & Avenue 39	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Dimensions	Iii	
5	Adams St & Avenue 40	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Dimensions	Iii	
6	Avenue 40 & Sun City Blvd	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	752	Dimensions	III-CF	Wireless Not In Use
7	Avenue 42 & Street B	332	McCain	170 E	Video	Vantage Edge 2	N/A	N/A	764	Dimensions	III-CF	Stand Alone
8	Avenue 48 & Arabia St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	762	Dimensions	III-CF	
9	Avenue 48 & Calhoun St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	752	Dimensions	III-CF	
10	Avenue 48 & Calle Conejo	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	Strobecom II	Dimensions	III-CF	
11	Avenue 48 & Dillon Rd	322	McCain	170 E	Video	Vantage Edge 2	N/A	N/A	754	Dimensions	III-CF	Stand Alone
12	Avenue 48 & Hjorth St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	
13	Avenue 48 & Indio Blvd	332	McCain	170 E	Video & Loops	Vantage Edge 2	N/A	N/A	752	Dimensions	III-CF	Stand Alone
14	Avenue 48 & Jackson St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	
15	Avenue 48 & Madison St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	
16	Avenue 48 & Shields Rd	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	762	Dimensions	III-CF	
17	Avenue 48 & Shopping Center	332	DTS	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	
18	Clinton St & Avenue 46	332	McCain	170 E	Loops	2 Ch	N/A	N/A	M262 & 252	Dimensions	III-CF	Stand Alone
19	Clinton St & Fred Waring	332	McCain	170 E	Loops	2 Ch	Wireless/TWP	N/A	752	Dimensions	III-CF	
20	Clinton St & Indio Blvd	332	DTS	170 E	Loops	2 Ch	N/A	N/A	M262	Dimensions	III-CF	Stand Alone
21	Clinton St & Miles Ave	332	IDC	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	M262	Dimensions	III-CF	TWP Not In Use
22	Clinton St & Palmyra Ave	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	TWP Not In Use
23	Dillon Rd & Cabazon Rd	332	Signal Control Co	170 E	Loops	2 Ch	N/A	N/A	454	Dimensions	III-CF	Stand Alone
24	Fred Waring Dr & Burr St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	454	Dimensions	III-CF	Wireless Not In Use
25	Fred Waring Dr & Heritage Palms Dr	332	Signal Control Co	170 E	Loops	2 Ch	Wireless/TWP	N/A	M262	Dimensions	III-CF	
26	Fred Waring Dr & Hoover Ave	332	DTS	170 E	Loops	2 Ch	Twisted Pair	N/A	752	Dimensions	III-CF	



No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
27	Fred Waring Dr & Madison St	332	McCain	170 E	Video & Loops	Vantage Edge 2	Wireless/TWP	N/A	752	Dimensions	III-CF	
28	Fred Waring Dr & Shopping Center (E/O Jefferson St)	332	Safetran	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	N/A	Dimensions	III-BF	
29	Fred Waring Dr & Indio Blvd	332	McCain	170 E	Loops	2 Ch	Wireless/TWP	N/A	M262	Dimensions	III-BF	
30	Fred Waring Dr & Heritage Court Ctr	332	Signal Control Co	170 E	Loops	2 CH	Wireless	N/A	M262	Dimensions	III-CF	
31	Golf Center Pkwy & Avenue 43	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	Wireless Not In Use
32	Golf Center Pkwy & Avenue 44	332	DTS	170 E	Video	Vantage Edge 2	Wireless/TWP	N/A	754	Dimensions	III-CF	
33	Golf Center Pkwy & Avenue 45	332	McCain	170 E	Video	Vantage Edge 2	N/A	N/A	454	Dimensions	III-CF	Stand-Alone
34	Golf Center Pkwy & Indio Springs Dr	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-BF	TWP Not In Use
35	Golf Center Pkwy & Terra Largo Pkwy	332	McCain	170 E	Video	Vantage Edge 2	N/A	N/A	752	Dimensions	III-CF	Stand-Alone
36	Highway 111 & Arabia St	332	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	M262	Dimensions	III-BF	
37	Highway 111 & Clinton St	322	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	754	Myers	Ii	
38	Highway 111 & Golf Center Pkwy	332	McCain	170 E	Video	Vantage Edge 2	N/A	N/A	454	Dimensions	III-CF	Stand-Alone
39	Highway 111 & Jackalope Trl	332	Psi	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	TWP Not In Use
40	Highway 111 & Jackson St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Dimensions	III-CF	Wireless Hub
41	Highway 111 & Las Palmas Rd	332	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	M262	Dimensions	III-BF	
42	Highway 111 & Madison St	332	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	752	Myers	III-CF	TWP Not In Use
43	Highway 111 & Mall Dr	332	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	752	Dimensions	III-CF	
44	Highway 111 & Monroe St	332	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	752	Myers	III-CF	Phone Drop
45	Highway 111 & Oasis St	332	DTS	170 E	Loops	2 Ch	Wireless	N/A	M262	Myers	N/A	
46	Highway 111 & Rubidoux St	332	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	M262	Dimensions	III-BF	
47	Highway 111 & Smurr St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	767	Dimensions	III-CF	
48	Highway 111 & Shields Rd	332	DTS	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	TWP Not In Use
49	Indio Blvd & Access Dwy	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50	Indio Blvd & Civic Center Dr	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	754	Dimensions	III-CF	TWP Not In Use
51	Indio Blvd & Hoover Ave	332	Signal Control Co	170 E	Loops	2 Ch	N/A	N/A	752	Dimensions	III-CF	Stand-Alone
52	Indio Blvd & Highway 111	332	McCain	170 E	Loops	2 Ch	N/A	N/A	N/A	Dimensions	III-BF	Stand-Alone



No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
53	Indio Blvd & Van Buren St	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
54	Jackson St & Avenue 42	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	752	Dimensions	III-CF	
55	Jackson St & Avenue 44	332	McCain	170 E	Loops	2 Ch	N/A	N/A	M262	Dimensions	Type I	Stand Alone
56	Jackson St & Avenue 45	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	
57	Jackson St & Civic Center Dr	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	
58	Jackson St & Date Ave	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	Wireless Not In Use
59	Jackson St & Dillon Rd	332	Safetran	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Dimensions	III-CF	
60	Jackson St & Dr. Carreon Blvd	332	McCain	170 E	Loops	2 Ch	N/A	N/A	N/A	Dimensions	Type I	Stand-Alone
61	Jackson St & Requa Ave	332	McCain	170 E	Loops	2 Ch	N/A	N/A	N/A	Clary	Type I	Stand-Alone
62	Jackson St & Showcase Pkwy	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
63	Jefferson St & Avenue 39	332	McCain	170 E	Video	Vantage Edge 2	N/A	N/A	752	Dimensions	Iii	Stand-Alone
64	Jefferson St & Avenue 40	332	Safetran	170 E	Video	Vantage Edge 2	Wireless	N/A	464	Dimensions	Iii	Antenna Missing
65	Jefferson St & Dunbar Dr	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	764	Dimensions	III-CF	
66	Jefferson St & Fred Waring Dr	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
67	Jefferson St & Indio Blvd	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	M262 & 752	Dimensions	III-BF	
68	Jefferson St & Miles Ave	332	McCain	170 E	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
69	Jefferson St & Pebble Beach Dr	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
70	Jefferson St & Sun City Blvd	332	IDC	170 E	Video	Vantage Edge 2	Wireless	N/A	752	Dimensions	Iii	
71	Jefferson St & Varner Rd	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Dimensions	III-CF	
72	Jefferson St & Westward Ho	332	Psi	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
73	Madison St & Avenue 40	332	DTS	170 E	Video	Vantage Edge 2	Wireless	N/A	754	Dimensions	III-CF	
74	Madison St & Autumn Ln	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	TWP Not In Use
75	Madison St & Avenue 46	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	Strobecom II	Dimensions	III-CF	Wireless Not In Use
76	Madison St & Indio Blvd	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	454	Dimensions	III-CF	TWP Not In Use
77	Miles Ave & Madison St	332	McCain	170 E	Video	Vantage Edge 2	N/A	N/A	452	Dimensions	III-CF	Stand-Alone
78	Miles Ave & Swingle Ave	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	TWP Not In Use



No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
79	Monroe St & Avenida Del Mar	332	McCain	170 E	Loops	2 Ch	Wireless/TWP	N/A	752	Dimensions	III-CF	Antenna Not In Use
80	Monroe St & Avenida Sombra	332	McCain	170 E	Video	Vantage Edge 2	N/A	N/A	754	Dimensions	III-CF	Stand-Alone
81	Monroe St & Avenue 42	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Dimensions	III-CF	
82	Monroe St & Avenue 44	332	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	M262 & 752	Dimensions	III-CF	
83	Monroe St & Avenue 48	332	McCain	170 E	Video	Vantage Edge 2	Wireless/TWP	N/A	752	Dimensions	III-CF	
84	Monroe St & Avenue 49	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Dimensions	III-CF	
85	Monroe St & Avenue 50	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Cabinet Locked	III-CF	
86	Monroe St & Country Club	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	752	Dimensions	III-CF	
87	Monroe St & Comet Ln	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	N/A	Dimensions	III-CF	TWP Not In Use
88	Monroe St & Dr. Carreon Blvd	332	McCain	170 E	Loops	2 Ch	Wireless/TWP	N/A	752	Dimensions	III-CF	
89	Monroe St & Fred Waring Dr	332	McCain	170 E	Loops	2 Ch	Wireless/TWP	N/A	M262	Dimensions	III-CF	
90	Monroe St & Hoover Ave	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
91	Monroe St & John Nobles Ave	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	752	Dimensions	III-CF	
92	Monroe St & Miles Ave	332	DTS	170 E	Loops	2 Ch	Wireless	N/A	M262	Dimensions	Type I	
93	Monroe St & Oleander Ave	332	McCain	170 E	Video	Vantage Edge 2	Twisted Pair	N/A	754	Dimensions	III-CF	
94	Monroe St & Requa Ave	332	McCain	170 E	Loops	2 Ch	Twisted Pair	N/A	M262	Dimensions	Type I	
95	Monroe St & Showcase Pkwy	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	764	Dimensions	III-CF	Wireless Not In Use
96	Oasis St & Dr. Carreon Blvd	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	Strobecom II	Dimensions	III-CF	Wireless Not In Use
97	Oasis St & Indio Blvd	332	McCain	170 E	Loops	2 Ch	Wireless	N/A	N/A	Dimensions	III-CF	
98	Oasis St & Miles Ave	332	McCain	170 E	Loops	2 Ch	N/A	N/A	N/A	Dimensions	III-CF	Stand-Alone
99	Oasis St & Requa Ave	332	DTS	170 E	Loops	2 Ch	N/A	N/A	754	Dimensions	III-CF	Stand-Alone
100	Varner Rd & Adams St	332	McCain	170 E	Video	Vantage Edge 2	Wireless	N/A	752	Dimensions	III	

1-2.5.2. Traffic Management Center (TMC)



The City of Indio has a dedicated traffic server configured with a Traffic Management System (TMS) located at the City Yard. The traffic server is configured and utilizes McCain "QUICNET" central system for command and control of all traffic signal operations. QUICNET communicates directly to the City's model 170E controllers that supply traffic signal timing/Time-of-Day (TOD) operation and provides real-time display through the system's Graphic User Interface (GUI).

Dual 900MHz and dual 5.8GHz wireless radios are established as backhaul links that communicate to on-street localized intersections. No hardwire communications enter the City Yard. The existing conditions are as follows (**Table 1.25**):

Table 1.25 Existing Traffic Management System Equipment

Traffic Management System	McCain QUICNET system
Traffic Server	Dell Precision 490 Xeon
Workstation PC	No workstation PC / remote command and control
Communications Equipment	Digi Portserver 16 channel terminal server Encom TS-1 terminal server
Hardwire Communications	No hardwire communications equipment
Wireless Communications	(2) Encom Wireless 900MHz spread spectrum radios (2) Encom Commpak BB 5.8GHz wireless Ethernet radios
Video Management System	No centralized VMS system

1-2.5.3. Future Projects

The City currently has two (2) upcoming projects: 1) a traffic signal modification project at Doctor Carreon Boulevard and Oasis Street, and 2) traffic signal improvements along Monroe Street between Oleander Avenue and Comet Lane.

The City has recently adopted new specifications for the traffic signal, communications and ITS elements, as shown below. Any future project improvements will include the following equipment, which is considered up-to-date technologies.

- Traffic signal controller assembly
    a. New Type 2070 ATC controllers with Omni eX software
    b. New Type 352i ATC (traffic controller cabinets)

- Wireless communications
    c. Upgrade to high-bandwidth 5.8GHz wireless system or higher, such as 5.9GHz DSRC
- Emergency Vehicle Preemption (EVP) System
    d. This EVP system includes infrared and GPS/radio priority control technologies
- Hybrid video detection system
    e. The Vantage Vector Hybrid video detection system. This utilizes both video and radar capabilities for stop bar and advanced detection

1-2.5.4. Conclusion

Based on our inventory and evaluation of the City's existing and future traffic signal system, ITS elements, communication system, and TMC there are existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

The City's future projects and recommended upgrades will include improvements that meet their latest specifications such as: new 2070 ATC (traffic controllers), Type 352i ATC (traffic controller cabinets), 5.8GHz wireless Ethernet radios with DSRC, EVP system (infrared/GPS/radio), and hybrid video/radar vehicle detection. Other ITS improvements should also be considered such as new centralized Advanced Traffic Management System (ATMS), closed circuit television (CCTV) camera systems, arterial management system technologies, etc. The City's current ATMS is McCain's QUICNET system; this is considered a legacy system. If the City considers upgrading this system, they may consider McCain's latest ATMS called TRANSPARITY.

In regards to the communications, a portion of the City of Indio uses IP based communications through its 5.8GHz wireless Ethernet radio system, it is important to note the communications protocol to the City's existing 170E controllers is still legacy analog, not digital. This is accomplished by use of a 170 controller terminal server that needs to be configured separately to establish communication. Therefore, the traffic signal system is not considered a true IP based Ethernet network. Looking to the future, the City should consider upgrading their communications system to provide a true Ethernet/IP-based communications system. This can be accomplished over hardwired/twisted-pair, fiber optic and/or wireless communications. Additional analysis and coordination with City staff will be required.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.6. City of La Quinta



The City of La Quinta is located south easterly in the Coachella Valley and borders the neighboring cities of Indio, Indian Wells, Palm Desert and the County of Riverside. Major routes/roadways include Highway 111 that traverses east-west through the City. Other major roadways include Fred Waring Drive, Miles Avenue, Washington Boulevard and Jefferson Street. Traffic signals along Highway 111 have been relinquished from Caltrans authority and are owned, operated and maintained by the City. Selected traffic signals along the City border are owned, operated and co-maintained by either the City of Indio or the City of Palm Desert; all other traffic signals are owned, operated and maintained by the City of La Quinta.

The existing traffic signal system within the City of La Quinta consists of the following:

- 54 traffic signals with six (6) on-street master controllers.
- Local communications occur over a mixture twisted-pair/copper interconnect cable (SIC) and 900/2400MHz wireless radio at locations where conduit does not exist.
- Back-haul communications to City Hall occur by use of 5.8GHz Ethernet wireless broadband radio at centralized master locations. Pre-existing leased line/dial-up communications at master locations have been abandoned in favor of 5.8GHz Ethernet wireless radio.
- At City Hall, a dedicated room is established for Traffic Management Center (TMC) operations including a workstation PC and two wall mounted video display monitors for traffic surveillance.
- Communication to City Hall occurs by a quad-spectral 5.8GHz wireless radio mounted atop City Hall roof that communicates to all 6 on-street master locations.
- Two (2) existing traffic signals are "stand-alone" and have no communication hardware.

There are six (6) City of La Quinta's traffic signals that are connected to the City of Palm Desert's traffic management system. These are located at: 1) Washington Street at Miles Avenue 2) Fred Waring Drive at Palm Royal Drive 3) Miles Avenue at Seeley Drive, 4) Washington Street at Via Sevilla, 5) Washington Street at Fred Warring Drive, and 6) Washington Street at Palm Royal Drive. The operations and status of these traffic signals are controlled remotely by Palm Desert staff.

Figure 1.13 illustrates the **existing traffic signal locations, communications, ITS components and the TMC at City Hall.**

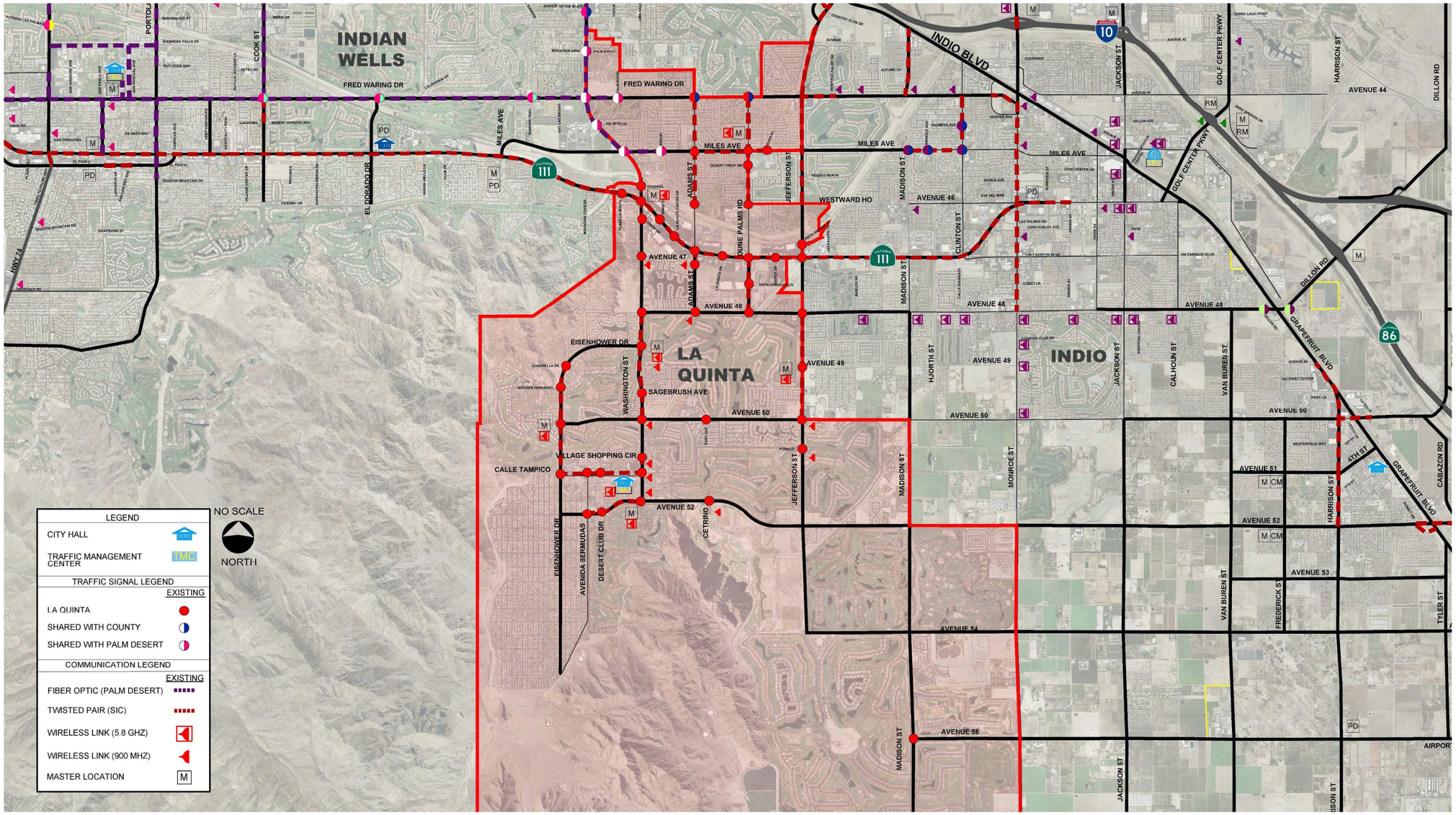
Figure 1.14 illustrates the **existing system architecture** configuration.

Table 1.26 summarizes the **number of project traffic signals** within the City of La Quinta for the Regional TSI Project.

Table 1.27 summarizes **the number of project corridors** within the City of La Quinta for the Regional TSI Project.

Existing System Inventory and Evaluation

Figure 1.13 City of La Quinta Existing Conditions



Existing System Inventory and Evaluation

Figure 1.14 City of La Quinta Existing System Architecture

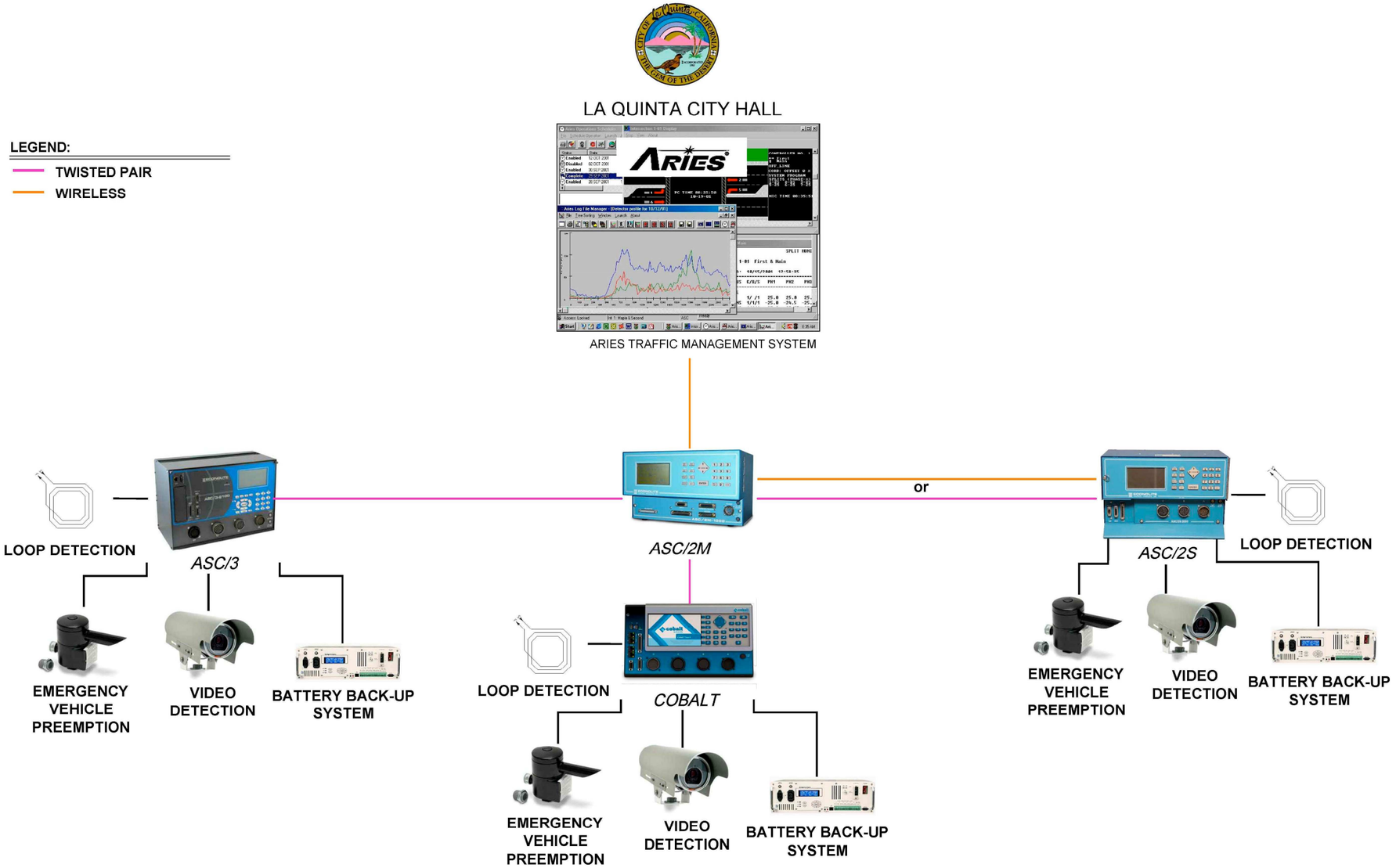


Table 1.26. City of La Quinta – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Adams St & Avenue 48	**28**	Washington St & Calle Tampico
2	Dune Palms Rd & Avenue 48	**29**	Washington St & Avenue 52
3	Avenue 50 & Park Ave	**30**	Eisenhower Dr & Calle Tampico
4	Calle Tampico & Desert Club Dr	**31**	Washington St & Sagebrush Ave
5	Calle Tampico & Avenida Bermudas	**32**	Avenue 52 & Cetrino (Silver Rock Wy)
6	Eisenhower Dr & Avenida Fernando	**33**	Washington St & Palm Royale Dr
7	Eisenhower Dr & Avenue 50	**34**	Washington St & Simon Dr
8	Eisenhower Dr & Coachella Dr	**35**	Miles Ave Pedestrian Crossing
9	Adams St & Fred Waring Dr	**36**	Dune Palms Rd & Desert Crest Dr
10	Dune Palms Rd & Fred Waring Dr	**37**	Jefferson & Avenue 49
11	Jefferson St & Vista Grande	**38**	Adams St & Avenue 47
12	Jefferson St & Avenue 48	**39**	Dune Palms Rd & Blackhawk Wy (Westward Ho)
13	Jefferson St & Avenue 50	**40**	Fred Waring Dr & Palm Royale Dr
14	Adams St & Miles Ave	**41**	Miles Ave & Seeley Dr
15	Dune Palms Rd & Miles Ave	**42**	Adams St & Corporate Centre
16	Adams St & Blackhawk Wy	**43**	Highway 111 & Plaza La Quinta
17	Avenue 52 & Avenida Bermudas	**44**	Highway 111 & Washington St
18	Airport Blvd & Madison St	**45**	Highway 111 & Simon Dr
19	Jefferson St & Pomelo/Pomelo Verano Dr	**46**	Highway 111 & La Quinta Center (Target)
20	Washington St & Fred Waring Dr	**47**	Highway 111 & Adams St
21	Washington St & Miles Ave	**48**	Highway 111 & La Quinta Dr/Walmart
22	Washington St & Channel Dr	**49**	Highway 111 & Dune Palms Rd
23	Washington St & Avenue 47 (Point Happy)	**50**	Highway 111 & Depot Dr
24	Washington St & Avenue 48	**51**	Highway 111 & Jefferson St
25	Washington St & Eisenhower Dr	**52**	Avenue 52 & Desert Club Dr
26	Washington St & Avenue 50	**53**	Dune Palms Rd & Vista Coralina Ln
27	Washington St & Village Shopping Ctr	**54**	Washington St & Via Sevilla

Table 1.27 City of La Quinta – Project Corridors

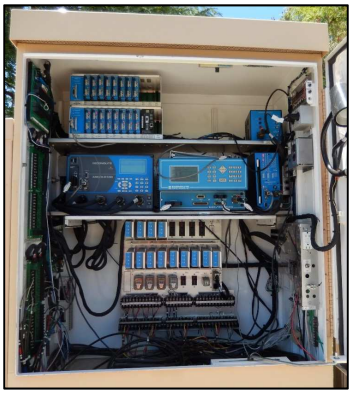
No.	Corridor	Project Corridor Type	Limits
1	Highway 111	Primary Corridor	Plaza La Quinta to Jefferson St
2	Fred Waring Dr	Primary Corridor	Washington St to Jefferson St
3	Miles Ave	Primary Corridor	Washington St to Jefferson St
4	Washington St	Primary Corridor	Avenue 52 to Palm Royal
5	Jefferson St	Primary Corridor	Avenue 54 to Indio Blvd
6	Madison St	Primary Corridor	Avenue 50 to Avenue 52
7	Eisenhower Dr	Primary Corridor	Avenue 52 to Washington St
8	Adams St	Primary Corridor	Avenue 48 to Fred Waring Dr
9	Dune Palms Rd	Primary Corridor	Avenue 48 to Fred Waring Dr
10	Avenue 48	Primary Corridor	Washington St to Jefferson St
11	Avenue 50	Primary Corridor	Eisenhower Dr to Jefferson St
12	Avenue 52	Primary Corridor	Eisenhower Dr to Monroe St
13	Calle Tampico	Secondary Corridor	Eisenhower Dr to Washington St
14	Avenida Bermudas	Secondary Corridor	Calle Tampico to Avenue 52

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 54 signalized intersections
- ✓ 14 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.6.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.



The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-

arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

  The City primarily NEMA based Type P, Type R and Type O and various state standard Type 332 traffic signal controller cabinets throughout the City.



Type 332



Type P



Type R



Type O

  All NEMA Type-P, Type R and Type O generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type P, Type O and Type 332 cabinets.

- **Traffic Signal Controllers**

  The City has several types of traffic signal controllers including type ASC/2's, ASC/3's and Cobalt controllers and are provided by various traffic signal controller manufacturers.



ASC/2-2100



ASC/3-2100



Cobalt

  The City uses a NEMA based controller standard. While the ASC/3 controller is still supported and IP capable; the ASC/2 controller is outdated in terms of support and integration into new ATMS systems. All new controller installations should adhere to ATC specification; such as Econolite Cobalt ATC.

- **Loop Detection**

The City has loop detection at few signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.



Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier if applicable.

- **Video Detection System**

The City has video detection at most signalized locations. The video detection systems within the City are manufactured by Iteris and Econolite. The City is using model Vantage Edge 2, Vantage Vector and Autoscope system(s).



Video Detection Camera



Iteris Vantage Edge 2 Processor



Iteris Vector



Autoscope

The City is using Vantage Edge 2 system for remote monitoring and set-up by use of the additional Edge Connect module for display of video images at their TMC. Lane-by-lane detection should be configured for all Adaptive controlled intersections (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification, such as the Iteris Vector or Econolite Encore system.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M and Global Traffic Technologies (GTT).



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at most signalized locations. The BBS within the City are manufactured by Dimensions, Myers, Alpha and Clary.



Myers Battery Backup



Dimensions Battery Backup



Clary Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has a mixture of twisted pair/hardwired signal interconnect cable (SIC), 900 MHz wireless and 5.8GHz Ethernet wireless radio communications.



Twisted Pair (SIC)



Wireless Radio Antenna (900 MHZ)



Wireless Radio Antenna (5.8GHZ)

All local communication via SIC cable or 900MHz radio is legacy analog type, that require modems to communicate. The 5.8GHz wireless system utilizes Ethernet IP, however, the City's ASC controllers still communicate serially. The City is currently under design for transition to an entirely new Ethernet IP based communication system that incorporates new Ethernet IP switching equipment. The new Ethernet/IP communication system will replace the existing SIC with fiber optic cable citywide and connect all traffic signals to the TMC. All existing 900MHz wireless will be salvaged.

- **Communication Hubs**

The City does not have communication hubs located in the field.

As part of the the Ethernet IP communication upgrade project, the City plans to establish new communication hubs in the field. They are typically installed at a centralized location in the field

as a collection point for the ITS elements on a private local area network, and for creating redundant sites for Ethernet communication back to central.

- **CCTV Cameras**

  The City does not have CCTV camera systems.

  New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This includes the type of camera (top mounted or dome) and the preferred type of installation; typically, they are mounted to an existing pole or on a standalone pole. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

Table 1.28 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.28 Existing Traffic Signal, Communication & ITS Inventory - City of La Quinta

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Adams St & Avenue 48	P-44	Econolite	ASC 3-2100	Video	Iteris Edge 2	Wireless	N/A	754	Dimensions	III-CF	
2	Dune Palms Rd & Avenue 48	P-44	Econolite	ASC 3-2100	Video	Iteris Edge 2	Twisted Pair	N/A	760 Chassis / 752	Dimensions	III-CF	
3	Avenue 50 & Park Ave	P-44, PNG	Econolite	ASC 3-2100	Loop	N/A	N/A	N/A	752	Dimensions	III-BF	Stand Alone
4	Calle Tampico & Desert Club Dr	P-44, PNG	Econolite	ASC 3-2100	Video	Iteris Edge 2	Twisted Pair	N/A	562	Dimensions	III-BF	
5	Calle Tampico & Avenida Bermudas	P-44	Econolite	ASC 3-2100	Video	Iteris Edge 2	Twisted Pair	N/A	752 / 562	Dimensions	III-CF	
6	Eisenhower Dr & Avenida Fernando	P-44, PNG	Econolite	ASC 3-2100	Loop	N/A	Twisted Pair	N/A	752	Dimensions	III-CF	
7	Eisenhower Dr & Avenue 50	P-44, PNG	Econolite	ASC 3-2100	Loop	N/A	Twisted Pair	N/A	764	Dimensions	III-BF	Master Location
8	Eisenhower Dr & Coachella Dr	P-44, PNG	Econolite	ASC 3-2100	Video	Econolite Autoscope	Twisted Pair	N/A	752	Dimensions	III-CF	
9	Adams St & Fred Waring Dr	P-44, PNG	Econolite	ASC 3-2100	Video / Loop	Iteris Edge 2	Twisted Pair	N/A	764	Dimensions	III-CF	Shared County Riverside
10	Dune Palms Rd & Fred Waring Dr	P-44	Econolite	Cobalt	Video / Loop	Iteris Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	Shared County Riverside
11	Jefferson St & Vista Grande	332	Econolite	ASC 3 Rack	Video	Iteris Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
12	Jefferson St & Avenue 48	P-44	Econolite	ASC 2-2100	Video	Iteris Edge 2	Twisted Pair	N/A	754	Dimensions	III-CF	
13	Jefferson St & Avenue 50	P-44	Econolite	ASC 2S-2100	Video	Iteris Edge 2	Twisted Pair	N/A	752 Chassis	Dimensions	III-CF	
14	Adams St & Miles Ave	P-44, PNG	Econolite	ASC 3-2100	Loop		Twisted Pair	N/A	764	Dimensions	III-CF	
15	Dune Palms Rd & Miles Ave	P-44, PNG	Econolite	Cobalt	Video / Loop	Iteris Edge 2 / Vector	Twisted Pair	N/A	562	Dimensions	III-CF	Master Location
16	Adams St & Blackhawk Wy	P-44, PNG	Econolite	ASC 3-2100	Video	Econolite Autoscope	Twisted Pair	N/A	754	Dimensions	III-CF	
17	Avenue 52 & Avenida Bermudas	P-44, PNG	Econolite	ASC 3-2100	Video	Iteris Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
18	Airport Blvd & Madison St	P-44	Econolite	ASC 2S-2100	Video	Iteris Edge 2	N/A	N/A	762 / 562	Dimensions	III-CF	Stand Alone
19	Jefferson St & Pomelo/Pomelo Verano Dr	P-44, PNG	Econolite	ASC 2S-2100	Video / Loop	Iteris Edge 2	Wireless	N/A	752	Dimensions	III-CF	
20	Washington St & Fred Waring	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	Controller on P.D. system
21	Washington St & Miles Ave	P-44, PNG	Econolite	ASC 2S-2100	Video	Iteris Vector	Fiber Optic	N/A	764	Myers	III-CF	Controller on P.D. system
22	Washington St & Channel Dr	O	Econolite	ASC 3-2100	Loop	N/A	Twisted Pair	N/A	752	Dimensions	III-BF	
23	Washington St & Avenue 47 (Point Happy)	P-44	Econolite	ASC 2S-2100	Loop	N/A	Wireless	N/A	752	Dimensions	III-CF	
24	Washington St & Avenue 48	P-44	Econolite	ASC 2S-2100	Video	Iteris Edge 2	Twisted Pair	N/A	752 Chassis	Dimensions	III-CF	
25	Washington St & Eisenhower Dr	P-44	Econolite	ASC 2-2100	Video	Iteris Edge 2 / Vector	Twisted Pair	N/A	764	Myers	III-CF	Master Location
26	Washington St & Avenue 50	P-44	Econolite	ASC 2S-2100	Video	Iteris Edge 2 / Vector	Twisted Pair	N/A	754	Dimensions	III-CF	

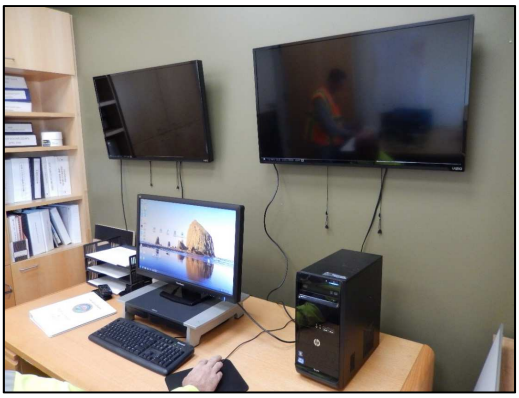


No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
27	Washington St & Village Shopping Ctr	P-44	Econolite	ASC 2S-2100	Video / Loop	Iteris Edge 2	Wireless	N/A	562	Dimensions	III-CF	
28	Washington St & Calle Tampico	P-44	Econolite	ASC 2S-2100	Video	Iteris Edge 2/Vector	Wireless/ TWP	N/A	754	Dimensions	III-CF	
29	Washington St & Avenue 52	P-44	Econolite	ASC 3-2100	Video	Iteris Edge 2	Wireless/ TWP	N/A	760 Chassis/ 764	Dimensions	III-BF	Master Location
30	Eisenhower Dr & Calle Tampico	P-44, PNG	Econolite	ASC 3-2100	Video	Econolite Autoscope	Twisted Pair	N/A	752	Dimensions	III-CF	
31	Washington St & Sagebrush Ave	R, PNG	Econolite	ASC 2S-2100	Video	Econolite Autoscope	Twisted Pair	N/A	752	Dimensions	III-BF	
32	Avenue 52 & Cetrino (Silver Rock Wy)	P-44, PNG	Econolite	ASC 2S-2100	Video	Econolite Autoscope	Wireless	N/A	752	Dimensions	III-CF	
33	Washington St & Palm Royale Dr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Shared City of P.D.
34	Washington St & Simon Dr	332	Econolite	ASC 3 Rack	Video / Loop	Econolite Autoscope	Twisted Pair	N/A	752	Dimensions	III-CF	
35	Miles Ave Pedestrian Crossing	P-44, PNG	Econolite	Cobalt	Video	Econolite Autoscope	Twisted Pair	N/A	452	Dimensions	III-BF	
36	Dune Palms Rd & Desert Crest Dr	P-44, PNG	Econolite	Cobalt	Video	Econolite Autoscope	Twisted Pair	N/A	752	Dimensions	III-BF	
37	Jefferson St & Avenue 49	R, PNG	Econolite	ASC 2S-2100	Video / Loop	Econolite Autoscope	Twisted Pair	N/A	752	Myers	III-BF	Master Location
38	Adams St & Avenue 47	332	Econolite	ASC 3 Rack	Video / Loop	Econolite Autoscope	Twisted Pair	N/A	752	Myers	III-CF	
39	Dune Palms Rd & Blackhawk Wy (Westward Ho)	P-44, PNG	Econolite	Cobalt	Video / Loop	Econolite Autoscope	Twisted Pair	N/A	452 / 752	Dimensions	III-BF	
40	Fred Waring Dr & Palm Royale Dr	P-44, PNG	Econolite	ASC 2S-2100	Video / Loop	Econolite Autoscope	Fiber Optic	N/A	754	Dimensions	III-CF	Controller on P.D. system
41	Miles Ave & Seeley Dr	P-44, PNG	Econolite	ASC 2S-2100	Video / Loop	Econolite Autoscope	Fiber Optic	N/A	752	Dimensions	III-CF	Controller on P.D. system
42	Adams St & Corporate Centre	P-44, PNG	Econolite	Cobalt	Video	Iteris Edge 2/Vector	Twisted Pair	N/A	764	Dimensions	III-CF	
43	Highway 111 & Plaza La Quinta	O, PNG	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Dimension	III-CF	
44	Highway 111 & Washington St	R, PNG	Econolite	ASC 3-2100	Video / Loop	Iteris Edge 2	Twisted Pair	N/A	764	Dimensions	III-CF	Master Location
45	Highway 111 & Simon Dr	O, PNG	Econolite	ASC 3-2100	Video	Iteris Edge 2/Vector	Twisted Pair	N/A	752	Alpha	III-BF	
46	Highway 111 & La Quinta Center (Target)	O, PNG	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	Alpha	III-BF	
47	Highway 111 & Adams St	P-44, PNG	Econolite	ASC 3-2100	Video / Loop	Econolite Autoscope	Twisted Pair	N/A	764	Dimensions	III-BF	
48	Highway 111 & La Quinta Dr (Walmart)	P-44, PNG	Econolite	ASC 3-2100	Video / Loop	Econolite Autoscope	Twisted Pair	N/A	562	Dimensions	III-CF	
49	Highway 111 & Dune Palms Rd	P-44, PNG	Econolite	ASC 3-2100	Video / Loop	Econolite Autoscope	Twisted Pair	N/A	764	Dimensions	III-BF	
50	Highway 111 & Depot Dr	P-44, PNG	Econolite	ASC 3-2100	Video / Loop	Econolite Autoscope	Twisted Pair	N/A	454	Dimensions	III-CF	
51	Highway 111 & Jefferson St	O, PNG	Econolite	ASC 3-2100	Video	Iteris Edge 2	Twisted Pair	N/A	764	Dimensions	III-BF	

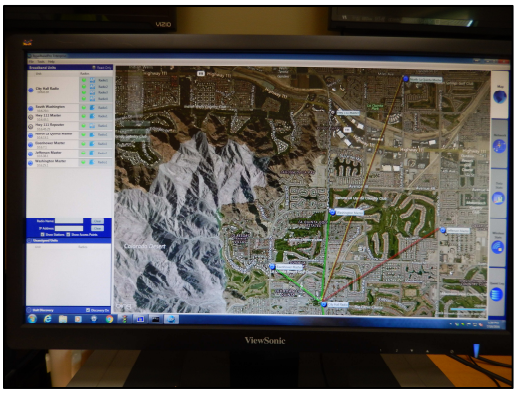


No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
52	Avenue 52 & Desert Club Dr	P-44, PNG	Econolite	ASC 3-2100	Video / Loop	Iteris Edge 2	Twisted Pair	N/A	760 Chassis/ 764	Dimensions	III-BF	
53	Dune Palms Rd & Vista Coralina Ln	P-44, PNG	Econolite	ASC 3-2100	Video / Loop	Iteris Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
54	Washington St & Via Sevilla	P-44, PNG	Econolite	ASC 3-2100	Video / Loop	Iteris Edge 2	Fiber Optic	N/A	752	Dimensions	III-CF	Controller on P.D. system

1-2.6.2. Traffic Management Center (TMC)



The City of La Quinta has a dedicated room for Traffic Management Center (TMC) operations located within City Hall. The room houses a dedicated workstation PC and two (2) wall mounted LED video monitors for traffic surveillance. The City of La Quinta utilizes an Econolite "ARIES" central system for command and control of all traffic signal operations. ARIES communicates to the City's six (6) on-street master controllers that supply traffic signal timing/Time-of-Day (TOD) operation and provides real-time display through the system's Graphic User Interface (GUI).



Connection to all six (6) on-street master controllers occurs over spread spectrum 5.8GHz wireless broadband through a quad spectral radio mounted atop City Hall. No hardwire communication enters City Hall.

In addition to the ARIES central control system, the City also utilizes other supplemental software programs, such as: Intuicom Broadband Enterprise software to manage the wireless 5.8GHz Ethernet backhaul radio network and Iteris VRAS program enables remote viewing of video detection cameras via the Iteris Edge Connect modules. These traffic based software systems help the City technicians with day-to-day traffic operations and maintenance. The existing conditions are as follows (**Table 1.29**):

Table 1.29 Existing Traffic Management System Equipment

Traffic Management System	Econolite ARIES system
Traffic Server	Hosted on City IT server
Workstation PC	HP Pro Core i5 workstation PC (2) Vizio LCD display monitors
Communications Equipment	No communications equipment (terminal servers located at Master field locations)
Hardwire Communications	No hardwire communications equipment
Wireless Communications	Intuicom Nitro 58/Quad Spectral 5.8GHz wireless Ethernet radio(s)
Video Management System	Iteris VRAS system (Video Detection camera system)

1-2.6.3. Future Projects

The City has been awarded funds (two grants) under the HSIP grant program:

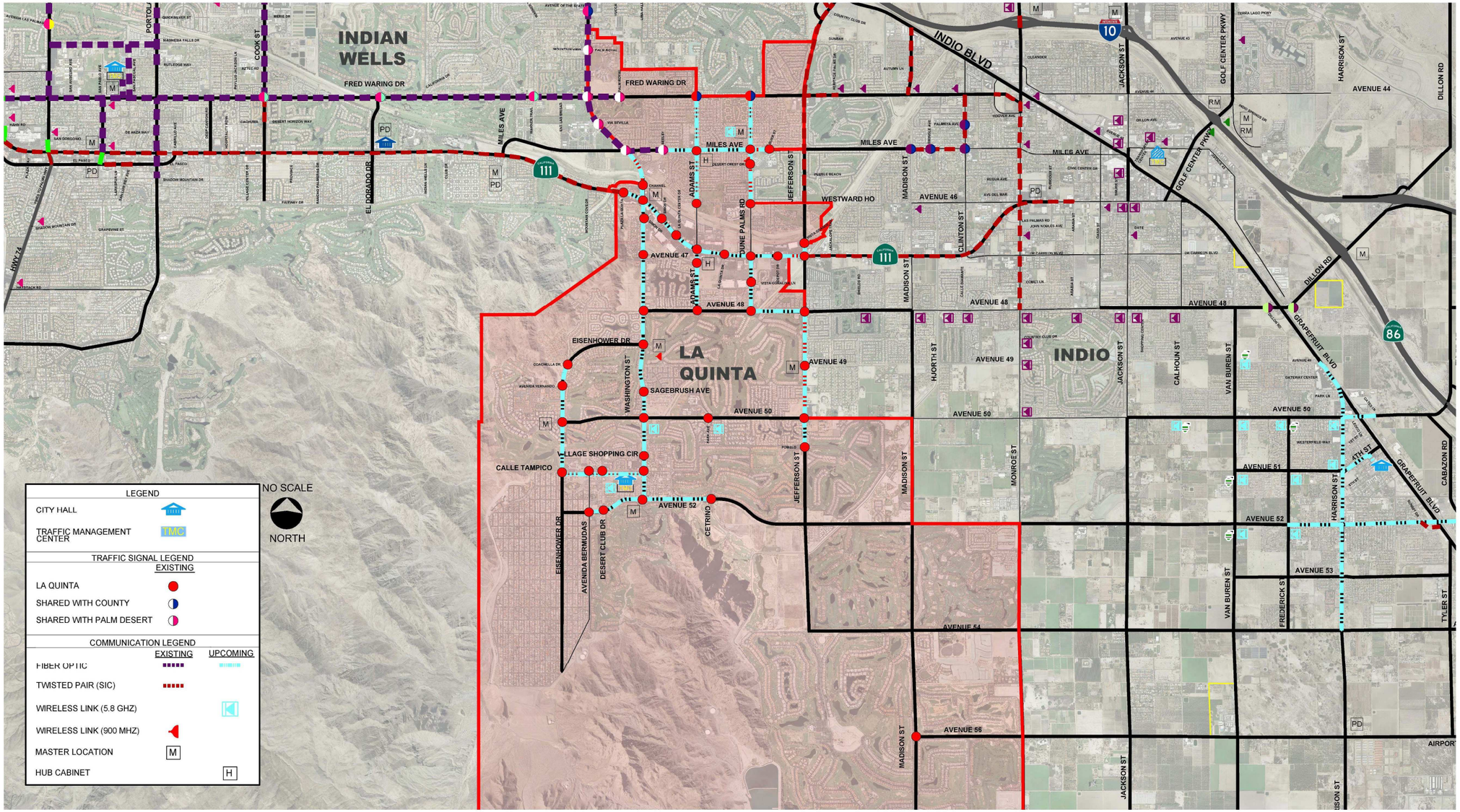
- LED Lighting upgrades at signalized intersections including traffic signal controller upgrades at selected locations.
- Provide fiber optic communications citywide. The proposed fiber optic communication project improvements include the replacement of legacy twisted-pair copper and wireless interconnect, and the installation of new fiber optic cabling in existing and new conduit.

Figure 1.15 illustrates the existing traffic signal locations and future communications systems (proposed fiber optic communications is approved; and the proposed wireless communications is pending approvals).

These future projects are currently under design and will be constructed in the near term. Therefore, it will be considered as our base conditions if further upgrades are considered under this project.

Existing System Inventory and Evaluation

Figure 1.15 City of La Quinta Future Conditions



1-2.6.4. Conclusion

Based on our inventory and evaluation of the City's existing and future traffic signal system, ITS elements, communication system, and TMC there are existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

The City's future projects include ITS improvements such as: new Econolite Cobalt ATC (traffic controllers), and citywide fiber optic and an Ethernet/IP-based communications improvements to all traffic signals. These upgrades build the foundation for the City to tie future ITS related components.

If the City considers future ITS or traffic signal related improvements; it is recommended to begin with selecting a new centralized Advanced Traffic Management System (ATMS). The City's current TMS is Econolite's ARIES system; this is considered a legacy system. If the City considers upgrading this system, it is recommended to upgrade to Econolite's latest ATMS system CENTRACS. Other ITS improvements should also be considered such as closed circuit television (CCTV) camera systems, arterial management system technologies, etc.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.7. City of Palm Desert



The City of Palm Desert is located centrally in the Coachella Valley and borders the neighboring cities of Indian Wells, Rancho Mirage, La Quinta and the County of Riverside. Interstate 10 (I-10) freeway traverses east-west through the northerly side of the city. Other major routes/roadways include Highway 111 that traverses east-west through the City, Fred Waring Drive, Country Club Drive, Frank Sinatra Drive, Monterey Avenue, Portola Avenue and El Paseo Drive. Traffic signals at the I-10 on/off ramps are owned, operated and maintained by Caltrans. Traffic signals along Highway 111 have been relinquished from Caltrans authority and are owned, operated and maintained by the City. Selected traffic signals along the City border are owned, operated and co-maintained by the City of Rancho Mirage, City of Indian Wells or City of La Quinta; all other traffic signals are owned, operated and maintained by the City of Palm Desert.

The existing traffic signal system within the City of Palm Desert consists of the following:

- 108 traffic signals with five (5) City Hall/City Yard masters and three (3) on-street master controllers.
- Local communications occur mainly over an extensive wide area fiber optic network. Single Mode Fiber Optic (SMFO) backbone cables exist along most of the City arterial corridors.
- The majority of the City's fiber optic communication occurs in a drop-and-repeat fashion by use of fiber optic data modems (FODM's). Areas with no fiber optic cable communicate over either 900MHz wireless radio links or twisted-pair/copper interconnect cable (SIC), such as Highway 111.
- At City Hall, a partitioned room is established for Traffic Management Center (TMC) operations including a communications rack and dedicated traffic workstation. At the City Yard, a communications rack and remote workstation(s) allow traffic technicians to monitor and maintain the traffic management system.
- A back-haul communications link to both City Hall and City Yard buildings occur over the same fiber optic network. Fiber optic cables terminate in closet type communication racks at both building locations.
- The City does not have any existing "stand-alone" traffic signals. All traffic signals have communications and are linked to the City's TMS.

While the City of Palm Desert has fiber optic communications to most of its signalized intersections, it is important to note the communications protocol between master and local controllers is legacy analog,

not Ethernet IP based. A newer section of City's traffic signals have been configured to communicate over an IP based network by use of Managed Fiber Optic Ethernet Access Switches (EAS), however, the City's central system still communicates to these signals via serial control. Therefore, the existing traffic system is not considered a true Ethernet IP network.

Additionally, it has been noted that both the Fiber Optic Ethernet Access Switches (EAS) and the ASC/3 IP based controllers have been configured on the same physical network. It is advised that we separate these networks moving forward for non-conflicting broadcasts and individual control.

The City of Palm Desert's Fiber Optic communication network extends along many major arterials and stretches into other City boundaries including City of La Quinta, City of Rancho Mirage and City of Indian Wells. At specific locations, other cities traffic signals are connected to the City of Palm Desert's traffic management system. The operations and status of these traffic signal controllers can be controlled remotely by Palm Desert staff, while the maintenance of these signals are provided by the respective cities.

Figure 1.16 illustrates the **project traffic signal locations, communications, ITS components, the TMC located at City Hall and the City Yard**.

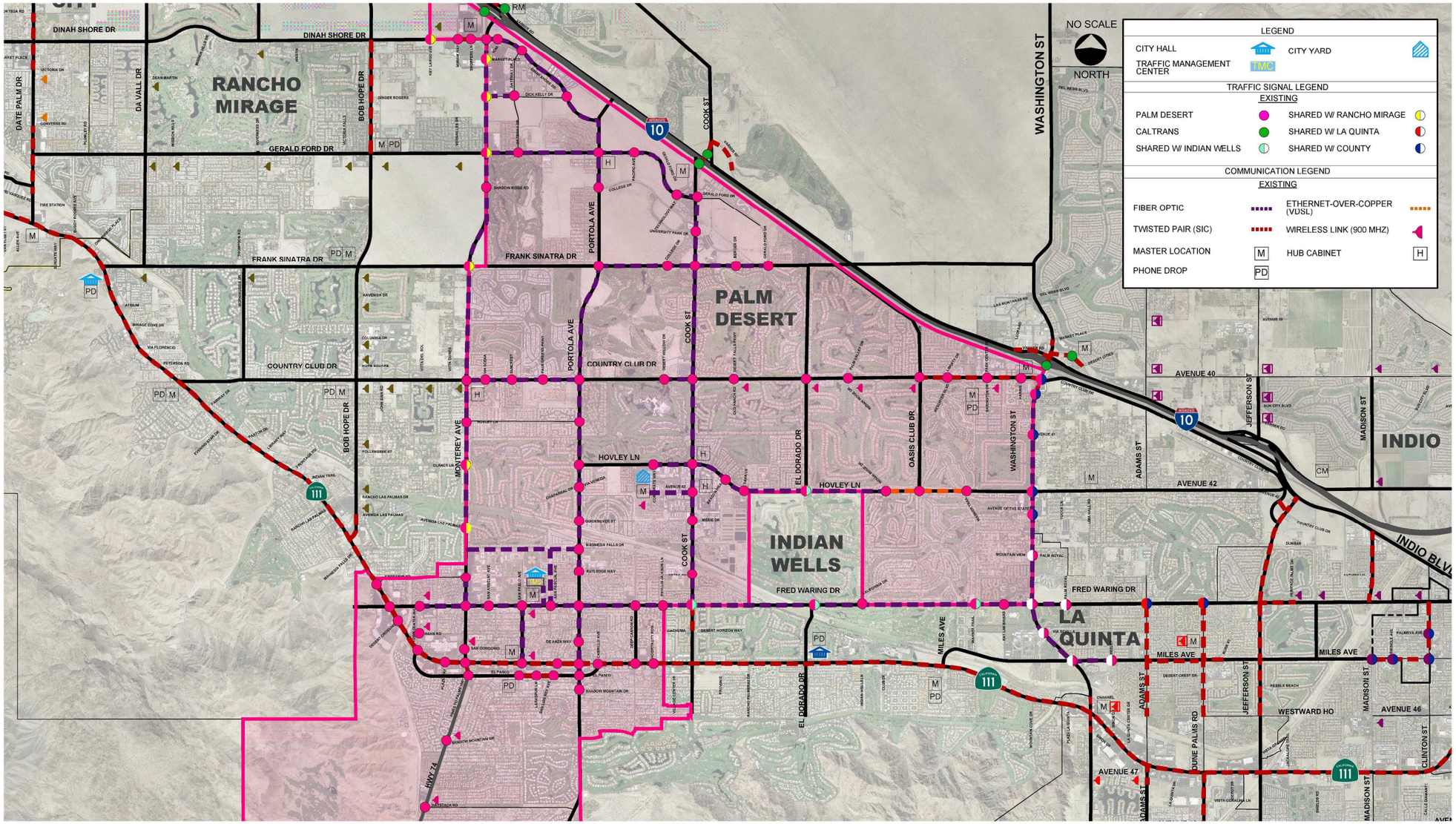
Figure 1.17 illustrates the **existing system architecture** configuration.

Table 1.30 summarizes the **number of project traffic signals** within the City of Palm Desert for the Regional TSI Project.

Table 1.31 summarizes the **number of project corridors** within the City of Palm Desert for the Regional TSI Project.

Existing System Inventory and Evaluation

Figure 1.16 City of Palm Desert Existing Conditions



Existing System Inventory and Evaluation

Figure 1.17 City of Palm Desert Existing System Architecture

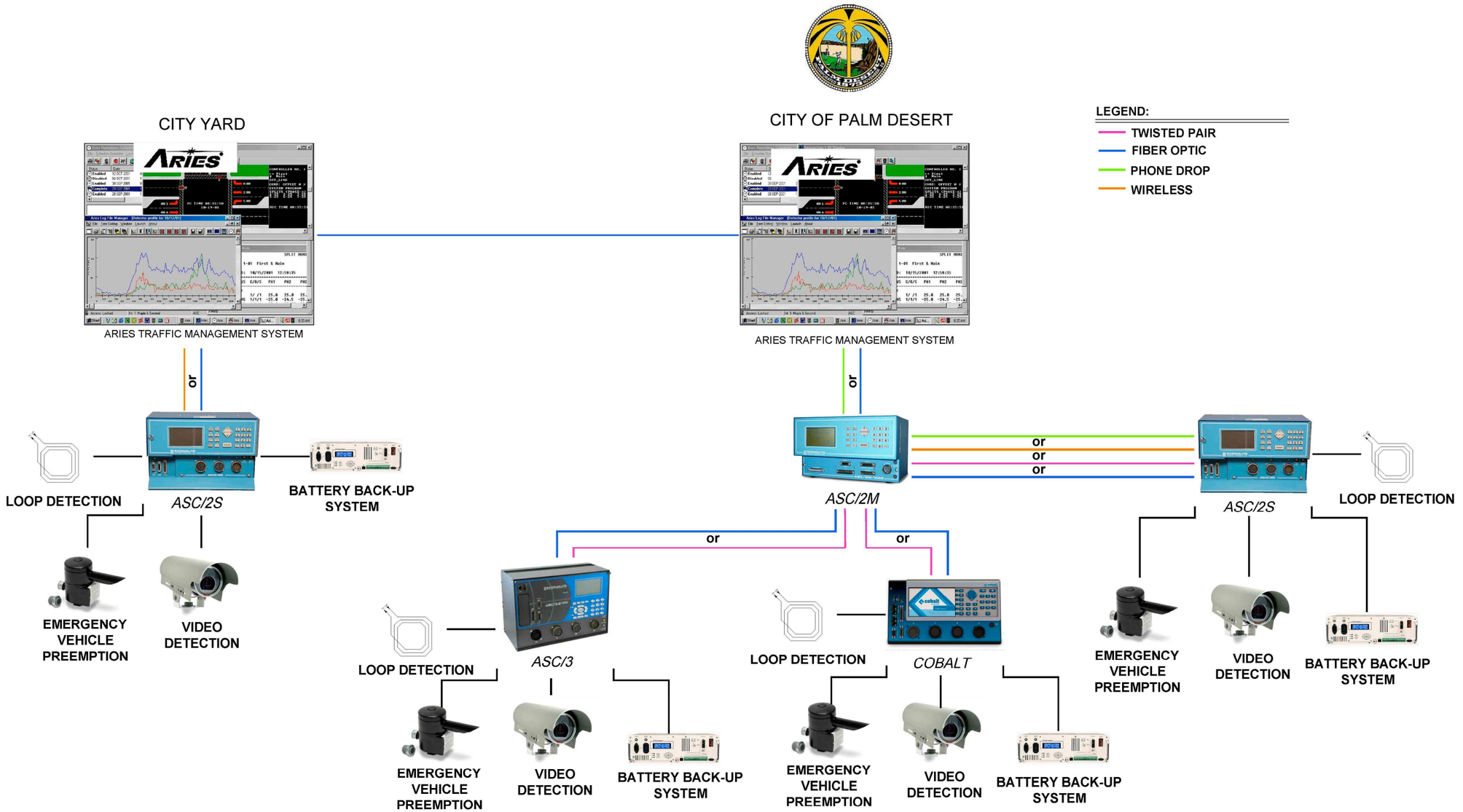


Table 1.30 City of Palm Desert – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Cook St & Aztec Rd	**29**	El Paseo & Larkspur Ln
2	Cook St & Merle Dr	**30**	El Paseo & San Luis Rey Ave
3	Cook St & Avenue 42	**31**	Frank Sinatra Dr & College Dr
4	Cook St & Frank Sinatra Dr	**32**	Frank Sinatra Dr & Berger Dr
5	Cook St & University Park Dr / Berger Dr	**33**	Frank Sinatra Dr & Gerald Ford Dr
6	Cook St & Gerald Ford Dr	**34**	Fred Waring Dr & Warner Trl
7	Country Club Dr & Monterey Ave	**35**	Fred Waring Dr & Desert Breezes Church
8	Country Club Dr & Via Scena	**36**	Fred Waring Dr & Monterey Ave
9	Country Club Dr & Suncrest / Regent	**37**	Fred Waring Dr & College of the Desert
10	Country Club Dr & Palm Greens / Via Portofino	**38**	Fred Waring Dr & San Pablo Ave
11	Country Club Dr & Portola Ave	**39**	Fred Waring Dr & San Pascual Ave
12	Country Club Dr & Desert Springs/Desert Willow	**41**	Fred Waring Dr & Portola Ave
14	Cook St & Country Club Dr	**42**	Fred Waring Dr & Deep Canyon Rd
15	Country Club Dr & Desert Falls Pkwy	**43**	Fred Waring Dr & Phyllis Jackson Ln
16	Country Club Dr & El Dorado Dr	**44**	Fred Waring Dr & Cook St
17	Country Club Dr & Palm Valley Dr / Indian Ridge Dr	**45**	Fred Waring Dr & California Dr
18	Country Club Dr & Oasis St/ Tamarisk St	**46**	Fred Waring Dr & Town Ctr
19	Country Club Dr & Resorter Liberty	**47**	Gateway Dr & Dick Kelly Dr
20	Country Club Dr & Park Ctr/Barrington Dr	**48**	Gerald Ford Dr & Technology Dr
21	Country Club Dr & Harris Ln	**49**	Gerald Ford Dr & Pacific Ave
22	Dinah Shore Dr & Toni Dr	**50**	Gerald Ford Dr & Gateway Dr
23	Dinah Shore Dr & Gateway Dr	**51**	Hovley Ln East & Corporate Wy
24	Dinah Shore Dr & Miriam Wy	**53**	Cook St & East Hovley Ln
25	Dinah Shore Dr & Shoppers Ln	**54**	Hovley Ln East & Beacon Hill La0rgo
26	Dinah Shore Dr & Key Largo Ave	**55**	Hovley Ln East & Water Wy
27	Dinah Shore Dr & Dick Kelly Dr	**56**	Hovley Ln East & El Dorado Dr
28	El Paseo & San Pablo Ave	**57**	Hovley Ln East & Casbah Wy / Indian Ridge Dr

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
59	Hovley Ln East & Warner Trl	**88**	El Paseo & Portola Ave
60	Highway 111 & Hospitality Row	**89**	Portola Ave & Gerald Ford Dr
61	Highway 111 & Deep Canyon Rd	**90**	Portola Ave & Julie Dr / College Dr
62	Highway 111 & El Paseo / Cabrillo Ave	**91**	Portola Ave & De Anza Wy
63	Highway 111 & San Luis Rey Ave	**92**	Portola Ave & Rutledge Wy
64	Highway 111 & Portola Ave	**93**	Portola Ave & Magnesia Falls Dr
65	Highway 111 & San Pablo Ave	**94**	Portola Ave & Quicksilver St
66	Highway 111 & Highway 74	**95**	Portola Ave & Chaparral / Via Venezia
67	Highway 111 & Plaza Wy	**96**	Portola Ave & Hovley Ln East
69	Highway 111 & Town Center Wy/ El Paseo	**97**	Portola Ave & Hovley Ln West
70	Highway 111 & Desert Crossing	**98**	Portola Ave & Shadow Mountain Dr
71	Highway 111 & Fred Waring Dr	**99**	Town Center Wy & Hahn Rd
72	Highway 111 & Parkview Dr	**100**	Washington St & Country Club Dr
73	Highway 74 & El Paseo	**101**	Washington St & Palm Royale Dr / Mountain View Ave
74	Highway 74 & Shadow Mountain Dr	**102**	Washington St & Fred Waring Dr
75	Highway 74 & Haystack Rd	**103**	Washington St & Ave of the States
76	Monterey Ave & Frank Sinatra Dr	**104**	Washington St & 42nd Hovley Ln East
77	Monterey Ave & Gerald Ford Dr	**105**	Washington St & Harris Ln
78	Monterey Ave & Market Pl	**106**	Washington St & Avenue 41
79	Monterey Ave & Dinah Shore Dr	**107**	Frank Sinatra & Portola Ave
80	Monterey Ave & Dick Kelly Dr	**108**	Portola Ave & Dinah Shore Dr
81	Monterey Ave & Shadow Ridge Rd		
82	Monterey Ave & Hovley Ln West		
83	Monterey Ave & Avenida Del Sol / Clancy Ln		
85	Monterey Ave & Gran Via / Avenida Las Palmas		
86	Monterey Ave & Parkview Dr		
87	Monterey Ave & San Gorgonio Wy		

Table 1.31 City of Palm Desert – Project Corridors

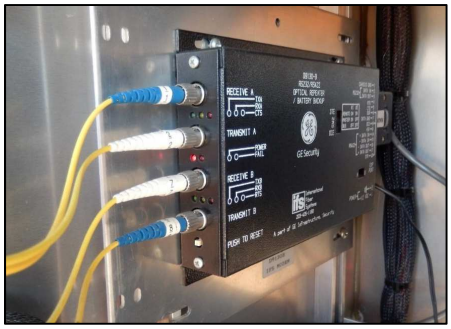
No.	Corridor	Project Corridor Type	Limits
1	Highway 111	Primary Corridor	Parkview Dr to Hospitality Row
2	Dinah Shore Dr	Primary Corridor	Key Largo Ave to Monterey Ave
3	Gerald Ford Dr	Primary Corridor	Monterey Ave to Cook St
4	Frank Sinatra Dr	Primary Corridor	Monterey Ave to El Dorado Dr
5	Tamerisk Row Dr/Oasis Club Dr	Primary Corridor	El Dorado Dr to Hovley Ln
6	Hwy 74 (Pines to Palms Highway)	Primary Corridor	Palm Desert City Limits South to Highway 111
7	Monterey Ave	Primary Corridor	Highway 111 to I-10
8	Country Club Dr	Primary Corridor	Monterey Ave to Washington St
9	Fred Waring Dr	Primary Corridor	Hwy 111 to Washington St
10	Mesa View Dr	Primary Corridor	Highway 74 (Pines to Palms Highway) to Portola Ave
11	Portola Ave	Primary Corridor	Shadow Mtn Dr to Dinah Shore Dr
12	San Pablo Ave	Primary Corridor	Highway 111 to Fred Waring Dr
13	Deep Canyon Rd	Primary Corridor	Highway 111 to Fred Waring Dr
14	Cook St	Primary Corridor	Fairway Dr to I-10
15	El Dorado Dr	Primary Corridor	Hovley Ln to Frank Sinatra Dr
16	Hovley Ln	Primary Corridor	Portola Ave to Washington St
17	Washington St	Primary Corridor	Fred Waring Dr to I-10
18	El Paseo Dr	Primary Corridor	Hwy 111 to Cabrillo Ave
19	Dick Kelly Dr	Secondary Corridor	Monterey Ave to Dinah Shore Dr
20	Gateway Dr	Secondary Corridor	Dinah Shore Dr to Gerald Ford Dr
21	Haystack Rd	Secondary Corridor	Highway 74 (Pines to Palms Highway) to Portola Ave
22	Dinah Shore Dr	Secondary Corridor	Monterey Ave to Portola Ave

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 108 signalized intersections
- ✓ 22 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.7.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.



The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

  The City has primary NEMA Type-P, and NEMA Type-R traffic signal controller cabinets with a few Type 332 controller cabinets throughout the City.



Type 332



Type-P



Type-R

  All NEMA Type-P and Type R cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type P, Type 332 cabinets.

- **Traffic Signal Controllers**

  The City has three models of traffic signal controllers including type ASC/2, ASC/3 and Cobalt controllers both in TS-1 and TS-2 type configurations.


ASC/2-2100


ASC/3-2100


Cobalt

The City uses a NEMA based controller standard. While the ASC/3 controller is still supported and IP capable, the ASC/2 controller is outdated in terms of support and integration into new ATMS systems. All new controller installations should adhere to ATC specification; such as Econolite Cobalt ATC.

- **Loop Detection**

The City has mainly loop vehicle detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.


Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier if applicable.

- **Video Detection System**

The City has video detection at only a few selected signalized locations. The video detection systems within the City are manufactured by Iteris and Econolite. The City is using model Vantage Edge 2 and Autoscope system(s).


Video Detection Camera



Autoscope


Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at their TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M, GTT and Tomar.



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at most signalized locations. The BBS within the City are manufactured by Dimensions and Myers.



Dimensions Battery Backup



Myers Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has an extensive Fiber Optic communication network. Additionally, they have a mixture of twisted pair/hardwired signal interconnect cable (SIC), 900MHz wireless, Ethernet-over-Copper (VDSL), Leased Line/Dial-up communications and Managed Ethernet Access Switches (EAS).



Fiber Optic



Ethernet-over-Copper (VDSL)



Wireless Radio Antenna (900 MHz)



Twisted-Pair (SIC)



Leased Line/Dial-Up

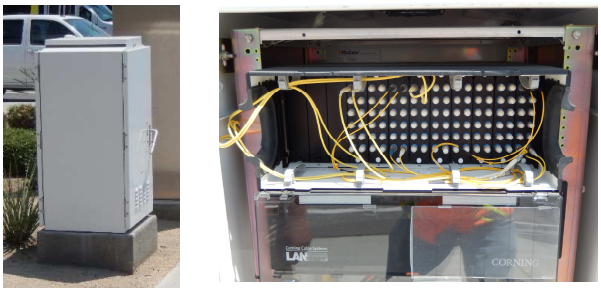


Ethernet Access Switch (EAS)

All local communication via Fiber Optic cable, 900MHz radio or SIC cable is legacy analog type, that require modems/FODM's to communicate. Typically, analog communications are no longer supported for new installations. Therefore, it is recommended a new Ethernet IP based communication system is established, that incorporates new Ethernet IP switching equipment. This includes considering upgrades of existing 900MHz wireless to new 5.8GHz wireless communications or higher, such as 5.9GHz DSRC wireless communications. There are also opportunities to utilize the City's existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable. The existing fiber optic backbone can be re-utilized for Ethernet IP communication dependent upon the age and condition of the cable. A segment of the City is configured for Ethernet IP communications over fiber optic and this can remain or be expanded for future ITS improvements. Leased line/dial-up communications should be considered upgrading to a DSL or Metro-E connection.

- **Communication Hubs**

The City has Fiber Optic communication hubs at selected locations. Fiber trunk line cables are brought up and terminate to Fiber Distribution Units (FDU) inside Type 336 cabinets.



HUB Cabinet

They are typically installed at a centralized location in the field as a collection point for the ITS elements on a private local area network, and for creating redundant sites for Ethernet communication back to central. Additional field communication hubs will be considered under the design phase of the project.

- **CCTV Cameras**

The City does not have CCTV camera systems.

New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This includes the type of camera (top mounted or dome) and the preferred type of installation; typically, they are mounted to an existing pole or on a standalone pole. This also includes the selection and installation of a video management system (VMS) hardware/software at the local

TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

Table 1.32 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.32 Existing Traffic Signal, Communication & ITS Inventory - City of Palm Desert

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Cook St & Aztec Rd	R, PNG	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	IP Location
2	Cook St & Merle Dr	P-44	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	452 / 562	N/A	III-CF	IP Location
3	Cook St & Avenue 42	P-44	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	IP Location
4	Cook St & Frank Sinatra Dr	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	562	N/A	III-CF	IP Location
5	Cook St & University Park Dr / Berger Dr	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	IP Location
6	Cook St & Gerald Ford Dr	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	IP Location
7	Country Club Dr & Monterey Ave	P-44	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	562 / 752	N/A	III-CF	Fiber Optic HUB
8	Country Club Dr & Via Scena	P-44, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
9	Country Club Dr & Suncrest Regent	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	762	N/A	III-CF	
10	Country Club Dr & Palm Greens Via Portofino	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	Polara APS
11	Country Club Dr & Portola Ave	P-44	Econolite	ASC 3-1000	Loop	2 CH	Fiber Optic	N/A	562	Dimensions	III-CF	FO side cabinet
12	Country Club Dr & Desert Springs/Desert Willow	R, PNG	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	N/A	N/A	III-CF	IP Location
14	Cook St & Country Club Dr	R, PNG	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	762	N/A	III-CF	IP Location
15	Country Club Dr & Desert Falls Pkwy	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
16	Country Club Dr & El Dorado Dr	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Wireless	N/A	562	N/A	III-CF	
17	Country Club Dr & Palm Valley Dr / Indian Ridge Dr	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Wireless	N/A	562	N/A	III-CF	
18	Country Club Dr & Oasis St/ Tamarisk St	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Wireless	N/A	752	N/A	III-CF	
19	Country Club Dr & Resorter / Liberty	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Wireless/TWP	N/A	752 / 562	N/A	III-CF	
20	Country Club Dr & Park Center Dr / Barrington Dr	P-44	Econolite	ASC 2-1000	Loop	2 CH	TWP/Wireless	N/A	562 / 752	N/A	III-CF	Master Location. Phone drop
21	Country Club Dr & Harris Ln	P-44	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	752	N/A	III-CF	
22	Dinah Shore Dr & Toni Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
23	Dinah Shore Dr & Gateway Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
24	Dinah Shore Dr & Miriam Wy	P-44	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	M-262	N/A	III-CF	
25	Dinah Shore Dr & Shoppers Ln	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Twisted Pair	N/A	4CH	N/A	III-CF	
26	Dinah Shore Dr & Key Largo Ave	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*Rancho Mirage
27	Dinah Shore Dr & Dick Kelly Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	



No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
28	El Paseo & San Pablo Ave	M-38	Econolite	ASC 2S-1000	Loop	2 CH	Twisted Pair	N/A	562	N/A	III-CF	Phone Drop
29	El Paseo & Larkspur Ln	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Twisted Pair	N/A	752	N/A	III-CF	
30	El Paseo & San Luis Rey Ave	R	Econolite	ASC 2S-1000	Loop	2 CH	Twisted Pair	N/A	562	N/A	III-BF	
31	Frank Sinatra & College Dr	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	IP Location
32	Frank Sinatra & Berger Dr	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	452	N/A	III-CF	IP Location
33	Frank Sinatra & Gerald Ford Dr	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	Dimensions	III-CF	IP Location
34	Fred Waring Dr & Warner Trl	P-44	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	262 / 562	N/A	III-CF	Indian Wells shared
35	Fred Waring Dr & Desert Breezes / Church	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
36	Fred Waring Dr & Monterey Ave	R	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	562	Dimensions	III-CF	Polara APS
37	Fred Waring Dr & College of the Desert	P-44, PNG	Econolite	ASC 2S-1000	Video / Loop	Econolite Autoscope	Fiber Optic	N/A	752	N/A	III-CF	
38	Fred Waring Dr & San Pablo Ave	R	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	562	Dimensions	III-CF	Polara APS
39	Fred Waring Dr & San Pascual Ave	P-44	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	462	N/A	III-CF	FO side cabinet
41	Fred Waring Dr & Portola Ave	R, PNG	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	562	Dimensions	III-CF	
42	Fred Waring Dr & Deep Canyon Rd	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	562	N/A	III-CF	
43	Fred Waring Dr & Phyllis Jackson Ln	R	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752 / 562	N/A	III-CF	
44	Fred Waring Dr & Cook St	R	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	562	N/A	III-CF	Indian Wells shared
45	Fred Waring Dr & California Dr	R	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
46	Fred Waring Dr & Town Ctr	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	562	N/A	III-CF	
47	Gateway Dr & Dick Kelly Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
48	Gerald Ford Dr & Technology Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	IP Location
49	Gerald Ford Dr & Pacific Ave	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	IP Location
50	Gerald Ford Dr & Gateway Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
51	Hovley Ln East & Corporate Wy	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
53	Cook St & East Hovley Ln	R, PNG	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	762	N/A	III-CF	Fiber Optic HUB
54	Hovley Ln East & Beacon Hill / Largo	P-44	Econolite	ASC 3-2100	Video / Loop	Iteris Edge 2	Fiber Optic	N/A	752	N/A	III-CF	IP Location
55	Hovley Ln East & Water Wy	P-44, PNG	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	562	N/A	III-CF	IP Location

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
56	Hovley Ln East & El Dorado Dr	R, PNG	Econolite	ASC 3-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	Indian Wells shared
57	Hovley Ln East & Casbah Wy / Indian Ridge Dr	P-44	Econolite	ASC 3-1000	Video / Loop	Iteris Edge 2	FO/Twisted Pair	N/A	752	N/A	III-CF	IP Location
58	Hovley Ln East & Oasis St	R, PNG	Econolite	ASC 3-1000	Loop	2 CH	Twisted Pair	N/A	752	N/A	III-CF	IP Location
59	Hovley Ln East & Warner Trl	P-44	Econolite	ASC 3-1000	Loop	2 CH	Twisted Pair	N/A	762 / 752	N/A	III-CF	IP Location
60	Highway 111 & Hospitality Row	R, PNG	Econolite	Cobalt	Loop	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
61	Highway 111 & Deep Canyon Rd	R, PNG	Econolite	Cobalt	Loop	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
62	Highway 111 & El Paseo / Cabrillo Ave	R, PNG	Econolite	Cobalt	Loop	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
63	Highway 111 & San Luis Rey Ave	332	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	M-252	Dimensions	III-CF	
64	Highway 111 & Portola Ave	332	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	M-252	Dimensions	III-CF	
65	Highway 111 & San Pablo Ave	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	Master Location
66	Highway 111 & Highway 74	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	762 / 752	Dimensions	III-CF	
67	Highway 111 & Plaza Wy	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	4 CH	Dimensions	III-CF	
69	Highway 111 & Town Center Wy/ El Paseo	332	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
70	Highway 111 & Desert Crossing	332	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
71	Highway 111 & Fred Waring Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
72	Highway 111 & Parkview Dr	332	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	4 CH	Dimensions	III-CF	
73	Highway 74 & El Paseo	332	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
74	Highway 74 & Shadow Mountain Dr	332	Econolite	ASC 2S-2100	Loop	2 CH	Wireless	N/A	752	Dimensions	III-CF	Link to City Yard
75	Highway 74 & Haystack Rd	332	Econolite	ASC 2S-2100	Loop	2 CH	Wireless	N/A	752	N/A	III-CF	Link to City Yard
76	Monterey Ave & Frank Sinatra Dr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*Rancho Mirage
77	Monterey Ave & Gerald Ford Dr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*Rancho Mirage
78	Monterey Ave & Market Pl	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	*Rancho Mirage
79	Monterey Ave & Dinah Shore Dr	P-44	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	752	N/A	III-CF	Master Location
80	Monterey Ave & Dick Kelly Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Twisted Pair	N/A	752 / 762	N/A	III-CF	Rancho Mirg shared
81	Monterey Ave & Shadow Ridge Rd	P-44	Econolite	ASC 3-2100	Loop	2 CH	Twisted Pair	N/A	752	N/A	III-CF	
82	Monterey Ave & Hovley Ln West	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
83	Monterey Ave & Avenida Del Sol / Clancy Ln	R	Econolite	ASC 2S-1000	Video / Loop	Iteris Versicam	Fiber Optic	N/A	562	N/A	III-CF	Rancho Mirg shared
85	Monterey Ave & Gran Via /Avenida Las Palmas	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	Rancho Mirg shared
86	Monterey Ave & Parkview Dr	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	762	Dimensions	III-CF	
87	Monterey Ave & San Gorgonio Wy	P-44	Econolite	ASC 2S-1000	Loop	2 CH	Wireless	N/A	562	N/A	III-BF	Link to City Yard
88	El Paseo & Portola Ave	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Under Construction
89	Portola Ave & Gerald Ford Dr	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	Fiber Optic HUB
90	Portola Ave & Julie College	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
91	Portola Ave & De Anza Wy	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
92	Portola Ave & Rutledge Wy	P-44, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	562	N/A	III-CF	
93	Portola Ave & Magnesia Falls Dr	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	762 / 752	N/A	III-CF	
94	Portola Ave & Quicksilver St	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Under Construction
95	Portola Ave & Chaparral Dr/ Via Venezia	R, PNG	Econolite	ASC 2S-1000	Video / Loop	Iteris Edge 2	Fiber Optic	N/A	752	N/A	III-CF	
96	Portola Ave & Hovley Ln East	P-44, PNG	Econolite	ASC 3-1000	Loop	2 CH	Fiber Optic	N/A	562 / 752	Myers	III Modified	
97	Portola Ave & Hovley Ln West	R	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
98	Portola Ave & Shadow Mountain Dr	R	Econolite	ASC 2S-1000	Loop	2 CH	Twisted Pair	N/A	752	N/A	III-CF	Under const.
99	Town Center Wy & Hahn Rd	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Wireless	N/A	752	N/A	III-CF	
100	Washington St & Country Club Dr	P-44, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	562	N/A	III-CF	
101	Washington St & Palm Royale Dr/ Mountain View Ave	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	
102	Washington St & Fred Waring Dr	R, PNG	Econolite	ASC 2S-1000	Loop	2 CH	Fiber Optic	N/A	752	N/A	III-CF	La Quinta shared
103	Washington St & Ave of the States	P-44	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	762 Chassis	N/A	III-CF	County Riv. shared
104	Washington St & Avenue 42 / Hovley Ln East	P-44	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	562 Chassis	N/A	III-CF	County Riv. shared
105	Washington St & Harris Ln	P-44	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	752 Chassis	N/A	III-CF	County Riv. shared
106	Washington St & Avenue 41	R, PNG	Econolite	ASC 3-2100	Loop	2 CH	Fiber Optic	N/A	452	Myers	III-CF	
107	Frank Sinatra Dr & Portola Ave	R, PNG	Econolite	ASC 2S-2100	Loop	2 CH	Fiber Optic	N/A	452	N/A	III-CF	
108	Portola Ave & Dinah Shore Dr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Exist 4-way Stop

1-2.7.2. Traffic Management Center (TMC)



The City of Palm Desert has a partitioned room for Traffic Management Center (TMC) operations located within City Hall. The room houses a dedicated traffic workstation PC and rack mounted communications equipment including three (3) master controllers for communications to the field. Palm Desert utilizes an Econolite "ARIES" central system for command and control of all traffic signal operations. ARIES central system communicates to the City's eight (8) master controllers that supply traffic signal timing/Time-of-Day (TOD) operation and provides real-time display through the system's Graphic User Interface (GUI).

The City Hall TMC room and equipment rack houses the following equipment and provides interface to master the three controllers. The existing conditions are as follows (**Table 1.33**):

Table 1.33 Existing Traffic Management System Equipment - City Hall

Traffic Management System	Econolite ARIES system
Traffic Server	No dedicated traffic server
Workstation PC	Dell Optiplex Core i5 workstation PC (hosting Econolite ARIES)
Communications Equipment	Etherwan 24 port EAS fiber switch (8) IFS fiber optic data modems (Analog) 56k fax modem 8 channel terminal server UPS unit
Hardwire Communications	(1) 72 SMFO cable, (2) 36 SMFO cables, (1) 18 MMFO cable (3) Fiber Distribution Units (FDU's) Verizon leased line/dial-up connection
Wireless Communications	No wireless communications equipment
Video Management System	No centralized VMS system
Master Controller	(3) Econolite ASC/2M master controllers

At the City Yard building a remote connection from City Hall allows traffic technicians access to the Econolite ARIES system for remote monitoring and surveillance in real-time. The City Yard equipment rack houses the following equipment and provides interface to two (2) master controllers. The existing conditions are as follows (**Table 1.34**):

Table 1.34 Existing Traffic Management System Equipment - City Yard

Workstation PC	City owned workstation PC for remote command and control
Communications Equipment	Etherwan 24 port EAS fiber switch IFS fiber optic data modem (Analog)
Hardwire Communications	(2) 72 SMFO cables (1) Fiber Distribution Unit (FDU)
Wireless Communications	900MHz wireless spread spectrum radio WWV time source
Video Management System	No centralized VMS system
Master Controller	(2) Econolite ASC/2M master controllers

The remaining three (3) on-street master controllers located in the field communicate via Verizon leased line/dial-up connection, or fiber optic and 900MHz wireless hybrid link to City Hall.



1-2.7.3. Future Projects

The City currently has two (2) upcoming near term projects that provide the following improvements:

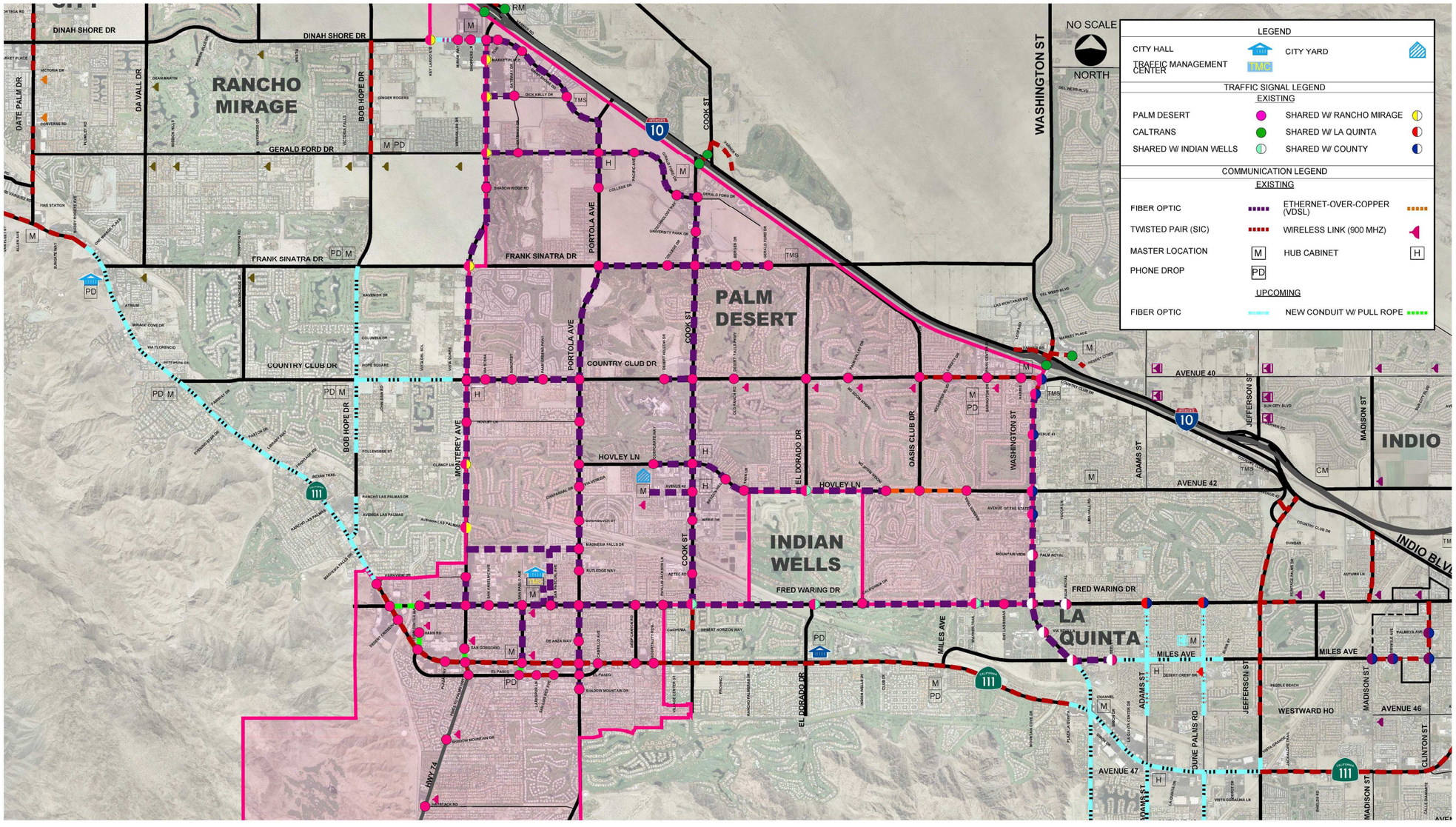
- Installation of new conduit and pull rope at 4 locations (Fred Waring Drive between Highway 111 and Town Center Way; Town Center Way between Highway 111 and Hahn Road; Monterey Avenue between Highway 111 and San Gorgonio Way; and San Pablo Avenue between El Paseo and Highway 111).
- New fiber optic cable on Dinah Shore Drive between Miriam Way and Monterey Avenue (this is the City of Rancho Mirage project for shared signal with the City of Palm Desert).

Figure 1.18 illustrates the existing traffic signal locations and future conduit and pull rope, and fiber optic communications alignment.

These future projects are currently under design and/or will be constructed in the near term. Therefore, it will be considered as our base conditions if further upgrades are considered under this project.

Existing System Inventory and Evaluation

Figure 1.18 City of Palm Desert Future Conditions



1-2.7.4. Conclusion

Based on our inventory and evaluation of the City's existing and future traffic signal system, and communication system, and TMC there are existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

The City's future projects include ITS improvements such as: new Econolite Cobalt ATC (traffic controllers), and Ethernet based fiber optic improvements. These upgrades build the foundation for the City to tie future ITS related components.

While the City of Palm Desert has fiber optic communications to most of its signalized intersections, it is important to note the communications protocol between master and local controllers is legacy analog, not Ethernet IP based. A newer section of the City's traffic signals have been configured to communicate over an IP based network by using Managed Fiber Optic Ethernet Access Switches (EAS), however, the City's central system still communicates to these signals via serial control. Therefore, the existing traffic system is not considered a true Ethernet IP network. Additionally, it has been noted that both the Fiber Optic Ethernet Access Switches (EAS) and the ASC/3 IP based controllers have been configured on the same physical network. It is advised that we separate these networks moving forward for non-conflicting broadcasts and individual control.

If the City considers future ITS or traffic signal related improvements; it is recommended to begin with selecting a new centralized Advanced Traffic Management System (ATMS). The City's current TMS is Econolite's ARIES system; this is considered a legacy system. If the City considers upgrading this system, it is recommended to upgrade to Econolite's latest ATMS system CENTRACS. Other ITS improvements should also be considered such as closed circuit television (CCTV) camera systems, arterial management system technologies, etc.

In regards to the communications, the City should consider upgrading their communications system to provide a true Ethernet/IP-based communications system. This can be accomplished over their existing fiber optic communications network. Additional analysis and coordination with City staff will be required.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.8. City of Palm Springs



The City of Palm Springs is located westerly in the Coachella Valley and borders the neighboring cities of Cathedral City, Desert Hot Springs, Rancho Mirage and the County of Riverside. Interstate 10 (I-10) freeway traverses east-west on the northerly border of the City. Other major routes/roadways include Highway 111 that turns into Palm Canyon Drive, Indian Canyon Drive Vista Chino, Ramon Road, Sunrise Way and Gene Autry Trail. Traffic signals on the I-10 on/off ramps, Vista Chino and Gene Autry Trail are owned, operated and maintained by Caltrans. Traffic signals along Highway 111 have been relinquished from Caltrans authority and are owned, operated and maintained by the City. Selected traffic signals along the city border are owned, operated and co-maintained by either the City of Cathedral City; all other traffic signals are owned, operated and maintained by the City of Palm Springs.

The existing traffic signal system within the City of Palm Springs consists of the following:

- 84 traffic signals with one (1) on-street master controller.
- Local communications occur over an extensive wide area network of 5.8GHz wireless broadband Ethernet radios located along most City arterial corridors. The 5.8GHz wireless radio network provides two-way data and video transmission in a point-to-multipoint configuration.
- High-bandwidth back-haul wireless communications occur on a separate wireless channel. The high-bandwidth back-haul radios use microwave technology in a licensed frequency spectrum to carry all ATMS, CCTV and Video Detection/Bluetooth data from the local intersections back to central. These high-bandwidth back-haul microwave radios are located at the Police Department, Palm Springs Baseball Stadium and at the roof of the Hyatt Hotel.
- N. Palm Canyon Drive and Tahquitz Canyon Way utilize existing copper interconnect cable (SIC) for IP based Ethernet-over-Copper (VDSL) communication.
- At City Hall, a dedicated room is established for Traffic Management Center (TMC) operations including a communications rack and core traffic server equipment. The traffic server equipment is configured to host all aforementioned ATMS, CCTV and Video Detection/Bluetooth systems.
- All traffic signal communications converge at the Police Department. Local wireless, back-haul wireless and Ethernet-over-copper communications terminate at a central room designated as the "spider-shack", and then transmit to City Hall Traffic Management Center via a single-mode fiber optic link.
- Ten (10) CCTV surveillance cameras located at selected high volume intersections.
- Three (3) Bluetooth arterial management system locations located along Ramon Road.

- The City does not have any existing "stand-alone" traffic signals. All traffic signals have communications and are linked to the City's TMS.

While the City of Palm Springs has IP based communications to most of its signalized intersections, it is important to note the communications protocol of the City's existing 170E controllers is still legacy analog, not Ethernet IP based. This is accomplished by use of a 170 controller Ethernet module that needs to be configured separately. An upgraded controller assembly would alleviate this issue moving forward.

Figure 1.19 illustrates the **project traffic signal locations, communications, CCTV camera locations, ITS components and TMC**.

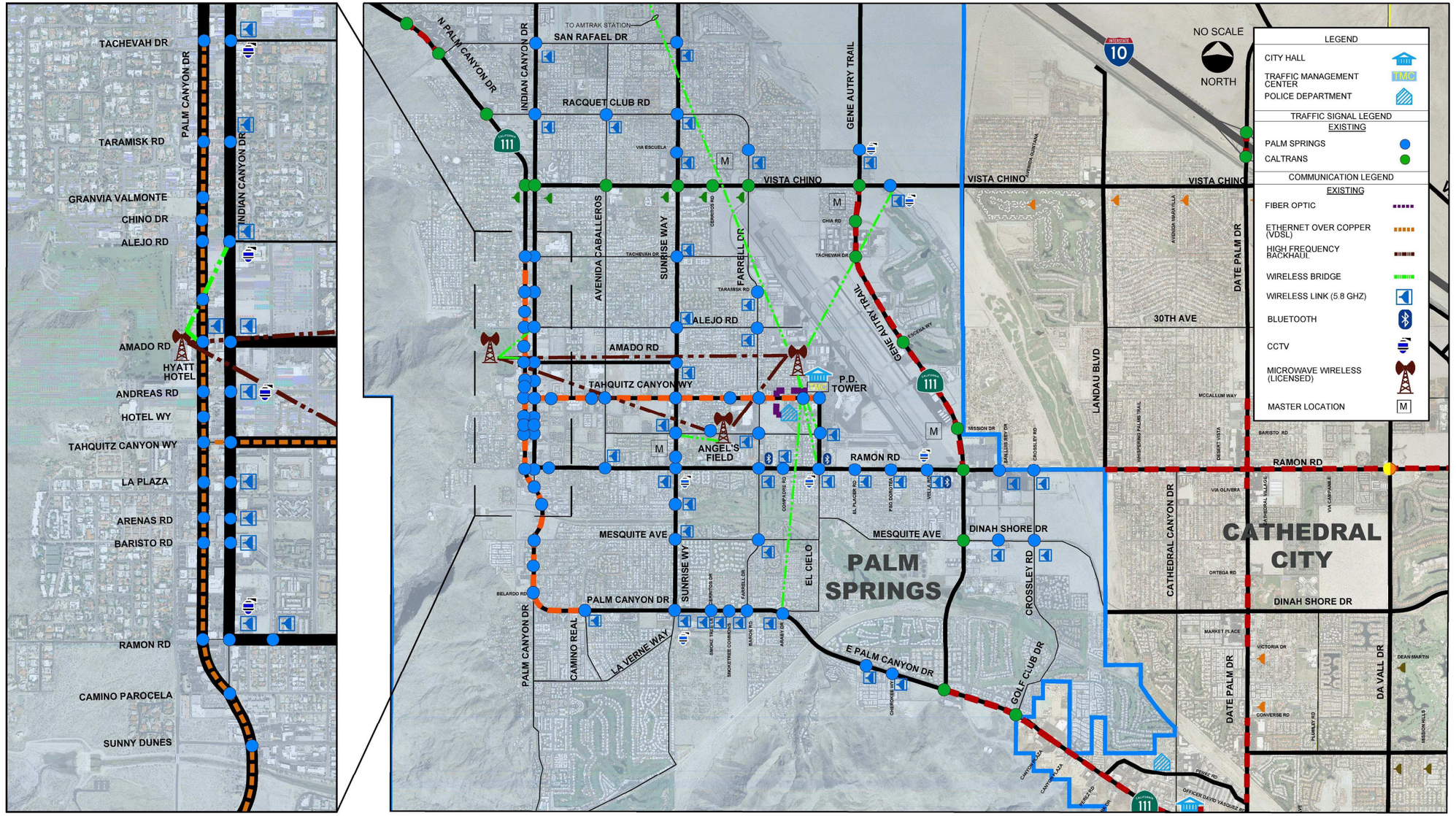
Figure 1.20 illustrates the **existing system architecture** configuration.

Table 1.35 summarizes the **number of project traffic signals** within the City of Palm Springs for the Regional TSI Project.

Table 1.36 summarizes the **number of project corridors** within the City of Palm Springs for the Regional TSI Project.

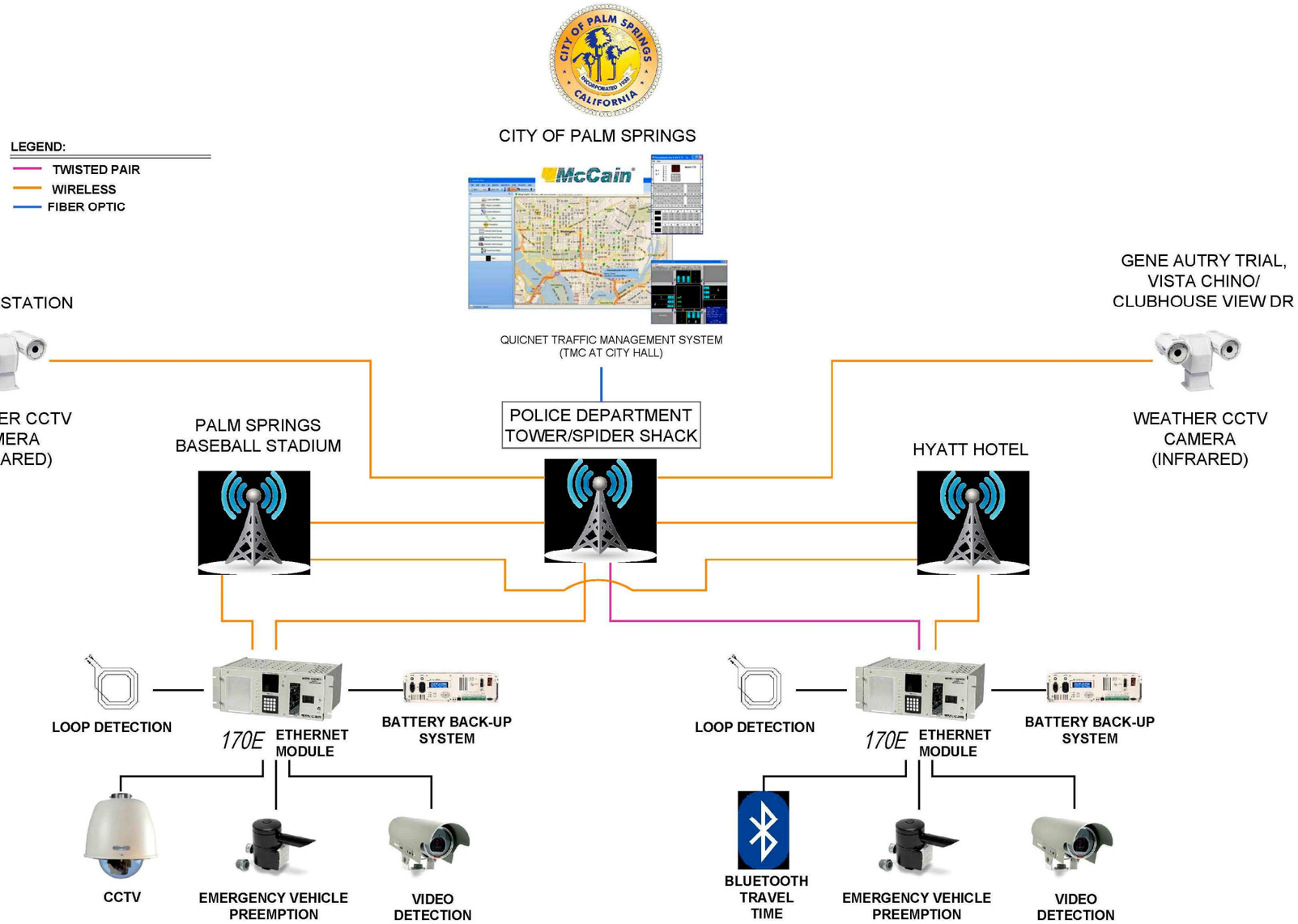
Existing System Inventory and Evaluation

Figure 1.19 City of Palm Springs Existing Conditions



Existing System Inventory and Evaluation

Figure 1.20 City of Palm Springs Existing System Architecture



ADVANTEC Consulting Engineers
CVAG
CITY OF PALM SPRINGS
EXISTING SYSTEM ARCHITECTURE

Table 1.35 City of Palm Springs – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	N Palm Canyon Dr & Tachevah Dr	**29**	Indian Canyon Dr & San Rafael Dr
2	N Palm Canyon Dr & Tamarisk Rd	**30**	Indian Canyon Dr & Racquet Club Rd
3	N Palm Canyon Dr & Granvia Valmonte	**31**	Indian Canyon Dr & Tachevah Dr
4	N Palm Canyon Dr & Alejo Rd	**32**	Indian Canyon Dr & Tamarisk Rd
5	N Palm Canyon Dr & Amado Center/ Ped Xing	**33**	Indian Canyon Dr & Alejo Rd
6	N Palm Canyon Dr & Amado Rd	**34**	Indian Canyon Dr & Amado Rd
7	N Palm Canyon Dr & Andreas Rd	**35**	Indian Canyon Dr & Andreas Rd
8	N Palm Canyon Dr & Desert Fashion Ped Xing	**36**	Indian Canyon Dr & Tahquitz Canyon Way
9	S Palm Canyon Dr & Tahquitz Canyon Wy	**37**	Indian Canyon Dr & La Plaza
10	S Palm Canyon Dr & La Plaza	**38**	Indian Canyon Dr & Arenas Rd
11	S Palm Canyon Dr & Arenas Rd	**39**	Indian Canyon Dr & Baristo Rd
12	S Palm Canyon Dr & The Village Green Ped Xing	**41**	Indian Canyon Dr & Ramon Rd
14	S Palm Canyon Dr & Baristo Rd	**42**	Sunrise Way & San Rafael Dr
15	S Palm Canyon Dr & Ramon Rd	**43**	Sunrise Way & Racquet Club Rd
16	S Palm Canyon Dr & Camino Parocela	**44**	Sunrise Way & Via Escuela
17	S Palm Canyon Dr & Sunny Dunes Rd	**45**	Sunrise Way & Tachevah Dr
18	S Palm Canyon Dr & Mesquite Ave	**46**	Sunrise Way & Alejo Rd
19	S Palm Canyon Dr & Morongo Ave	**47**	Sunrise Way & Amado Rd
20	S Palm Canyon Dr & E Palm Canyon Dr	**48**	Sunrise Way & Tahquitz Canyon Way
21	Camino Real & E Palm Canyon Dr	**49**	Sunrise Way & Baristo Rd
22	Sunrise Way & E Palm Canyon Dr	**50**	Sunrise Way & Ramon Rd
23	Cerritos Dr & E Palm Canyon Dr	**51**	Sunrise Way & Sunny Dunes Rd
24	Smoke Tree Commons & E Palm Canyon Dr	**53**	Sunrise Way & Mesquite Ave
25	Farrell Dr/ Barona Rd & E Palm Canyon Dr	**54**	Farrell Dr & Via Escuela
26	Escoba Dr/ Araby Dr & E Palm Canyon Dr	**55**	Farrell Dr & Tamarisk Rd
27	Auto Center & E Palm Canyon Dr	**56**	Farrell Dr & Alejo Rd

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
57	Farrell Dr & Ramon Rd	**74**	San Luis Rey Dr & Dinah Shore Dr
58	Farrell Dr & Mesquite/ Golf Cart Xing	**75**	Crossley Rd & Dinah Shore Dr
59	Farrell Dr & Mesquite Ave	**76**	Avenida Caballeros & Racquet Club Rd
60	Calle Encilia & Tahquitz Canyon Wy	**77**	El Cielo Rd & Baristo Rd
61	Calle El Segundo & Tahquitz Canyon Wy	**78**	PSHS/ Palm Springs Mall
62	Avenida Caballeros & Tahquitz Canyon Wy	**79**	Sunrise Way & Boys and Girls/ Shopping Ctr
63	Sunset Wy & Tahquitz Canyon Wy	**80**	S Palm Canyon Dr & Southridge Dr
64	El Cielo Rd & Tahquitz Canyon Wy	**81**	Indian Canyon Dr & Garnet Ave
65	Calle Encilla & Ramon Rd	**82**	Indian Canyon Dr & 20th Ave
66	Avenida Caballeros & Ramon Rd	**83**	Vista Chino & Clubhouse View Dr
67	Compadre Rd & Ramon Rd	**84**	Gene Autry Trl & Via Escula
68	El Cielo Rd & Ramon Rd		
69	El Placer & Ramon Rd		
70	Paseo Dorotea & Ramon Rd		
71	Vella Rd & Ramon Rd		
72	San Luis Rey Dr & Ramon Rd		
73	Crossley Rd & Ramon Rd		

Table 1.36 City of Palm Springs – Project Corridors

No.	Corridor	Project Corridor Type	Limits
1	State Route 111	Primary Corridor	I-10 to Palm Canyon Dr
2	Palm Canyon Dr/Hwy 111	Primary Corridor	Vista Chino to Gene Autry Trl
3	Indian Canyon Dr/ Indian Ave	Primary Corridor	Sunrise Pkwy to SR-62
4	Indian Canyon Dr	Primary Corridor	Palm Canyon Dr to Sunrise Pkwy
5	Palm Dr	Primary Corridor	I-10 to Dillon Rd, Camino Aventura to Two Bunch Palms Trl
6	20th Ave	Primary Corridor	Indian Canyon Dr to Bennet Rd
7	Vista Chino	Primary Corridor	Palm Canyon Dr to Palm Springs City Limits (E/O Clubhouse View Dr)
8	Tahquitz Canyon Wy	Primary Corridor	Palm Canyon Dr to El Cielo Rd
9	Amado Rd	Primary Corridor	Palm Canyon Dr to Sunrise Way
10	Ramon Rd	Primary Corridor	Palm Canyon Dr to Landau Blvd
11	Sunrise Wy	Primary Corridor	Palm Canyon Dr to San Rafael Dr
12	El Cielo Rd	Primary Corridor	Ramon Rd to Tahquitz Canyon Wy
13	Gene Autry Trl	Primary Corridor	Palm Canyon Dr to I-10
14	Alejo Rd	Primary Corridor	Palm Canyon Dr to Farrell Dr
15	Dinah Shore Dr	Primary Corridor	Gene Autry Trl to City Limits
16	San Rafael Dr	Secondary Corridor	E Palm Canyon Dr to Sunrise Wy
17	Racquet Club Rd	Secondary Corridor	E Palm Canyon Dr to Farrell Dr
18	Tamarisk Rd	Secondary Corridor	Indian Canyon Dr to Farrell Dr
19	Arenas Rd	Secondary Corridor	Tahquitz Canyon Way to Calle El Segundo
20	Baristo Rd	Secondary Corridor	Avenida Caballeros to El Cielo Rd
21	Mesquite Ave	Secondary Corridor	Sunrise Wy to Gene Autry Trl
22	Avenida Caballeros	Secondary Corridor	San Rafael Dr to Ramon Rd
23	Farrell Dr	Secondary Corridor	Racquet Club Dr to E Palm Canyon Dr
24	El Cielo Rd	Secondary Corridor	Aviation Rd to Tahquitz Canyon Dr, Ramon Rd to Escoba Dr
25	Crossley Rd	Secondary Corridor	Ramon Rd to E Palm Canyon Dr

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 84 signalized intersections
- ✓ 25 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.8.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.



The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

  The City has Type 332 and Type 333 Jumbo P traffic signal controller cabinets throughout the City.



Type 332



Type 333JP

  The Type 332 and Jumbo Type 333 cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type 332 cabinets.

- **Traffic Signal Controllers**

The City has 170E model traffic signal controllers manufactured by different vendors.



Type 170E

The existing Caltrans standard 170E controller is a cost effective solution to standardized intersection control. However the 170 controller is now considered legacy system as it does not support Ethernet IP and cannot support other various advanced ITS functions. Therefore a new ATC controller standard should be established for future improvements, such as McCain Omni eX ATC.

- **Loop Detection**

The City has mainly loop vehicle detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.



Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier if applicable.

- **Video Detection System**

The City has video detection at a few selected signalized locations. The video detection systems within the City are manufactured by Iteris and Econolite. The City is using model Vantage Edge 2 and Autoscope system(s).



Video Detection Camera



Autoscope



Iteris Vantage Edge 2 Processor

The City is using Vantage Edge 2 system for remote monitoring and set-up by use of the additional Edge Connect module for display of video images at their TMC. Lane-by-lane detection should be configured for all Adaptive controlled intersections and to provide performance measurements. Existing Video detections systems can be updated by either adding

additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M and Global Traffic Technologies (GTT).



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at most signalized locations. The BBS within the City are manufactured by Clary and Dimensions.



Dimensions Battery Backup



Clary Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has an extensive 5.8GHz Ethernet wireless network. Additionally, they have Ethernet-over-Copper (VDSL) communications, Managed Ethernet Access Switches (EAS) and Microwave Wireless back-haul communications.



Wireless Antenna (5.8GHZ)



Ethernet-over-Copper (VDSL)



Ethernet Access Switch (EAS)

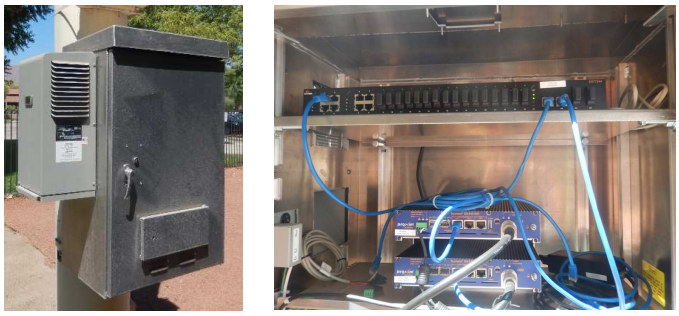


Microwave Wireless

All local communication via SIC cable(VDSL) or 5.8Ghz wireless radio is Ethernet IP based. Set-up in a point-to-multipoint fashion, local intersections communicate to centralized locations that transmit back to central over Microwave wireless back-haul link. The multi-tiered system is set-up for citywide efficiency and can easily support additional locations or future ITS components.

- **Communication Hubs**

The City has Wireless back-haul communication hubs located at Palm Springs Baseball Stadium, Hyatt Hotel and the Police Department. The wireless air conditioned hub cabinets contain the high-bandwidth Microwave wireless equipment and local aggregate wireless equipment.



Wireless HUB Cabinet

The wireless field communication hub cabinet aggregates multiple 5.8GHz wireless links and uplink the signal into Microwave wireless for all back-haul TMS, CCTV system, and Bluetooth arterial management system transmission back to City Hall.

- **CCTV Cameras**

The City has several different IP based CCTV surveillance camera systems. The CCTV cameras are manufactured by Cohu, Axis and FLIR.



Cohu (PTZ)



Axis (PTZ)



FLIR (Infrared)

The City is using the FLIR CCTV system as a “weather” CCTV system. These cameras are installed a three separate locations and were designed to view the low roadway crossings at the White Water River. The CCTV system was designed to manage these low crossing roadway segments during flash flooding conditions and alert city staff for road closures. Additional CCTV camera locations shall be evaluated under the design phase of the project. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system.

- **Bluetooth Arterial Management System**

  The City has Bluetooth detection based arterial management system manufactured by Iteris. The City uses Vantage Velocity system.



Bluetooth detector

The existing arterial management system shall be evaluated under the design phase of the project for the integration of additional locations, and/or selection of latest state-of-the art system.

Table 1.37 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.37 Existing Traffic Signal, Communication & ITS Inventory - City of Palm Springs

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	N Palm Canyon Dr & Tachevah Dr	332	McCain	170 E	Loops	2 CH	VDSL	N/A	N/A	N/A	III-CF	
2	N Palm Canyon Dr & Tamarisk Rd	332	SafeTran	170 E	Loop	2 CH	VDSL	N/A	N/A	N/A	III-BF	
3	N Palm Canyon Dr & Granvia Valmonte	332	McCain	170 E	Video	(3) Edge 2	VDSL	N/A	4 CH	Clary	III-CF	
4	N Palm Canyon Dr & Alejo Rd	332	N/A	170 E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Under construction
5	N Palm Canyon Dr & Amado Center/ Ped Xing	332	McCain	170 E	N/A	N/A	VDSL	N/A	N/A	N/A	III-BF	
6	N Palm Canyon Dr & Amado Rd	332	SafeTran	170 E	Loops	2 CH	Wireless/ VDSL	N/A	N/A	N/A	III-CF	Wireless Link to Hyatt hotel
7	N Palm Canyon Dr & Andreas Rd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Under construction
8	N Palm Canyon Dr & Desert Fashion Ped Xing	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Under construction
9	S Palm Canyon Dr & Tahquitz Canyon Way	332	McCain	170 E	Loops	2 CH	VDSL	N/A	4 CH	N/A	III-BF	NWC under const.
10	S Palm Canyon Dr & La Plaza	332	McCain	170 E	Video	(2) Edge 2	VDSL	N/A	4 CH	Clary	III-BF	
11	S Palm Canyon Dr & Arenas Rd	332	SafeTran	170 E	Loops	2 CH	VDSL	N/A	N/A	N/A	III-BF	
12	S Palm Canyon Dr & The Village Green Ped Xing	332	McCain	170 E	N/A	N/A	VDSL	N/A	N/A	N/A	III-BF	
13	S Palm Canyon Dr & Baristo Rd	332	McCain	170 E	Loops	2 CH	VDSL	N/A	N/A	N/A	III-BF	
14	S Palm Canyon Dr & Ramon Rd	332	McCain	170 E	Loops	2 CH	VDSL	N/A	4 CH	N/A	III-BF	
15	S Palm Canyon Dr & Camino Parocela	332	McCain	170 E	Loops	2 CH	VDSL	N/A	N/A	N/A	III-CF	
16	S Palm Canyon Dr & Sunny Dunes Rd	332	SafeTran	170 E	Loops	2 CH	VDSL	N/A	N/A	Clary	III-BF	
17	S Palm Canyon Dr & Mesquite Ave	332	McCain	170 E	Loops	2 CH	VDSL	N/A	N/A	N/A	II-BF	
18	S Palm Canyon Dr & Morongo Ave	332	SafeTran	170 E	Loops	2 CH	VDSL	N/A	N/A	N/A	III-BF	
19	S Palm Canyon Dr & E Palm Canyon Dr	332	SafeTran	170 E	Loops	2 CH	VDSL	N/A	N/A	N/A	III-BF	
20	Camino Real & E Palm Canyon Dr	332	SafeTran	170 E	Video	(1) Edge 2	Wireless/ VDSL	N/A	4 CH	Clary	III-BF	
21	Sunrise Wy & E Palm Canyon Dr	332	McCain	170 E	Loops	2 CH	Wireless	Cohu 3920	562	N/A	III-BF	Polara APS
22	Cerritos Dr & E Palm Canyon Dr	332	McCain	170 E	Loops	2 CH	Wireless	N/A	StobeCom II	N/A	III-BF	
23	Smoke Tree Commons & E Palm Canyon Dr	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	
24	Farrell Dr/ Barona Rd & E Palm Canyon Dr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No key to cabinet
25	Escoba Dr/ Araby Dr & E Palm Canyon Dr	332	McCain	170 E	Video	(3) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	Wireless Link to PD tower
26	Auto Center & E Palm Canyon Dr	332	McCain	170 E	Video	(3) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	



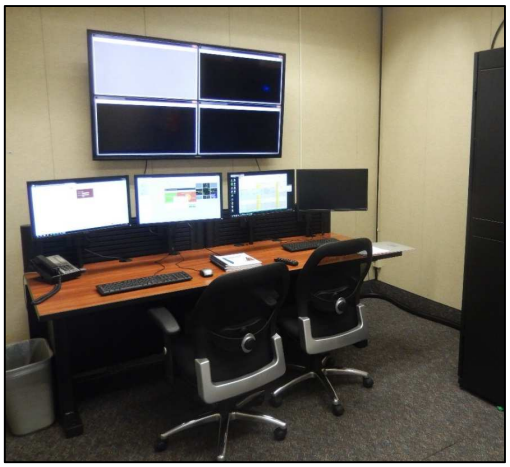
No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
27	Cherokee Way & E Palm Canyon Dr	332	McCain	170 E	Loops	2 CH	Wireless	N/A	4 CH	Clary	III-BF	
29	Indian Canyon Dr & San Rafael Dr	332 (old)	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Dimensions	III-BF	Polara APS
30	Indian Canyon Dr & Racquet Club Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	
31	Indian Canyon Dr & Tachevah Dr	332	McCain	170 E	Video & Loops	(2) Edge 2	Wireless	Cohu 3920	N/A	N/A	III-BF	
32	Indian Canyon Dr & Tamarisk Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	
33	Indian Canyon Dr & Alejo Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	Cohu 3920	N/A	Clary	III-BF	Wireless Link to Hyatt hotel
34	Indian Canyon Dr & Amado Rd	332	McCain	170 E	Video	(3) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	
35	Indian Canyon Dr & Andreas Rd	332	McCain	170 E	Video	(3) Edge 2	Wireless	Axis Q60	4 CH	N/A	III-BF	
36	Indian Canyon Dr & Tahquitz Canyon Wy	332	McCain	170 E	Loops	2 CH	VDSL	N/A	4 CH	Clary	Underground	
37	Indian Canyon Dr & La Plaza	332	Safetran	170 E	Video	(2) Edge 2	Wireless	N/A	752	Clary	III-BF	
38	Indian Canyon Dr & Arenas Rd	332	McCain	170 E	Video	(3) Edge 2	Wireless	N/A	752	Clary	III-BF	
39	Indian Canyon Dr & Baristo Rd	332	McCain	170 E	Video	(2) Edge 2	Wireless	N/A	752	N/A	III-BF	
40	Indian Canyon Dr & Ramon Rd	332	Safetran	170 E	Loops	2 CH	Wireless	Cohu 3920	4 CH	N/A	III-BF	
41	Sunrise Wy & San Rafael Dr	332	Safetran	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	Polara APS
42	Sunrise Wy & Racquet Club Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	Polara APS
43	Sunrise Wy & Via Escuela	332	Safetran	170 E	Video	(4) Edge 2	Wireless	N/A	562	N/A	III-BF	
44	Sunrise Wy & Tachevah Dr	332	Signal Control Co	170 E	Loops	2 CH	Wireless	N/A	4 CH	Clary	III-BF	
45	Sunrise Wy & Alejo Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	
46	Sunrise Wy & Amado Rd	332	US Traffic Corp	170 E	Loops	2 CH	Wireless	N/A	4 CH	Clary	III-BF	
47	Sunrise Wy & Tahquitz Canyon Wy	332	McCain	170 E	Video	(4) Edge 2	VDSL	N/A	4 CH	Clary	III-BF	
48	Sunrise Wy & Baristo Rd	332	US Traffic Corp	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	N/A	Wireless Link to Angels Field
49	Sunrise Wy & Ramon Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	Cohu 3920	4 CH	Dimensions	III-BF	Polara APS
50	Sunrise Wy & Sunny Dunes Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	
51	Sunrise Wy & Mesquite Ave	332	US Traffic Corp	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-CF	Polara APS
52	Farrell Dr & Via Escuela	333JP	Safetran	170 E	Loops	2 CH	Wireless	N/A	752	N/A	III-BF	



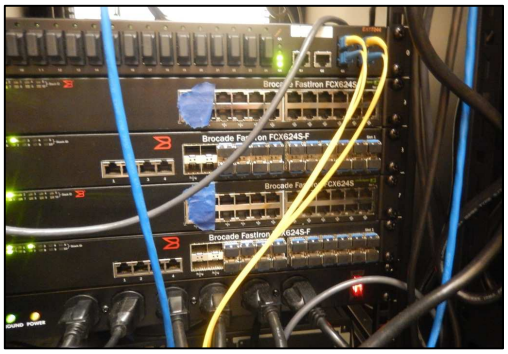
No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
53	Farrell Dr & Tamarisk Rd	333JP	US Traffic Corp	170 E	Video	(5) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	
54	Farrell Dr & Alejo Rd	333JP	McCain	170 E	Loops	2 CH	Wireless	N/A	4 CH	N/A	II-B	
55	Farrell Dr & Tahquitz Canyon Wy	332	McCain	170 E	Video	(4) Edge 2	VDSL	N/A	4 CH	Clary	III-BF	Polara APS
56	Farrell Dr & Baristo Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	Polara APS
57	Farrell Dr & Ramon Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Dimensions	III-BF	Bluetooth Detection
58	Farrell Dr & Mesquite/ Golf Cart Xing	333JP	McCain	170 E	Loops	2 CH	Wireless	N/A	N/A	N/A	II-B	
59	Farrell Dr & Mesquite Ave	332	Safetran	170 E	Loops	2 CH	Wireless	N/A	N/A	N/A	III-BF	
60	Calle Encilia & Tahquitz Canyon Wy	332	McCain	170 E	Loops	2 CH	VDSL	N/A	4 CH	N/A	III-BF	
61	Calle El Segundo & Tahquitz Canyon Wy	332	McCain	170 E	Video	(4) Edge 2	VDSL	N/A	N/A	Clary	III-BF	Polara APS
62	Avenida Caballeros & Tahquitz Canyon Wy	332	McCain	170 E	Loops	2 CH	VDSL	N/A	4 CH	Clary	III-CF	Polara APS
63	Sunset Way & Tahquitz Canyon Wy	332	McCain	170 E	Video	(4) Edge 2	VDSL	N/A	4 CH	Clary	III-BF	
64	El Cielo Rd & Tahquitz Canyon Wy	333 JP	McCain	170 E	Video	(4) Edge 2	VDSL	N/A	4 CH	Clary	III-BF	TWP to PD shack
65	Calle Encilla & Ramon Rd	332	McCain	170 E	Loops	2 CH	Wireless	N/A	N/A	N/A	II-BF	Polara APS
66	Avenida Caballeros & Ramon Rd	333 JP	McCain	170 E	Loops	2 CH	Wireless	N/A	N/A	N/A	III-BF	Polara APS
67	Compadre Rd & Ramon Rd	332	Safetran	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	N/A	III-BF	
68	El Cielo Rd & Ramon Rd	332	McCain	170 E	Loops	2 CH	Wireless	Cohu 3920	4 CH	N/A	III-BF	Bluetooth. Link to PD tower
69	El Placer & Ramon Rd	332	IDC	170 E	Video	(4) Edge 2	Wireless	N/A	752	Clary	III-BF	
70	Paseo Dorotea & Ramon Rd	332	McCain	170 E	Loops	2 CH	Wireless	N/A	4 CH	Clary	III-CF	
71	Vella Rd & Ramon Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	Cohu 3920	754	N/A	III-BF	Bluetooth Detection
72	San Luis Rey Dr & Ramon Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-CF	Polara APS
73	Crossley Rd & Ramon Rd	332	McCain	170 E	Loops	2 CH	Wireless	N/A	4 CH	Clary	III-BF	
74	San Luis Rey Dr & Dinah Shore Dr	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	
75	Crossley Rd & Dinah Shore Dr	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	752/ 762	Clary	III-BF	
76	Avenida Caballeros & Racquet Club Rd	332	McCain	170 E	Video	(4) Edge 2	Wireless	N/A	4 CH	Clary	III-BF	Polara APS
77	El Cielo Rd & Baristo Rd	332	McCain	170E	Video	(3) Edge 2	Wireless	N/A	752	N/A	III-BF	Link to PD tower
78	PSHS/ Palm Springs Mall	332	Safetran	170E	Video	(4) Edge 2	Wireless	N/A	4 CH	Dimensions	III-BF	Polara APS

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
79	Sunrise Way & Boys and Girls/ Shopping Ctr	332	McCain	170E	Video	(4) Edge 2	VDSL	N/A	4 CH	Dimensions	III-BF	Master Location
80	S. Palm Canyon Dr & Southridge Dr	336	N/A	N/A	N/A	N/A	Wireless	N/A	N/A	N/A	III-BF	Advanced Warning Flasher + Wireless repeaters
81	Indian Canyon Dr & Garnet Ave	332	McCain	170E	Video	(4) Edge 2	Twisted Pair	N/A	454	Clary	III-BF	TWP not in use
82	Indian Canyon Dr & 20th Ave	332	McCain	170E	Video	(4) Edge 2	Twisted Pair	N/A	454	Clary	III-BF	TWP not in use
83	Vista Chino & Clubhouse View Dr	332	McCain	170E	Video	(3) Edge 2	Wireless	FLIR PT fixed	4 CH	Clary	III-BF	Wireless Link to PD tower
84	Gene Autry Trl & Via Escuela	332	DTS	170E	Video	(4) Edge 2	Wireless	FLIR PT fixed	4 CH	Clary	III-BF	

1-2.8.2. Traffic Management Center (TMC)



The City of Palm Springs has a recently completed a Traffic Management Center (TMC) operations room located within City Hall. The TMC room utilizes dual workstations and a large overhead LCD monitor for remote monitoring and maintenance of the citywide traffic network. All local intersections and roadside ITS components interface to this room for remote access and control by City staff/technicians. The City of Palm Springs utilizes a McCain "QuicNET Pro" central system for command and control of all traffic signal operations. QuicNET Pro communicates directly to the City's model 170E controllers that supply traffic signal timing/Time-of-Day (TOD) operation, local intersection timing, coordination parameters and provides real-time display through the system's Graphic User Interface (GUI).



The City's TMC room and equipment rack is located centrally to the Public Works Division. The equipment rack houses multiple database traffic servers and rack mounted communications equipment for real-time traffic monitoring and surveillance to all roadside elements. A single (96) strand single-mode fiber optic (SMFO) cable is used to interconnect the TMC room to the Police Department spider shack, located across Tahquitz Canyon Way. The TMC communications rack employs a number of high bandwidth Ethernet switches both in RJ-45 and Fiber Optic format. These high bandwidth Ethernet switches are configured in a "stack" that allows fail-over redundancy should a singular switch fail. The existing conditions are as follows **(Table 1.38**):

Table 1.38 Existing Traffic Management System Equipment - City Hall

Traffic Management System	McCain QUICNET PRO 4.1
Traffic Server	Dell R220 (QUICNET server) Dell R730 (Chameleon CCTV server) Dell R220 (Vantage View server) Dell R220 (Vantage Velocity server) Rack mount KVM
Workstation PC	(2) Dell Optiplex 3020 workstation PC's (1) Samsung LCD display monitor
Communications Equipment	Etherwan 24 port Gigabit fiber switch (4) Brocade Fastiron FCX Layer 3 switches Netgear 24 port unmanaged switch UPS unit
Hardwire Communications	(1) 96 SMFO cable (1) Fiber Distribution Unit (FDU)

Wireless Communications	No wireless communications equipment
Video Management System	FLIR systems CHAMELEON software (CCTV camera stream) Iteris Vantage View (Video Detection camera stream)

At the Police Department spider shack a remote fiber optic link connects to City Hall TMC and provides two-way data and video transmission from all roadside field elements to the City's central system. The Police Department equipment rack houses the following ITS equipment (**Table 1.39**):

Table 1.39 Existing Traffic Management System Equipment - Police Department

Communications Equipment	Etherwan 24 port Gigabit fiber switch Etherwan 8 port Ethernet-over-copper (VDSL) switch GDI Modem rack (abandoned)
Hardwire Communications	(1) 96 SMFO cable (1) Fiber Distribution Unit (FDU)
Wireless Communications	(2) Proxim Tsunami GX-810 Microwave back-haul radios (5) Proxim Tsunami 5.8GHz Quick bridge radios

The City also utilizes several other traffic based software programs in addition to the QUICNET PRO central control system including Iteris Vantage View software (Video Detection/ Bluetooth arterial management system) and FLIR Chameleon Program enables remote viewing of CCTV video surveillance cameras throughout the City. These traffic based software systems help City staff with day-to-day traffic operations and maintenance. Overall, the recently constructed TMC and ITS improvements have been well thought-out and implemented with best practices. These upgrades build the foundation for the City to tie future ITS related components to the new ATMS system for further advancement.



1-2.8.3. Future Projects

The City has been awarded funds under the HSIP grant program in order to modify nineteen (19) traffic signals. The project is called the "Traffic Signal Improvements (HSIP Cycle 7)" project. It is anticipated that design services will begin in year 2017.

1-2.8.4. Conclusion

Based on our inventory and evaluation of the City's existing and future traffic signal system, ITS elements, communication system, and TMC there are existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

The City's recently constructed and future projects include many ITS improvements such as: a new TMC, fiber optic improvements, high-bandwidth wireless backhaul, 5.8GHz wireless Ethernet radios, Ethernet/IP-based communications, hybrid video/radar detection, Bluetooth arterial management system, weather CCTV camera system, and closed circuit television (CCTV) surveillance cameras at selected intersections. These upgrades build the foundation for the City to tie future ITS related components to their new TMC for further advancement.

If the City considers future ITS or traffic signal related improvements; it is recommended to begin with selecting a new centralized Advanced Traffic Management System (ATMS). The City's current ATMS is McCain's QuicNET Pro system. If the City considers upgrading this system, they may consider McCain's latest ATMS called TRANSPARITY. With a new ATMS, the city also needs to consider upgrading their existing traffic signal controllers to 2070 ATC's with the latest firmware. Other ITS elements should also be considered to enhance traffic operations and mobility within and across jurisdictional boundaries.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.9. City of Rancho Mirage



The City of Rancho Mirage is located centrally in the Coachella Valley and borders the neighboring cities of Palm Springs, Cathedral City, Palm Desert and the County of Riverside. Major routes/roadways include Highway 111 that transverses east-west through the City, Frank Sinatra Drive, Gerald Ford Drive, Country Club Drive, Bob Hope Drive and Monterey Avenue. Traffic signals on the I-10 on/off ramps are owned, operated and maintained by Caltrans. Traffic signals along Highway 111 have been relinquished from Caltrans authority and are owned, operated and maintained by the City. Selected traffic signals along the City border are owned, operated and co-maintained by either the City of Cathedral City or City of Palm Desert; all other traffic signals are owned, operated and maintained by the City of Rancho Mirage.

The existing traffic signal system within the City of Rancho Mirage consists of the following:

- 45 traffic signals with four (4) on-street master controllers.
- Local communications occur over a mixture twisted-pair/copper interconnect cable (SIC) and 900MHz/2400MHz wireless radio at locations where underground conduit does not exist.
- At City Yard building, a workstation PC is established for Traffic Management System (TMS) operations and traffic surveillance. A leased line/dial up connection communicates to all 4 on-street master locations.
- Back-haul communications to City Hall occur by use of leased line/dial up communications at centralized master locations.
- Five (5) existing traffic signals are "stand-alone" and have no communication hardware.

There are three (3) City of Rancho Mirage's traffic signals that are connected to the City of Palm Desert's traffic management system. These are located at: 1) Monterey Avenue at Frank Sinatra Drive 2) Monterey Avenue at Gerald Ford Drive and 3) Monterey Avenue at Market Place Way. The operations and status of these traffic signals can be controlled remotely by Palm Desert staff.

Figure 1.21 illustrates the **existing traffic signal locations, communications, ITS components and City Hall**.

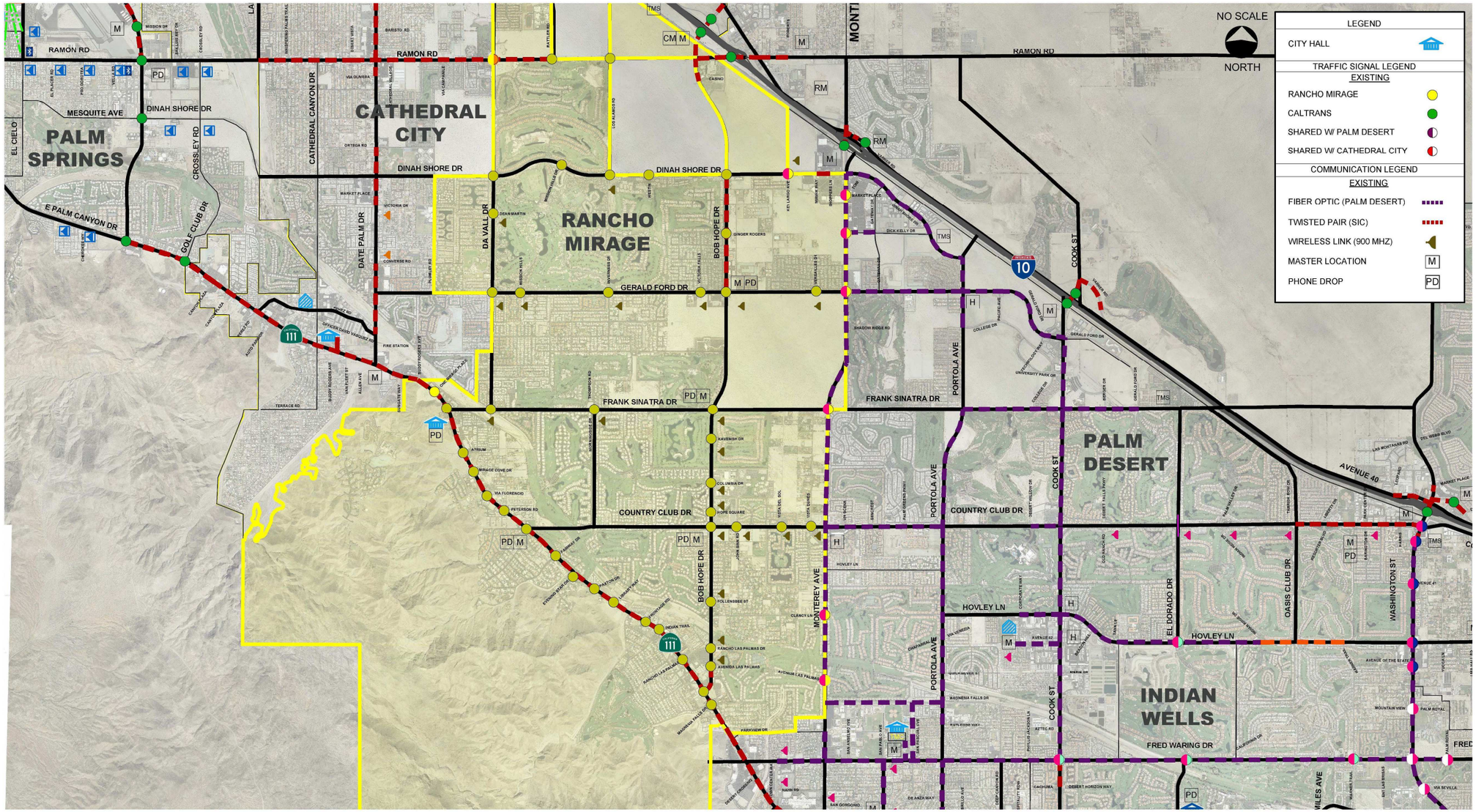
Figure 1.22 illustrates the **existing system architecture** configuration.

Table 1.40 summarizes the **number of project traffic signals** within the City of Rancho Mirage for the Regional TSI Project.

Table 1.41 City of summarizes the **number of project corridors** within the City of Rancho Mirage for the Regional TSI Project.

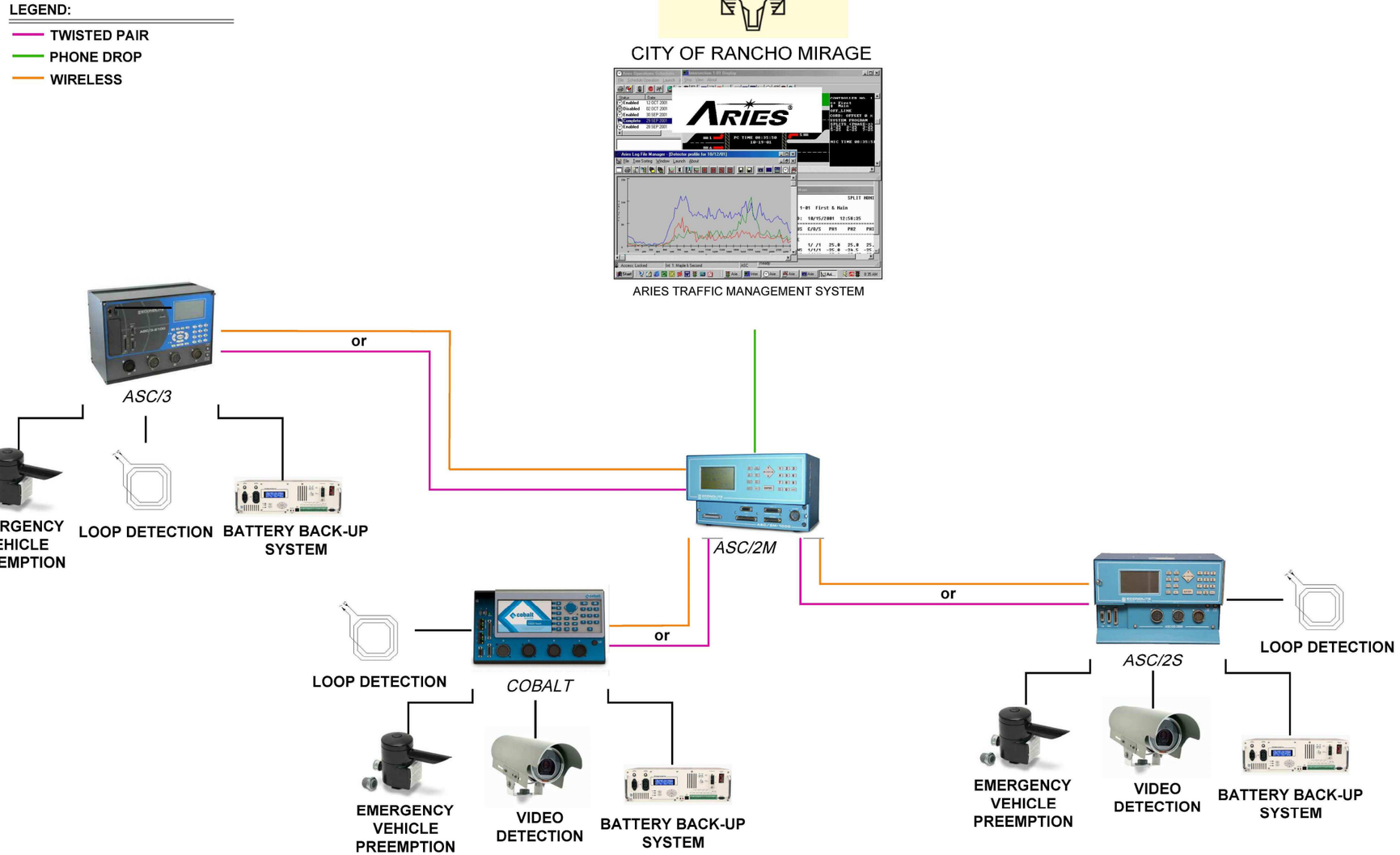
Existing System Inventory and Evaluation

Figure 1.21 City of Rancho Mirage Existing Conditions



Existing System Inventory and Evaluation

Figure 1.22 City of Rancho Mirage Existing System Architecture



CITY OF RANCHO MIRAGE

EXISTING SYSTEM ARCHITECTURE

Table 1.40 City of Rancho Mirage – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Highway 111 & One Mirage Place	**26**	Bob Hope Dr & Gerald Ford Dr
2	Highway 111 & Frank Sinatra Dr	**27**	Bob Hope Dr & Ginger Rodgers Rd
3	Highway 111 & Atrium Wy	**28**	Bob Hope Dr & Dinah Shore Dr
4	Highway 111 & Mirage Cove Dr	**29**	Country Club Dr & John L. Sinn Rd
5	Highway 111 & Via Florencio	**30**	Country Club Dr & Vista Del Sol/ Desert Lakes Dr
6	Highway 111 & Peterson Rd	**31**	Country Club Dr & Vista Dunes Rd
7	Highway 111 & Country Club Dr	**32**	Frank Sinatra Dr & Da Vall Dr
8	Highway 111 & Thunderbird Rd/ Fairway Dr	**33**	Gerald Ford Dr & Da Vall Dr
9	Highway 111 & Evening Star Dr	**34**	Frank Sinatra Dr & Morningside Dr/Thompson Rd
10	Highway 111 & Paxton Dr	**35**	Gerald Ford Dr & Mission Hills Dr
11	Highway 111 & Library Wy	**36**	Gerald Ford Dr & Inverness Dr/ Los Alamos Rd
12	Highway 111 & Frontage Rd	**37**	Gerald Ford Dr & Victoria Falls Dr
13	Highway 111 & Indian Trl	**38**	Gerald Ford Dr & Versailles Dr
14	Highway 111 & Rancho Las Palmas	**39**	Da Vall Dr & Dean Martin Dr
15	Highway 111 & Bob Hope Dr	**40**	Dinah Shore Dr & Da Vall Dr
16	Highway 111 & Magnesia Falls Dr	**41**	Dinah Shore Dr & Mission Hills Dr
17	Indian Trl & RM. Elem School	**42**	Dinah Shore Dr & Los Alamos Rd
18	Bob Hope Dr & Avenida Las Palmas	**43**	Dinah Shore Dr & Westin Mission Hills Resort
19	Bob Hope Dr & Rancho Las Palmas	**44**	Ramon Rd & Rattler Rd
20	Bob Hope Dr & Follansbee Dr/ Sunrise Dr	**45**	Ramon Rd & Los Alamos Rd
21	Bob Hope Dr & Country Club Dr		
22	Bob Hope Dr & Hope Square		
23	Bob Hope Dr & Columbia/Hospital		
24	Bob Hope Dr & Kavenish Wy		
25	Bob Hope Dr & Frank Sinatra Dr		

Table 1.41 City of Rancho Mirage – Project Corridors

No.	Corridor	Project Corridor Type	Limits
1	Palm Canyon Dr/ Highway 111	Primary Corridor	One Mirage Place to Magnesia Falls Dr
2	Ramon Rd	Primary Corridor	Da Vall Rd to I-10
3	Dinah Shore Dr	Primary Corridor	Plumley Rd to Monterey Ave
4	Gerald Ford Dr	Primary Corridor	Plumley Rd to Monterey Ave
5	Frank Sinatra Dr	Primary Corridor	Highway 111 to Monterey Ave
6	Da Vall Dr	Primary Corridor	Frank Sinatra Dr to 30th Ave (N/O Ramon Rd)
7	Morningside Dr	Primary Corridor	Country Club Dr to Frank Sinatra Dr
8	Bob Hope Dr	Primary Corridor	Highway 111 to I-10
9	Monterey Ave	Primary Corridor	Highway 111 to I-10
10	Country Club Dr	Primary Corridor	Highway 111 to Monterey Ave

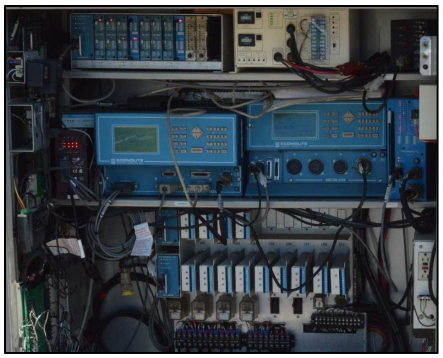
An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 45 signalized intersections
- ✓ 10 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.9.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.

The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).



In addition, an inventory of the existing communication systems was conducted along the City's corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

  The City has primarily NEMA Type-P and NEMA Type-O traffic signal controller cabinets throughout the City.



Type-P



Type-O

  Both NEMA Type-P and Type O cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type P, Type O cabinets.

- **Traffic Signal Controllers**

  The City has several types of traffic signal controllers including ASC/2, ASC/3 and Cobalt controllers.



ASC/2-2100



ASC/3-2100



Cobalt

  The City uses a NEMA based controller standard. While the ASC/3 controller is still supported and IP capable; the ASC/2 controller is outdated in terms of support and integration into new ATMS systems. All new controller installations should adhere to ATC specification; such as Econolite Cobalt ATC.

- **Loop Detection**

The City has loop vehicle detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors



Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier if applicable.

- **Video Detection System**

The City has video detection at selected signalized locations. The video detection systems within the City are manufactured by Iteris and Econolite. The City is using model Vantage Edge 2 and Autoscope system(s).



Video Detection Camera



Autoscope



Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at a future TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification.

- **Emergency Vehicle Pre-Emption System (EVP)**

The City has EVP systems at various signalized locations. The EVP systems within the City are manufactured by 3M and Global Traffic Technologies (GTT).



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The City has battery back-up systems (BSS) at most signalized locations. The BBS within the City are manufactured by Dimensions and ElectroTech.



Dimensions Battery Backup



ElectroTech Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The City has a mixture of twisted pair/hardwire signal interconnect cable (SIC), 900/2400MHz wireless and Leased Line/Dial-up communications.



Twisted Pair (SIC)



Leased Line/Dial-up



Wireless Radio Antenna (900 MHz, 2400 MHz)

All local communication via SIC cable, 900/2400MHz radio or Leased Line/Dial-up is legacy analog type, that require modems to communicate. Typically, analog communications are no longer supported for new installations. Therefore, it is recommended a new Ethernet IP based communication system is established, that incorporates new Ethernet IP switching equipment. This includes considering upgrades of existing 900MHz wireless to new 5.8GHz wireless communications or higher, such as 5.9GHz DSRC wireless communications. There are also opportunities to utilize the City's existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable. Leased line/dial-up communications should be considered upgrading to a DSL or Metro-E connections.

- **Communication Hubs**

The City does not have communication hubs.

Field communication hubs are beneficial for aggregation of local traffic signal controllers and ITS elements on a private area wide network. They are typically installed at a centralized location in the field as a collection point for the ITS elements, and for creating redundant sites for communication back to central. When considering new Ethernet/IP communications systems,

primarily using fiber optic cable, it is best practice to include field communication hubs in the planning and design of the new Ethernet communication network.

- **CCTV Cameras**

  The City does not have CCTV camera systems.

  New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This includes the type of camera (top mounted or dome) and the preferred type of installation; typically, they are mounted to an existing pole or on a standalone pole. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

Table 1.42 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.42 Existing Traffic Signal, Communication & ITS Inventory - City of Rancho Mirage

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Highway 111 & One Mirage Pl	O	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	754	Dimensions	III-CF	
2	Highway 111 & Frank Sinatra Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	760 Chassis / 752	Dimensions	III-CF	
3	Highway 111 & Atrium Wy	O	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	752	Dimensions	III-CF	
4	Highway 111 & Mirage Cove Dr	O	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	562	Dimensions	Type I	
5	Highway 111 & Via Florencio	P44	Econolite	ASC/2S-2100	Video	Edge 2	Twisted Pair	N/A	752 / 562	Dimensions	III-CF	
6	Highway 111 & Peterson Rd	P44	Econolite	ASC/2-1000	Video	Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
7	Highway 111 & Country Club Dr	P44	Econolite	ASC/2S-2100	Video	Edge 2	Twisted Pair	N/A	764	Electrotech	III	Master Location. Phone Drop
8	Highway 111 & Thunderbird Rd/Fairway Dr	O	Econolite	ASC/2S-2100	Video	Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
9	Highway 111 & Evening Star Dr	P44	Econolite	ASC/2S-2100	Video & Loops	Solo Mini-Hub	Twisted Pair	N/A	764	Dimensions	III-CF	
10	Highway 111 & Paxton Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	752	Dimensions	III-CF	
11	Highway 111 & Library Wy	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	752	Dimensions	III-CF	
12	Highway 111 & Frontage Rd	P44	Econolite	ASC/2S-2100	Video & Loops	Solo Mini-Hub	Twisted Pair	N/A	754	Dimensions	III-CF	
13	Highway 111 & Indian Trl	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	752 Chassis	Dimensions	III-CF	
14	Highway 111 & Rancho Las Palmas	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	764	Dimensions	III-CF	
15	Highway 111 & Bob Hope Dr	P44	Econolite	ASC/2S-2100	Video & Loops	Solo Mini-Hub	Twisted Pair	N/A	562	Dimensions	III-CF	
16	Highway 111 & Magnesia Falls Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	754	Dimensions	III-CF	
17	Indian Trl & Rancho Mirage Elementary School	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
18	Bob Hope Dr & Avenida Las Palmas	P44	Econolite	ASC/2S-2100	Video & Loops	2 Ch	Wireless/TWP	N/A	762 / 562	Electrotech	III-CF	
19	Bob Hope Dr & Rancho Las Palmas	P44	Econolite	ASC/2-1000	Loops	2 Ch	Wireless/TWP	N/A	752	Electrotech	III-CF	
20	Bob Hope Dr & Follansbee Rd/ Sunrise Dr	P44	Econolite	ASC/2S-2100	Video & Loops	Solo Mini-Hub	Wireless	N/A	764	Dimensions	III-CF	
21	Bob Hope Dr & Country Club Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	752	Dimensions	Iii	Master Location. Phone Drop
22	Bob Hope Dr & Hope Square	P44	Econolite	ASC/2S-2100	Loops	2ch	Wireless	N/A	752	Electrotech	III-CF	
23	Bob Hope Dr & Columbia/Hospital	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	752 Chassis	Electrotech	III-CF	
24	Bob Hope Dr & Kavenish Wy	P44	Econolite	ASC/2S-2100	Video & Loops	Solo Mini-Hub	Wireless	N/A	764	Dimensions	III-CF	

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
25	Bob Hope Dr & Frank Sinatra Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	752	Dimensions	III-CF	Master Location. Phone Drop
26	Bob Hope Dr & Gerald Ford Dr	P44	Econolite	Cobalt	Loops	2 Ch	Twisted Pair	N/A	762	Dimensions	III-CF	Master Location. Phone Drop
27	Bob Hope Dr & Ginger Rodgers Rd	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	M262	Electrotech	III-CF	
28	Bob Hope Dr & Dinah Shore Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Twisted Pair	N/A	752	Dimensions	III-CF	
29	Country Club Dr & John L. Sinn Rd	P44	Econolite	ASC/2-2100	Loops	2 Ch	Wireless	N/A	752	Electrotech	III-CF	
30	Country Club Dr & Vista Del Sol/ Desert Lakes Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	M262	Electrotech	III-CF	
31	Country Club Dr & Vista Dunes	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	752	Dimensions	III-CF	
32	Frank Sinatra Dr & Da Vall Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	M262	Dimensions	Iii	
33	Gerald Ford Dr & Da Vall Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	M262	Dimensions	III-CF	
34	Frank Sinatra Dr & Morningside Dr/Thompson Rd	P44	Econolite	ASC/2-1000	Loops	2 Ch	Wireless	N/A	562	Dimensions	III-CF	
35	Gerald Ford Dr & Mission Hills Dr	P44	Econolite	ASC/2S-2100	Loops	Terra access Point	Wireless	N/A	752	Dimensions	III-CF	
36	Gerald Ford Dr & Inverness Dr/ Los Alamos Rd	P44	Econolite	ASC/2S-2100	Loops	2 Ch	N/A	N/A	M262	Dimensions	III-CF	
37	Gerald Ford Dr & Victoria Falls Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	752	Dimensions	III-CF	
38	Gerald Ford Dr & Versailles Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	Wireless	N/A	752	Dimensions	III-CF	
39	Da Vall Dr & Dean Martin Dr	P44	Econolite	ASC/3-2100	Loops	2 Ch	Wireless	N/A	752	Dimensions	III-CF	
40	Dinah Shore Dr & Da Vall Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	N/A	N/A	752	Dimensions	III-CF	Stand Alone
41	Dinah Shore Dr & Mission Hills Dr	P44	Econolite	ASC/2S-2100	Loops	2 Ch	N/A	N/A	M262	Dimensions	III-CF	Stand Alone
42	Dinah Shore Dr & Los Alamos Rd	P44	Econolite	ASC/2S-2100	Video & Loops	2 Ch	Wireless	N/A	752	Dimensions	III-CF	
43	Dinah Shore Dr & Westin Mission Hills Resort	P44	Econolite	ASC/2S-2100	Loops	Solo Mini-Hub	N/A	N/A	752	Dimensions	III-CF	Stand Alone
44	Ramon Rd & Rattler Rd	P44	Econolite	ASC/3-2100	Loops	2 Ch	Twisted Pair	N/A	752	Dimensions	III-CF	
45	Ramon Rd & Los Alamos Rd	P44	Econolite	ASC/2S-2100	Video & Loops	2 Ch	N/A	N/A	752	Dimensions	III-CF	Stand Alone

1-2.9.2. Traffic Management Center (TMC)

The City of Rancho Mirage has a workstation PC for Traffic Management Center (TMC) operations located within City Yard building. The workstation PC is configured and utilizes the Econolite "ARIES" central system for command and control of all traffic signal operations. ARIES communicates to the four (4) on-street master controllers via leased line/dial-up that supplies traffic signal timing/Time-of-Day (TOD) operation and provides real-time display through the system's Graphic User Interface (GUI). The existing conditions are as follows (**Table 1.43**):

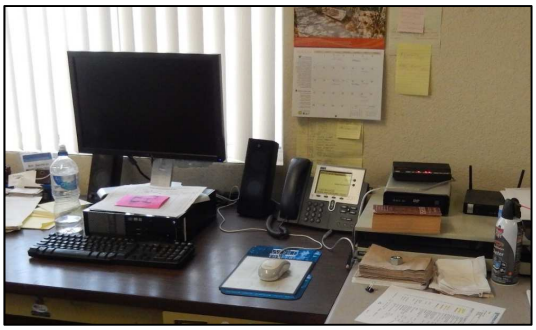


Table 1.43 Existing Traffic Management System Equipment

Traffic Management System	Econolite ARIES
Traffic Server	No dedicated traffic server
Workstation PC	City owned workstation PC for remote command and control (hosting Econolite ARIES)
Communications Equipment	US robotics 56k fax modem
Hardwire Communications	Leased-line/dial-up connection
Wireless Communications	No wireless communications equipment
Video Management System	No centralized VMS system

1-2.9.3. Future Projects

The City currently has three (3) upcoming near term projects with the following proposed improvements:

- *Fiber optic communications upgrade and signal synchronization:* Highway 111 within the City limits (from One Mirage Place to Magnesia Falls Drive); Bob Hope Drive between Highway 111 and Rancho Las Palmas Drive; Bob Hope Drive between Sunrise Drive and Frank Sinatra Drive; and Country Club Drive between Bob Hope Drive and Vista Dune Road.
- *Fiber optic communications upgrade*: Miriam Way and Monterey Avenue (for shared signals with the City of Palm Desert).

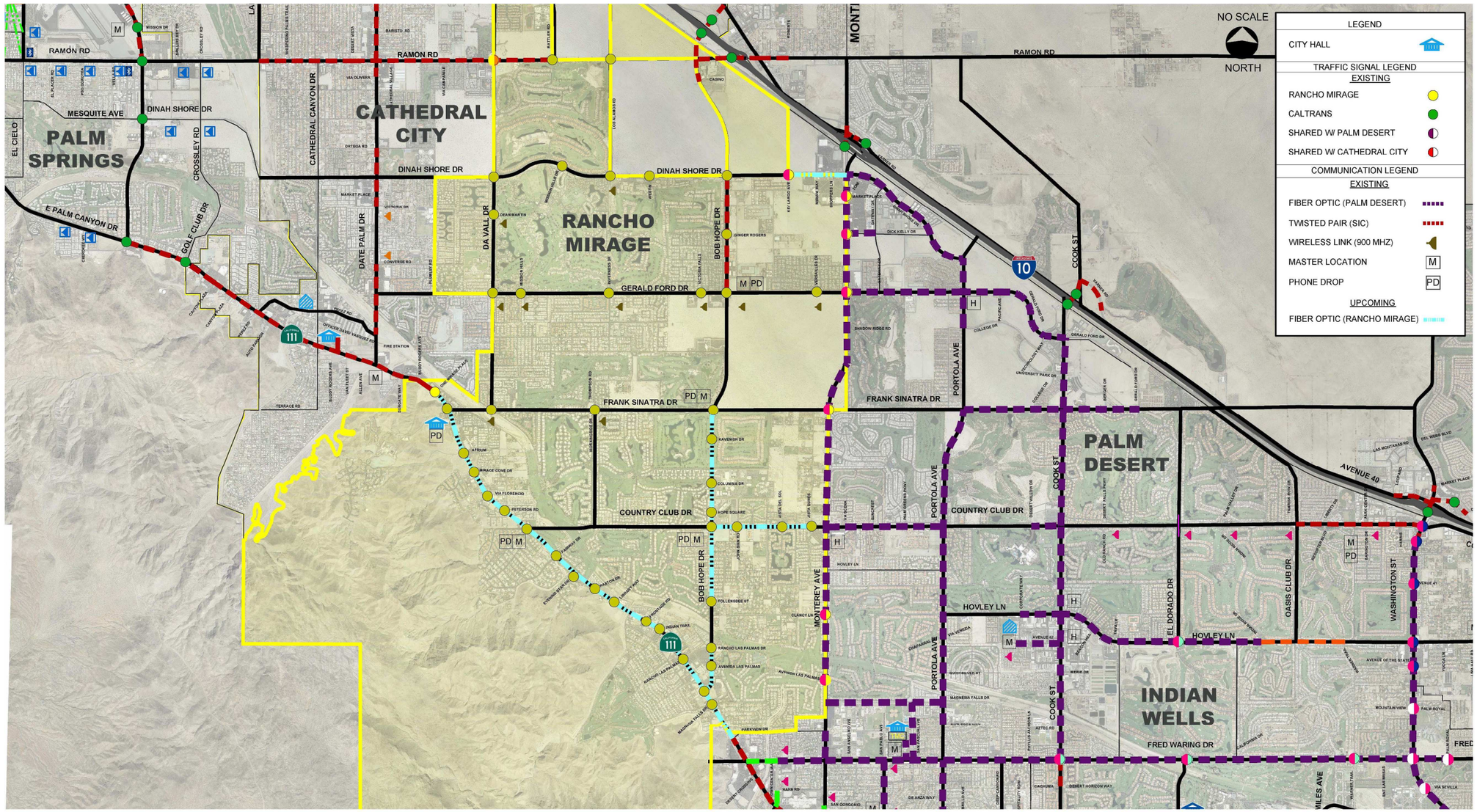
- *Implementation of signal coordination/timing improvements and the installation of pedestrian heads* on Monterey Avenue between Gran Via/Avenida Las Palmas to Dinah Shore Drive, and on Dinah Shore Drive from Monterey Avenue to Key Largo Avenue.
- *Traffic signal modification/upgrades* at the intersection of Bob Hope Drive and Frank Sinatra including a new Cobalt ATC signal controller.

Figure 1.23 illustrates the **existing traffic signal locations, proposed fiber optic communications alignment and City Hall**.

These future projects are currently under design and/or will be constructed in the near term. Therefore, it will be considered as our base conditions if further upgrades are considered under this project.

Existing System Inventory and Evaluation

Figure 1.23 City of Rancho Mirage Future Conditions



1-2.9.4. Conclusion

Based on our inventory and evaluation of the City's existing and future traffic signal system, ITS elements, communication system, and TMC, the City of Rancho Mirage has existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

The City's future projects include ITS improvements such as: new Econolite Cobalt ATC traffic controllers and fiber optic improvements. These upgrades build the foundation for the City to tie future ITS related components.

If the City considers future ITS or traffic signal related improvements, it is recommended to begin with selecting a new centralized Advanced Traffic Management System (ATMS). The City's current TMS is Econolite's ARIES system; this is considered a legacy system. If the City considers upgrading this system, it is recommended to upgrade to Econolite's latest ATMS system CENTRACS. Other ITS improvements should also be considered such as closed circuit television (CCTV) camera systems, hybrid video/radar detection, arterial management technologies, etc.

In regards to the communications, the City should consider upgrading their communications system to provide an Ethernet/IP-based communications system. This can be accomplished over hardwired/twisted-pair, fiber optic and/or new wireless Ethernet communications. Additional analysis and coordination with City staff will be required.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.10. Caltrans District 8



The State of California Department of Transportation (Caltrans) District 8 provides jurisdiction over both San Bernardino and Riverside counties, including the surrounding area of the Coachella Valley. Major routes include Interstate 10 (I-10), Highway 111, Highway 74, and State Route 86 (SR-86). Traffic signals on the I-10 and SR-86 on/off ramps are owned, operated and maintained by Caltrans. The majority of the traffic signals along Highway 111 have been relinquished from Caltrans authority and are owned, operated and maintained by cities in the Coachella Valley. However, selected traffic signals located on Gene Autry Trail, Vista Chino, and Palm Canyon Drive within the City of Palm Springs are owned, operated, and maintained by Caltrans.

The existing traffic signal system within Caltrans jurisdiction consists of the following:

- 51 traffic signals with twelve (12) on-street master controllers.
- Local communications occur over both twisted-pair/copper interconnect cable (SIC) and 900MHz wireless radio at locations where underground conduit does not exist.
- Located off the I-15 freeway in the City of Fontana, Caltrans District 8 Traffic Management Center (TMC) provides remote traffic command, control, and surveillance.
- Back-haul communications to Caltrans TMC occurs by use of leased line/dial-up and subscription based 3G/4G wireless data modems located at centralized master locations.
- Two (2) Changeable Message Sign (CMS) systems are located along interstate 10.
- Fifteen (15) Traffic Monitoring Systems (TMS) are located along interstate 10.
- Five (5) existing traffic signals are "stand-alone" and have no communication hardware.

Most Caltrans signalized intersections operate as a pair, or a grouping, with one location designated as the master location that provides TOD information to all local controllers tied to that group. These individual groups of traffic signal communicate and provide two-way traffic communication from the field to the TMC via the master controller, as the local controllers do not communicate directly to the TMC.

Figure 1.24 illustrates the **project traffic signal locations, communications, ITS components and TMC**.

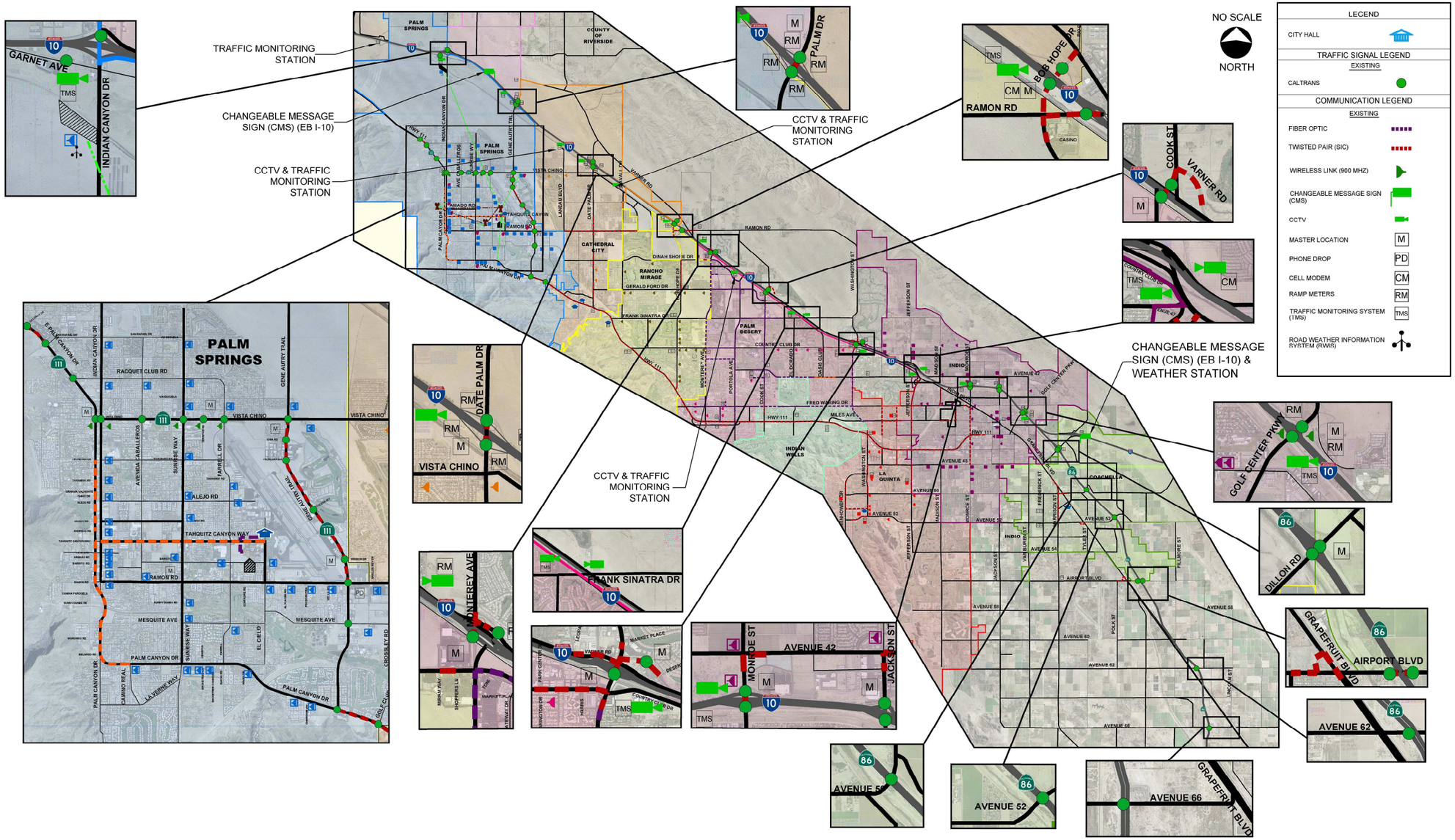
Figure 1.25 illustrates the **existing system architecture** configuration.

Table 1.44 summarizes the **number of project traffic signals** within Caltrans District 8 for the Regional TSI Project.

Table 1.45 summarizes the **number of project corridors** within Caltrans District 8 for the Regional TSI Project.

Existing System Inventory and Evaluation

Figure 1.24 Caltrans District 8 Existing Conditions



Existing System Inventory and Evaluation

Figure 1.25 Caltrans District 8 Existing System Architecture

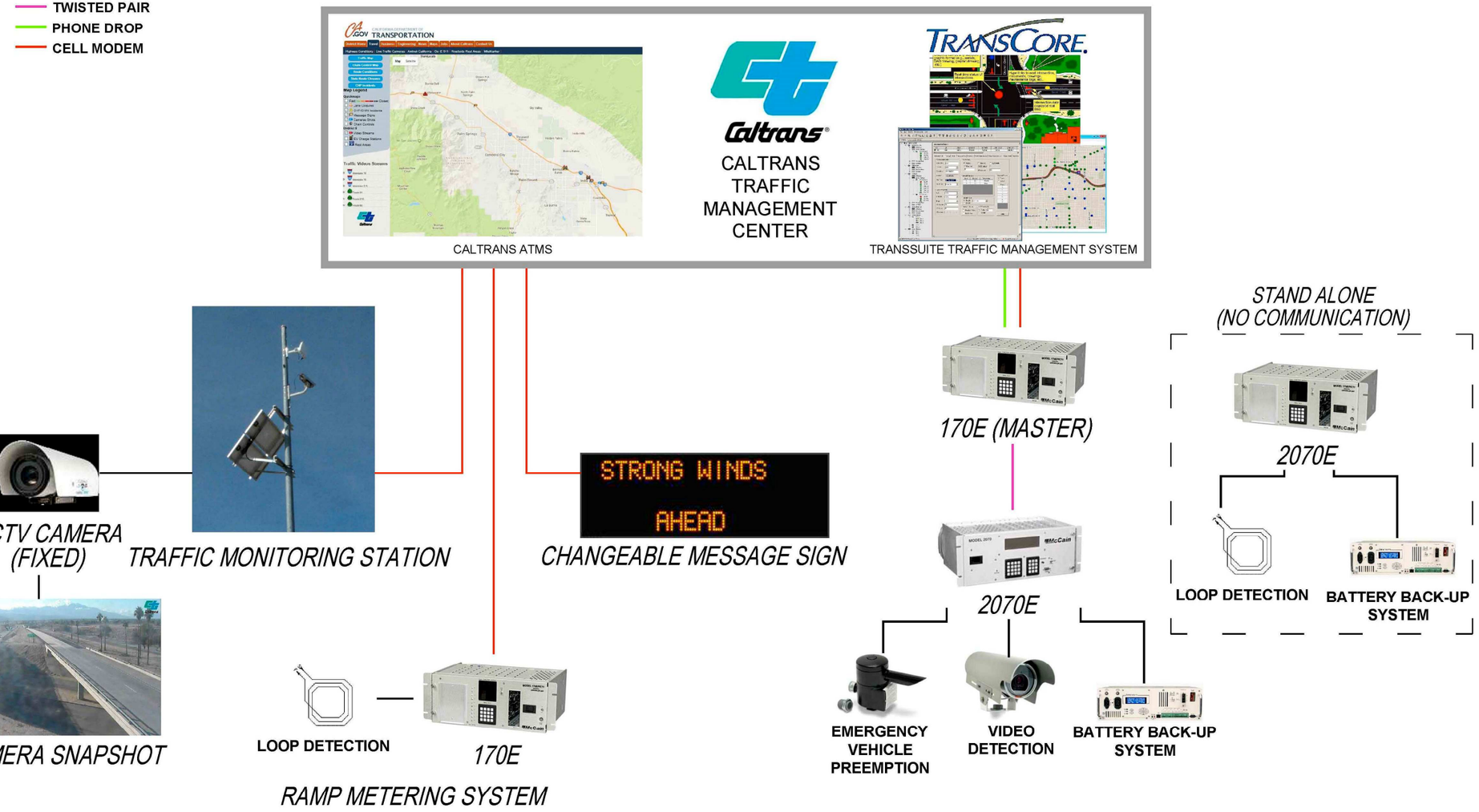


Table 1.44 Caltrans District 8 – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	I-10 EB Ramp(s) & Indian Canyon Dr	**26**	SR-86 NB Ramp(s) & Airport Blvd
2	I-10 WB Ramp(s) & Indian Canyon Dr	**27**	SR-86 SB Ramp(s) & Airport Blvd
3	I-10 EB Ramp(s) & Palm Dr	**28**	SR-86 Ramp(s) & Avenue 52
4	I-10 WB Ramp(s) & Palm Dr	**29**	SR-86 Ramp(s) & Avenue 50
5	I-10 EB Ramp(s) & Date Palm Dr	**30**	SR-86 NB Ramp(s) & Dillon Rd
6	I-10 WB Ramp(s) & Date Palm Dr	**31**	SR-86 SB Ramp(s) & Dillon Rd
7	I-10 EB Ramp(s) & Bob Hope Dr	**32**	Golf Club Dr & E Palm Canyon Dr
8	I-10 WB Ramp(s) & Bob Hope Dr	**33**	Gene Autry Trl & E Palm Canyon Dr
9	I-10 EB Ramp(s) & Ramon Rd	**34**	Mesquite Rd & Gene Autry Trl
10	I-10 EB Ramp(s) & Monterey Ave	**35**	Ramon Rd & Gene Autry Trl
11	I-10 WB Ramp(s) & Monterey Ave	**36**	Mission Dr & Gene Autry Trl
12	I-10 EB Ramp(s) & Cook St	**37**	PSUSD (District) Center Dr & Gene Autry Trl
13	I-10 WB Ramp(s) & Cook St	**38**	Skywest Dr / Escena Way & Gene Autry Trl
14	I-10 EB Ramp(s) & Washington St	**39**	Tamarisk Rd & Gene Autry Trl
15	I-10 WB Ramp(s) & Washington St	**40**	Tacheva Dr & Gene Autry Trl
16	I-10 EB Ramp(s) & Jefferson St	**41**	Chia Rd / Artisan Way & Gene Autry Trl
17	I-10 WB Ramp(s) & Jefferson St	**42**	Gene Autry Wy & Vista Chino
18	I-10 EB Ramp(s) & Monroe St	**43**	Farrell Dr & Vista Chino
19	I-10 WB Ramp(s) & Monroe St	**44**	Cerritos Rd & Vista Chino
20	I-10 EB Ramp(s) & Jackson St	**45**	Sunrise Wy & Vista Chino
21	I-10 WB Ramp(s) & Jackson St	**46**	Avenida Caballeros & Vista Chino
22	I-10 EB Ramp(s) & Golf Center Pkwy	**47**	Indian Canyon Dr & Vista Chino
23	I-10 WB Ramp(s) & Golf Center Pkwy	**48**	Vista Chino & N Palm Canyon Dr
24	SR-86 & Avenue 66 (RIV-195)	**49**	Racquet Club Rd & N Palm Canyon Dr
25	SR-86 & Avenue 62	**50**	San Rafael Rd / Tramway Rd & N Palm Canyon Dr
		51	Gateway Dr & N Palm Canyon Dr

Table 1.45 Caltrans District 8 – Project Corridors

No.	Corridor	Project Corridor Type	Limits
1	I-10	Primary Corridor	East and West through the Coachella Valley
2	SR-86	Primary Corridor	I-10 to south of Coachella Valley
3	SR-62	Primary Corridor	I-10 to the north through Coachella Valley
4	Hwy 111	Primary Corridor	I-10 to Palm Canyon Dr
5	Highway 74	Primary Corridor	Hwy 111 to Palm Desert City Limits
6	N Palm Canyon Dr	Primary Corridor	I-10 to Vista Chino
7	Vista Chino	Primary Corridor	Palm Canyon Dr to Gene Autry Trl
8	Gene Autry Trl	Primary Corridor	Vista Chino to E Palm Canyon Dr

An inventory of existing traffic signal equipment, video detection equipment, ITS elements, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 51 signalized intersections
- ✓ 8 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.10.1. Existing Traffic Signal, Communications & Intelligent Transportation Systems (ITS)

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.



The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).

In addition, an inventory of the existing communication systems was conducted along Caltrans corridors. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

The State has state standard 332 traffic signal controller cabinets.



Type 332

State standard Type 332 cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type 332 cabinets.

- **Traffic Signal Controllers**

The State has type 2070, 2070E and 2070 ATC traffic signal local controllers manufactured by different vendors. The State also has 170E and 2070 Field Master controllers.



Type 2070E



Type 2070 ATC



Type 170E (Master)

Caltrans standard 2070 controller supports Ethernet IP communication. However the 170 controller is now considered a legacy system as it does not support Ethernet IP and cannot support other various advanced ITS functions. Therefore, new controller installations should adhere to State specification 2070 controller standard or ATC controller specification.

- **Loop Detection**

The State has loop vehicle detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.



Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier if applicable.

- **Video Detection System**

The State has video detection at selected signalized locations. The video detection systems within the State are manufactured by Iteris. The State is using model Vantage Edge 2.



Video Detection Camera



Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at a TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification.

- **Emergency Vehicle Pre-Emption System (EVP)**

The State has EVP systems at various signalized locations. The EVP systems within the state-right-of-way are manufactured by 3M, Global Traffic Technologies (GTT) and Tomar.



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The State has battery back-up systems (BSS) at most signalized locations. The BBS within the City are manufactured by Dimensions and Alpha.



Dimensions Battery Backup



Alpha Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The State has a mixture of twisted pair/hardwire signal interconnect cable (SIC) and 900MHz wireless communications. The State also has 3G/4G wireless cellular modems and leased line/dial up connections.



Twisted Pair (SIC)



3G/4G Cellular



Wireless Radio Antenna (900 MHz)



Leased Line/Dial-Up

All local communication via SIC cable or 900MHz radio is legacy analog type, that require modems to communicate. Typically, analog communications are no longer supported for new installations. 3G/4G modems communicate digitally, however provide medium-to-low data rates. Caltrans should consider a full Ethernet IP based local communication system that incorporates new Ethernet IP switching equipment. This includes considering upgrades of existing 900MHz wireless to new 5.8GHz wireless communications or higher, such as 5.9GHz DSRC wireless communications. There are also opportunities to utilize existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable. Leased line/dial-up communications should be considered upgrading to a DSL or Metro-E connection.

- **Communication Hubs**

The State has communication hubs within other parts of the State highway system, but not within the Coachella Valley.

Field communication hubs are beneficial for aggregation of local traffic signal controllers and ITS elements on a private area wide network. They are typically installed at a centralized location in the field as a collection point for the ITS elements, and for creating redundant sites for communication back to central. When considering new Ethernet/IP communications systems, primarily using fiber optic cable, it is best practice to include field communication hubs in the planning and design of the new Ethernet communication network.

- **CCTV Cameras**

The State has a combination of analog and IP based CCTV surveillance camera systems. The CCTV cameras are primary manufactured by Cohu. Within the Coachella Valley, the CCTV camera systems are located within the State highway system along the I-10 freeway. These cameras are fixed, and are typically associated with Traffic Monitoring Systems; "snapshot" images that can be view from Caltrans TMC.



Cohu (Fixed)

New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This includes the type of camera (top mounted or dome) and the preferred type of installation; typically, they are mounted to an existing pole or on a standalone pole. This also includes the selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

- **Changeable Message Signs**

The State uses model 500 CMS sign systems in the Coachella Valley. The signs are furnished and maintained by Caltrans.



CMS Sign

The State is under design for new two (2) full LED model 500 CMS sign systems within the Coachella Valley. The updated full LED CMS sign should provide greater functionality to Caltrans staff and higher visibility to the motoring public traveling along I-10 and SR-86.

- **Traffic Monitoring Stations**

The State uses TMS monitoring stations along the I-10 freeway to provide monitoring and sampling of existing traffic conditions. The TMS stations typically include either a fixed CCTV snapshot camera or Roadway Weather Information Station (RWIS) located on the same pole or standard.



TMS station

Table 1.46 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

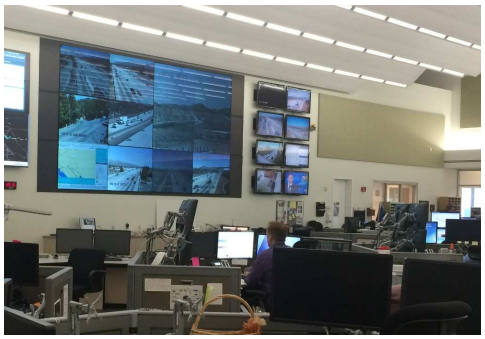
Table 1.46 Existing Traffic Signal, Communication & ITS Inventory - Caltrans District 8

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	I-10 EB Ramp(s) & Indian Canyon Dr	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	N/A	Dimensions	III-CF	Cell Modem Not In Use
2	I-10 WB Ramp(s) & Indian Canyon Dr	332	Econolite	2070 ATC	Loops	2 Ch	Twisted Pair	N/A	N/A	Dimensions	III-CF	Twisted Pair Not In Use
3	I-10 EB Ramp(s) & Palm Dr	332	McCain	2070	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	N/A	Dimensions	III-CF	
4	I-10 WB Ramp(s) & Palm Dr	332	Econolite	2070 ATC	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	N/A	Dimensions	III-CF	Master Location
5	I-10 EB Ramp(s) & Date Palm Dr	332	Intelight	2070e	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	N/A	Alpha	III-CF	
6	I-10 WB Ramp(s) & Date Palm Dr	332	Intelight	2070e	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	N/A	Alpha	III-CF	
7	I-10 EB Ramp(s) & Bob Hope Dr	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	Master Location. Cell Loc
8	I-10 WB Ramp(s) & Bob Hope Dr	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	
9	I-10 EB Ramp(s) & Ramon Rd	332	Econolite	2070	Loops	2 Ch	Twisted Pair	N/A	Strobecom II	Locked	III-CF	
10	I-10 EB Ramp(s) & Monterey Ave	332	Econolite	2070 ATC	Loops	2 Ch	Twisted Pair	N/A	562	Alpha	III-CF	
11	I-10 WB Ramp(s) & Monterey Ave	332	Econolite	2070 ATC	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	464	Locked	III-CF	Master Location.
12	I-10 EB Ramp(s) & Cook St	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	562	Locked	III-CF	Master Location.
13	I-10 WB Ramp(s) & Cook St	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	752	Locked	III-CF	
14	I-10 EB Ramp(s) & Washington St	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	752	Locked	III-CF	Master Loc. Phone Drop.
15	I-10 WB Ramp(s) & Washington St	332	Safetran	2070 ATC	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	464	Alpha	III-CF	
16	I-10 EB Ramp(s) & Jefferson St											Under Construction
17	I-10 WB Ramp(s) & Jefferson St											Under Construction
18	I-10 EB Ramp(s) & Monroe St	332L	McCain	2070	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	752	Alpha	III-CF	
19	I-10 WB Ramp(s) & Monroe St	332L	McCain	2070	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	752	Alpha	III-CF	Master Location
20	I-10 EB Ramp(s) & Jackson St	332	Econolite	2070 ATC	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	
21	I-10 WB Ramp(s) & Jackson St	332	McCain	2070	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	752	Locked	III-CF	Master Location.
22	I-10 EB Ramp(s) & Golf Center Pkwy	332	Econolite	2070	Loops & Video	Vantage Edge 2	Wireless	N/A	N/A	Dimensions	III-CF	
23	I-10 WB Ramp(s) & Golf Center Pkwy	332	Econolite	2070	Loops & Video	Vantage Edge 2	Wireless	N/A	N/A	Alpha	III-CF	Master Location
24	SR-86 & Avenue 66 (RIV-195)	332	Econolite	2070 ATC	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	N/A	Locked	III-CF	Twisted Pair Not In Use
25	SR-86 & Avenue 62	332	McCain	2070	Loops	2 CH	N/A	N/A	N/A	Locked	III-CF/ BF	Stand Alone

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
26	SR-86 NB Ramp(s) & Airport Blvd	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	N/A	Dimensions	III-CF	
27	SR-86 SB Ramp(s) & Airport Blvd	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	N/A	Dimensions	III-CF	
28	SR-86 Ramp(s) & Avenue 52	332	McCain	2070	Loops	2 Ch	N/A	N/A	N/A	Locked	III-CF	Stand Alone
29	SR-86 Ramp(s) & Avenue 50	332	McCain	2070	Loops	2 Ch	N/A	N/A	N/A	Locked	III-CF	Stand Alone
30	SR-86 NB Ramp(s) & Dillon Rd	332	Econolite	2070 ATC	Loops	2 Ch	Twisted Pair	N/A	N/A	Dimensions	III-CF	Master Location
31	SR-86 SB Ramp(s) & Dillon Rd	332	Econolite	2070	Loops	2 Ch	Twisted Pair	N/A	N/A	Dimensions	III-CF	
32	Golf Club Dr & E Palm Canyon Dr	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	N/A	Locked	III-CF	Master Location. D-Mark
33	Gene Autry Trl & E Palm Canyon Dr	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	M262	Alpha	III-CF	D-Mark Box
34	Mesquite Rd & Gene Autry Trl	332	McCain	2070	Loops	2 Ch	N/A	N/A	752	Locked	III-CF	Stand Alone
35	Ramon Rd & Gene Autry Trl	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	752	Locked	III-CF	Phone Drop
36	Mission Dr & Gene Autry Trl	332	Econolite	2070 ATC	Loops	2 Ch	Twisted Pair	N/A	752	Dimensions	III-CF	
37	PSUSD (District) Center Dr & Gene Autry Trl	332L	McCain	2070 ATC	Loops	2 Ch	Twisted Pair	N/A	752	Alpha	III-CF	Master Location. GPS
38	Skywest Dr / Escena Way & Gene Autry Trl	332	Econolite	2070 ATC	Loops & Video	Vantage Edge 2	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	
39	Tamarisk Rd & Gene Autry Trl	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	754	Dimensions	III-BF	
40	Tacheva Dr & Gene Autry Trl	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	2080	Locked	III-CF	
41	Chia Rd / Artisan Way & Gene Autry Trl	332	McCain	2070 ATC	Loops	2 Ch	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	
42	Gene Autry Wy & Vista Chino	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	Strobecom II	Locked	III-BF	Master Not In Use
43	Farrell Dr & Vista Chino	332	McCain	2070	Loops & Video	Vantage Edge 2	Wireless	N/A	Strobecom II	Locked	III-BF	
44	Cerritos Rd & Vista Chino	332	McCain	2070	Loops	2 Ch	Wireless	N/A	Strobecom II	Alpha	III-CF	Master Location
45	Sunrise Wy & Vista Chino	332	McCain	2070	Loops & Video	Vantage Edge 2	Wireless	N/A	562	Dimensions	III-BF	
46	Avenida Caballeros & Vista Chino	332	McCain	2070	Loops	2 Ch	N/A	N/A	N/A	Locked	III-BF	Stand Alone
47	Indian Canyon Dr & Vista Chino	332	McCain	2070	Video	Vantage Edge 2	Wireless	N/A	Strobecom II	Locked	III-BF	
48	Vista Chino & N Palm Canyon Dr	332	Econolite	2070 ATC	Loops	2 Ch	Wireless	N/A	N/A	Dimensions	Type I	Master Location
49	Racquet Club Rd & N Palm Canyon Dr	332	Econolite	2070 ATC	Loops	2 Ch	N/A	N/A	N/A	Locked	III-CF	Stand Alone
50	San Rafael Rd / Tramway Rd & N Palm Canyon Dr	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	N/A	Locked	III-CF	
51	Gateway Dr & N Palm Canyon Dr	332	McCain	2070	Loops	2 Ch	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	

1-2.10.2. Traffic Management Center (TMC)

The Caltrans District 8 Traffic Management Center (TMC) is located in the City of Fontana off the I-15 freeway. The TMC center manages over 7,000 lane miles of state highways and freeways throughout Riverside and San Bernardino counties and monitors road conditions 24 hours a day. Caltrans and emergency responders utilizes their Advanced Traffic Management System (ATMS) for monitoring and control of their traffic monitoring stations, ramp metering systems, and closed circuit television (CCTV) camera systems.



Caltrans also utilizes TransCore's "TransSuite" central system, for command and control of all traffic signal operations. This is Caltrans latest central system and they are currently migrating from their existing TMS that was developed in-house called CTNET. TransSuite communicates to the on-street master controllers via leased line/dial-up and 3G/4G cellular wireless communication that supplies traffic signal timing/Time-of-Day (TOD) operation and provides real-time display through the system's Graphic User Interface (GUI). The existing conditions are as follows (**Table 1.47**).

Table 1.47 Existing Traffic Management System Equipment

Traffic Management System	TransCore TransSuite
Traffic Server	Has dedicated traffic servers
Workstation PC	Has workstation PC's for remote command and control
Communications Equipment	Has Analog/Digital networking communications equipment
Hardwire Communications	Has Fiber Optic, Leased-line/dial-up connection
Wireless Communications	Has 3G/4G cellular wireless communications
Video Management System	Has centralized VMS system

1-2.10.3. Future Projects

Caltrans future projects related to traffic signal, communications, and ITS elements include:

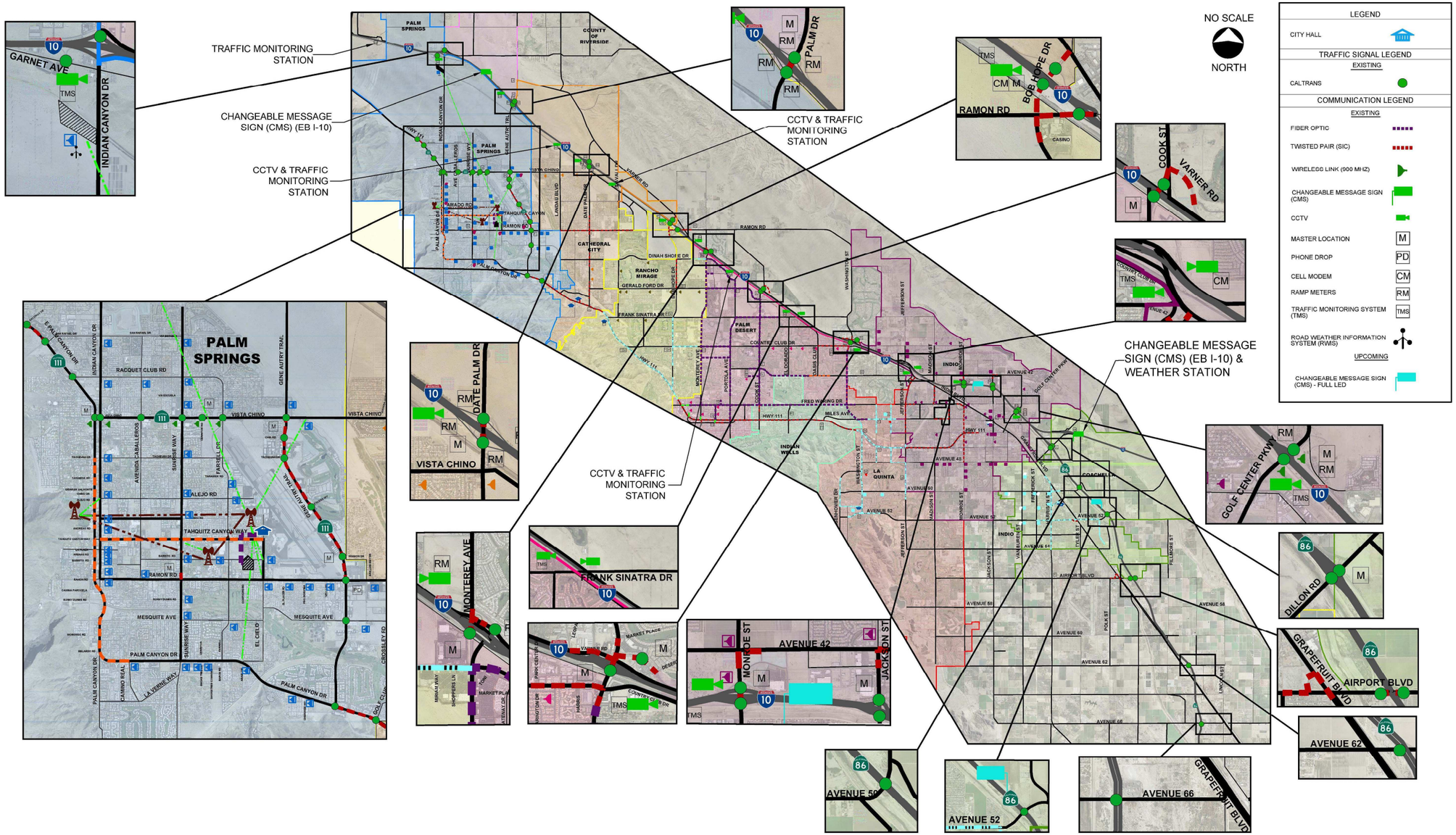
- The installation of two Changeable Message Signs (CMS). One CMS on I-10 facing eastbound traffic between Monroe Street and Jackson Street, and the other CMS on SR-86 facing northbound traffic between Avenue 52 and Avenue 50.
- Portola Avenue at I-10 interchange is a future interchange project that will most likely include traffic signals, communications, and other ITS elements.
- Currently the Jefferson Street at I-10 interchange project is under construction.

Figure 1.26 illustrates the **existing traffic signal locations, communications, and future CMS/ITS elements**.

These future projects are currently under design and/or will be constructed in the near term. Therefore, it will be considered as our base conditions if further upgrades are considered under this project.

Existing System Inventory and Evaluation

Figure 1.26 Caltrans Future Conditions



1-2.10.4. Conclusion

Based on our inventory and evaluation of the Caltrans existing and future traffic signal system, ITS elements, communication system, changeable message signs (CMS), and traffic monitoring stations within the Coachella Valley, Caltrans has existing equipment that do and do not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

Caltrans future projects include ITS improvements such as: new full LED CMS signs, new traffic signals and communications for each interchange project (Jefferson Street at I-10 interchange, and Portola Avenue at I-10).

If Caltrans considers future ITS or traffic signal related improvements; they should consider new closed circuit television (CCTV) camera systems, hybrid video/radar detection, arterial management system technologies, etc. including communications with adjacent local agency or County owned signals. This will require coordination and equipment upgrades between both agencies, as well as coordination with traffic signal controller manufacturers to ensure communications are viable and can be implemented in the field.

In regards to the communications, all local communication operates via SIC cable or 900MHz radio is legacy analog type that requires modems to communicate. Typically, analog communications are no longer supported for new installations. 3G/4G modems communicate digitally, however provide medium-to-low data rates. Dependent upon the new ITS equipment deployed in the field, Caltrans should consider a full Ethernet/IP-based local communication system that incorporates new Ethernet IP switching equipment. This includes considering new wireless Ethernet IP based communications. There are also opportunities to utilize the existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-2.11. County of Riverside



The County of Riverside Department of Transportation (County) provides jurisdiction of traffic signal operations in unincorporated areas and communities of the County. Within the Coachella Valley, these areas are border the local agencies. Major routes within the County's jurisdiction include Bob Hope Drive, Ramon Road, Varner Road, Washington Street and Avenue 42. Traffic signals within these unincorporated areas and communities are owned, operated and maintained by the County or shared with a local agency or Caltrans.

The existing traffic signal system within County jurisdiction consists of the following:

- 28 traffic signals with two (2) on-street master controllers.
- Local communications occur over twisted-pair/copper interconnect cable (SIC).
- There is currently no communication established at the County of Riverside offices for remote command and control.
- All traffic signal timing/Time-of-Day (TOD) parameters are handled via the on-street master controllers for all local controllers tied to the on-street master system, or locally at each stand-alone intersection.
- Eleven (11) existing traffic signals are "stand-alone" and have no communication hardware.

Most of the County's signalized intersections operate in "stand-alone" mode with no communication to a master location or central control system. However, some signalized intersections are tied within either a Caltrans or City agency grouping to obtain TOD updates from an on-street master location.

Figure 1.27 illustrates the **project traffic signal locations, communications, and ITS components**.

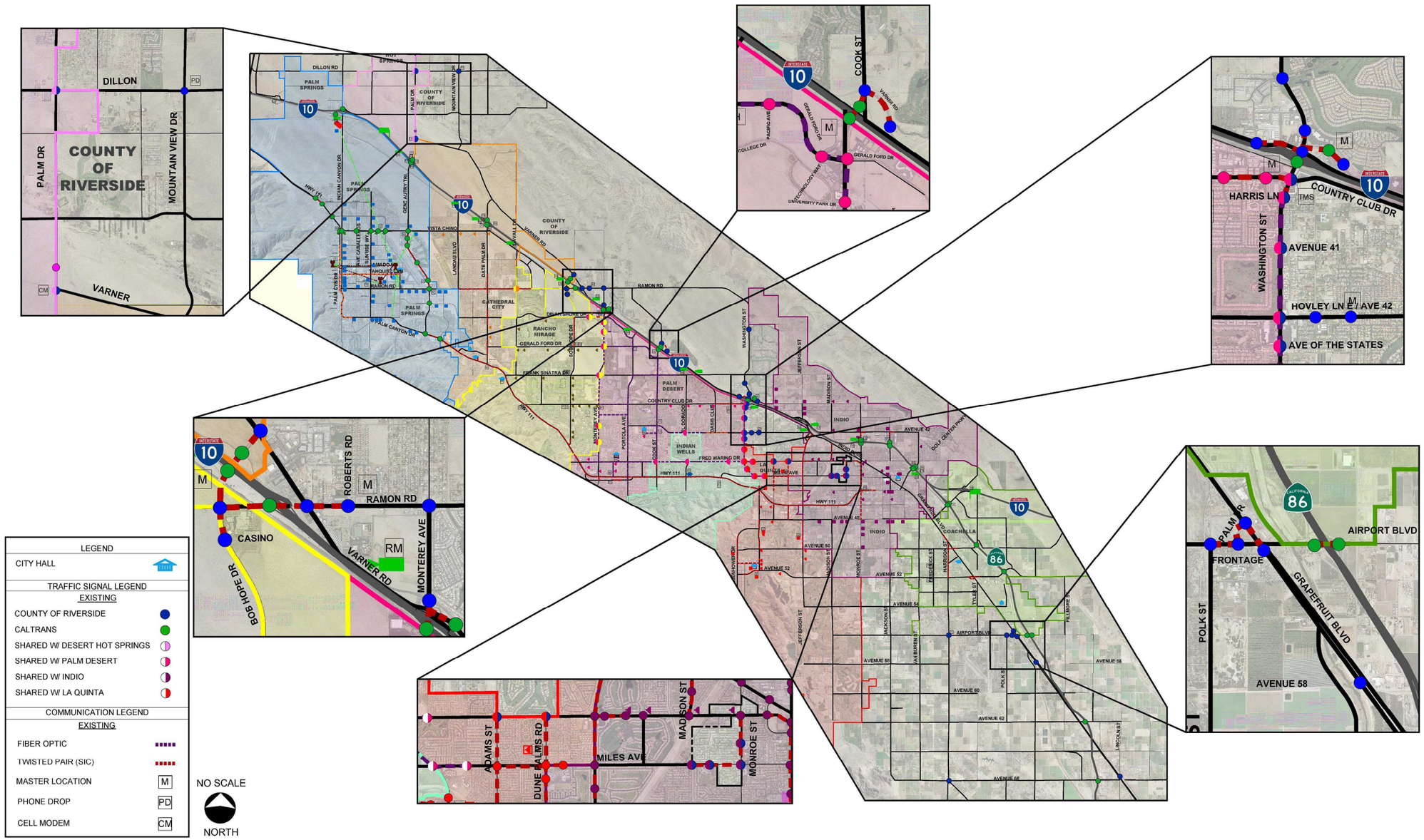
Figure 1.28 illustrates the **existing system architecture** configuration.

Table 1.48 summarizes the **number of project traffic signals** within County jurisdiction for the Regional TSI Project.

Table 1.49 summarizes the **number of project corridors** within County jurisdiction for the Regional TSI Project.

Existing System Inventory and Evaluation

Figure 1.27 County of Riverside Existing Conditions



ADVANTEC Consulting Engineers

CVAG

COUNTY OF RIVERSIDE

EXISTING CONDITIONS

Existing System Inventory and Evaluation

Figure 1.28 County of Riverside Existing System Architecture

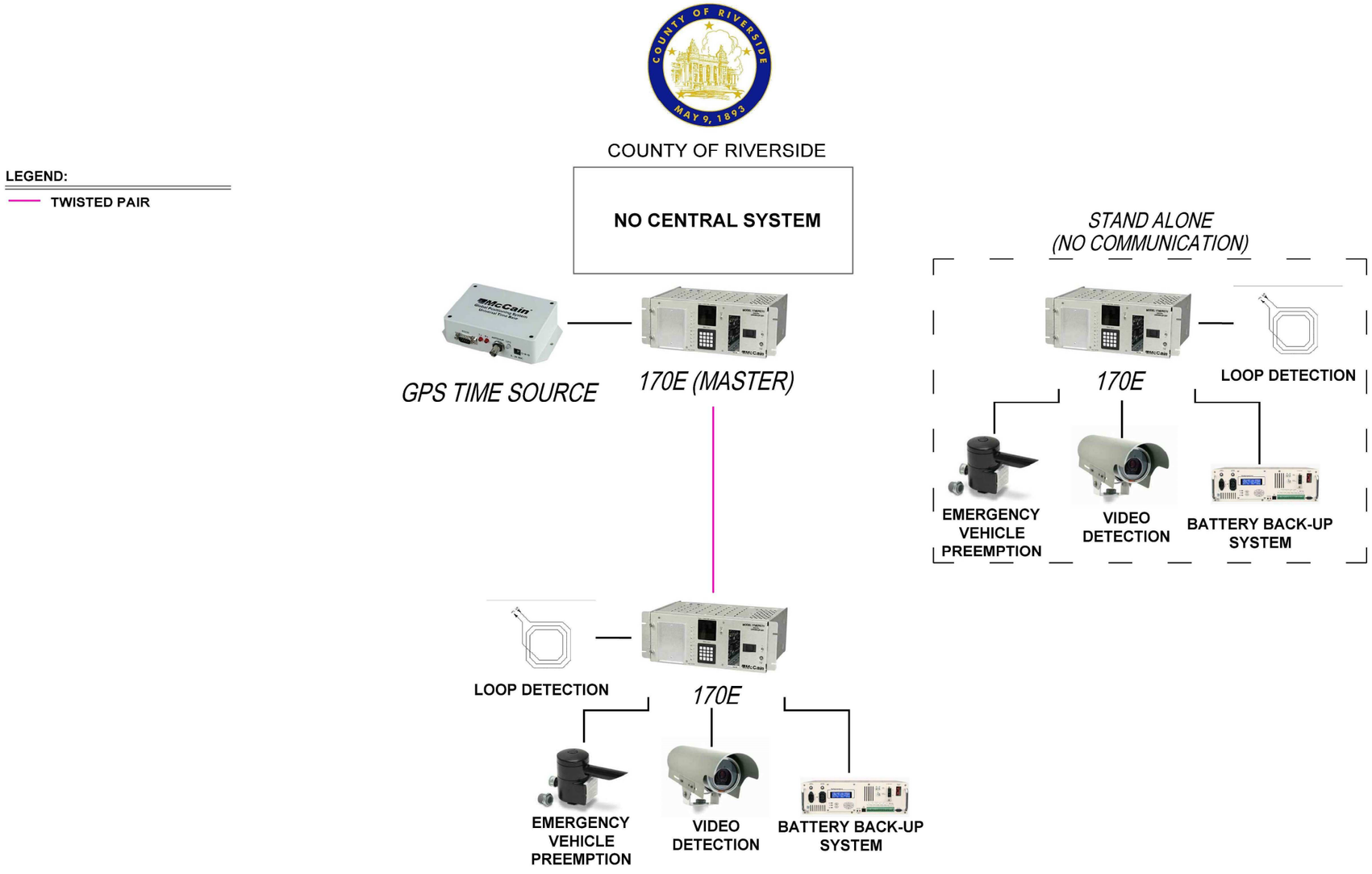


Table 1.48 County of Riverside – Project Traffic Signals

No.	Intersection	No.	Intersection
Existing Traffic Signal Locations			
1	Lima Hall Rd & Avenue 42	**15**	Ramon Rd & Bob Hope Dr
2	Yucca Ln & Avenue 42	**16**	Ramon Rd & Monterey Ave
3	Palm Dr & Airport Blvd	**17**	Ramon Rd & Roberts Rd
4	Polk St & Airport Blvd	**18**	Ramon Rd & Varner Rd
5	Bob Hope Dr & Casino Ent	**19**	Varner Rd & Bob Hope Dr
6	Mountain View Rd & Dillon Rd	**20**	Varner Rd & Classic Club Blvd
7	Grapefruit Blvd & 4th St	**21**	Varner Rd & Cook St
8	Grapefruit Blvd & Avenue 58	**22**	Varner Rd & Desert Cities Dr
9	Grapefruit Blvd & Frontage Rd	**23**	Varner Rd & Leopard St
10	Grapefruit Blvd & Palm Dr	**24**	Varner Rd & Monterey Ave
11	Harrison St & Avenue 66	**25**	Varner Rd & Washington St
12	Harrison St & Avenue 74	**26**	Washington St & Del Webb - North
13	Harrison St & Airport Blvd	**27**	Washington St & Del Webb - South (Las Montanas)
14	Palm St & Varner Rd	**28**	Washington St & Market Pl

Table 1.49 County of Riverside – Project Corridors

No.	Corridor	Project Corridor Type	Limits
1	SR-111/Highway 111	Primary Corridor	I-10 to the south of Coachella Valley
2	Indian Canyon Dr/ Indian Ave	Primary Corridor	Sunrise Pkwy to SR-62
3	Worsley Rd	Primary Corridor	20th Ave to Mission Creek Rd
4	Mission Creek Rd	Primary Corridor	SR-62 to Worsley Rd
5	Pierson Blvd	Primary Corridor	SR-62 to Little Morongo Rd
6	Dillon Rd	Primary Corridor	SR-62 to Avenue 44
7	Palm Dr	Primary Corridor	I-10 to Dillon Rd, Camino Aventura to Two Bunch Palm Trl
8	Varner Rd	Primary Corridor	Palm Dr to Adams St
9	Little Morongo Rd	Primary Corridor	20th Ave to August Ave
10	Mountain View Rd	Primary Corridor	Varner Rd to Brunner Ln
11	Long Canyon Rd	Primary Corridor	20th Ave to Hacienda Ave

No.	Corridor	Project Corridor Type	Limits
12	20th Ave	Primary Corridor	Indian Canyon Dr to Bennet Rd
13	Bennet Rd	Primary Corridor	20th Ave to Hacienda Ave
14	Cook St	Primary Corridor	I-10 to Mesquite Tree Dr
15	Washington St	Primary Corridor	I-10 to Ramon Rd
16	Avenue 52	Primary Corridor	Monroe St to Van Buren St
17	Ramon Rd	Primary Corridor	I-10 to Washington St

An inventory of existing traffic signal equipment, video detection equipment, and communication equipment was conducted by ADVANTEC including, but not limited to, the following:

- ✓ Completed field review and equipment inventory
- ✓ 28 signalized intersections
- ✓ 17 project corridors
- ✓ Communication system
- ✓ Traffic management system/work station and equipment inventory
- ✓ Research of current/future projects that are under design and/or funded

1-2.11.1. Existing Traffic Signal, Communication & Intelligent Transportation System (ITS) and Evaluation

In order to ensure accuracy and completeness during the field review process, the ADVANTEC Team used standardized field forms to account for each piece of intersection data required for the inventory and evaluation of the existing traffic signal system, communication systems, and associated equipment. Sample field forms are contained in **Appendix B**.

The field review of existing conditions for each signalized intersection consisted of documenting each location and type of existing traffic signal controller/cabinet, signal communication equipment, vehicle detection equipment, emergency vehicle pre-emption (EVP) system, signal mast-arm pole locations, battery back-up system, traffic signal phasing, and CCTV cameras (if available).



In addition, an inventory of the existing communication systems was conducted. This included a thorough investigation and evaluation of the communication equipment at each signalized intersection as well as other facilities where future connections may be anticipated. The following is a general overview of the inventory performed for the existing traffic signal and communication systems and facilities:

- **Traffic Signal Controller Cabinets**

  The County has state standard 332 and 333JP traffic signal controller cabinets.



Type 332



Type 333JP

Both Type 332 and Jumbo Type 333 cabinets generally have enough cabinet space to house traffic signal components and additional equipment, such as BBS units and other ITS elements. A side-mount cabinet for BBS battery storage is suggested for all Type 332 cabinets.

- **Traffic Signal Controllers**

The County has type 170E traffic signal local controllers manufactured by different vendors. The County also has 170E Field Master controllers.



Type 170E

The existing County's standard 170E controller was considered a cost effective solution to standardized intersection control. However the 170 controller is now considered a legacy system as it does not support Ethernet IP and cannot support other various advanced ITS functions. Therefore, a new ATC controller standard should be established for future improvements, such as ATC controller.

- **Loop Detection**

The County has loop vehicle detection at signalized locations. Typical detector loop installation consists of 6-foot diameter loop saw cut into pavement with conductors.



Loop Detectors

For future improvements, new stop bar loop detection should include a 'Type D' loop detector and subsequent Bike Detection capable detector amplifier if applicable.

- **Video Detection System**

The County has video detection at selected signalized locations. The video detection systems within the County are manufactured by Iteris. The County is using model Vantage Edge 2.



Video Detection Camera



Iteris Vantage Edge 2 Processor

The Vantage Edge 2 system can be configured for remote monitoring and set-up by use of an additional Edge Connect module for display of video images at a future TMC. Additionally, lane-by-lane detection should be configured for better system detection and to be ready for potential future Adaptive Traffic Control Systems (ATCS) and to provide performance measurements. Existing Video detections systems can be updated by either adding additional components, or outdated systems should be replaced entirely to newer hybrid video/radar specification.

- **Emergency Vehicle Pre-Emption System (EVP)**

The County has EVP systems at various signalized locations. The EVP systems within the County are manufactured by 3M and Global Traffic Technologies (GTT), and Tomar.



Optical Detector

Updated EVP system utilizes GPS sensors and/or Wi-Fi technology for advanced detection and/or integration of TSP systems. The updated EVP systems should be considered with new or modified signalized intersections.

- **Battery Back-Up System**

The County has battery back-up systems (BSS) at most signalized locations. The BBS within the County are manufactured by Dimensions, Alpha and Myers.



Dimensions Battery Backup



Alpha Battery Backup



Myers Battery Backup

Most BBS units today have available set-up and configuration for remote alarms and reporting to central. This can generally be configured though Ethernet IP or by serial control. Connectivity to BBS should be considered with new or modified signalized intersections.

- **Communication System**

The County uses twisted pair/hardwire signal interconnect cable (SIC) hardwire communications. The County also uses GPS stand-alone time source equipment.



Twisted Pair (SIC)



GPS Time Source

All local communication via SIC cable is legacy analog type, that require modems to communicate. Typically, analog communications are no longer supported for new installations. Therefore, based on the ITS improvements the county deploys, a new Ethernet IP based communication system should be reviewed, that incorporates new Ethernet IP switching equipment. This includes considering upgrades to new 5.8GHz wireless communications or higher, such as 5.9GHz DSRC wireless communications. There are also opportunities to utilize the existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable.

- **Communication Hubs**

The County does not have communication hubs.

Field communication hubs are beneficial for aggregation of local traffic signal controllers and ITS elements on a private area wide network. They are typically installed at a centralized location in the field as a collection point for the ITS elements, and for creating redundant sites for communication back to central. When considering new Ethernet/IP communications systems, primarily using fiber optic cable, it is best practice to include field communication hubs in the planning and design of the new Ethernet communication network.

- **CCTV Cameras**

The County does not have CCTV camera systems.

New HD IP CCTV cameras are recommended for remote viewing and monitoring of local intersection conditions in real-time at major intersections, crossing arterials, or strategic viewing locations. When considering the installation of new CCTV cameras systems, it is important to understand that there are various types of CCTV camera manufacturers to choose from. This includes the type of camera (top mounted or dome) and the preferred type of installation; typically, they are mounted to an existing pole or on a standalone pole. This also includes the

selection and installation of a video management system (VMS) hardware/software at the local TMC for remote viewing, monitoring, and control of the system. All of these elements should be considered when planning and designing new CCTV camera systems.

Table 1.50 provides a detailed summary of the inventory at the existing traffic signal and communication systems and facilities including traffic signal locations, traffic signal controller cabinet types, traffic signal controller units, vehicle detection system (loop/video detection), communication system (twisted pair/hardwired, fiber optic, wireless), CCTV systems, battery back-up systems and service enclosure type per intersection. For a complete list of existing traffic signal inventory see **Appendix A**.

Table 1.50 Existing Traffic Signal, Communication & ITS Inventory - County of Riverside

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
1	Lima Hall Rd & Avenue 42	332	McCain	170E Quad	Video & Loops	Vantage Edge 2	N/A	N/A	Strobecom II	Dimensions	III-CF	Stand Alone, GPS
2	Yucca Ln & Avenue 42	332	McCain	170E Quad	Loops	2 CH	N/A	N/A	752	Dimensions	III-CF	Stand Alone, GPS
3	Palm Dr & Airport Blvd	332	McCain	170E Quad	Video & Loops	Vantage Edge 2	Twisted Pair	N/A	464	Dimensions	III-CF	
4	Polk St & Airport Blvd	332	McCain	170E Quad	Video & Loops	Vantage Edge 2	Twisted Pair	N/A	464	Dimensions	III-CF	GPS
5	Bob Hope Dr & Casino Ent	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
6	Mountain View Rd & Dillon Rd	333 JP	McCain	170E Quad	Loops	2 CH	N/A	N/A	752 & m262	Dimensions	III-CF	Phone Drop in Cabinet
7	Grapefruit Blvd & 4th St	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	N/A	Myers	III-BF	
8	Grapefruit Blvd & Avenue 58	332	McCain	170E Quad	Loops	2 CH	N/A	N/A	N/A	Dimensions	III-CF	Stand Alone
9	Grapefruit Blvd & Frontage Rd	332	McCain	170E Quad	Video & Loops	Vantage Edge 2	Twisted Pair	N/A	Strobecom II	Dimensions	III-CF	Stand Alone, GPS
10	Grapefruit Blvd & Palm Dr	332	McCain	170E Quad	Video & Loops	Vantage Edge 2	Twisted Pair	N/A	462	Dimensions	III-CF	GPS
11	Harrison St & Avenue 66	332	McCain	170E Quad	Video & Loops	Vantage Edge 2	N/A	N/A	462	Dimensions	III-CF	Stand Alone, GPS
12	Harrison St & Avenue 74	332	McCain	170E Quad	Loops	2 CH	N/A	N/A	452	Dimensions	III-CF	Stand Alone
13	Harrison St & Airport Blvd	332	McCain	170E Quad	Loops	2 CH	N/A	N/A	m262	Dimensions	III-CF	Stand Alone , Phone Drop
14	Palm St & Varner Rd	332	Safetran	170E Quad	Video & Loops	Vantage Edge 2	N/A	N/A	452	Dimensions	III-CF	Cell Modem
15	Ramon Rd & Bob Hope Dr	332	McCain	170E Quad	Video	Vantage Edge 2	Twisted Pair	N/A	752	Dimensions	III-CF	GPS
16	Ramon Rd & Monterey Ave	332	McCain	170E Quad	Video & Loops	Vantage Edge 2	N/A	N/A	StrobeCom II	Dimensions	III-CF	Stand Alone, GPS
17	Ramon Rd & Roberts Rd	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	StrobeCom II	Myers	III-CF	
18	Ramon Rd & Varner Rd	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	N/A	Dimensions	III-CF	
19	Varner Rd & Bob Hope Dr	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	StrobeCom II	Dimensions	III-CF	
20	Varner Rd & Classic Club Blvd	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	752	Dimensions	III-CF	
21	Varner Rd & Cook St	332	Signal Control Co	170 Dual	Loops	2 CH	Twisted Pair	N/A	562	Alpha	III-BF	
22	Varner Rd & Desert Cities Dr	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	7854	Dimensions	III-CF	
23	Varner Rd & Leopard St	332	IDC	170E	Loops	2 CH	N/A	N/A	752	Dimensions	III-CF	Stand Alone
24	Varner Rd & Monterey Ave	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	562	Alpha	III-CF	
25	Varner Rd & Washington St	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	752 & 462	Alpha	III-CF	

No.	Intersection	Controller Cabinet Type	Controller Unit		Detection System		Communication System	CCTV System	EVP System	Battery Back-Up System	Service Enclosure Type	Comments
			Manufacture	Model / Type	Loops or Video	Manufacture / Model	Type					
26	Washington St & Del Webb - North	332	IDC	170E	Loops	2 CH	N/A	N/A	752	Alpha	III-CF	Stand Alone
27	Washington St & Del Webb - South (Las Montanas)	332	McCain	170E Quad	Loops	2 CH	N/A	N/A	752	Alpha	III-CF	Stand Alone
28	Washington St & Market Pl	332	McCain	170E Quad	Loops	2 CH	Twisted Pair	N/A	562	Dimensions	III-CF	

1-2.11.2. Traffic Management Center (TMC)

The County of Riverside does not have a Traffic Management Center (TMC) for remote command and control of traffic signal operations. However, the County does have an approved set of plans for a new County office building that includes a dedicated room for TMC center operations. The new building installation and subsequent TMC room will depend on future funding. The existing conditions are as follows (**Table 1.51**):

Table 1.51 Existing Traffic Management System Equipment

Traffic Management System	No centralized TMS system
Traffic Server	No dedicated traffic server
Workstation PC	No workstation PC for remote command and control
Communications Equipment	No communications equipment
Hardwire Communications	No hardwire communications equipment
Wireless Communications	No wireless communications equipment
Video Management System	No centralized VMS system

1-2.11.3. Future Projects

The County does have an approved set of plans for a new County office building that includes a dedicated room for TMC center operations. The new building installation and subsequent TMC room will depend on future funding. Otherwise, the County has no ITS or traffic signal related improvements planned in the near future within the Coachella Valley.

1-2.11.4. Conclusion

Based on our inventory and evaluation of the County's existing traffic signal system, ITS elements, communication system, the existing equipment does not have the ability to be upgraded to provide Ethernet/IP communications. This equipment has been identified by the ADVANTEC Team, including a general evaluation of the existing system/equipment capabilities, deficiencies, and opportunities.

If the County considers future ITS or traffic signal related improvements; they should consider upgrading their Type 170 controllers to Type 2070 ATC. Other ITS improvements should also be considered such as closed circuit television (CCTV) camera systems, hybrid video/radar detection, arterial management system technologies, etc. including communications with adjacent local agency and/or Caltrans owned signals. This will require coordination and equipment upgrades between both parties, as well as

coordination with traffic signal controller manufacturers to ensure communications are viable and can be implemented in the field.

In regards to the communications, all local communication via SIC cable is a legacy analog type, that require modems to communicate. Typically, analog communications are no longer supported for new installations. Therefore a new Ethernet IP based communication system should be reviewed, that incorporates new Ethernet IP switching equipment. This includes considering upgrades to fiber optic cable or new 5.8GHz wireless communications or higher, such as 5.9GHz DSRC wireless communications. There are also opportunities to utilize the existing hardwired/twisted-pair SIC for Ethernet/IP communications and/or replace the existing SIC with fiber optic cable.

If the County obtains funding for their planned TMC, they should explore opportunities to provide communications for command and control of their traffic signals and ITS elements within the Coachella Valley. This may include connecting County owned and operated signals to a local agency's TMC.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the ITS Mater Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections.

1-3. EXISTING REGIONAL TRAFFIC MANAGEMENT SYSTEM EVALUATION

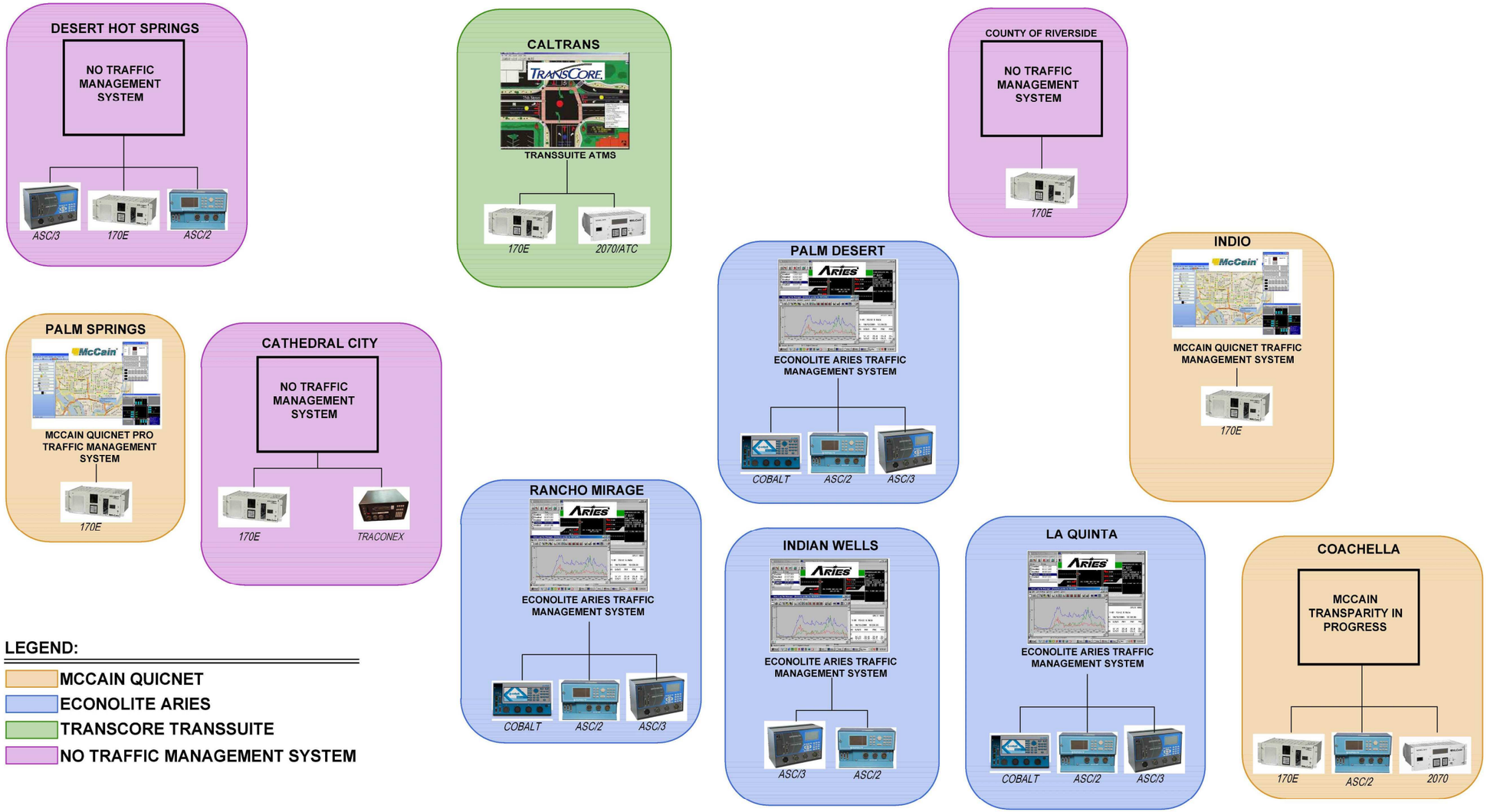
The types of existing Traffic Management Systems (TMS), traffic signal controllers, communications, and Intelligent Transportation System (ITS) technologies within the Coachella Valley vary from agency to agency. Based the existing system inventory and evaluation in Section 2, we have an understanding about each agency's system at a local level; and the next step is to understand how these systems function at the regional level.

This will be considered our baseline conditions, and it will help determine what type of coordination and improvements are necessary to provide better communications and coordination between the local agencies, and potentially share data and video across jurisdictional boundaries. Therefore, this section describes how and why each agency operates their TMS independently; it provides opportunities to share information from traffic operations center to traffic operations center – this is commonly known as center to center (C2C) communications; and provides opportunities for connectively at a regional level. Further details will be provided regarding the development of a regional network and Traffic Management Center (TMC) in subsequent sections of this report.

Figure 1.29 illustrates the **Coachella Valley's Existing Regional Traffic Management System** per agency.

Existing System Inventory and Evaluation

Figure 1.29 Coachella Valley Regional Traffic Management System Configuration



As shown in **Figure 1.29**, the existing traffic management systems (TMS) within the Coachella Valley consists of: Econolite's ARIES TMS, McCain's QuicNet TMS, TransCore TransSuite TMS, and there are local agencies and the County without a centralized TMS. Generally, these systems are independently owned, operated and maintained by each agency, without communications or connectivity to share information to an adjacent agency or across jurisdictional boundaries. Aside from the institutional factors, there are physical and technological limitations and capabilities of these existing TMS that need to be understood including:

- Legacy type TMS and communication systems are considered outdated and have limited to no capabilities to communicate with other systems
- Propriety TMS and traffic signal controller protocol (Legacy Econolite and McCain Systems)
- Agencies that do not have central traffic control systems
- No physical or wireless connections
- Geographic location where each central system is housed

Newer Advanced Traffic Management Systems (ATMS) such as Econolite Centracs and McCain Transparity ATMS have the capabilities to provide newer technologies such as; peer to peer communications, high resolution data, ATCS functionality, C2C communications and Connected Vehicle integration. TransCore's TransSuite ATMS is a system that is controller agonistic (it can communicate with controllers from various manufactures), but it is limited when considering C2C communications with other manufacturers such as Econolite and McCain. Once a new ATMS is considered then other upgrades should follow such as: new Advanced Transportation Controllers (ATC), upgrading communications networks to be Ethernet/IP-based – the combination of these improvements allows the ease integrating these systems and helps provide integration of other ITS sub-systems such as video management systems or arterial management systems.

In developing a regional network, and having the capability share data and video across jurisdictional boundaries, it is important to understand what technologies are available, how they work together, and which can be used in our toolbox when considering upgrades. Therefore, our initial upgrades should start with the central ATMS, ATC specification traffic signal controllers, Ethernet/IP-based communications network, and closing communication gaps. In addition, other ITS improvements should also be considered such as closed circuit television (CCTV) camera systems, hybrid video/radar detection, arterial management system technologies, etc. to facilitate the operations of the signalized intersections and corridors; and to provide performance measurement tools to pro-actively manage the transportation system in the Coachella Valley.

It should be noted that the information obtained in this section will be used as a basis to recommend communication technologies and recommend equipment installation and/or upgrades to meet the goals and objectives for the CVAG's Regional Traffic Signal Interconnect (TSI) Master Plan and the Regional Traffic Signal Synchronization Project. A more comprehensive total signal system evaluation is carried over into Chapter 2 of the Regional TSI Master Plan, *Evaluation of Surrounding Systems*. In addition, a higher level overview and more broad understanding of current ITS systems on the market will be developed in Chapter 3 of the Regional Traffic Signal Interconnect (TSI) Master Plan, *Assessment of Advanced Transportation System (ITS) Opportunities*. The recommended communication technologies and recommended equipment installation/upgrades will be provided in subsequent sections. Further

details will be provided regarding the development of a regional network and Traffic Management Center (TMC) in subsequent chapters of this report.

Appendix A:

Existing Traffic Signal System Equipment Matrix

Appendix A1.1:

Existing Traffic Signal System Equipment Matrix

City of Cathedral City

Regional Traffic Signal Synchronization Program
City of Cathedral City
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (Slic)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
1	Date Palm Dr & Perez Rd	333 JP	12" Raised	SWC	McCain	170 ATC Coldfire		CMU	210E	Loops	EDI	2 CH	(6) 222					(2) 12 Pr								Dimensions	Inside Cabinet	4	Opticom	m262	2	SWC	III-BF	
2	Date Palm Dr & Gerald Ford Dr	333	18" Raised	NWC	McCain	170 ATC Coldfire		CMU	210E	Loops	EDI	2 CH	(7) 222					(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	m262	2	NWC	III-CF	
3	Date Palm Dr & Converse Rd	333L	18" Raised	SEC	McCain	170 ATC Coldfire		CMU	210E	Loops	EDI	2 CH	(6) 222					(1) 12 Pr			Encom 5100					Dimensions	Inside Cabinet	4	Opticom	m262	1	SEC	III-CF	
4	Date Palm Dr & Victoria Dr	333L	18" Raised	NWC	McCain	170 ATC Coldfire		CMU	210E	Loops	EDI	2 CH	(6) 222					(1) 12 Pr			Encom 5100					Dimensions	Inside Cabinet	4	Opticom	m262	1	NWC	III-CF	
5	Date Palm Dr & Market Place	333L	18" Raised	SWC	McCain	170 ATC Coldfire		CMU	210E	Video	Iteris	Vantage Edge 2	4	LCD Monitor				(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	m262	1	SWC	III-CF	
6	Date Palm Dr & Dinah Shore Dr	333L	18" Raised	NWC	McCain	170 ATC Coldfire		CMU	210	Video	Iteris	Vantage Edge 2	4	LCD Monitor				(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	m262	2	NWC	III-CF	
7	Date Palm Dr & Dave Kelly Rd / Ortega Rd	333L	24" Raised	NWC	McCain	170 ATC Coldfire		CMU	210E	Loops	EDI	2 CH	(11) 222					(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	562	2	NWC	III-CF	
8	Date Palm Dr & Cathedral Village	333L	18" Raised	NWC	McCain	170 ATC Coldfire		CMU	210E	Loops	EDI	2 CH	(7) 222					(1) 6 Pr & (1) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	762	1	NWC	III-CF	
9	Date Palm Dr & Ramon Rd	333 JP	18" Raised	NWC	McCain	170 ATC Coldfire		CMU	210E	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(2) 12 Pr								Dimensions	Inside Cabinet	4	Opticom	562 & m262	2 & 2	NWC	III-CF	
10	Date Palm Dr & Baristo Rd	333 JP	18" Raised	SEC	McCain	170E Quad w/233		CMU	2010 ECL	Loops	EDI	2 CH	(10) 222					(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	m262	1	SEC	III-CF	
11	Date Palm Dr & McCallum Wy	333 JP	18" Raised	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	EDI	2 CH	(7) 222					(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	762	1	SEC	III-CF	
12	Date Palm Dr & 30th Ave	333 JP	18" Raised	NWC	McCain	170E Quad w/233		CMU	210E	Loops	EDI	2 CH	(12) 222													Dimensions	Inside Cabinet	4	Opticom	562	2	NWC	III-CF	Stand Alone
13	Date Palm Dr & Vista Chino	333 JP	18" Raised	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor												Dimensions	Inside Cabinet	4	Opticom	764	1	SWC	III-CF & III-BF	Wireless Antenna only. Stand Alone
14	Ramon Rd & Landau Blvd	333 JP	18" Raised	SEC	McCain	170E Quad w/233		CMU	210E	Loops	EDI	2 CH	(5) 222					(1) 12 Pr	GDI 400							Dimensions	Inside Cabinet	6	Opticom	454	1	SEC	III-BF	
15	Ramon Rd & Whispering Palms Trl	333 JP	18" Raised	NEC	McCain	170E Quad w/233		CMU	210E	Loops	EDI	2 CH	(10) 222					(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	562 / 762	1/1	NEC	III-CF	
16	Ramon Rd & Avenida Maravilla	333 JP	18" Raised	SEC	McCain	170E Quad w/233		CMU	210E	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	m262	2	SEC	III-CF	
17	Ramon Rd & Desert Vista Rd	333 JP	18" Raised	SEC	McCain	170E Quad w/233		CMU	210E	Loops	EDI	2 CH	(1) 222					(2) 12 Pr	GDI 400							Dimensions	Inside Cabinet	4	Opticom	562	1	NWC	III-BF	
18	Ramon Rd & Cathedral Village	P-44	18" Raised	NEC	Traconex	390 CJ		CMU	LCD-12P	Loops & Video	Iteris	Vantage Edge 2	(1) 921-2TC-1EX	B/W Monitor				(2) 12 Pr	Controller Modem 400	IDC Interface						Dimensions	Inside Cabinet	4	Opticom	m262	1	NEC	III-CF	
19	Ramon Rd & Via Companile	P-44	18" Raised	SEC	Traconex	390 CJ		CMU	LCD-12P	Loops	IDC	2 CH	(9) 921-2TC-1					(2) 12 Pr	Controller Modem 400	IDC Interface						Dimensions	Sidemount Cabinet	4	Opticom	752	2	SEC	III-CF	
20	Palm Canyon Dr & Canyon Plaza (North)	P-44	18" Raised	SEC	Traconex	390 CJ		CMU	LCD-12P	Loops	IDC	2 CH	(6) 921-2TC-1EX					(1) 12 Pr	Controller Modem 400	IDC Interface						Dimensions	Sidemount Cabinet	4	Opticom	762	1	NWC	III-CF	
21	Palm Canyon Dr & Canyon Plaza South)	P-44	18" Raised	SEC	Traconex	390 CJ		CMU	LCD-12P	Loops	IDC	2 CH	(7) 921-2TC-EX					(2) 12 Pr	Controller Modem 400	IDC Interface						Dimensions	Sidemount Cabinet	4	Opticom	562	2	NEC	III-CF	
22	Palm Canyon Dr & Perez Rd	333	18" Raised	NWC	McCain	170E Quad w/233		CMU	210E	Video	Iteris	Vantage Edge 2	4	LCD Monitor				(2) 12 Pr	Controller Modem 400							Dimensions	Inside Cabinet	4	Opticom	764	1	NWC	III-CF	Twisted Pair not in use
23	Palm Canyon Dr & Auto Park Dr	P-44	18" Raised	NWC	Traconex	390 CJ		CMU	LCD-12P	Video	Odetics	Vantage Plus	1	LCD Monitor				(2) 12 Pr	Controller Modem 400	IDC Interface						Myers	Sidemount Cabinet	4	Opticom	562	1	NWC	III-CF	
24	Palm Canyon Dr & Bankside Dr	332	18" Raised	NWC	McCain	170 ATC Coldfire		CMU	210	Video	Iteris	Vantage Edge 2	4	LCD - Rackmount				(2) 12 Pr	Controller Modem 400							Clary	Sidemount Cabinet	6	Opticom	752	2	NWC	III-CF	
25	Palm Canyon Dr & Cathedral Canyon Dr	P-44	18" Raised	SWC	McCain	170E Quad w/233		CMU	NM512	Video	Odetics	Vantage Plus	1	B/W Monitor				(1) 6 Pr & (1) 12 Pr	Controller Modem 400	IDC Interface						Dimensions	Sidemount Cabinet	4	Opticom	562	2	SEC	III-CF	
26	Palm Canyon Dr & Buddy Rogers Ave	P-44	18" Raised	SEC	McCain	170E Quad w/233		CMU	NM512 & LCD-12P	Video	Odetics	Vantage Plus	1	B/W Monitor				(1) 6 Pr & (1) 12 Pr	Controller Modem 400	IDC Interface						Dimensions	Sidemount Cabinet	4	Opticom	562	2	SEC	III-CF	
27	Palm Canyon Dr & Van Fleet St/ Monty Hall Dr	P-44	18" Raised	SEC	McCain	170E Quad w/233		CMU	LCD-12P	Loops & Video	Odetics	Vantage Plus	1	B/W Monitor				(2) 12 Pr	Controller Modem 400	IDC Interface						Dimensions	Sidemount Cabinet	4	Opticom	562	2	SEC	III-CF	
28	Palm Canyon Dr & Allen Ave	333	18" Raised	SEC	McCain	170 ATC Coldfire		CMU	210E	Video	Iteris	Vantage Edge 2	2	LCD Monitor				(2) 12 Pr	Controller Modem 400							Dimensions	Inside Cabinet	4	Opticom	562	2	SEC	III-CF	
29	Palm Canyon Dr & Date Palm Dr	333	18" Raised	SWC	McCain	170 ATC Coldfire	170E Quad w/210	CMU	210E	Video	Iteris	Vantage Edge 2	3	LCD Monitor				(3) 12 Pr	Controller Modem 400							Dimensions	Inside Cabinet	4	Opticom	562	2	SWC	III-CF	
30	Palm Canyon Dr & Sungate Wy	333	18" Raised	SWC	McCain	170 ATC Coldfire		CMU	210E	Video	Iteris	Vantage Edge 2	4	LCD Monitor				(2) 12 Pr	Controller Modem 400							Dimensions	Inside Cabinet	4	Opticom	562	2	NWC	III-CF	
31	Palm Canyon Dr & Officer Jermaine Gibson / Buddy Rogers Ave	333	18" Raised	NWC	McCain	170 ATC Coldfire		CMU	210E	Loops	EDI	2 CH	(9) 222					(1) 6 Pr & (1) 12 Pr	Controller Modem 400							Dimensions	Inside Cabinet	4	Opticom	562	2	NWC	III-CF	
32	Vista Chino & Avenida Quintana	P-44	18" Raised	NEC	Traconex	390 CJ		CMU	2000-16B	Loops	Detection Systems	2 CH	(5) 222B								900 MHZ	GDI 900 DS						Opticom	m262	1	NEC	III-CF	
33	Vista Chino & Landau Blvd	333 JP	18" Raised	NWC	McCain	170E Quafd w/233		CMU	210E	Loops	EDI	2 CH	(10) 222								900 MHZ	GDI 900 DS				Dimensions	Inside Cabinet	4	Opticom	m262	2	NWC	III-BF	
34	Vista Chino & Avenida Maravilla	P-44	18" Raised	NEC	Traconex	390 CJ		CMU	LCD-12P	Loops	Detection Systems	2 CH	(7) 921-2TC-1								900 MHZ	GDI 900 DS				Dimensions	Sidemount Cabinet	4	Opticom	562	2	NEC	III-CF	
35	Dinah Shore Dr & Cathedral Canyon Dr	333 JP	18" Raised	SWC	McCain	170E Quad w/233		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor												Dimensions	Inside Cabinet	4	Opticom	m262	2	SWC	III-CF	Stand Alone
36	Dinah Shore Dr & Plumley Rd	P-44	2" Raised	SWC	Traconex	390 CJ		CMU	NSM - 12	Loops	Various	2 CH	5													Myers	Sidemount Cabinet	4	Opticom	562	2	SWC	III-CF	Stand Alone
37	Perez Rd & Cathedral Canyon Dr	333 JP	18" Raised	NWC	McCain	170E Quad w/233		CMU	210E	Loops	EDI	2 CH	(11) 222													Dimensions	Inside Cabinet	4	Opticom	m262	2	NWC	III-CF	Stand Alone
38	Gerald Ford Dr & Plumley Rd/ Ave Del Sol	P-44	18" Raised	SEC	Traconex	390 CJ		CMU	LCD-12P	Video	Iteris	Vantage Plus	1	B/W Monitor												Dimensions	Sidemount Cabinet	4	Opticom	752	1	SEC	III-BF	Stand Alone
39	Date Palm Dr & Buddy Rogers Ave/ Fire Station	2TC24F2EX	3' 1-A Pole	NWC	-	F Tray Electro Mechanical								B/W Monitor																SWC	III-BF	Stand Alone
40	Cathedral Canyon Dr & Officer David Vasquez Rd/ Civic Center	P-44	18" Raised	NWC	Traconex	390 CJ		CMU	SSM-12E	Video	Odetics	Vantage Plus	1	B/W Monitor												Dimensions	Sidemount Cabinet	4	Opticom	752	2	NWC	III-CF	Stand Alone
41	30th Ave & Landau Blvd	333 JP	18" Raised	SWC	McCain	170E Quad w/233		CMU	210E	Loops	EDI	2 CH	(7) 222													Dimensions	Inside Cabinet	4	Opticom	m262	2	SWC	III-CF	Stand Alone
42	Ramon Rd & Da Vall	P44	18"	NWC	Econolite	ASC/2S-2100		Guardian	LCD12P	Loops	AccuCount	2 CH	10					(1) 12 pr								Dimensions	Sidemount Cabinet	4	Opticom	562	2	NEC	III-CF	Polara APS station *Shared with City of Rancho Mirage

Appendix A1.2:

Existing Traffic Signal System Equipment Matrix

City of Coachella

Regional Traffic Signal Synchronization Program

City of Coachella
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
1	Grapefruit Blvd & Avenue 49	332	2"	SWC	PSI	170E		CMU	210P	Video & Loops	Iteris	Vantage Edge 2	(1) IDC 222	B/W				(1) 12 Pr								Dimensions	Inside Cabinet	4	Opticom	752	2	SWC	III-CF	
2	Grapefruit Blvd & Gateway Center Dr	332	4"	SWC	Econolite	ASC/2-2000 RM		CMU	210	Video	Iteris	Vantage Edge 2	3	B/W				(2) 6 Pr														SWC	III-CF	Twisted Pair not working
3	Grapefruit Blvd & Park Ln/Harrison St	332	18"	NEC	PSI	170E w/200		CMU	210	Loops	Various	2 CH	(7) 222					(1) 12 Pr & (1) 6 Pr														NEC	Type I	Twisted Pair not working
4	Harrison St & Avenue 50	332	2"	SEC	Signal Control Co	170 w/200		CMU	210	Video	Iteris	Vantage Edge 2	(1) Vantage Access	B/W				(1) 12 Pr & (2) 6 Pr											Opticom	752	2	SEC	III-CF	Twisted Pair not working
5	Harrison St & Westerfield Wy/1st St	332	2"	NWC	DTS	170E Quad w/200		CMU	210	Loops	Sarasota	2 CH	(14) 222					(1) 12 Pr											Opticom	m262	2	NWC	III-CF	Twisted Pair not working
6	Harrison St & Avenue 51	332	2"	NEC	Signal Control Co	170 Dual		CMU	210	Video	Iteris	Vantage Edge 2	(1) Vantage Access	B/W				(2) 12 Pr														NEC	III-CF	Twisted pair not in use
7	Harrison St & 6th St	332	2"	NWC	Signal Control Co	170E w/200		CMU	210	Loops	EDI	2 CH	(10) 222					(2) 12 Pr	Controller GDI 400										Opticom	562	2	NWC	III-CF	Twisted Pair not in use
8	Harrison St & Avenue 52	332	3"	NEC	IDC	170E w/200		CMU	210	Video	Iteris	Vantage Edge 2	(1) Vantage Access	B/W				(1) 12 Pr														NEC	III-BF	Twisted Pair not in use
9	Harrison St & Avenue 53	332	2"	NWC	IDC	170E w/200		CMU	210	Video	Iteris	Vantage Edge 2	4	B/W												Dimensions	Inside Cabinet	4	Opticom	752	2	NWC	III-CF	Stand Alone
10	Harrison St & Avenue 54	332	18"	NEC	McCain	170E w/200		CMU	210E	Loops	EDI	2 CH	(12) 222													Clary	Inside Cabinet	4				NEC	III-CF	Stand Alone
11	Van Buren St & Avenue 50	332	2"	NEC	Signal Control Co	170 w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W												Dimensions	Inside Cabinet	4	Opticom	754	1	NEC	III-CF	Stand Alone
12	Frederick St & Avenue 51	332	2"	SEC	McCain	2070E w/2033	170E Quad w/210	CMU	210	Video	Iteris	Vantage Edge 2	4	LCD - Rackmount												Dimensions	Sidemount Cabinet	4	Opticom	764	1	SEC	III-BF	Master Location. Cell Modem (not connected)
13	Frederick St & Avenue 52	332	2"	NEC	McCain	2070E w/2033	170E Quad w/210	CMU	210	Video	Iteris	Vantage Edge 2	4	LCD - Rackmount												Dimensions	Sidemount Cabinet	4	Opticom	764	1	NEC	III-BF	Master Location. Cell Modem (not connected)
14	Avenue 50 & Leoco Ln	332	2"	SEC	PSI	170E w/200		CMU	210	Loops	IDC	2 CH	(6) 222					(2) 6 Pr											Opticom	752	1	SEC	III-CF	Twisted Pair not working
15	Avenue 50 & Oates Ln	332	2"	SWC	IDC	170E w/200		CMU	210	Loops	IDC	2 CH	(10) 222					(1) 6 Pr														SWC	III-CF	Twisted Pair not in use
16	Grapefruit Blvd & Sunset Dr	332	2"	SWC	McCain	170E Quad w/200		CMU	210	Video & Loops	Iteris	Vantage Edge 2	(4) 222	LCD				(1) 12 Pr								Clary	Sidemount Cabinet	8	Opticom	764	1	SWC	III-CF	Twisted Pair not in use
17	Avenue 52 & Sunset Dr	332	2"	NWC	McCain	170E Quad w/200		CMU	210	Video & Loops	Iteris	Vantage Edge 2	(4) 222	LCD				(2) 12 Pr								Clary	Sidemount Cabinet	8	Opticom	764	1	NEC	III-CF	
18	Avenue 52 & Industrial Wy/Tyler St	332	2"	NEC	McCain	170E Quad w/200		CMU	210	Video & Loops	Iteris	Vantage Edge 2	(2) 222	LCD				(1) 12 Pr								Clary	Sidemount Cabinet	8	Opticom	764	1	NEC	III-CF	Twisted Pair not in use
19	Dillon Rd & Harrison Pl	332	2"	NWC	DTS	170E Quad w/200		CMU	210C	Loops	Reno	2 CH	(6) 222					(1) 6 Pr								Dimensions	Sidemount Cabinet	4				NWC	III-CF	Twisted Pair not in use
20	Avenue 48 & Dillon Rd	322	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	B/W Monitor												Dimensions	Sidemount Cabinet		Opticom	754	1	SWC	III-CF	Stand Alone
21	Dillon Rd & Cabazon Rd	332	6"	SEC	Signal Control Co	170SC w/200		CMU	2010 ECL	Loops	EDI	2 CH	(12) 222													Dimensions	Sidemount Cabinet		Opticom	454	1	SEC	III-CF	Stand Alone

Appendix A1.3:

Existing Traffic Signal System Equipment Matrix

City of Desert Hot Springs

Regional Traffic Signal Synchronization Program

City of Desert Hot Springs Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
1	Hacienda Ave & Mountain View Rd	R	2"	NWC	Econolite	ASC/2S-2100		MMU	16LE	Video	Iteris	Vantage Edge 2	4	B/W Monitor					ASC2							Dimensions	Sidemount Cabinet	4	Opticom	454	1	NWC	III-CF	Stand Alone
2	Indian Canyon Dr & Mission Lakes Blvd	R	18"	NEC	Econolite	ASC/3-2100		MMU	16E	Video	Iteris	Vantage Edge 2	3	B/W Monitor												Dimensions	Sidemount Cabinet	4	Opticom	752	2	NEC	III-CF	Stand Alone
3	Palm Dr & Camino Campanero	332	4"	SWC	McCain	170E Quad w/233		CMU	210	Loops	EDI	2 CH	(6) 222									900 MHZ	Encom 5100					Opticom	762	2	SWC	III-BF	Wireless not connected
4	Palm Dr & Dillon Rd	333 JP	18"	SEC	McCain	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(12) 222						GDI 400 DS							Dimensions	Inside Cabinet	4	Opticom	m262	2	SEC	III-CF	*Shared with County of Riverside Stand Alone, Phone Drop (Aban)
5	Palm Dr & Hacienda Ave	332	2"	NEC	McCain	170E Quad w/200		CMU	210	Loops	EDI, Sarasota, Reno	2 CH	4/5/1									900 MHZ	GDI 900 DS					Tomar	Strobeco m II	1	NEC	III-CF	
6	Palm Dr & Ironwood Dr	332	3"	SWC	Safetran	170E Quad w/200		CMU	210	Loops	EDI, Diablo, Econolite	2 CH	7/2/1									900 MHZ	GDI 900 DS			Dimensions	Inside Cabinet	4	Tomar	Strobeco m II	1	SWC	III-CF	Wireless not working
7	Palm Dr & Pierson Blvd	322	2"	NWC	McCain	170E Quad w/200	170E Quad w/210	CMU	210C	Loops	Detection Sys, EDI, Econolite	2 CH	1/5/2									900 MHZ	GDI 900 DS					Tomar	Strobeco m II	1	SEC	III-BF, III-CF	Master Location. Wireless not working
8	Palm Dr & Two Bunch Palms Trl	332	2"	SWC	McCain	170E Quad w/233		CMU	210	Loops	EDI, Reno	2 CH	(10) 222									900 MHZ	Encom 5100					Opticom	m262	2	SWC	III-CF	Wireless not connected
9	Pierson Blvd & Golden Eagle Wy / Atlantic Ave	P44		SEC	Econolite	ASC/3-2100		MMU	16	Loops	Econolite & EDI	2 CH	(8) LM 622									900 MHZ	MDS 9810			Myers	Sidemount Cabinet	4	Tomar	Strobeco m II	1	SEC	III-CF	GPS, Wireless not connected
10	Pierson Blvd & Karen Ave	332	2"	NWC	McCain	170E Quad w/200		CMU	210	Video	Iteris	Vantage Edge 2	3	B/W Monitor				(1) 6 pr								Dimensions	Sidemount Cabinet	4	Tomar	Strobeco m II	1	NWC	III-CF	Twisted Pair not in use
11	Pierson Blvd & Skyborne Dr	332	2"	NWC	McCain	170E		CMU	210	Video	Iteris	Vantage Edge 2	3	B/W Monitor				(1) 6 pr								Dimensions	Sidemount Cabinet	4	Tomar	Strobeco m II	1	NWC	III-CF	Twisted Pair not in use
12	Pierson Blvd & West Dr	332	2"	SEC	IDC	170E w/200		CMU	210P	Loops	IDC	2 CH	(6) 222									900 MHZ	MDS 9810			Myers	Sidemount Cabinet	4	Tomar	Strobeco m II	1	SEC	III-CF	GPS, Wireless not connected
13	Palm Dr & Paul Dr	332	2"	NEC	McCain	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(8) 222															Opticom	Strobeco m II	1	NEC	III-CF	Stand Alone
14	Palm Dr & Varner Rd	332	2" Raised	SEC	Safetran	170E Quad w/233		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(2) 222	LCD - Rackmount												Dimensions	Sidemount Cabinet	4	Opticom	452	2	SEC	III-CF	*Shared with County of Riverside Cell Modem

Appendix A1.4:

Existing Traffic Signal System Equipment Matrix

City of Indian Wells

Regional Traffic Signal Synchronization Program

City of Indian Wells

Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
1	Highway 111 & Village Center Dr	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(8) G-68					(1) 12pr #19	FSK						Myers	side-mount cabinet	4	Opticom	762	2	NWC	III-CF	
2	Highway 111 & Cook St	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(15) G-68					(2) 12pr #19	FSK						Myers	side-mount cabinet	4	Opticom	764	1	NWC	III-CF	Polara APS station
3	Highway 111 & Province Wy	R, PNG	18" Raised	NEC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(7) LMD622					(1) 6pr #19, (1) 12pr #19	FSK						Myers	side-mount cabinet	4	Opticom	752	2	NEC	III-CF	
4	Highway 111 & Palmeras Rd	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	1600	Loop	Econolite	2 CH	(7) LMD622					(2) 12pr #19	FSK	Econolite					Myers	side-mount cabinet	4	Opticom	752	2	NWC	III-CF	
5	Highway 111 & El Dorado Dr	332	4" Raised	NWC	Econolite	ASC 3-2100		CMU	2010 ECL	Loop	Reno	2 CH	(12) 222					(2) 12pr #19	FSK						Myers	side-mount cabinet	4	Opticom	752	2	NWC	III-BF	
6	Highway 111 & Indian Wells Ln	332		NWC	Econolite	ASC 3-2100		CMU	210	Loop	Reno	2 CH	(8) 222					(1) 12pr #19, (2) 6pr #19	FSK						Myers	side-mount cabinet	4	Opticom	752	2	NWC	III-BF	
7	Highway 111 & Club Dr	332	4" Raised	NWC	Econolite	ASC 3-2100		CMU	210 E	Loop	Reno	2 CH	(6) 222					(4) 6pr #19	FSK						Myers	side-mount cabinet	4	Opticom	752	2	NWC	III-BF	
8	Highway 111 & Miles Ave	332	4" Raised	NWC	Econolite	ASC 3-2100	ASC/2M-1000	CMU	210	Loop	Reno	2 CH	(11) 222					(1) 12pr #19, (2) 6pr #19	FSK						Myers	side-mount cabinet	4	Opticom	752	2	NWC	III-BF	Master Location. Existing phone drop to City Hall. GPS time source to OSM
9	Highway 111 & Mountain Cove Dr	332	4" Raised	NWC	Econolite	ASC 3-2100		CMU	210 C	Loop	Reno	2 CH	(9) 222					(1) 12pr #19, (1) 6pr #19	FSK						Myers	side-mount cabinet	4	Opticom	752	2	NWC	III-BF	
10	Cook St & Cachuma Rd	P-44	18" Raised	SWC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(8) LMD622					(1) 6pr #19	FSK									Opticom	752	1	SWC	III-CF	Stand alone intersection. No Comm.
11	El Dorado Dr & Fred Waring Dr	R, PNG	4" Raised	SEC	Econolite	ASC 3-2100		MMU	16 E	Video	Iteris	Edge 2 (4)	(4) RZ4 Camera		(1) 12 SMFO	1U 12 port wall	IFS D9130-B											Opticom	752	2	SEC	III-BF	*Controller on City of Palm Desert system
12	Miles Ave & Warner Trl	R, PNG	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Video / Loop	Iteris	Edge 2	(1) RZ4 Camera, (5) LMD622															Opticom	752	1	NWC	III-BF	Stand alone intersection. No Comm.
13	Fred Waring Dr & Warner Trl	P-44	18" Raised	SWC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(12) G-68 / LM622		(1) 12 SMFO	2U 12 port wall	IFS D9130-B											Opticom	262 / 562	1 EA	SWC	III-CF	*Shared with City of Palm Desert
14	Fred Waring Dr & Cook St	R	4" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(15) LM622		(1) 36 SMFO	Breakout cable	IFS D9130-B											Opticom	562	2	NWC	III-CF	*Shared with City of Palm Desert
15	Havley Ln East & El Dorado Dr	R, PNG	4" Raised	SEC	Econolite	ASC 3-1000		MMU	16 E	Loop	Econolite	2 CH	(11) G-68		(1) 36 SMFO	2U 12 port wall	Etherwan EX73222											Opticom	752	2	SEC	III-CF	*Shared with City of Palm Desert. IP based Controller

Appendix A1.5:

Existing Traffic Signal System Equipment Matrix

City of Indio

Regional Traffic Signal Synchronization Program

City of Indio City Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
1	Avenue 42 & Country Club Dr	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	454	1	NWC	III-CF		Twisted Pair not Connected
2	Avenue 42 & Golf Course Dr	332	Flush	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD Monitor				(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	SEC	III-CF		Twisted Pair not Connected
3	Avenue 42 / Country Club Dr & Jefferson St	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(3) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	454	1	NEC	III-CF		
4	Adams St & Avenue 39	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								5.8 GHZ				Dimensions	Sidemount Cabinet		Opticom	764	1	SWC	III-CF		
5	Adams St & Avenue 40	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								(2) 5.8 GHZ	GarnettCom 6 port	170 Ethernet module		Dimensions	Sidemount Cabinet		Opticom	764	1	SEC	III-CF		
6	Avenue 40 & Sun City Blvd	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor								900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	752	2	SEC	III-CF		Wireless disconnected
7	Avenue 42 & Street B	332	4"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	LCD - Rackmount												Dimensions	Sidemount Cabinet		Opticom	764	1	SEC	III-CF		Stand Alone. Wireless abandoned
8	Avenue 48 & Arabia St	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	LCD - Rackmount								5.8 GHZ	Encom Compak SW-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	762	2	NWC	III-CF		
9	Avenue 48 & Calhoun St	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								5.8 GHZ	Encom Compak SW-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	752	2	SEC	III-CF		
10	Avenue 48 & Calle Conejo	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Encom Compak SW-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Tomar	Strobeco m II	1	NWC	III-CF		
12	Avenue 48 & Dillon Ave	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD Monitor								5.8 GHZ	Encom Compak SW-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	754	2	SEC	III-CF		
13	Avenue 48 & Hjorth St	332	2"	SWC	McCain	170 Dual w/200		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(2) 222	B/W Monitor												Dimensions	Sidemount Cabinet		Opticom	752	1	SWC	III-CF		Stand Alone
14	Avenue 48 & Indio Blvd	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								(2) 5.8 GHZ	Encom Compak SW-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	754	1	SEC	III-CF		
15	Avenue 48 & Jackson St	332	6"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Encom Compak SW-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	754	2		III-CF		
16	Avenue 48 & Madison St	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								5.8 GHZ	Encom Compak SW-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	762	2	NEC	III-CF		
17	Avenue 48 & Shields Rd	332	2"	SEC	DTS	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD Monitor								5.8 GHZ	Encom Compak SW-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	754	1	SEC	III-CF		
18	Avenue 48 & Shopping Center	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	Various	2 CH	(12) 222													Dimensions	Sidemount Cabinet		Opticom	m262 & 252	1 & 1	NWC	III-CF		Stand Alone
19	Clinton St & Avenue 46	332	2"	NEC	McCain	170E Quad w/200		CMU	210	Loops	IDC	2 CH	(16) 222					(1) 6 Pr	Controller GDI 400			900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	752	2	NEC	III-CF		
20	Clinton St & Fred Waring	332	2"	SWC	DTS	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(7) 222													Dimensions	Sidemount Cabinet		Opticom	m262	2	SWC	III-CF		Stand Alone
21	Clinton St & Indio Blvd	332	2"	NEC	IDC	170E w/200		CMU	210E	Video	Iteris	Vantage Edge 2		LCD - Rackmount				(2) 6 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	m262	2	NEC	III-CF		*Shared with County of Riverside McCain GPS / SIC not in use
22	Clinton St & Palmyra Ave	332	2"	SEC	McCain	170E Quad w/200		CMU	210	Video	Iteris	Vantage Edge 2		LCD Monitor				(2) 6 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	SEC	III-CF		*Shared with County of Riverside Twisted Pair not Connected
24	Fred Waring Dr & Burr St	332	4"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	B/W Monitor								900 MHZ				Dimensions	Sidemount Cabinet		Opticom	454	1	NWC	III-CF		900 MHZ wirless abandoned
25	Fred Waring Dr & Heritage Palms Dr	332	2"	SEC	Signal Control Co	170E w/200		CMU	210	Loops	Saraso ta & EDI	2 CH	8 / 1					(1) 6 Pr	Controller GDI 400			900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	m262	1	SEC	III-CF		
26	Fred Waring Dr & Hoover Ave	332	2"	SWC	DTS	170E Quad w/200		CMU	210	Loops	IDC	2 CH	(12) 222					(2) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	SWC	III-CF		
27	Fred Waring Dr & Madison St	332	4"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(2) 222	B/W Monitor				(1) 6 Pr	Controller GDI 400			900 MHZ	(2) Encom 5100			Dimensions	Sidemount Cabinet		Opticom	752	2	NWC	III-CF		Empty D-Mark Box
28	Fred Waring Dr & Shopping Center (E/O Jefferson St)	332	2"	SWC	SafeTran	170E Quad w/200		CMU	210C	Video	Iteris	Vantage Edge 2		B/W Monitor				(2) 6 Pr	Controller GDI 400			GDI SM336SA				Dimensions	Sidemount Cabinet					SWC	III-BF		
29	Fred Waring Dr & Indio Blvd	332	2"	SEC	McCain	170E Quad w/200		CMU	210	Loops	EDI & Reno	2 CH	(5 & 1) 222					(1) 12 Pr	Controller GDI 400			900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	m262	2	SEC	III-BF		
30	Fred Waring Dr & Heritage Court Ctr	332	4"	SEC	Signal Control Co	170E Quad w/200		CMU	210	Loops	Saraso ta & IDC	2 CH	(8 & 1) 222									900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	m262	1	SEC	III-CF		
31	Golf Center Pkwy & Avenue 43	332	2"	SWC	McCain	170E Quad w/200				Video	Iteris	Vantage Edge 2		LCD - Rackmount								900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	754	1	SWC	III-CF		Wireless not connected
32	Golf Center Pkwy & Avenue 44	332	2"	NEC	DTS	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD - Rackmount				(1) 12 Pr	Controller GDI 400			900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	754	1	NEC	III-CF		GPS not in use yet
33	Golf Center Pkwy & Avenue 45	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD Monitor												Dimensions	Sidemount Cabinet		Opticom	454	1	SWC	III-CF		Stand Alone
34	Golf Center Pkwy & Indio Springs Dr	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(7) 222					(1) 12 Pr								Dimensions	Sidemount Cabinet		Opticom	752	2	SEC	III-BF		GPS Opticom SEC. SIC not connected
35	Golf Center Pkwy & Terra Largo Pkwy	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor												Dimensions	Sidemount Cabinet		Opticom	752	2	NEC	III-CF		Stand Alone
36	Highway 111 & Arabia St	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	IDC/Re no/EDI	2 CH	(6 / 1 / 1) 222					(2)6 Pr & (1)12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	m262	2	SWC	III-BF		
37	Highway 111 & Clinton St	332	2"	SWC	McCain	170E Quad w/200		CMU	210	Loops	EDI/Re no	2 CH	(4 / 2) 222					(2) 6 Pr	Controller GDI 400							Myers	Sidemount Cabinet		Opticom	754	1	SWC	II		

Regional Traffic Signal Synchronization Program

City of Indio City Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
38	Highway 111 & Golf Center Pkwy	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD Monitor												Dimensions	Sidemount Cabinet		Opticom	454	1	SEC	III-CF		Stand Alone
39	Highway 111 & Jackalope Trl	332	2"	NWC	PSI	170E w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	B/W Monitor				(2) 6 Pr & (1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	1	NWC	III-CF		SIC not connected
40	Highway 111 & Jackson St	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor								(4) 5.8 GHZ	B&B E-Link (model ESW188)	170 Ethernet Module		Dimensions	Sidemount Cabinet		Opticom	764	1	SEC	III-CF		Wireless HUB location
41	Highway 111 & Las Palmas Rd	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	Various	2 CH	(8) 222					(2) 6 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	m262	2	SWC	III-BF		
42	Highway 111 & Madison St	332	2"	NWC	McCain	170E Quad w/200		CMU	210C	Loops	Varoius	2 CH	(13) 222					(1) 6 Pr	Controller GDI 400							Myers	Sidemount Cabinet		Opticom	752	2	NWC	III-CF		SIC not connected
43	Highway 111 & Mall Dr	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	EDI / Reno	2 CH	(13 / 1) 222					(2) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	1	NWC	III-CF		
44	Highway 111 & Monroe St	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	EDI / Reno / IDC	2 CH	(14 / 1 / 1) 222					(2) 6 Pr & (2) 12 Pr	Controller GDI 400							Myers	Sidemount Cabinet		Opticom	752	2	SWC	III-CF		Phone Drop
45	Highway 111 & Oasis St	332	12"	NEC	DTS	170E Quad w/200		CMU	210	Loops	Various	2 CH	9					(1) 12 Pr	Controller GDI 400			900 MHZ	Encom 5100			Myers	Sidemount Cabinet		Opticom	m262	2	SEC	Vault		
46	Highway 111 & Rubidoux St	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	Sarasota / EDI / IDC	2 CH	(4/3/3) 222					(2) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	m262	2	SEC	III-BF		
47	Highway 111 & Smurr St	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								(2) 5.8 GHZ	B&B E-Link (model ESW188)	170 Ethernet Module		Dimensions	Sidemount Cabinet		Opticom	767	1	NWC	III-CF		
48	Highway 111 & Shields Rd	332	2"	SWC	DTS	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Tomar	StrobCom II	1	SWC	III-CF		Twisted Pair not Connected
49	Indio Blvd & Access Dwy																																		*Couldn't locate Intersection
50	Indio Blvd & Civic Center Dr	332	12"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	754	1	SWC	III-CF		Twisted Pair not Connected
51	Indio Blvd & Hoover Ave	332	2"	SWC	Signal Control Co	170 Duel w/200		CMU	210	Loops	IDC	2 CH	(2) 222						Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	SWC	III-CF		Stand Alone
52	Indio Blvd & Highway 111	332	2"	SEC	McCain	170E Quad w/200		CMU	210	Loops	EDI/IDC	2 CH	(7/2) 222													Dimensions	Sidemount Cabinet					SWC	III-BF		Stand Alone
53	Indio Blvd & Van Buren St																																		*Couldn't locate Intersection
54	Jackson St & Avenue 42	332	4"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD Monitor				(1) 6 Pr & (2) 12 Pr				(2) 5.8 GHZ	Henrich Hesb8G-W	170 Ethernet module		Dimensions	Sidemount Cabinet		Opticom	752	2	SWC	III-CF		
55	Jackson St & Avenue 44	332	4"	SEC	McCain	170E Quad w/200		CMU	210	Loops	Sarasota	2 CH	(3) 222													Dimensions	Sidemount Cabinet		Opticom	m262	2	SEC	Type I		Stand Alone
56	Jackson St & Avenue 45	332	4"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2		B/W Monitor								(2) 5.8 GHZ	Henrich Hesb8G-W	170 Ethernet module		Dimensions	Sidemount Cabinet		Opticom	754	1	SEC	III-CF		
57	Jackson St & Civic Center Dr	332	10"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor								(2) 5.8 GHZ	Henrich Hesb8G-W			Dimensions	Sidemount Cabinet		Opticom	754	1	NEC	III-CF		
58	Jackson St & Date Ave	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor								900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	754	1	NWC	III-CF		Encom not working
59	Jackson St & Dillon Ave	332	2"	NEC	SafeTran	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								(2) 5.8 GHZ	Henrich Hesb8G-W	170 Ethernet module		Dimensions	Sidemount Cabinet		Opticom	764	1	NEC	III-CF		
60	Jackson St & Dr. Carreon Blvd	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	EDI	2 CH	(8) 222													Dimensions	Sidemount Cabinet					NEC	Type I		Stand Alone
61	Jackson St & Requa Ave	332	2"	SWC	McCain	170E Quad w/200		CMU	210C	Loops	IDC	2 CH	(1) 222													Clary	Inside Cabinet					SWC	Type I		Stand Alone
62	Jackson St & Showcase Pkwy	332	4"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD Monitor				(1) 6 Pr & (1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	NWC	III-CF		Twisted Pair not Connected
63	Jefferson St & Avenue 39	332	1"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor												Dimensions	Sidemount Cabinet		Opticom	752	2	SWC	III-CF		Stand Alone
64	Jefferson St & Avenue 40	332	2"	SEC	SafeTran	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								5.8 GHZ	Encom Compak Sw-100			Dimensions	Sidemount Cabinet		Opticom	464	1	SEC	III-CF		Antenna missing
65	Jefferson St & Dunbar Dr	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount				(2) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	764	1	NEC	III-CF		
66	Jefferson St & Fred Waring Dr	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2		B/W Monitor				(1) 6 Pr & (2) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	SEC	III-CF		Comm not working
67	Jefferson St & Indio Blvd	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	B/W Monitor				(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	m262 & 752	1 & 1	SWC	III-BF		
68	Jefferson St & Miles Ave	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Loops & Video	Iteris	Vantage Edge 2	(1) Edge Connect & (2) 222	B/W Monitor				(2) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	NEC	III-CF		
69	Jefferson St & Pebble Beach Dr	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	B/W Monitor				(2) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	NEC	III-CF		
70	Jefferson St & Sun City Blvd	332	2"	NEC	IDC	170E w/200		CMU	210C	Video	Iteris	Vantage Edge 2	4	LCD Monitor								(2) 5.8 GHZ	Encom Compak SW-100	170 Ethernet module		Dimensions	Sidemount Cabinet		Opticom	752	2	NEC	III		
71	Jefferson St & Varner Rd	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD - Rackmount								(2) 5.8 GHZ	Encom Compak SW-100	170 Ethernet module		Dimensions	Sidemount Cabinet		Opticom	764	1	NWC	III-CF		
72	Jefferson St & Westward Ho	332	12"	NEC	PSI	170 w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	NEC	III-CF		WWV time source (abandoned)

Regional Traffic Signal Synchronization Program

City of Indio City Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
73	Madison St & Avenue 40	332	2"	SWC	DTS	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD Monitor					Controller GDI 400			900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	754	1	SWC	III-CF		
74	Madison St & Autumn Ln	332	2"	NWC	McCain	170E Quad w/200		CMU	210C	Video	Iteris	Vantage Edge 2	3	B/W Monitor				(1) 6 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	NWC	III-CF		Twisted Pair not Connected
75	Madison St & Avenue 46	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor								(2) 900 MHZ	(2) Encom 5100			Dimensions	Sidemount Cabinet		Tomar	StrobeCom II	1	NEC	III-CF		Encom 5100 not in use
76	Madison St & Indio Blvd	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	B/W Monitor				(1) 6 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	454	1	SEC	III-CF		Twisted Pair not Connected
77	Miles Ave & Madison St	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	LCD- Rackmount												Dimensions	Sidemount Cabinet		Opticom	452	2	SWC	III-CF		*Shared with County of Riverside Stand Alone. McCain GPS not working
78	Miles Ave & Swingle Ave	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD - Rackmount				(1) 6 Pr								Dimensions	Sidemount Cabinet		Opticom	752	2	SWC	III-CF		*Shared with County of Riverside Twisted Pair not Connected
79	Monroe St & Avenida Del Mar	332	2"	NWC	McCain	170E Quad w/200		CMU	210C	Loops	EDI / Detection System	2 CH	(10) 222					(2) 12 Pr	Controller GDI 400			900 MHZ				Dimensions	Sidemount Cabinet		Opticom	752	2	NWC	III-CF		Antenna Not in use
80	Monroe St & Avenida Sombra	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD Monitor												Dimensions	Sidemount Cabinet		Opticom	754	1	SWC	III-CF		Stand Alone
81	Monroe St & Avenue 42	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								(2) 5.8 GHZ	Henrich HESB86-W			Dimensions	Sidemount Cabinet		Opticom	764	1	SEC	III-CF		
82	Monroe St & Avenue 44	332	2"	SWC	McCain	170E Quad w/200		CMU	210	Loops	Various	2 CH	(9) 222					(1) 12 Pr	Controller GDI 400			900 MHZ	Encom 5100			Dimensions	Sidemount Cabinet		Opticom	m262 & 752	1 & 1	SWC	III-CF		
83	Monroe St & Avenue 48	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount				(1) 12 Pr				(2) 5.8 GHZ	Encom Compak Sw-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	752	2	SWC	III-CF		
84	Monroe St & Avenue 49	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								(2) 5.8 GHZ	Encom Compak Sw-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	764	1	SWC	III-CF		
85	Monroe St & Avenue 50	332	2"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	B/W Monitor								5.8 GHZ	Encom Compak Sw-100	Encom Commpak TS-1		Cabinet Locked	Cabinet Locked		Opticom	764	1	NEC	III-CF		
86	Monroe St & Country Club Dr	332	2"	SEC	McCain	170E Quad w/200		CMU	210	Video	Iteris	Vantage Edge 2	4	LCD Monitor								(2) 5.8 GHZ	Encom Compak Sw-100	Encom Commpak TS-1		Dimensions	Sidemount Cabinet		Opticom	752	1	SEC	III-CF		
87	Monroe St & Cornet Ln	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	LCD Monitor				(2) 6 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet					SWC	III-CF		Twisted Pair not in use
88	Monroe St & Dr. Carreon Blvd	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	IDC & Reno	2 CH	(12) 222					(1) 6 Pr	Controller GDI 400			900 MHZ	Wireless Encom 5100			Dimensions	Sidemount Cabinet		Opticom	752	2	SWC	III-CF		
89	Monroe St & Fred Waring Dr	332	2"	SWC	McCain	170E Quad w/200		CMU	210	Loops	IDC	2 CH	(12) 222					(3) 12 Pr	Controller GDI 400			900 MHZ	Wireless Encom 5100			Dimensions	Sidemount Cabinet		Opticom	m262	2	SWC	III-CF		
90	Monroe St & Hoover Ave	332	2"	NWC	McCain	170E Quad w/200		CMU	210	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	752	2	NWC	III-CF		
91	Monroe St & John Nobles Ave	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	B/W Monitor								900 MHZ	Wireless Encom 5100			Dimensions	Sidemount Cabinet		Opticom	752	2	SEC	III-CF		
92	Monroe St & Miles Ave	332	2"	NWC	DTS	170E Quad w/200		CMU	210	Loops	Various	2 CH	(10) 222									900 MHZ	Wireless Encom 5100			Dimensions	Sidemount Cabinet		Opticom	m262	2	NWC	Type I		
93	Monroe St & Oleander Ave	332	2"	NEC	McCain	170E Quad w/200		CMU	210	Video	Iteris	Vantage Edge 2	4	B/W Monitor				(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	754	1	NEC	III-CF		
94	Monroe St & Requa Ave	332	2"	NWC	McCain	170E Quad w/200		CMU	210	Loops	Various	2 CH	(7) 222					(1) 12 Pr	Controller GDI 400							Dimensions	Sidemount Cabinet		Opticom	m262	2	NWC	Type I		
95	Monroe St & Showcase Pkwy	332	2"	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount								5.8 GHZ				Dimensions	Sidemount Cabinet		Opticom	764	1	SEC	III-CF		Wireless not in use
96	Oasis St & Dr. Carreon Blvd	332	2"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD Monitor								900 MHZ				Dimensions	Sidemount Cabinet		Tomar	StrobeCom II	1	NWC	III-CF		Wireless Encom 5100 Removed
97	Oasis St & Indio Blvd	332	2"	SEC	McCain	170E Quad w/200		CMU	210C	Loops	Various	2 CH	(9) 222									900 MHZ	Wireless Encom 5200R			Dimensions	Sidemount Cabinet					SEC	III-CF		
98	Oasis St & Miles Ave	332	12"	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Loops	Various	2 CH	(4) 222													Dimensions	Sidemount Cabinet					NWC	III-CF		Stand Alone
99	Oasis St & Requa Ave	332	2"	SEC	DTS	170E Quad w/200		CMU	2010 ECL	Loops	Various	2 CH	(12) 222													Dimensions	Sidemount Cabinet		Opticom	754	2	SEC	III-CF		Stand Alone
100	Varner Rd & Adams St	332	4"	NEC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	LCD Monitor								5.8 GHZ	GarnetCom(Magnum ES42)	170 Ethernet module		Dimensions	Sidemount Cabinet		Opticom	752	2	NEC	III-CF		

Appendix A1.6:

Existing Traffic Signal System Equipment Matrix

City of La Quinta

Regional Traffic Signal Synchronization Program
City of La Quinta
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
1	Adams St & Avenue 48	P-44	18" Raised	NEC	Econolite	ASC 3-2100		MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module								900MHZ	GDI 900DS			Dimensions	side-mount cabinet	4	Opticom	754	1	NEC	III-CF	
2	Dune Palms Rd & Avenue 48	P-44	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 LE	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ B/W Monitor				(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	760 Chassis / 752	1 EA	NWC	III-CF	
3	Avenue 50 & Park Ave	P-44, PNG	18" Raised	SEC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(8) LMD622							Econolite					Dimensions	side-mount cabinet	4	Opticom	752	2	SEC	III-BF	No Comm. Signal offline. Stand-alone intersection
4	Calle Tampico & Desert Club Dr	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ LCD Monitor				(2) 12pr #19	FSK	Econolite					Dimensions	side-mount cabinet	4	Opticom	562	2	NWC	III-BF	Polara APS station
5	Calle Tampico & Avenida Bermudas	P-44	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ Edge Connect				(2) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752 / 562	1 EA	NWC	III-CF	Polara APS station
6	Eisenhower Dr & Avenida Fernando	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(10) LMD622					(2) 12pr #19	FSK	Econolite					Dimensions	side-mount cabinet	4	Opticom	752	2	NWC	III-CF	
7	Eisenhower Dr & Avenue 50	P-44, PNG	18" Raised	SWC	Econolite	ASC 3-2100	ASC 2M-1000	MMU	16 E	Loop	Econolite	2 CH	(8) LMD622					(2) 12pr #19	FSK	Econolite		5.8GHZ Nitro		Digi Portserver		Dimensions	side-mount cabinet	4	Opticom	764	1	SWC	III-BF	Master Location. Exist phone drop abandoned.
8	Eisenhower Dr & Coachella Dr	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 LE	Video	Econolite	Autoscope	(4) Solo Pro Camera					(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752	2	NWC	III-CF	
9	Adams St & Fred Waring Dr	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 LE	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ LCD Monitor				(1) 12pr #19	FSK	Econolite					Dimensions	side-mount cabinet	4	Opticom	764	1	NEC	III-CF	*Shared with County of Riverside
10	Dune Palms Rd & Fred Waring Dr	P-44	18" Raised	SWC	Econolite	Cobalt		MMU	16 E	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ LCD Monitor				(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752	2	SWC	III-CF	*Shared with County of Riverside
11	Jefferson St & Vista Grande	332	4" Raised	SWC	Econolite	ASC 3 Rack		CMU	2010 ECL	Video	Iteris	Edge 2	(4) RZ4 Camera	(2) Extension Modules				(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752	2	SWC	III-CF	
12	Jefferson St & Avenue 48	P-44	18" Raised	NWC	Econolite	ASC 2-2100		MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ Edge Connect/ LCD Monitor				(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	754	1	NWC	III-CF	
13	Jefferson St & Avenue 50	P-44	18" Raised	SEC	Econolite	ASC 2S-2100		MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module				(1) 12pr #19	GDI 496			900MHZ	GDI 900DS		Dimensions	stand-alone cabinet	4	Opticom	752 Chassis	2	SEC	III-CF	
14	Adams St & Miles Ave	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 LE	Loop	Econolite	2 CH	(8) LMD622					(3) 12pr #19	FSK	Econolite					Dimensions	side-mount cabinet	4	Opticom	764	1	NEC	III-CF	
15	Dune Palms Rd & Miles Ave	P-44, PNG	18" Raised	SWC	Econolite	Cobalt	ASC 2M-1000	MMU	16 E	Video / Loop	Iteris	Edge 2/Vector	(2) RZ4, (2) Vector Cameras, (2) LM622	TS2 Interface Module/ Edge Connect/ LCD Monitor				(4) 12pr #19	FSK			5.8GHZ Nitro		Digi Portserver / Verizon 4 port switch		Dimensions	side-mount cabinet	4	Opticom	562	2	SWC	III-CF	Master Location. Exist phone drop abandoned.
16	Adams St & Blackhawk Wy	P-44, PNG	18" Raised	NEC	Econolite	ASC 3-2100		MMU	16 LE	Video	Econolite	Solo Pro	(3) Solo Pro Camera					(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	754	1	NEC	III-CF	
17	Avenue 52 & Avenida Bermudas	P-44, PNG	18" Raised	NEC	Econolite	ASC 3-2100		MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ B/W Monitor				(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752	2	NEC	III-CF	
18	Airport Blvd & Madison St	P-44	18" Raised	SEC	Econolite	ASC 2S-2100		MMU	16 E	Video	Iteris	Edge 2	(3) RZ4 Camera	TS2 Interface Module/ Edge Connect											Dimensions	side-mount cabinet	4	Opticom	762 / 562	1 EA	SEC	III-CF	No Comm. Signal Offline. Uses WWV for TOD source
19	Jefferson St & Pomelo	P-44, PNG	18" Raised	SWC	Econolite	ASC 2S-2100		MMU	16 E	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera (6) LM622	TS2 Interface Module								900MHZ	GDI 900DS			Dimensions	side-mount cabinet	4	Opticom	752	2	SWC	III-CF	
20	Washington St & Fred Waring	R, PNG	4" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(16) Model G / LM622		(2) 12 SMFO, (2) 36 SMFO	2U 24 port wall	IFS D9130-B										Opticom	752	2	NWC	III-CF	*Shared with the City of Palm Desert
21	Washington St & Miles Ave	P-44, PNG	18" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 LE	Video	Iteris	Vector	(4) Vector Camera	TS2 Interface Module/ Edge Connect/ LCD Monitor	(2) 12 SMFO	2U 12 port wall	IFS D9130-B								Myers	stand-alone cabinet	4	Opticom	764	1	NEC	III-CF	*Shared with the City of Palm Desert
22	Washington St & Channel Dr	O	4" Raised	NEC	Econolite	ASC 3-2100		MMU	16 LE	Loop	Econolite	2 CH	(16) LM622					(1) 25pr #19	FSK	Econolite					Dimensions	side-mount cabinet	4	Opticom	752	2	NEC	III-BF	
23	Washington St & Avenue 47 (Point Happy)	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 LE	Loop	Econolite	2 CH	(8) LM622									2400MHZ	GDI 2400DS			Dimensions	side-mount cabinet	4	Opticom	752	2	NWC	III-CF	Signal Offline. 2.4ghz antenna at Eisenhower bad
24	Washington St & Avenue 48	P-44	18" Raised	SWC	Econolite	ASC 2S-2100		MMU	16 LE	Video	Iteris	Edge 2	(3) RZ4 Camera	TS2 Interface Module/ Edge Connect/ LCD Monitor				(1) 12pr #19	GDI 496						Dimensions	side-mount cabinet	4	Opticom	752 Chassis	2	SWC	III-CF	
25	Washington St & Eisenhower Dr	P-44	18" Raised	NWC	Econolite	ASC 2-2100	ASC 2M-1000	MMU	16 LE	Video	Iteris	Edge 2/Vector	(2) RZ4, (2) Vector Camera	TS2 Interface Module/ Edge Connect/ LCD Monitor				(2) 12pr #19	GDI 496			900MHZ / (2) 5.8GHZ Nitro	GDI 900DS	Comnet 8 port # CWFE8MS		Myers	stand-alone cabinet	4	Opticom	764	1	NWC	III-CF	Master Location. Exist phone drop abandoned. Repeater Location from Hwy 111 Master to City Hall
26	Washington St & Avenue 50	P-44, PNG	18" Raised	SWC	Econolite	ASC 2S-2100		MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ Edge Connect/ LCD Monitor				(1) 12pr #19	(3) GDI 496	Econolite		900MHZ			Dimensions	stand-alone cabinet	4	Opticom	752	2	NEC	III-BF	Exist 900MHZ wireless disconnected
27	Washington St & Village Shopping Ctr	P-44	18" Raised	SWC	Econolite	ASC 2S-2100		MMU	16 E	Video / Loop	Iteris	Edge 2	(1) RZ4 Camera, (6) LM 622									900MHZ	GDI 900DS			Dimensions	side-mount cabinet	4	Opticom	562	1	SWC	III-CF	
28	Washington St & Calle Tampico	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Video	Iteris	Edge 2/Vector	(2) RZ4, (2) Vector Camera	TS2 Interface Module/ Edge Connect/ LCD Monitor				(1) 12pr #19	FSK			2400MHZ	GDI 2400DS			Dimensions	side-mount cabinet	4	Opticom	754	1	NEC	III-CF	
29	Washington St & Avenue 52	P-44	18" Raised	NWC	Econolite	ASC 3-2100	ASC 2M-1000	MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ LCD Monitor				(1) 6pr #19	FSK			900MHZ / 5.8GHZ Nitro	GDI 2400DS	Digi Portserver		Dimensions	side-mount cabinet	4	Opticom	760 Chassis/ 764	1 EA	NEC	III-BF	Master Location. Exist phone drop abandoned.
30	Eisenhower Dr & Calle Tampico	P-44, PNG	18" Raised	NEC	Econolite	ASC 3-2100		MMU	16 LE	Video	Econolite	Autoscope	(4) Solo Pro Camera					(2) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752	2	NEC	III-CF	
31	Washington St & Sagebrush Ave	R, PNG	18" Raised	SEC	Econolite	ASC 2S-2100		MMU	16 LE	Video	Econolite	Autoscope	(3) Solo Pro Camera					(2) 12pr #19	GDI 496						Dimensions	side-mount cabinet	4	Opticom	752	2	SEC	III-BF	
32	Avenue 52 & Cetrino (Silver Rock Wy)	P-44, PNG	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Video	Econolite	Autoscope	(4) Solo Pro Camera									900MHZ	GDI 900DS			Dimensions	side-mount cabinet	4	Opticom	752	2	NWC	III-CF	
33	Washington St & Palm Royale Dr	R, PNG	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(16) LM622		(1) 12 SMFO	2U 12 port wall	IFS D9130-B										Opticom	752	2	NEC	III-CF	*Shared with City of Palm Desert
34	Washington St & Simon Dr	332	4" Raised	NEC	Econolite	ASC 3 Rack		CMU	2010 ECL	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (4) 222					(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752	2	NEC	III-CF	
35	Miles Ave Pedestrian Crossing	P-44, PNG	18" Raised	SWC	Econolite	Cobalt		MMU	16 E	Video	Econolite	Autoscope	(2) Solo Pro Camera					(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	452	1	SWC	III-BF	
36	Dune Palms Rd & Desert Crest Dr	P-44, PNG	18" Raised	NEC	Econolite	Cobalt		MMU	16 E	Video	Econolite	Autoscope	(3) Solo Pro Camera					(2) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752	2	NEC	III-BF	
37	Jefferson St & Avenue 49	R, PNG	4" Raised	SWC	Econolite	ASC 2S-2100	ASC 2M-1000	MMU	16 LE	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (6) LM622					(2) 12pr #19	GDI 496			5.8GHZ Nitro		Digi Portserver		Myers	stand-alone cabinet	4	Opticom	752	2	SWC	III-BF	Master Location. Exist phone drop abandoned.
38	Adams St & Avenue 47	332	4" Raised	NEC	Econolite	ASC 3 Rack		CMU	2010 ECL	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (2) 222					(1) 12pr #19	GDI 496			900MHZ	GDI 900DS			Myers	stand-alone cabinet	4	Opticom	752	2	NEC	III-CF	
39	Dune Palms Rd & Blackhawk Wy (Westward Ho)	P-44, PNG	18" Raised	SWC	Econolite	Cobalt		MMU	16 E	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (2) LM622					(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	452 / 752	1 EA	SWC	III-BF	
40	Fred Waring Dr & Palm Royale Dr	P-44, PNG	18" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (2) LM622		(1) 12 SMFO	1U 12 port rack	IFS D9130-B			Econolite					Dimensions	side-mount cabinet	4	Opticom	754	1	NEC	III-CF	*Shared with City of Palm Desert

Regional Traffic Signal Synchronization Program
City of La Quinta
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
41	Miles Ave & Seeley Dr	P-44, PNG	18" Raised	SEC	Econolite	ASC 2S-2100		MMU	16 LE	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (2) LM622		(1) 12 SMFO	2U 12 port wall	IFS D9130-B			Econolite						Dimensions	side-mount cabinet	4	Opticom	752	1	SEC	III-CF	*Shared with City of Palm Desert
42	Adams St & Corporate Centre	P-44, PNG	18" Raised	SWC	Econolite	Cobalt		MMU	16 LE	Video	Iteris	Edge 2/Vector	(2) RZ4, (2) Vector Camera	TS2 Interface Module/ Edge Connect				(1) 12pr #19	FSK	Econolite						Dimensions	stand-alone cabinet	4	Opticom	764	1	SWC	III-CF	Polara APS Station
43	Highway 111 & Plaza La Quinta	O, PNG	4" Raised	SWC	Econolite	ASC 3-2100		MMU	16 LE	Loop	Econolite	2 CH	(16) LM622					(1) 25pr #19	FSK	Econolite						Dimension	side-mount cabinet	4	Opticom	752	1	SWC	III-CF	
44	Highway 111 & Washington St	R, PNG	4" Raised	SEC	Econolite	ASC 3-2100	ASC 2M-1000	MMU	16 LE	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera, (10) LM622	TS2 Interface Module/ LCD Monitor				(3) 25pr, (1) 12pr #19	GDI 496	Econolite	Ruggedcom RS900L	5.8GHZ Nitro		Digi Portserver		Dimensions	side-mount cabinet	4	Opticom	764	1	SEC	III-CF	Master Location. Exist phone drop abandoned.
45	Highway 111 & Simon Dr	O, PNG	4" Raised	NWC	Econolite	ASC 3-2100		MMU	16 LE	Video	Iteris	Edge 2/Vector	(2) RZ4, (2) Vector Camera	TS2 Interface Module/ Edge Connect/ LCD Monitor				(1) 25pr, (1) 12pr #19	FSK	Econolite						Alpha	side-mount cabinet	4	Opticom	752	2	NWC	III-BF	
46	Highway 111 & La Quinta Center (Target)	O, PNG	4" Raised	NWC	Econolite	ASC 3-2100		MMU	16 LE	Loop	Econolite	2 CH	(16) LM622					(2) 12pr #19	FSK	Econolite						Alpha	side-mount cabinet	4	Opticom	752	2	NWC	III-BF	
47	Highway 111 & Adams St	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (5) LM622					(4) 12pr #19	FSK	Econolite						Dimensions	stand-alone cabinet	4	Opticom	764	1	NWC	III-BF	
48	Highway 111 & La Quinta Dr (Walmart)	P-44, PNG	18" Raised	SEC	Econolite	ASC 3-2100		MMU	16 E	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (8) LM622					(1) 12pr, (1) 6pr #19	FSK	Econolite						Dimensions	stand-alone cabinet	4	Opticom	562	2	SEC	III-CF	
49	Highway 111 & Dune Palms Rd	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (5) LM622					(2) 12pr, (1) 6pr #19	FSK	Econolite						Dimensions	stand-alone cabinet	4	Opticom	764	1	NWC	III-BF	
50	Highway 111 & Depot Dr	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (3) LM622					(3) 6pr #19	FSK	Econolite						Dimensions	stand-alone cabinet	4	Opticom	454	1	NWC	III-CF	
51	Highway 111 & Jefferson St	O, PNG	4" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Video	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module				(1) 12pr, (1) 6pr #19	FSK	Econolite						Dimensions	side-mount cabinet	4	Opticom	764	1	NWC	III-BF	
52	Avenue 52 & Desert Club Dr	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera, (2) G68	TS2 Interface Module/ B&W Monitor				(2) 6pr #19	FSK	Econolite						Dimensions	stand-alone cabinet	4	Opticom	454	1	SWC	III-BF	
53	Dune Palms Rd & Vista Coralina Ln	P-44, PNG	18" Raised	NEC	Econolite	ASC 3-2100		MMU	16 LE	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera, (2) LM622	TS2 Interface Module/ LCD Monitor				(2) 12pr #19	FSK	Econolite						Dimensions	stand-alone cabinet	4	Opticom	454	1	NEC	III-BF	
54	Washington St & Via Sevilla	P-44, PNG	18" Raised	SEC	Econolite	ASC 3-2100		MMU	16 E	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera, (4) LM622	TS2 Interface Module/ LCD Monitor	(1) 12 SMFO	1U 12 port wall	IFS D-9130B			Econolite						Dimensions	side-mount cabinet	4	Opticom	462	2	SEC	III-CF	*Shared with City of Palm Desert

Appendix A1.7:

Existing Traffic Signal System Equipment Matrix

City of Palm Desert

Regional Traffic Signal Synchronization Program

City of Palm Desert

Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
1	Cook St & Aztec Rd	R, PNG	4" Raised	NWC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(8) G-68		(1) 36 SMFO	1U 6 port wall	Etherwan EX73222												Opticom	752	1	NWC	III-CF		IP based Controller
2	Cook St & Merle Dr	P-44	18" Raised	NEC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(7) Model G (1) 622		(1) 36 SMFO	1U 12 port wall	Etherwan EX73222												Opticom	452 / 562	1 EA	NEC	III-CF	Required	IP based Controller
3	Cook St & Avenue 42	P-44	18" Raised	SEC	Econolite	ASC 3-2100		MMU	16	Loop	Econolite	2 CH	(8) Model G		(3) 12 SMFO	(3) 12 port pre-term panel	Etherwan EX73222												Opticom	752	2	SEC	III-CF		IP based Controller. Side Mount Cabinet (Fiber Optic)
4	Cook St & Frank Sinatra Dr	P-44	18" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(13) Model G		(3) 12 SMFO	4U 24 port wall	Etherwan EX71440							ASC/2 Ethernet Module					Opticom	562	2	NWC	III-CF		IP based Controller. Side Mount Cabinet (Fiber Optic)
5	Cook St & University Park Dr / Berger Dr	P-44	18" Extension	NEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(16) G-68		(1) 18 SMFO, (1) 12 SMFO	2U 12 port wall	Etherwan EX73222							ASC/2 Ethernet Module					Opticom	752	2	NEC	III-CF		IP based Controller
6	Cook St & Gerald Ford Dr	R, PNG	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(16) LM622		(1) 12 SMFO	2U 12 port wall	Etherwan EX73222							ASC/2 Ethernet Module					Opticom	752	2	SWC	III-CF		IP based Controller
7	Country Club Dr & Monterey Ave	P-44	18" Raised	SEC	Econolite	ASC 2S-2100		MMU	16	Loop	Econolite	2 CH	(16) Model G		(3) 36 SMFO, (1) 6 SMFO	Breakout cable	IFS D9130-B												Opticom	562 / 752	1 EA	SEC	III-CF		Existing Fiber Optic HUB Cabinet (Type 336). 4U Rack Mount FDU, (3) 36 SMFO Cables
8	Country Club Dr & Via Scena	P-44, PNG	18" Extension	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(12) G-68		(1) 12 SMFO	2U 12 port wall	IFS D9130-B												Opticom	752	1	NWC	III-CF		
9	Country Club Dr & Suncrest Regent	P-44	18" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G		(1) 36 SMFO	2U 12 port wall	IFS D9130-B												Opticom	762	1	NEC	III-CF		
10	Country Club Dr & Palm Greens Via Portofino	P-44	18" Extension	NEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G / 622		(2) 36 SMFO	Breakout cable	IFS D9130-B												Opticom	752	1	NEC	III-CF		Polara APS Station
11	Country Club Dr & Portola Ave	P-44	4" Raised	SEC	Econolite	ASC 3-1000		MMU	16 E	Loop	Econolite	2 CH	(9) Model G		(3) 36 SMFO	(9) 12 port pre-term panel	IFS D9130-B									Dimensions	inside cabinet	2 EA	Opticom	562	2	SEC	III-CF	Required	Side Mount Cabinet (Fiber Optic)
12	Country Club Dr & Desert Springs/Desert Willow	R, PNG	4" Raised	SEC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(12) G-68 / LM622		(1) 36 SMFO	2U 12 port wall	Etherwan EX73222															SEC	III-CF		IP based Controller
14	Cook St & Country Club Dr	R, PNG	4" Raised	SEC	Econolite	ASC 3-2100		MMU	16 E	Loop	Reno	2 CH	(16) G-200		(1) 36 SMFO	2U 12 port wall	Etherwan EX73222												Opticom	762	2	SEC	III-CF		IP based Controller
15	Country Club Dr & Desert Falls Pkwy	P-44	18" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(7) Model G									900MHZ	GDI 900DS						Opticom	752	1	NEC	III-CF		
16	Country Club Dr & El Dorado Dr	P-44	18" Raised	SEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G									900MHZ	GDI 900DS						Opticom	562	2	SEC	III-CF		
17	Country Club Dr & Palm Valley Dr / Indian Ridge Dr	P-44	18" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) LM622									900MHZ	GDI 900DS						Opticom	562	2	NWC	III-CF		
18	Country Club Dr & Oasis St/ Tamarisk St	P-44	18" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(12) LM622					(1) 12pr #19	FSK			900MHZ	GDI 900DS						Opticom	752	2	NWC	III-CF		
19	Country Club Dr & Resorter / Liberty	P-44	18" Raised	SEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) LM622					(2) 6pr #19	FSK										Opticom	752 / 562	1 EA	SEC	III-CF		
20	Country Club Dr & Park Center Dr / Barrington Dr	P-44	18" Raised	NWC	Econolite	ASC 2-1000	ASC 2M-1000	MMU	16	Loop	Econolite	2 CH	(8) LM622					(2) 6pr #19	FSK			900MHZ	GDI 900DS						Opticom	562 / 752	1 EA	NWC	III-CF	Required	Master Location. Exist phone drop to City Hall
21	Country Club Dr & Harris Ln	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(8) LM622					(2) 6pr #19	FSK										Opticom	752	2	NWC	III-CF	Required	
22	Dinah Shore Dr & Toni Dr	R, PNG	4" Raised	NWC	Econolite	ASC 2S-2100		MMU	16	Loop	Econolite	2 CH	(8) G-68		(2) 36 SMFO	2U 12 port wall	IFS D9130-B												Opticom	752	2	NWC	III-CF		
23	Dinah Shore Dr & Gateway Dr	R, PNG	4" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(8) G-68		(1) 24 SMFO	Breakout cable	IFS D9130-B												Opticom	752	2	NWC	III-CF		
24	Dinah Shore Dr & Miriam Wy	P-44	18" Raised	NEC	Econolite	ASC 2S-2100		MMU	16	Loop	Econolite	2 CH	(8) Model G					(1) 12pr #18	FSK										Opticom	M-262	2	NEC	III-CF		
25	Dinah Shore Dr & Shoppers Ln	P-44	18" Extension	NWC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(11) Model G					(2) 12pr #18	FSK										Tomar	4 CH	1	NWC	III-CF		
26	Dinah Shore Dr & Key Largo Ave	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622			Econolite						2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	752	2	SWC	III-CF		*Shared with City of Rancho Mirage
27	Dinah Shore Dr & Dick Kelly Dr	R, PNG	4" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(13) LM622		(1) 24 SMFO	2U 12 port wall	IFS D9130-B												Opticom	752	2	NEC	III-CF		
28	El Paseo & San Pablo Ave	M-38	18" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G					(1) 12pr #19	FSK										Opticom	562	2	NWC	III-CF		Exist phone drop to City Hall
29	El Paseo & Larkspur Ln	P-44	18" Raised	NWC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(8) G-68					(2) 12pr #19	FSK										Opticom	752	2	NWC	III-CF		
30	El Paseo & San Luis Rey Ave	R	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(5) G-68					(1) 12pr #19	FSK										Opticom	562	2	NEC	III-BF		
31	Frank Sinatra & College Dr	R, PNG	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(9) LM622		(1) 12 SMFO	2U 12 port wall	Etherwan EX73222							ASC/2 Ethernet Module					Opticom	752	2	NEC	III-CF		IP based Controller
32	Frank Sinatra & Berger Dr	R, PNG	4" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(11) Model G		(1) 12 SMFO	12 port pre-term panel	Etherwan EX73222							ASC/2 Ethernet Module					Opticom	452	2	NWC	III-CF		IP based Controller
33	Frank Sinatra & Gerald Ford Dr	R, PNG	4" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 LE	Loop	Econolite	2 CH	(11) G-68		(1) 12 SMFO	12 port pre-term panel	Etherwan EX73222							ASC/2 Ethernet Module		Dimensions	side mount cabinet	4 EA	Opticom	752	2	NWC	III-CF		IP based Controller. Polara APS station
34	Fred Waring Dr & Warner Trl	P-44	18" Raised	SWC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(12) G-68 / LM622		(1) 12 SMFO	2U 12 port wall	IFS D9130-B												Opticom	262 / 562	1 EA	SWC	III-CF		*Shared Indian Wells Intersection
35	Fred Waring Dr & Desert Breezes / Church	R, PNG	4" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(16) G-68		(1) 12 SMFO	2U 12 port wall	IFS D9130-B												Opticom	752	2	NWC	III-CF		
36	Fred Waring Dr & Monterey Ave	R	4" Raised	SEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(16) G200 / LM622		(1) 24 SMFO	2U 12 port wall	IFS D9130-B									Dimensions	side mount cabinet	4 EA	Opticom	562	2	SEC	III-CF		Polara APS Station
37	Fred Waring Dr & College of the Desert	P-44, PNG	18" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Video / Loop	Econolite	Autoscope	(2) Solo Pro, (2) Model G	B/W Monitor	(1) 24 SMFO	1U 6 port wall	IFS D9130-B												Opticom	752	2	SWC	III-CF		
38	Fred Waring Dr & San Pablo Ave	R	4" Raised	SEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(13) Model G / 200		(1) 36 SMFO, (1) MMFO	2U 24 port rack, 2U 6 port wall	IFS D9130-B, IFS D-9110-B					900MHZ	GDI 900DS			Dimensions	side mount cabinet	4 EA	Opticom	562	2	SEC	III-CF		Polara APS Station
39	Fred Waring Dr & San Pascual Ave	P-44	18" Raised	SEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(13) G-68 / 622		(1) 36 SMFO	2U 12 port wall	IFS D9130-B												Opticom	462	1	SEC	III-CF		Side mount cabinet (Fiber Optic)

Regional Traffic Signal Synchronization Program
City of Palm Desert
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
41	Fred Waring Dr & Portola Ave	R, PNG	4" Raised	NWC	Econolite	ASC 3-2100		MMU	16 LE ip	Loop	Reno	2 CH	(16) G-200		(1) 24 SMFO, (1) 12 SMFO	2U 24 port wall	IFS D9130-B									Dimensions	side mount cabinet	4 EA	Opticom	562	2	NWC	III-CF		
42	Fred Waring Dr & Deep Canyon Rd	R, PNG	4" Raised	SWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(14) Model G		(1) 12 SMFO	2U 12 port wall	IFS D9130-B												Opticom	562	2	SWC	III-CF		
43	Fred Waring Dr & Phyllis Jackson Ln	R	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(12) Model G / 622		(1) 36 SMFO	Breakout cable	IFS D9130-B												Opticom	752 / 562	1 EA	NEC	III-CF		
44	Fred Waring Dr & Cook St	R	4" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(15) LM622		(1) 36 SMFO	Breakout cable	IFS D9130-B												Opticom	562	2	NWC	III-CF		*Shared Indian Wells Intersection
45	Fred Waring Dr & California Dr	R	4" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(6) G-68		(1) 12 SMFO	2U 12 port wall	IFS D9130-B												Opticom	752	2	NEC	III-CF		
46	Fred Waring Dr & Town Ctr	R, PNG	4" Raised	SWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(15) Model G		(1) 36 SMFO	2U 24 port wall	IFS D9130-B					900MHZ	GDI 900DS						Opticom	562	2	SWC	III-CF		
47	Gateway Dr & Dick Kelly Dr	R, PNG	4" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(8) LM622		(1) 12 SMFO	2U 12 port wall	IFS D9130-B												Opticom	752	2	NWC	III-CF		
48	Gerald Ford Dr & Technology Dr	R, PNG	4" Raised	SWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(13) LM622		(1) 12 SMFO	2U 12 port wall	Etherwan EX73222							ASC/2 Ethernet Module					Opticom	752	2	SWC	III-CF		IP based Controller
49	Gerald Ford Dr & Pacific Ave	R, PNG	4" Raised	SWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(14) LM622 / 200		(1) 12 SMFO	2U 12 port wall	Etherwan EX73222							ASC/2 Ethernet Module					Opticom	752	2	SWC	III-CF		IP based Controller
50	Gerald Ford Dr & Gateway Dr	R, PNG	4" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(8) LM622		(1) 12 SMFO	2U 24 port wall	IFS D9130-B												Opticom	752	2	NWC	III-CF		
51	Hovley Ln East & Corporate Wy	P-44	18" Raised	SWC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(8) Model G		(1) 12 SMFO	1U 12 port wall	IFS D9130-B												Opticom	752	2	SWC	III-CF		
53	Cook St & East Hovley Ln	R, PNG	4" Raised	NEC	Econolite	ASC 3-2100		MMU	16 E	Loop	Econolite	2 CH	(16) G-200		(3) 36 SMFO, (1) 6 SMFO	2U 6 port wall	Etherwan EX73222												Opticom	762	2	NEC	III-CF		IP Based Controller. Existing Fiber Optic HUB Cabinet (Type 336). 4U Rack Mount FDU, (3) 36 SMFO Cables
54	Hovley Ln East & Beacon Hill / Largo	P-44	18" Raised	SWC	Econolite	ASC 3-2100		MMU	16 E	Video / Loop	Iteris	Edge 2	(2) RZ4 camera, (4) Model G	B/W Monitor	(1) 12 SMFO	1U 12 port wall	Etherwan EX73222												Opticom	752	2	SWC	III-CF		IP based Controller
55	Hovley Ln East & Water Wy	P-44, PNG	18" Raised	SEC	Econolite	ASC 3-2100		MMU	16 LE ip	Loop	Econolite	2 CH	(5) G-68		(1) 12 SMFO	2U 12 port wall	Etherwan EX73222												Opticom	562	1	SEC	III-CF		IP based Controller
56	Hovley Ln East & El Dorado Dr	R, PNG	4" Raised	SEC	Econolite	ASC 3-1000		MMU	16 E	Loop	Econolite	2 CH	(11) G-68		(1) 36 SMFO	2U 12 port wall	Etherwan EX73222												Opticom	752	2	SEC	III-CF		*Shared Indian Wells Intersection. IP based Controller
57	Hovley Ln East & Casbah Wy / Indian Ridge Dr	P-44	18" Raised	SWC	Econolite	ASC 3-1000		MMU	16 E	Video / Loop	Iteris	Edge 2	(1) RZ4 camera, (6) Model G	B/W Monitor	(1) 36 SMFO	2U 12 port wall	Etherwan EX73222	(1) 6pr #19			Etherwan ED3175								Opticom	752	1	SWC	III-CF		IP based Controller
58	Hovley Ln East & Oasis St	R, PNG	4" Raised	SWC	Econolite	ASC 3-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G					(2) 6pr #19			Etherwan ED3175								Opticom	752	2	SWC	III-CF		IP based Controller
59	Hovley Ln East & Warner Trl	P-44	18" Raised	SEC	Econolite	ASC 3-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G					(1) 6pr #19			Etherwan ED3175								Opticom	762 / 752	1 EA	SEC	III-CF		IP based Controller
60	Highway 111 & Hospitality Row	R, PNG	4" Raised	NWC	Econolite	Cobalt		MMU	16 LE ip	Loop	Econolite	2 CH	(10) G-200					(1) 6pr #19	FSK							Dimensions	side mount cabinet	4 EA	Opticom	752	1	NWC	III-CF		
61	Highway 111 & Deep Canyon Rd	R, PNG	4" Raised	NWC	Econolite	Cobalt		MMU	16 LE ip	Loop	Econolite	2 CH	(14) G-200 / G-68					(2) 6pr #19	FSK							Dimensions	side mount cabinet	4 EA	Opticom	752	1	NWC	III-CF		
62	Highway 111 & El Paseo / Cabrillo Ave	R, PNG	4" Raised	SWC	Econolite	Cobalt		MMU	16 LE ip	Loop	Econolite	2 CH	(15) LM622					(2) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Opticom	752	1	SEC	III-CF		
63	Highway 111 & San Luis Rey Ave	332	4" Raised	SWC	Econolite	ASC 2S-2100		CMU	2010 ECL	Loop	Reno	2 CH	(12) 222					(2) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Opticom	M-252	1	SWC	III-CF		
64	Highway 111 & Portola Ave	332	4" Raised	NEC	Econolite	ASC 2S-2100		CMU	2010 ECL	Loop	Reno	2 CH	(18) 222		(1) 36 SMFO	1U 24 port rack		(2) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Opticom	M-252	2	NEC	III-CF		
65	Highway 111 & San Pablo Ave	R, PNG	4" Raised	NEC	Econolite	ASC 2S-2100	ASC 2M-1000	MMU	16 E	Loop	Econolite	2 CH	(16) G-68					(2) 6pr #19	GDI 496			900MHZ	GDI 900DS			Dimensions	side mount cabinet	4 EA	Opticom	752	2	NEC	III-CF	Required	Master Location. Exist wireless to Fred Waring/San Pablo.
66	Highway 111 & Highway 74	R, PNG	4" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 LE ip	Loop	Econolite	2 CH	(16) G-68					(3) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Opticom	762 / 752	1 EA	NWC	III-CF		
67	Highway 111 & Plaza Wy	R, PNG	4" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(15) LM622					(2) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Tomar	4 CH	1	NEC	III-CF		
69	Highway 111 & Town Center Wy/ El Paseo	332	4" Raised	NEC	Econolite	ASC 2S-2100		CMU	2010 ECL	Loop	Reno	2 CH	(16) 222					(2) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Opticom	752	2	NEC	III-CF		
70	Highway 111 & Desert Crossing	332	4" Raised	NWC	Econolite	ASC 2S-2100		CMU	2010 ECL	Loop	Reno	2 CH	(14) 222					(2) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Opticom	752	1	Mid-block	III-CF		
71	Highway 111 & Fred Waring Dr	R, PNG	4" Raised	SEC	Econolite	ASC 2S-2100		MMU	16 LE ip	Loop	Econolite	2 CH	(16) G-200					(2) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Opticom	752	2	SEC	III-CF		Intersection under construction
72	Highway 111 & Parkview Dr	332	4" Raised	NEC	Econolite	ASC 2S-2100		CMU	2010 ECL	Loop	Reno	2 CH	(13) 222					(1) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Tomar	4 CH	1	NEC	III-CF		
73	Highway 74 & El Paseo	332	4" Raised	NEC	Econolite	ASC 2S-2100		CMU	2010 ECL	Loop	Reno	2 CH	(12) 222					(1) 6pr #19	GDI 496							Dimensions	side mount cabinet	4 EA	Opticom	752	2	NEC	III-CF		
74	Highway 74 & Shadow Mountain Dr	332	4" Raised	SWC	Econolite	ASC 2S-2100		CMU	2010 ECL	Loop	Reno	2 CH	(12) 222									900MHZ	GDI 900DS			Dimensions	side mount cabinet	4 EA	Opticom	752	2	SWC	III-CF		Exist wireless to City Yard
75	Highway 74 & Haystack Rd	332	4" Raised	SWC	Econolite	ASC 2S-2100		CMU	2010 ECL	Loop	Reno	2 CH	(12) 222									900MHZ	GDI 900DS						Opticom	752	1	SWC	III-CF		Exist wireless to City Yard
76	Monterey Ave & Frank Sinatra Dr	P44	24"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(16) LM 622		(1) 12 SMFO	2U 12 Port Wall	IFS D9130		RS232							ElectroTechs	Inside Cabinet	2	Opticom	752	2	NEC	III-CF		*Shared with City of Rancho Mirage
77	Monterey Ave & Gerald Ford Dr	R	12"	NWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(12) LM 622		(1) 24 SMFO		IFS D9130-B		RS232							Dimensions	Inside Cabinet	4	Opticom	562	2	NWC	III-CF		*Shared with City of Rancho Mirage
78	Monterey Ave & Market Pl	P44	18"	NWC	Econolite	ASC/2S-2100		MMU	16	Loops	Econolite	2 CH	(7) LM 622 & (6) LM622t		(2) 6 SMFO		GE D9130-B		RS232							ElectroTechs	Inside Cabinet	2	Opticom	752	1	NWC	III-CF		*Shared with City of Rancho Mirage
79	Monterey Ave & Dinah Shore Dr	P-44	18" Raised	NWC	Econolite	ASC 2S-2100	ASC 2M-1000	MMU	16 E	Loop	Econolite	2 CH	(15) Model G / LM622		(2) 36 SMFO, (1) 6 SMFO	(6) 12 port pre-term panel	IFS D9130-B, IFS D9130-E	(1) 6pr #18											Opticom	752	2	NWC	III-CF	Required	Master Location. Side Mount Cabinet (Fiber Optic)
80	Monterey Ave & Dick Kelly Dr	R, PNG	4" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(9) G-68		(2) 12 SMFO	2U 24 port wall	IFS D9130-B												Opticom	752 / 762	1 EA	NWC	III-CF		*Shared with City of Rancho Mirage

Regional Traffic Signal Synchronization Program
City of Palm Desert
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
81	Monterey Ave & Shadow Ridge Rd	P-44	18" Raised	NEC	Econolite	ASC 3-2100		MMU	16	Loop	Econolite	2 CH	(8) LM622		(1) 36 SMFO	2U 12 port wall	IFS D9130-B											Opticom	752	1	NEC	III-CF		
82	Monterey Ave & Hovley Ln West	P-44	18" Raised	SEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(12) Model G / LM622		(1) 36 SMFO	1U 12 port wall	IFS D9130-B											Opticom	752	2	SEC	III-CF		
83	Monterey Ave & Avenida Del Sol / Clancy Ln	R	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Video / Loop	Iteris	Versicam	(1) RZ4 camera, (5) LM622		(1) 36 SMFO	1U 12 port wall	IFS D9130-B											Opticom	562	1	NWC	III-CF		*Shared with City of Rancho Mirage
85	Monterey Ave & Gran Via /Avenida Las Palmas	P-44	18" Raised	SWC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(5) Model G / LM622		(1) 36 SMFO	1U 12 port wall	IFS D9130-B											Opticom	752	1	SWC	III-CF		*Shared with City of Rancho Mirage
86	Monterey Ave & Parkview Dr	R, PNG	4" Raised	SWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(12) G-200		(1) 24 SMFO	1U 12 port wall	IFS D9130-B									Dimensions	side mount cabinet	4 EA	Opticom	762	2	SWC	III-CF		Polara APS Station
87	Monterey Ave & San Gorgonio Wy	P-44	18" Extension	SWC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(8) G-200 / LM622									900MHZ	GDI 900DS						Opticom	562	2	SWC	III-BF	Required	Exist wireless to City Yard
88	El Paseo & Portola Ave																												Opticom						Intersection under construction. 4-way stop operation
89	Portola Ave & Gerald Ford Dr	R, PNG	4" Raised	SEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(16) LM622		(4) 36 SMFO, (1) 6 SMFO	1U 12 port wall	Etherwan EX73222							ASC/2 Ethernet Module					Opticom	752	2	SEC	III-CF		IP Based Controller. Existing Fiber Optic HUB Cabinet (Type 336). (2) Rack Mount FDU, (4) 36 SMFO Cables
90	Portola Ave & Julie College	R, PNG	4" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(12) LM622		(1) 12 SMFO	2U 12 port wall	Etherwan EX73222							ASC/2 Ethernet Module					Opticom	752	2	NEC	III-CF		IP based Controller
91	Portola Ave & De Anza Wy	R, PNG	4" Raised	SWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G		(1) 18 SMFO, (2) 36 SMFO	2U 24 port wall	IFS D9130-B											Opticom	752	2	SWC	III-CF		
92	Portola Ave & Rutledge Wy	P-44, PNG	18" Raised	SWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(7) Model G		(1) 12 SMFO	Breakout Cable	IFS D9130-B											Opticom	562	2	SWC	III-CF		
93	Portola Ave & Magnesia Falls Dr	R, PNG	4" Raised	SEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(10) Model G		(2) 36 SMFO	2U 12 port wall	IFS D9130-B											Opticom	762 / 752	1 EA	SEC	III-CF		
94	Portola Ave & Quicksilver St																																		Intersection under construction
95	Portola Ave & Chaparral Dr/ Via Venezia	R, PNG	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Video / Loop	Iteris	Edge 2	(2) RZ4 camera, (10) Model G	B/W Monitor	(1) 36 SMFO	Breakout Cable	IFS D9130-B	(2) 6pr #19										Opticom	752	1	NEC	III-CF		
96	Portola Ave & Hovley Ln East	P-44, PNG	18" Raised	NEC	Econolite	ASC 3-1000		MMU	16 LE ip	Loop	Econolite	2 CH	(8) G-68		(3) 36 SMFO	(9) 12 port pre-term panel	IFS D9130-B									Myers	Service Cabinet	4 EA	Opticom	562 / 752	1 EA	NWC	III Modified		
97	Portola Ave & Hovley Ln West	R	4" Raised	SEC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(8) Model G / LM622		(1) 36 SMFO	1U 12 port wall	IFS D9130-B											Opticom	752	2	SWC	III-CF		
98	Portola Ave & Shadow Mountain Dr	R	4" Raised	SWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G					(1) 12 pr #19, (2) 6pr #19	FSK									Opticom	752	2	SWC	III-CF		Intersection under construction
99	Town Center Wy & Hahn Rd	R, PNG	4" Raised	SWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(8) Model G									900MHZ	GDI 900DS					Opticom	752	1	Mid Block	III-CF		
100	Washington St & Country Club Dr	P-44, PNG	18" Raised	SEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(16) Model G					(2) 6pr #19	FSK									Opticom	562	2	SEC	III-CF		*Shared with County of Riverside
101	Washington St & Palm Royale Dr/ Mountain View Ave	R, PNG	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(16) LM622		(1) 12 SMFO	2U 12 port wall	IFS D9130-B											Opticom	752	2	NEC	III-CF		*Shared with City of La Quinta
102	Washington St & Fred Waring Dr	R, PNG	4" Raised	NWC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(16) Model G / LM622		(2) 12 SMFO, (2) 36 SMFO	2U 24 port wall	IFS D9130-B											Opticom	752	2	NWC	III-CF		*Shared with the City of La Quinta
103	Washington St & Ave of the States	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Shelf	2 CH	(11) Shelf mount		(2) 36 SMFO	2U 12 port wall	IFS D9130-B											Opticom	762 Chassis	1	NWC	III-CF		*Shared with the County of Riverside
104	Washington St & Avenue 42 / Hovley Ln East	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16	Loop	Shelf	2 CH	(11) Shelf mount		(1) 12 SMFO	2U 12 port wall	IFS D9130-B											Opticom	562 Chassis	2	NWC	III-CF		*Shared with the County of Riverside
105	Washington St & Harris Ln	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		CMU	LCD-12 P	Loop	Shelf	2 CH	(8) Shelf mount		(1) 12 SMFO	1U 12 port wall	IFS D9130-B	(1) 6pr #19										Opticom	752 Chassis	1	NWC	III-CF		*Shared with the County of Riverside
106	Washington St & Avenue 41	R, PNG	4" Raised	NEC	Econolite	ASC 3-2100		MMU	16 LE	Loop	Econolite	2 CH	(10) G-68		(1) 12 SMFO	1U 12 port wall	IFS D9130-B									Myers	side mount cabinet	4 EA	Opticom	452	2	NEC	III-CF		*Shared with the County of Riverside
107	Frank Sinatra Dr & Portola Ave	R, PNG	4" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(16) G-68		(1) 12 SMFO	1U 12 port wall	Etherwan EX73222											Opticom	452	2	NEC	III-CF		
108	Portola Ave & Dinah Shore Dr																																		Existing 4-way stop. Traffic Signal not constructed yet.
109	Fred Waring Dr & El Dorado Dr	R, PNG	4" Raised	SEC	Econolite	ASC 3-2100		MMU	16 E	Video	Iteris	Edge 2 (4)	(4) RZ4 Camera		(1) 12 SMFO	1U 12 port wall	IFS D9130-B											Opticom	752	2	SEC	III-BF		*Signal on City of Indian Wells
110	Washington St & Miles Ave	P-44, PNG	18" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 LE	Video	Iteris	Vector	(4) Vector Camera	TS2 Interface Module/ Edge Connect/ LCD Monitor	(2) 12 SMFO	2U 12 port wall	IFS D9130-B									Myers	stand-alone cabinet	4	Opticom	764	1	NEC	III-CF		*Shared with City of La Quinta
111	Fred Waring Dr & Palm Royale Dr	P-44, PNG	18" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (2) LM622		(1) 12 SMFO	1U 12 port rack	IFS D9130-B			Econolite						Dimensions	side-mount cabinet	4	Opticom	754	1	NEC	III-CF		*Shared with City of La Quinta
112	Miles Ave & Seeley Dr	P-44, PNG	18" Raised	SEC	Econolite	ASC 2S-2100		MMU	16 LE	Video / Loop	Econolite	Autoscope	(4) Solo Pro Camera / (2) LM622		(1) 12 SMFO	2U 12 port wall	IFS D9130-B			Econolite						Dimensions	side-mount cabinet	4	Opticom	752	1	SEC	III-CF		*Shared with City of La Quinta
113	Washington St & Via Sevilla	P-44, PNG	18" Raised	SEC	Econolite	ASC 3-2100		MMU	16 E	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera, (4) LM622	TS2 Interface Module/ LCD Monitor	(1) 12 SMFO	1U 12 port wall	IFS D-9130B			Econolite						Dimensions	side-mount cabinet	4	Opticom	462	2	SEC	III-CF		*Shared with City of La Quinta

Appendix A1.8:

Existing Traffic Signal System Equipment Matrix

City of Palm Springs

Regional Traffic Signal Synchronization Program
City of Palm Springs
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
1	N Palm Canyon Dr & Tachevah Dr	332	4" Raised	NEC	McCain	170E		CMU	210	Loops	EDI	2 CH	(4) 222					(1) 12pr #19			Etherwan ED3175			170 Ethernet Module									NEC	III-CF		
2	N Palm Canyon Dr & Tamarisk Rd	332	4" Raised	NEC	SafeTran	170E		CMU	210	Loop	EDI	2 CH	(4) 222 / 262					(1) 6pr #19, (1) 12pr #19			Etherwan ED3175			170 Ethernet Module									NEC	III-BF		
3	N Palm Canyon Dr & Granvia Valmonte	332	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(3) Edge 2	(1) Edge Connect	B/W Monitor				(2) 6pr #19			Etherwan ED3175			170 Ethernet Module		Clary	inside cabinet	6	Tomar	4 CH	1	NEC	III-CF		
4	N Palm Canyon Dr & Alejo Rd	332	4" Raised																															*Under Construction
5	N Palm Canyon Dr & Amado Center/ Ped Xing	332	4" Raised	SWC	McCain	170E		CMU	210 E	N/A								(2) 6pr #19			Etherwan ED3175			170 Ethernet Module									NWC	III-BF		
6	N Palm Canyon Dr & Amado Rd	332	4" Raised	NWC	SafeTran	170E		CMU	210 E	Loops	EDI	2 CH	(4) 222					(2) 6pr #19			Etherwan ED3175	(2) 5.8 GHZ		170 Ethernet Module									NWC	III-CF		Quick Bridge link to Hyatt Hotel
7	N Palm Canyon Dr & Andreas Rd	332	4" Raised																															*Under Construction
8	N Palm Canyon Dr & Desert Fashion Ped Xing	332	4" Raised																															*Under Construction
9	S Palm Canyon Dr & Tahquitz Canyon Way	332	4" Raised	SEC	McCain	170E		CMU	210 E	Loops	EDI	2 CH	(4) 222					(2) 6pr #19, (1) 12pr #19			Etherwan ED3175			170 Ethernet Module					Tomar	4 CH	1	SEC	III-BF		NWC under construction
10	S Palm Canyon Dr & La Plaza	332	4" Raised	SWC	McCain	170E		CMU	210	Video	Iteris	(2) Edge 2	(2) Iteris RZ4 Camera	B/W Monitor				(2) 6pr #19			Etherwan ED3175			170 Ethernet Module		Clary	inside cabinet	6	Tomar	4 CH	1	SWC	III-BF		
11	S Palm Canyon Dr & Arenas Rd	332	4" Raised	NWC	SafeTran	170E		CMU	210	Loops	SafeTran	2 CH	(2) 222					(2) 6 Pr #19			Etherwan ED3175			170 Ethernet Module									NWC	III-BF		
12	S Palm Canyon Dr & The Village Green Ped Xing	332	4" Raised	SEC	McCain	170E		CMU	210E	N/A	N/A	N/A	N/A					(2) 6 Pr #19			Etherwan ED3175			170 Ethernet Module									SEC	III-BF		
13	S Palm Canyon Dr & Baristo Rd	332	4" Raised	NEC	McCain	170E		CMU	210E	Loops	SafeTran	2 CH	(2) 222					(1) 6 Pr #19			Etherwan ED3175			170 Ethernet Module									NEC	III-BF		
14	S Palm Canyon Dr & Ramon Rd	332	4" Raised	NWC	McCain	170E		CMU	210E	Loops	SafeTran	2 CH	(3) 222					(2) 6 Pr #19 & (1) 12 Pr #19			Etherwan ED3175			170 Ethernet Module					Tomar	4 CH	1	NWC	III-BF		
15	S Palm Canyon Dr & Camino Parocela	332	4" Raised	SEC	McCain	170E		CMU	210E	Loops	EDI	2 CH	(9) 222					(2) 6 Pr #19			Etherwan ED3175			170 Ethernet Module									NEC	III-CF		
16	S Palm Canyon Dr & Sunny Dunes Rd	332	4" Raised	SWC	SafeTran	170E		CMU	210	Loops	EDI	2 CH	(14) 222					(2) 6 Pr #19			Etherwan ED3175			170 Ethernet Module		Clary	inside cabinet	6				SWC	III-BF		
17	S Palm Canyon Dr & Mesquite Ave	332	4" Raised	SWC	McCain	170E		CMU	210	Loops	EDI, Detection Systems	2 CH	(1) 222 & (1) 262					(1) 6 Pr #19 & (1) 12 Pr #19			Etherwan ED3175			170 Ethernet Module									SWC	II-BF		
18	S Palm Canyon Dr & Morongo Ave	332	4" Raised	SEC	SafeTran	170E		CMU	210	Loops	EDI, Detection Systems	2 CH	(3) 222 & (2) 262					(1) 6 Pr #19 & (1) 12 Pr #19			Etherwan ED3175			170 Ethernet Module									NEC	III-BF		
19	S Palm Canyon Dr & E Palm Canyon Dr	332	4" Raised	SWC	SafeTran	170E		CMU	210	Loops	EDI, Sarasota	2 CH	(5) 222					(1) 6 Pr #19 & (1) 12 Pr #19			Etherwan ED3175			170 Ethernet Module									SEC	III-BF		
20	Camino Real & E Palm Canyon Dr	332	4" Raised	SEC	SafeTran	170E		CMU	210	Video	Iteris	(1) Edge 2	(1) Edge Connect & (8) 222	B/W Monitor				(1) 6 Pr #19			Etherwan ED3175	5.8 GHZ		170 Ethernet Module		Clary	inside cabinet	6	Tomar	4 CH	1	SEC	III-BF		
21	Sunrise Wy & E Palm Canyon Dr	332	4" Raised	SEC	McCain	170E		CMU	210	Loops	EDI, Detector Systems	2 CH	(7) 222 & (4) 272 & (2) 262									(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module	Cohu 3920 Dome				Opticom	562	2	SEC	III-BF		Polara APS station
22	Cerritos Dr & E Palm Canyon Dr	332	4" Raised	SEC	McCain	170E		CMU	210	Loops	Detector Systems	2 CH	(9) 222D									5.8 GHZ	Etherwan EX78820	170 Ethernet Module					Tomar	StobeCom II	1	NEC	III-BF		
23	Smoke Tree Commons & E Palm Canyon Dr	332	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect									5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NEC	III-BF		
24	Farrell Dr/ Barona Rd & E Palm Canyon Dr	332	4" Raised																															No Key to Cabinet - Could not open
25	Escoba Dr/ Araby Dr & E Palm Canyon Dr	332	4" Raised	SEC	McCain	170E		CMU	210	Video	Iteris	(3) Edge 2	(1) Edge Connect	B/W Monitor								(3) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SEC	III-BF		Quick Bridge link to PD Tower
26	Auto Center & E Palm Canyon Dr	332	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(3) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NEC	III-BF		
27	Cherokee Way & E Palm Canyon Dr	332	4" Raised	SEC	McCain	170E		CMU	210	Loops	EDI	2 CH	(10) 222									5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-BF		
29	Indian Canyon Dr & San Rafael Dr	332 (old)	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	LCD Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Dimensions	Sidemount Cabinet	6	Tomar	4 CH	1	NEC	III-BF		Polara APS station
30	Indian Canyon Dr & Racquet Club Rd	332	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	LCD Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NEC	III-BF		
31	Indian Canyon Dr & Tachevah Dr	332	4" Raised	SWC	McCain	170E		CMU	210	Video & Loops	Iteris	(2) Edge 2	(1) Edge Connect & (2) 222	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module	Cohu 3920 Dome							SWC	III-BF	Required	
32	Indian Canyon Dr & Tamarisk Rd	332	4" Raised	SWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-BF		
33	Indian Canyon Dr & Alejo Rd	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect									(3) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module	Cohu 3920 Dome	Clary	Inside Cabinet	6				NWC	III-BF		Quick Bridge link to Hyatt Hotel
34	Indian Canyon Dr & Amado Rd	332	4" Raised	SWC	McCain	170E		CMU	210	Video	Iteris	(3) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-BF		
35	Indian Canyon Dr & Andreas Rd	332	4" Raised	SWC	McCain	170E		CMU	210	Video	Iteris	(3) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module	Axis Q60 Dome				Tomar	4 CH	1	SWC	III-BF		
36	Indian Canyon Dr & Tahquitz Canyon Wy	332	4" Raised	SWC	McCain	170E		CMU	210	Loops	EDI, Detector Systems	2 CH	(2) 222 & (1) 262					(2) 12 Pr #19			Etherwan ED3175			170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	150' W/O TS Cabinet	Undergro und		
37	Indian Canyon Dr & La Plaza	332	4" Raised	NEC	Safetran	170E		CMU	210	Video	Iteris	(2) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Opticom	752	1	NEC	III-BF		
38	Indian Canyon Dr & Arenas Rd	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(3) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Opticom	752	1	NWC	III-BF		
39	Indian Canyon Dr & Baristo Rd	332	4" Raised	NWC	McCain	170E		CMU	210E	Video	Iteris	(2) Edge 2	(1) Edge Connect	LCD Monitor								5.8 GHZ	Ethernet EX78820	170 Ethernet Module					Opticom	752	1	NWC	III-BF	Required	
40	Indian Canyon Dr & Ramon Rd	332	4" Raised	SWC	SafeTran	170E		CMU	210E	Loops	Safetran	2 CH	(9) 222									(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module	Cohu 3920 Dome				Tomar	4 CH	1	SWC	III-BF		

Regional Traffic Signal Synchronization Program
City of Palm Springs
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
41	Sunrise Wy & San Rafael Dr	332	4" Raised	SWC	Safetran	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	LCD Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-BF		Polara APS station
42	Sunrise Wy & Racquet Club Rd	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	LCD Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NWC	III-BF		Polara APS station
43	Sunrise Wy & Via Escuela	332	4" Raised	SWC	Safetran	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module					Opticom	562	2	SWC	III-BF		
44	Sunrise Wy & Tachevah Dr	332	4" Raised	NEC	Signal Control Co	170E		CMU	210	Loops	IDC	2 CH	(10) 222									5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NEC	III-BF		
45	Sunrise Wy & Alejo Rd	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	LCD Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NWC	III-BF		
46	Sunrise Wy & Amado Rd	332	4" Raised	SEC	US Traffic Corp	170E		CMU	210	Loops	IDC	2 CH	(8) 222									5.8 GHZ	N/A	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SEC	III-BF		
47	Sunrise Wy & Tahquitz Canyon Wy	332	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor				(2) 12 Pr #19			Etherwan ED3175			170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NEC	III-BF		Polara APS station
48	Sunrise Wy & Baristo Rd	332	4" Raised	SEC	US Traffic Corp	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	LCD Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1				Quick Bridge link to Angels Field tower. Polara APS station
49	Sunrise Wy & Ramon Rd	332	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect					(1) 12 Pr #19			Etherwan ED3175	(2) 5.8 GHZ		170 Ethernet Module	Cohu 3920 Dome	Dimensions	Sidemount Cabinet	6	Tomar	4 CH	1	NEC	III-BF		Polara APS station
50	Sunrise Wy & Sunny Dunes Rd	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect									5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NWC	III-BF		
51	Sunrise Wy & Mesquite Ave	332	4" Raised	SEC	US Traffic Corp	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	LCD Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-CF		Polara APS station
52	Farrell Dr & Via Escuela	332	18" Raised	NEC	SafeTran	170E		CMU	210	Loops	Sarasota & EDI	2 CH	(3 & 3) 222									5.8 GHZ	Etherwan EX78820	170 Ethernet Module					Opticom	752	2	NEC	III-BF		
53	Farrell Dr & Tamarisk Rd	332	18" Raised	SEC	US Traffic Corp	170E		CMU	210	Video	Iteris	(5) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SEC	III-BF		
54	Farrell Dr & Alejo Rd	333JP	18" Raised	NEC	McCain	170E		CMU	210E	Loops	EDI	2 CH	(8) 222									(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module					Tomar	4 CH	1	NEC	II-B		
55	Farrell Dr & Tahquitz Canyon Wy	332	4" Raised	SWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor				(2) 12 Pr #19			Etherwan ED3175			170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-BF		Polara APS station
56	Farrell Dr & Baristo Rd	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NWC	III-BF		Polara APS station
57	Farrell Dr & Ramon Rd	332	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect									(3) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Dimensions	Sidemount Cabinet	4	Tomar	4 CH	1	NEC	III-BF		Iteris Vantage Velocity (Bluetooth)
58	Farrell Dr & Mesquite/ Golf Cart Xing	333JP	18" Raised	SWC	McCain	170E		CMU	210E	Loops	EDI	2 CH	(2) 222									5.8 GHZ	Etherwan EX78820	170 Ethernet Module								SWC	II-B		
59	Farrell Dr & Mesquite Ave	332	4" Raised	NWC	SafeTran	170E		CMU	210E	Loops	Safetran	2 CH	(10) 222									5.8 GHZ	Etherwan EX78820	170 Ethernet Module								NWC	III-BF		
60	Calle Encilia & Tahquitz Canyon Wy	332	4" Raised	SEC	McCain	170E		CMU	210E	Loops	Diablo	2 CH	(5) 222					(2) 12 Pr #19			Etherwan ED3175			170 Ethernet Module					Tomar	4 CH	1	SEC	III-BF		
61	Calle El Segundo & Tahquitz Canyon Wy	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor				(2) 12 Pr #19			Etherwan ED3175			170 Ethernet Module		Clary	Inside Cabinet	6				NWC	III-BF		Polara APS station
62	Avenida Caballeros & Tahquitz Canyon Wy	332	4" Raised	SWC	McCain	170E		CMU	210	Loops	EDI	2 CH	(8) 222					(2) 12 Pr #19			Etherwan ED3175			170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	Median Island	III-CF		Polara APS station
63	Sunset Way & Tahquitz Canyon Wy	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor				(2) 12 Pr #19			Etherwan ED3175			170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	Median Island	III-BF		
64	El Cielo Rd & Tahquitz Canyon Wy	332	18" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor				(2) 12 Pr #19			Etherwan ED3175			170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NWC	III-BF		(1) 12Pr #19 SIC terminates in PD Spider shack
65	Calle Encilla & Ramon Rd	333 JP	4" Raised	NWC	McCain	170E		CMU	210E	Loops	EDI	2 CH	(5) 222									5.8 GHZ	Etherwan EX78820	170 Ethernet Module								Sidemount	II-BF		Polara APS station
66	Avenida Caballeros & Ramon Rd	333 JP	18" Raised	NWC	McCain	170E		CMU	210E	Loops	EDI	2 CH	(6) 222									5.8 GHZ	Etherwan EX78820	170 Ethernet Module								NWC	III-BF		Polara APS station
67	Compadre Rd & Ramon Rd	332	4" Raised	NWC	Safetran	170E		CMU	210E	Video	Iteris	(4) Edge 2	(1) Edge Connect									5.8 GHZ	Etherwan EX78820	170 Ethernet Module					Tomar	4 CH	1	NWC	III-BF		
68	El Cielo Rd & Ramon Rd	332	4" Raised	NWC	McCain	170E		CMU	210	Loops	Reno	2 CH	(10) 222									(3) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module	Cohu 3920 Dome				Tomar	4 CH	1	SEC	III-BF		Quick Bridge link to PD Tower. Vantage Velocity (Bluetooth)
69	El Placer & Ramon Rd	332	4" Raised	NEC	IDC	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect									5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Opticom	752	2	NEC	III-BF		
70	Paseo Dorotea & Ramon Rd	332	4" Raised	NWC	McCain	170E		CMU	210	Loops	EDI	2 CH	(8) 222									5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NWC	III-CF		
71	Vella Rd & Ramon Rd	332	4" Raised	SWC	McCain	170E		CMU	210E	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module	Cohu 3920 Dome				Opticom	754	1	SWC	III-BF		Iteris Vantage Velocity (Bluetooth)
72	San Luis Rey Dr & Ramon Rd	332	18" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NEC	III-CF		Polara APS station
73	Crossley Rd & Ramon Rd	332	4" Raised	NEC	McCain	170E		CMU	210	Loops	EDI	2 CH	(7) 222									(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	NEC	III-BF		
74	San Luis Rey Dr & Dinah Shore Dr	332	4" Raised	SWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2										5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-BF		
75	Crossley Rd & Dinah Shore Dr	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	LCD Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Opticom	752/ 762	1 EA	NWC	III-BF		
76	Avenida Caballeros & Racquet Club Rd	332	4" Raised	SWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-BF		Polara APS station
77	El Cielo Rd & Baristo Rd	332	4" Raised	SWC	McCain	170E		CMU	210	Video	Iteris	(3) Edge 2	(1) Edge Connect	B/W Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module					Opticom	752	2	SWC	III-BF		Quick Bridge link to PD Tower. Polara APS station
78	PSHS/ Palm Springs Mall	332	4" Raised	NWC	SafeTran	170E		CMU	210E	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor								5.8 GHZ	Etherwan EX78820	170 Ethernet Module		Dimensions	Sidemount Cabinet	4	Tomar	4 CH	1	NWC	III-BF		Polara APS station
79	Sunrise Wy & Boys and Girls/ Shopping Ctr	332	4" Raised	NEC	McCain	170E	170E w/ 210FM	CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect					(1) 12 Pr #19			Etherwan ED3575			170 Ethernet Module		Dimensions	Sidemount Cabinet	4	Tomar	4 CH	1	NEC	III-BF	Required	Master location. McCain GPS unit. Polara APS station.
80	S. Palm Canyon Dr & Southridge Dr	336	Pedestal mount																			(2) 5.8 GHZ										SEC	III-BF		Advanced warning Flasher location. Wireless repeaters.

Regional Traffic Signal Synchronization Program
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Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Duplex Outlet	Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type		
81	Indian Canyon Dr & Garnet Ave	332	4" Raised	NEC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2		LCD Monitor				(2) 6 Pr #19	GDI 400							Clary	Inside Cabinet	6	Opticom	454	1	NEC	III-BF		Twisted-pair (SIC) not connected.
82	Indian Canyon Dr & 20th Ave	332	4" Raised	NWC	McCain	170E		CMU	210	Video	Iteris	(4) Edge 2		LCD Monitor				(2) 6 Pr #19	GDI 400							Clary	Inside Cabinet	6	Opticom	454	1	NWC	III-BF		Twisted-pair (SIC) not connected.
83	Vista Chino & Clubhouse View Dr	332	4" Raised	SEC	McCain	170E		CMU	210E	Video	Iteris	(3) Edge 2	(1) Edge Connect	B/W Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module	FLIR PT fixed camera	Clary	Inside Cabinet	6	Tomar	4 CH	1	SEC	III-BF		
84	Gene Autry Trl & Via Escuela	332	4" Raised	SWC	DTS	170E		CMU	210	Video	Iteris	(4) Edge 2	(1) Edge Connect	B/W Monitor								(2) 5.8 GHZ	Etherwan EX78820	170 Ethernet Module	FLIR PT fixed camera	Clary	Inside Cabinet	6	Tomar	4 CH	1	SWC	III-BF		

Appendix A1.9:

Existing Traffic Signal System Equipment Matrix

City of Rancho Mirage

Regional Traffic Signal Synchronization Program
City of Rancho Mirage
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
1	Highway 111 & One Mirage Pl	O		NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(12) LM 622					(1) 6 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	Polara APS station
2	Highway 111 & Frank Sinatra Dr	P44	18"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(13) LMD 622					(1) 12 pr & (1) 6 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	762	2	NEC	III-CF	Polara APS station
3	Highway 111 & Atrium Wy	O	2"	SEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(7) LM 622					(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	(1) 562 & (1) 262	1 EA	SEC	III-CF	
4	Highway 111 & Mirage Cove Dr	O	2"	SWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622					(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	(1) 752 & (1) 562	1 EA	SWC	Type I	Polara APS station
5	Highway 111 & Via Florencio	P44	18"	NWC	Econolite	ASC/2S-2100		MMU	16LE	Video	Iteris	Edge 2		B/W Monitor				(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	562	1	NWC	III-CF	Polara APS station
6	Highway 111 & Peterson Rd	P44	18"	NWC	Econolite	ASC/2-1000		MMU	16	Video	Iteris	Edge 2		LCD Monitor				(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	562	1	NWC	III-CF	
7	Highway 111 & Country Club Dr	P44	18"	NEC	Econolite	ASC/2S-2100	ASC/2M-1000	MMU	1600	Video	Iteris	Edge 2		B/W Monitor				(2) 12 pr	ASC2							ElectroTech	Inside Cabinet	2	Opticom	562	2	NWC	III-CF	Master Location. GPS Time Source. Phone Drop.
8	Highway 111 & Thunderbird Rd/Fairway Dr	O	2"	NEC	Econolite	ASC/2S-2100		MMU	16E	Video	Iteris	Edge 2		B/W Monitor				(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	562	2	NEC	III-CF	
9	Highway 111 & Evening Star Dr	P44	18"	NWC	Econolite	ASC/2S-2100		MMU	1600	Video & Loops	Econolite	Solo Mini-Hub	(6) LM 622					(1) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	1	NWC	III-CF	
10	Highway 111 & Paxton Dr	P44	18"	NWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(7) LM 622					(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	NWC	III-CF	
11	Highway 111 & Library Wy	P44	18"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622					(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	
12	Highway 111 & Frontage Rd	P44	12"	SEC	Econolite	ASC/2S-2100		MMU	16E	Video & Loops	Econolite	Solo Mini-Hub	(6) LM 622					(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	
13	Highway 111 & Indian Trl	P44	18"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(4) LM 622 & (6) LM622I					(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	
14	Highway 111 & Rancho Las Palmas	P44	18"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(5) LM 622 & (3) LM 622I					(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	
15	Highway 111 & Bob Hope Dr	P44	18"	SEC	Econolite	ASC/2S-2100		MMU	16E	Video & Loops	Econolite	Solo Mini-Hub	(3) LM 622 & (3) LM 622I					(2) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	SEC	III-CF	
16	Highway 111 & Magnesia Falls Dr	P44	18"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(6) LM 622 & (2) LM 622I					(1) 12 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	
17	Indian Trl & Rancho Mirage Elementary School																																
18	Bob Hope Dr & Avenida Las Palmas	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Video & Loops	Econolite	2 CH	(4) LM 622					(2) 12 pr	RS232			900 MHZ	GDI 900 DS			ElectroTech	Inside Cabinet	2	Opticom	m262	1	SWC	III-CF	
19	Bob Hope Dr & Rancho Las Palmas	P44	18"	NWC	Econolite	ASC/2-1000		MMU	16E	Loops	Econolite	2 CH	(8) LM 622					(1) 12 pr	RS232			900 MHZ	GDI 900 DS			ElectroTech	Inside Cabinet	2	Opticom	m262	2	SWC	III-CF	
20	Bob Hope Dr & Follansbee Rd/ Sunrise Dr	P44	18"	NEC	Econolite	ASC/2S-2100		MMU	16E	Video & Loops	Econolite	Solo Mini-Hub	(6) LM 622	B/W Monitor					RS232			900 MHZ	GDI 900 DS			Dimensions	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	
21	Bob Hope Dr & Country Club Dr	P44	12"	NEC	Econolite	ASC/2S-2100	ASC/2M-1000	MMU	16E	Loops	Econolite	2 CH	(8) LM 622						ASC2			900 MHZ	GDI 900 DS			Dimensions	Inside Cabinet	2	Opticom	m262	2	NEC	Type II	Master Location. GPS Time Source. Phone Drop. Polara
22	Bob Hope Dr & Hope Square	P44	12"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2CH	(8) LM 622						RS232			900 MHZ	GDI 900 DS			ElectroTech	Inside Cabinet	2	Opticom	m262	1	SEC	III-CF	
23	Bob Hope Dr & Columbia/Hospital	P44	18"	NWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622						RS232			900 MHZ	GDI 900 DS			ElectroTech	Inside Cabinet	2	Opticom	m262	2	NWC	III-CF	
24	Bob Hope Dr & Kavenish Wy	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Video & Loops	Econolite	Solo Mini-Hub	(3) LM 622 & (3) LM 622I						ASC2			900 MHZ	GDI 900 DS			Dimensions	Inside Cabinet	2	Opticom	562	1	NWC	III-CF	
25	Bob Hope Dr & Frank Sinatra Dr	P44	18"	NEC	Econolite	ASC/2S-2100	ASC/2M-1000	MMU	16E	Loops	Econolite	2 CH	(8) LM 622						RS232			2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	262	2	NEC	III-CF	Master Location. GPS Time Source. Phone Drop.
26	Bob Hope Dr & Gerald Ford Dr	P44	18"	NWC	Econolite	Cobalt	ASC/2M-1000	MMU	16E	Video & Loops	Econolite	2 CH	(4) LM 622	LCD Monitor				(1) 12 pr				2400 MHZ	GDI 2400 DS			Dimensions	Side Mount	2	Opticom	762	2	NWC	III-CF	Master Location. GPS Time Source. Phone Drop.
27	Bob Hope Dr & Ginger Rodgers Rd	P44	18"	NWC	Econolite	ASC/2S-2100		CMU	LCD12P	Loops	Detection System	2 CH	(5) 222R					(2) 6 pr	ASC2							ElectroTech	Inside Cabinet	2	Opticom	m262	2	NWC	III-CF	
28	Bob Hope Dr & Dinah Shore Dr	P44	18"	SEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622					(1) 6 pr	ASC2							Dimensions	Inside Cabinet	2	Opticom	752	2	SEC	III-CF	
29	Country Club Dr & John L. Sinn Rd	P44	18"	NWC	Econolite	ASC/2-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622						RS232			900 MHZ	GDI 900 DS			ElectroTechs	Inside Cabinet	2	Opticom	752	2	NWC	III-CF	
30	Country Club Dr & Vista Del Sol/ Desert Lakes Dr	P44	18"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622						ASC2			900 MHZ	GDI 900 DS			ElechtroTechs	Inside Cabinet	3	Opticom	m262	1	NEC	III-CF	
31	Country Club Dr & Vista Dunes	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(4) LM 622 & (4) LM 622I						RS232			900 MHZ	GDI 900 DS			Dimensions	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	
32	Frank Sinatra Dr & Da Vall Dr	P44	18"	NWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622						RS232			2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	m262	2	SWC	III	
33	Gerald Ford Dr & Da Vall Dr	P44	18"	SEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622						RS232			2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	m262	2	SWC	III-CF	
34	Frank Sinatra Dr & Morningside Dr/Thompson Rd	P44	18"	SWC	Econolite	ASC/2-1000		MMU	16E	Loops	Econolite	2 CH	(8) LM 622									2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	562	2	SWC	III-CF	
35	Monterey Ave & Frank Sinatra Dr	P44	24"	NEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(16) LM 622		(1) 12 SMFO	2U 12 Port Wall	IFS D9130		RS232							ElectroTechs	Inside Cabinet	2	Opticom	752	2	NEC	III-CF	*Controller on City Palm Desert system
36	Gerald Ford Dr & Mission Hills Dr	P44	18"	NEC	Econolite	ASC/2S-2100		MMU	16E	Video	Econolite	TerreAccess Point							RS232			2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	752	1	NEC	III-CF	
37	Gerald Ford Dr & Inverness Dr/ Los Alamos Rd	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16	Loops	Econolite	2 CH	(6) LM 622									2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	m262	1	SWC	III-CF	
38	Gerald Ford Dr & Victoria Falls Dr	P44	18"	SEC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(4) LM 622 & (4) LM 622I						RS232			2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	752	2	SEC	III-CF	
39	Gerald Ford Dr & Versailles Dr	P44	18"	NWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(4) LM 622 & (1) LM 622I & (1) Model C			Econolite			RS232			2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	752	2	NWC	III-CF	
40	Monterey Ave & Gerald Ford Dr	R	12"	NWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(12) LM 622		(1) 24 SMFO		IFS D9130-B		RS232							Dimensions	Inside Cabinet	4	Opticom	562	2	NWC	III-CF	*Controller on City Palm Desert system

Regional Traffic Signal Synchronization Program
City of Rancho Mirage
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
41	Da Vall Dr & Dean Martin Dr	P44	18"	SWC	Econolite	ASC/3-2100		MMU	16E	Loops	Econolite	2 CH	(4) LM 622 & (4) LM 622t								2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	752	2	SWC	III-CF	
42	Dinah Shore Dr & Da Vall Dr	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) Model C												Dimensions	Inside Cabinet	2	Opticom	752	2	SWC	III-CF	*Stand-Alone. No Communication
43	Dinah Shore Dr & Mission Hills Dr	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622						ASC2						Dimensions	Inside Cabinet	2	Opticom	m262	2	SWC	III-CF	*Stand-Alone. No Communication
44	Dinah Shore Dr & Los Alamos Rd	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622			Econolite			ASC2			2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	752	2	SWC	III-CF	
45	Dinah Shore Dr & Westin Mission Hils Resort	P44	18"	SEC	Econolite	ASC/2S-2100		MMU	16E	Video & Loops	Econolite	Solo Mini-Hub	(3) LM 622 & (3) LM 622t												Dimensions	Inside Cabinet	2	Opticom	752	1	SEC	III-CF	*Stand-Alone. No Communication
46	Dinah Shore Dr & Key Largo Ave	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622			Econolite						2400 MHZ	GDI 2400 DS			Dimensions	Inside Cabinet	2	Opticom	752	2	SWC	III-CF	*Shared with City of Palm Desert
47	Monterey Ave & Market Place Wy	P44	18"	NWC	Econolite	ASC/2S-2100		MMU	16	Loops	Econolite	2 CH	(7) LM 622 & (6) LM622t		(2) 6 SMFO		GE D9130-B		RS232						ElectroTechs	Inside Cabinet	2	Opticom	752	1	NWC	III-CF	*Shared with City of Palm Desert. Controller on City Palm Desert system.
48	Ramon & Da Vall Dr	P44	18"	NWC	Econolite	ASC/2S-2100		Guardian	LCD12P	Loops	AccuCount	2 CH	10					(1) 12 pr							Dimensions	Sidemount Cabinet	4	Opticom	562	2	NEC	III-CF	Polara APS station *Shared with City of Cathedral City
49	Ramon Rd & Rattler Rd	P44	18"	SWC	Econolite	ASC/3-2100		MMU	16E	Loops	Econolite	2 CH	(16) LM 622					(1) 12 pr							Dimensions	Inside Cabinet	2	Opticom	752	2	SWC	III-CF	Polara APS station
50	Ramon Rd & Los Alamos Rd	P44	18"	SWC	Econolite	ASC/2S-2100		MMU	16E	Loops	Econolite	2 CH	(8) LM 622			Econolite			RS232						Dimensions	Inside Cabinet	2	Opticom	752	2	SWC	III-CF	*Stand-Alone. No Communication
51	Monterey Ave & Dick Kelly Dr	R. PNG	4" Raised	NEC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Econolite	2 CH	(9) G-68		(2) 12 SMFO	2U 24 port wall	IFS D9130-B											Opticom	752 / 762	1 EA	NWC	III-CF	*Shared with City of Palm Desert
52	Monterey Ave & Avenida Del Sol / Clancy Ln	R	4" Raised	NEC	Econolite	ASC 2S-1000		MMU	16 E	Video / Loop	Iteris	Versicam	(1) RZ4 camera, (5) LM622		(1) 36 SMFO	1U 12 port wall	IFS D9130-B											Opticom	562	1	NWC	III-CF	*Shared with City of Palm Desert
53	Monterey Ave & Gran Via / Las Palmas	P-44	18" Raised	SWC	Econolite	ASC 2S-1000		MMU	16	Loop	Econolite	2 CH	(5) Model G / LM622		(1) 36 SMFO	1U 12 port wall	IFS D9130-B											Opticom	752	1	SWC	III-CF	*Shared with City of Palm Desert

Appendix A1.10:

Existing Traffic Signal System Equipment Matrix

Caltrans District 8

Regional Traffic Signal Synchronization Program
Caltrans
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
1	I-10 EB Ramp(s) & Indian Canyon Dr	332	2" Raised	NEC	McCain	2070		CMU	210	Loops	Diablo	2 CH	(9) 222					(1) 6 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4				NEC	III-CF	Cell Modem (Raven X) not installed
2	I-10 WB Ramp(s) & Indian Canyon Dr	332	2" Raised	NWC	Econolite	2070 ATC		CMU	210	Loops	Various	2 CH	(10) 222					(1) 6 Pr	2070-1B							Dimensions	Sidemount Cabinet	4				NWC	III-CF	Twisted Pair not in use
3	I-10 EB Ramp(s) & Palm Dr	332	2" Raised	SWC	McCain	2070		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(3) 222	LCD- Rackmount				(1) 12 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4				SWC	III-CF	
4	I-10 WB Ramp(s) & Palm Dr	332	2" Raised	NEC	Econolite	2070 ATC	170E Quad w/210	CMU	210	Loops & Video	Iteris	Vantage Edge 2	(3) 222	LCD- Rackmount				(1) 12 Pr	2070-1B							Dimensions	Sidemount Cabinet	4				SWC	III-CF	Master Location
5	I-10 EB Ramp(s) & Date Palm Dr	332	2" Raised	NWC	Intelight	2070E		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(3) 222	B/W Monitor				(1) 12 Pr	2070-6A & 2070-1E							Alpha	Sidemount Cabinet	4				SEC	III-CF	
6	I-10 WB Ramp(s) & Date Palm Dr	332	2" Raised	SWC	Intelight	2070E		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(2) 222	B/W Monitor				(1) 12 Pr	2070-6A & 2070-1B							Alpha	Sidemount Cabinet	4				SWC	III-CF	
7	I-10 EB Ramp(s) & Bob Hope Dr	332	2" Raised	SWC	McCain	2070	170E Quad w/210	CMU	210	Loops	Diablo	2 CH	(11) 222					(2) 6 Pr	2070-6A & Master GDI 400							Dimensions	Sidemount Cabinet	4	Tomar	StrobeCom II	1	SWC	III-CF	Master Location. Cell Modem (Raven X)
8	I-10 WB Ramp(s) & Bob Hope Dr	332	2" Raised	NEC	McCain	2070		CMU	210	Loops	Diablo	2 CH	(10) 222					(2) 6 Pr	2070-6A GDI							Dimensions	Sidemount Cabinet	4	Tomar	StrobeCom II	1	NEC	III-CF	
9	I-10 EB Ramp(s) & Ramon Rd	332	2" Raised	NEC	Econolite	2070		CMU	210	Loops	Various	2 CH	(6) 222					(2) 6 Pr	2070-1B								Sidemount Cabinet	4	Tomar	StrobeCom II	1	NEC	III-CF	Sidemount Cabinet Locked
10	I-10 EB Ramp(s) & Monterey Ave	332	2" Raised	NEC	Econolite	2070 ATC		CMU	210	Loops	Various	2 CH	(11) 222					(1) 6 Pr & (1) 12 Pr	2070-6A & 2070-1B							Alpha	Sidemount Cabinet	4	Opticom	562	1	NEC	III-CF	
11	I-10 WB Ramp(s) & Monterey Ave	332	2" Raised	SEC	Safetran	2070 ATC	2070 ATC	CMU	210	Loops & Video	Iteris	Vantage Edge 2	(4) 222	LCD - Rackmount											Alpha	Sidemount Cabinet	4	Opticom	464	1	SEC	III-CF	Master Location
12	I-10 EB Ramp(s) & Cook St	332	2" Raised	SWC	McCain	2070	170E Quad w/210	CMU	210	Loops	EDI	2 CH	(10) 222					(1) 6 Pr	2070-6A & 2070-1B								Sidemount Cabinet	4	Opticom	562	2	SEC	III-CF	Master Location. Sidemount Cabinet Locked
13	I-10 WB Ramp(s) & Cook St	332	2" Raised	NWC	McCain	2070		CMU	210	Loops	EDI	2 CH	(9) 222					(2) 6 Pr	2070-6A & 2070 1-B								Sidemount Cabinet	4	Opticom	752	2	NEC	III-CF	Sidemount Cabinet Locked
14	I-10 EB Ramp(s) & Washington St	332	2" Raised	NWC	McCain	2070	170E Quad w/210	CMU	210	Loops	EDI	2 CH	(10) 222					(2) 12 Pr	2070-6A & 2070 1-B								Sidemount Cabinet	4	Opticom	752	1	NWC	III-CF	Master Location. Phone Drop and D-Mark Box, Sidemount Cabinet Locked
15	I-10 WB Ramp(s) & Washington St	332	4" Raised	SEC	Safetran	2070 ATC		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(4) 222	LCD - Rackmount				(1) 12 Pr	2070-6A & 2070 1-B							Alpha	Sidemount Cabinet	4	Opticom	464	1	SEC	III-CF	
16	I-10 EB Ramp(s) & Jefferson St																																Under Construction
17	I-10 WB Ramp(s) & Jefferson St																																Under Construction
18	I-10 EB Ramp(s) & Monroe St	332L	2" Raised	NWC	McCain	2070		CMU	210C	Loops & Video	Iteris	Vantage Edge 2	(1) Edge Connect & (3) 222	LCD - Rackmount				(1) 6 Pr	2070-6A							Alpha	Sidemount Cabinet	4	Opticom	752	1	NWC	III-CF	
19	I-10 WB Ramp(s) & Monroe St	332L	6" Raised	NWC	McCain	2070	170E Quad w/210	CMU	210	Loops & Video	Iteris	Vantage Edge 2	(1) Edge Connect & (3) 222	LCD - Rackmount				(1) 6 Pr	2070-6A & Master GDI 400							Alpha	Sidemount Cabinet	4	Opticom	752	1	NWC	III-CF	Master Location
20	I-10 EB Ramp(s) & Jackson St	332	2" Raised	NWC	Econolite	2070 ATC		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(3) 222	LCD - Rackmount				(1) 6 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4	Opticom	752	1	NWC	III-CF	
21	I-10 WB Ramp(s) & Jackson St	332	2" Raised	NWC	McCain	2070	170E Quad w/210	CMU	210	Loops & Video	Iteris	Vantage Edge 2	(5) 222	LCD - Rackmount				(1) 6 Pr	2070-6A & 2070-1B & Master GDI 400								Sidemount Cabinet	4	Opticom	752	1	NWC	III-CF	Master Location. Sidemount Cabinet Locked
22	I-10 EB Ramp(s) & Golf Center Pkwy	332	2" Raised	SWC	Econolite	2070		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(2) 222	LCD - Rackmount					2070-6A & 2070-1B				Encom 5100			Dimensions	Sidemount Cabinet	4				NWC	III-CF	
23	I-10 WB Ramp(s) & Golf Center Pkwy	332	2" Raised	NEC	Econolite	2070	170E Quad w/210	CMU	210	Loops & Video	Iteris	Vantage Edge 2	(3) 222	LCD - Rackmount					2070-6A & 2070-1B & Master GDI 400				Encom 5100			Alpha	Sidemount Cabinet	4				SWC	III-CF	Master Location
24	SR-86 & Avenue 66 (RIV-195)	332	2" Raised	SWC	Econolite	2070 ATC		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(6) 222	B/W Monitor				(1) 12 Pr	2070-1B								Sidemount Cabinet	4				SWC	III-CF	Sidemount Cabinet Locked, Twisted Pair not in use
25	SR-86 & Avenue 62	332	2" Raised	SWC	McCain	2070		CMU	210	Loops	Diablo	2 CH	(13) 222						2070-1B								Sidemount Cabinet					NWC	III-CF & III-BF	Stand Alone, Sidemount Cabinet Locked
26	SR-86 NB Ramp(s) & Airport Blvd	332	2" Raised	SEC	McCain	2070		CMU	210	Loops	Sarasota	2 CH	(9) 222					(1) 12 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4				SEC	III-CF	
27	SR-86 SB Ramp(s) & Airport Blvd	332	2" Raised	SEC	McCain	2070		CMU	210	Loops	Sarasota	2 CH	(12) 222					(1) 12 Pr	2070-1B							Dimensions	Sidemount Cabinet	4				SEC	III-CF	
28	SR-86 Ramp(s) & Avenue 52	332	2" Raised	NEC	McCain	2070		CMU	210	Loops	Diablo	2 CH	(16) 222						2070-1B								Sidemount Cabinet	4				NEC	III-CF	Stand Alone, Sidemount Cabinet Locked
29	SR-86 Ramp(s) & Avenue 50	332	2" Raised	NWC	McCain	2070		CMU	210	Loops	Diablo	2 CH	(16) 222						2070-1B								Sidemount Cabinet	4				NWC	III-CF	Stand Alone, Sidemount Cabinet Locked
30	SR-86 NB Ramp(s) & Dillon Rd	332	2" Raised	NEC	Econolite	2070 ATC	170E Quad w/210	CMU	210C	Loops	Various	2 CH	(11) 222					(2) 6 Pr	2070-6A & 2070-1B & Master GDI 400							Dimensions	Sidemount Cabinet	4				NEC	III-CF	Master Location
31	SR-86 SB Ramp(s) & Dillon Rd	332	2" Raised	SEC	Econolite	2070		CMU	210	Loops	Various	2 CH	(10) 222					(1) 6 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4				SEC	III-CF	
32	Golf Club Dr & E Palm Canyon Dr	332	2" Raised	NWC	McCain	2070	170E Quad w/210	CMU	210	Loops	Various	2 CH	(7) 222	Sensys				(1) 12 Pr	2070-6A & 2070-1B								Sidemount Cabinet	4				NWC	III-CF	Master Location. D-Mark Box, Sensys not in use, Sidemount Cabinet Locked
33	Gene Autry Trl & E Palm Canyon Dr	332	2" Raised	NWC	McCain	2070		CMU	210C	Loops	EDI	2 CH	(16) 222					(1) 6 Pr & (2) 12 Pr	2070-1B							Alpha	Sidemount Cabinet	4	Opticom	m262	2	SEC	III-CF	D-Mark Box
34	Mesquite Rd & Gene Autry Trl	332	2" Raised	SWC	McCain	2070		CMU	210	Loops	EDI	2 CH	(14) 222						2070-1B								Sidemount Cabinet	4	Opticom	752	2	SWC	III-CF	Stand Alone, Sidemount Cabinet Locked
35	Ramon Rd & Gene Autry Trl	332	18" Raised	SWC	McCain	2070		CMU	210	Loops	EDI	2 CH	(18) 222	Sensys				(1) 6 Pr	2070-6A & 2070-1B								Sidemount Cabinet	4	Opticom	752	2	SWC	III-CF	Phone Drop, Sidemount Cabinet Locked
36	Mission Dr & Gene Autry Trl	332	2" Raised	SEC	Econolite	2070 ATC		CMU	210	Loops	Diablo	2 CH	(10) 222					(2) 6 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4	Opticom	752	2	SEC	III-CF	
37	PSUSD (District) Center Dr & Gene Autry Trl	332L	2" Raised	NEC	McCain	2070 ATC	2070 E	CMU	210	Loops	Diablo	2 CH	(14) 222					(2) 6 Pr	2070-6A & 2070-1B							Alpha	Sidemount Cabinet	4	Opticom	752	2	SEC	III-CF	Master Location. GPS (Antenna Only)
38	Skywest Dr / Escena Way & Gene Autry Trl	332	2" Raised	NEC	Econolite	2070 ATC		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(10) 222	LCD- Rackmount				(2) 6 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4	Tomar	StrobeCom II	1	NEC	III-CF	
39	Tamarisk Rd & Gene Autry Trl	332	8" Raised	SEC	McCain	2070		CMU	210	Loops	Sarasota	2 CH	(12) 222					(1) 6 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4	Opticom	754	1	NWC	III-BF	
40	Tacheva Dr & Gene Autry Trl	332	2" Raised	SEC	McCain	2070		CMU	210	Loops	EDI	2 CH	(17) 222					(2) 6 Pr	2070-6A & 2070-1B								Sidemount Cabinet	4	Tomar	2080	1	SEC	III-CF	Sidemount Cabinet Locked

Updated: 10/11/16

Regional Traffic Signal Synchronization Program
Caltrans
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
41	Chia Rd / Artisan Way & Gene Autry Trl	332	2" Raised	NEC	McCain	2070 ATC		CMU	210	Loops	Diablo	2 CH	(15) 222					(2) 6 Pr	2070-6A & 2070-1B							Dimensions	Sidemount Cabinet	4	Tomar	StrobeCom II	1	NEC	III-CF	
42	Gene Autry Wy & Vista Chino	332	2" Raised	NWC	McCain	2070	170E Quad w/210	CMU	210	Loops	Various	2 CH	(18) 222					(2) 6 Pr	2070-6A & 2070-1B & Master GDI 400								Sidemount Cabinet	4	Tomar	StrobeCom II	2	NWC	III-BF	Master not in use, Sidemount Cabinet Locked
43	Farrell Dr & Vista Chino	332	18" Raised	NWC	McCain	2070		CMU	210	Loops & Video	Iteris	Vantage Edge 2	(1) Edge Connect & (4) 222	LCD - Rackmount					2070-6A & 2070-1B				Encom 5100			Sidemount Cabinet	4	Tomar	StrobeCom II	1	NWC	III-BF	Sidemount Cabinet Locked
44	Cerritos Rd & Vista Chino	332	2" Raised	NWC	McCain	2070	170E Quad w/210	CMU	210	Loops	Diablo	2 CH	(15) 222						2070-6A & 2070-1B & Master GDI 400				Encom 5100		Alpha	Sidemount Cabinet	4	Tomar	StrobeCom II	1	NWC	III-CF	Master Location
45	Sunrise Wy & Vista Chino	332	4" Raised	NEC	McCain	2070		CMU	210C	Loops & Video	Iteris	Vantage Edge 2	(11) 222	LCD - Rackmount, Sensys CC/EX					2070-6A & 2070-1B				Encom 5100		Dimensions	Sidemount Cabinet	4	Opticom	562	2	NEC	III-BF	
46	Avenida Caballeros & Vista Chino	332	2" Raised	SEC	McCain	2070		N/A	N/A	Loops	Sarasota	2 CH	(1) 224 & (2) 222						2070-1B							Sidemount Cabinet	4				SWC	III-BF	Stand Alone, Sidemount Cabinet Locked
47	Indian Canyon Dr & Vista Chino	332	2" Raised	SEC	McCain	2070		CMU	210	Video	Iteris	Vantage Edge 2	(1) Edge Connect	LCD - Rackmount					2070-6A & 2070-1B				Encom 5100			Sidemount Cabinet	4	Tomar	StrobeCom II	1	SEC	III-BF	Sidemount Cabinet Locked
48	Vista Chino & N Palm Canyon Dr	332	4" Raised	SWC	Econolite	2070 ATC	170E Quad w/210	CMU	210	Loops	Sarasota	2 CH	(4) 222	Sensys CC					2070-6A & 2070-1B & Master GDI 400				Encom 5100		Dimensions	Sidemount Cabinet	4				SWC	Type I	Master Location
49	Racquet Club Rd & N Palm Canyon Dr	332	2" Raised	NWC	Econolite	2070 ATC		CMU	210	Loops	Various	2 CH	(6) 222						2070-1B							Sidemount Cabinet	4				SWC	III-CF	Stand Alone, Sidemount Cabinet Locked
50	San Rafael Rd / Tramway Rd & N Palm Canyon Dr	332	2" Raised	NEC	McCain	2070		CMU	210	Loops	EDI	2 CH	(8) 222					(1) ? Pr	2070-1B							Sidemount Cabinet	4				NWC	III-CF	Sidemount Cabinet Locked
51	Gateway Dr & N Palm Canyon Dr	332	2" Raised	NEC	McCain	2070		CMU	210	Loops	Reno	2 CH	(10) 222	Sensys				(1) 6 Pr	2070-1B						Dimensions	Sidemount Cabinet	4	Tomar	StrobeCom II	1	NEC	III-CF	

Appendix A1.11:

Existing Traffic Signal System Equipment Matrix

County of Riverside

Regional Traffic Signal Synchronization Program

County of Riverside
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System										CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
1	Lima Hall Rd & Avenue 42	332	2" Raised	NWC	McCain	170E Quad w/233	170E Quad w/210	CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(1) Vantage Access & (2) 222	LCD - Rackmount												Dimensions	Sidemount Cabinet	4	Tomar	Strobecom II	2	NWC	III-CF	Stand Alone, GPS
2	Yucca Ln & Avenue 42	332	2" Raised	NWC	McCain	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(12) 222													Dimensions	Sidemount Cabinet	4	Opticom	752	2	NWC	III-CF	Stand Alone, GPS
3	Palm Dr & Airport Blvd	332	2" Raised	NWC	McCain	170E Quad w/233		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(3) 222	LCD - Rackmount				(1) 6Pr								Dimensions	Sidemount Cabinet	4	Opticom	464	1	NWC	III-CF	
4	Polk St & Airport Blvd	332	2" Raised	NEC	McCain	170E Quad w/233		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(2) 222	LCD - Rackmount				(1) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4	Opticom	464	1	NEC	III-CF	GPS
5	Bob Hope Dr & Casino Ent	332	2" Raised	NEC	McCain	170E Quad w/233		CMU	220	Loops	IDC	2 CH	(9) 222					(1) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4	Opticom	752	2	NEC	III-CF	
6	Mountain View Rd & Dillon Rd	333 JP	18" Raised	NEC	McCain	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(10) 222						GDI 400							Dimensions	Inside Cabinet	4	Opticom	752 & m262	2	NEC	III-CF	Phone Drop in Cabinet
7	Grapefruit Blvd & 4th St	332	2" Raised	NWC	McCain	170E Quad w/200		CMU	210 C	Loops	Various	2 CH	(8) 222					(1) 4 Pr	GDI 400							Myers	Inside Cabinet	4				NWC	III-BF	900 MHZ (For RR)
8	Grapefruit Blvd & Avenue 58	332	2" Raised	SEC	McCain	170E Quad w/200		CMU	210	Loops	Various	2 CH	(8) 222													Dimensions	Sidemount Cabinet	4				NEC	III-CF	Stand Alone
9	Grapefruit Blvd & Frontage Rd	332	2" Raised	SEC	McCain	170E Quad w/200		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(3) 222	LCD - Rackmount				(1) 6 Pr								Dimensions	Sidemount Cabinet	4	Tomar	Strobecom II	2	SEC	III-CF	Stand Alone, GPS
10	Grapefruit Blvd & Palm Dr	332	2" Raised	NWC	McCain	170E Quad w/200		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(1) Edge Connect (2) 222	LCD - Rackmount				(1) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4	Opticom	462	2	NWC	III-CF	GPS
11	Harrison St & Avenue 66	332	2" Raised	NWC	McCain	170E Quad w/233		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(1) Edge Connect (4) 222	LCD - Rackmount												Dimensions	Sidemount Cabinet	4	Opticom	462	2	NWC	III-CF	Stand Alone, GPS
12	Harrison St & Avenue 74	332	2" Raised	SEC	McCain	170E Quad w/233		CMU	2010 ECL	Loops	EDI	2 CH	(14) 222													Dimensions	Sidemount Cabinet	4	Opticom	452	2	SEC	III-CF	Stand Alone
13	Harrison St & Airport Blvd	332	8" Raised	SEC	McCain	170E Quad w/200		CMU	210	Loops	Various	2 CH	(10) 222													Dimensions	Sidemount Cabinet	4	Opticom	m262	2	SEC	III-CF	Stand Alone , Phone Drop
14	Palm St & Varner Rd	332	2" Raised	SEC	Safetran	170E Quad w/233		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(2) 222	LCD - Rackmount												Dimensions	Sidemount Cabinet	4	Opticom	452	2	SEC	III-CF	*Shared with City of Desert Hot Springs Cell Modem
15	Ramon Rd & Bob Hope Dr	332	2" Raised	SEC	McCain	170E Quad w/233		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	(1) Vantage Access	B/W Monitor				(3) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4	Opticom	752	2	SEC	III-CF	GPS
16	Ramon Rd & Monterey Ave	332	2" Raised	SEC	McCain	170E Quad w/233		CMU	2010 ECL	Video & Loops	Iteris	Vantage Edge 2	(1) Edge Connect (3) 222	LCD - Rackmount												Dimensions	Sidemount Cabinet	4	Tomar	StrobeCom II	2	SEC	III-CF	Stand Alone, GPS
17	Ramon Rd & Roberts Rd	332	2" Raised	NEC	McCain	170E Quad w/200	170E Quad w/210	CMU	210 ECL	Loops	EDI	2 CH	(5) 222					(1) 6 Pr	GDI 400							Myers	Sidemount Cabinet	4	Tomar	StrobeCom II	2	NEC	III-CF	
18	Ramon Rd & Varner Rd	332	2" Raised	SWC	McCain	170E Quad w/233		CMU	210	Loops	EDI	2 CH	(9) 222					(1) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4				SWC	III-CF	
19	Varner Rd & Bob Hope Dr	332	2" Raised	SWC	McCain	170E Quad w/200		CMU	210 ECL	Loops	EDI	2 CH	(10) 222					(1) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4	Tomar	StrobeCom II	1	SWC	III-CF	
20	Varner Rd & Classic Club Blvd	332	2" Raised	SWC	McCain	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(10) 222					(1) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4	Opticom	752	1	SWC	III-CF	
21	Varner Rd & Cook St	332	2" Raised	SWC	Signal Control Co	170 Dual w/200		CMU	210	Loops	EDI	2 CH	(12) 222					(2) 6 Pr	GDI 400							Alpha	Sidemount Cabinet	4	Opticom	562	2	SEC	III-BF	
22	Varner Rd & Desert Cities Dr	332	2" Raised	SWC	McCain	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(10) 222					(1) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4	Opticom	7854	1	SWC	III-CF	
23	Varner Rd & Leopard St	332	2" Raised	NEC	IDC	170E w/200		CMU	210	Loops	IDC	2 CH	(6) 222													Dimensions	Sidemount Cabinet	4	Opticom	752	2	NEC	III-CF	Stand Alone
24	Varner Rd & Monterey Ave	332	2" Raised	SWC	McCain	170E Quad w/200		CMU	210	Loops	Various	2 CH	(14) 222					(1) 6 Pr & (2) 12 Pr	GDI 400							Alpha	Sidemount Cabinet	4	Opticom	562	1	SWC	III-CF	
25	Varner Rd & Washington St	332	2" Raised	NEC	McCain	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(18) 222					(3) 6 Pr	GDI 400							Alpha	Sidemount Cabinet	4	Opticom	752 & 462	1 & 1	NEC	III-CF	
26	Washington St & Del Webb - North	332	2" Raised	NEC	IDC	170E w/200		CMU	210	Loops	IDC	2 CH	(7) 222													Alpha	Sidemount Cabinet	4	Opticom	752	2	NEC	III-CF	Stand Alone
27	Washington St & Del Webb - South (Las Montanas)	332	2" Raised	SEC	McCain	170E Quad w/233		CMU	210	Loops	IDC	2 CH	(12) 222													Alpha	Sidemount Cabinet	4	Opticom	752	2	SEC	III-CF	Stand Alone
28	Washington St & Market Pl	332	2" Raised	SEC	McCain	170E Quad w/233		CMU	210	Loops	EDI	2 CH	(10) 222					(1) 6 Pr	GDI 400							Dimensions	Sidemount Cabinet	4	Opticom	562	1	SEC	III-CF	
29	Washington St & Ave of the States	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16 E	Loop	Shelf	2 CH	(11) Shelf mount		(2) 36 SMFO	2U 12 port wall	IFS D9130-B												Opticom	762 Chassis	1	NWC	III-CF	*Shared with the City of Palm Desert
30	Washington St & Harris Ln	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		CMU	LCD-12 P	Loop	Shelf	2 CH	(8) Shelf mount		(1) 12 SMFO	1U 12 port wall	IFS D9130-B	(1) 6pr #19												Opticom	752 Chassis	1	NWC	III-CF	*Shared with the City of Palm Desert
31	Washington St & Avenue 42 / Hovley Ln E	P-44	18" Raised	NWC	Econolite	ASC 2S-2100		MMU	16	Loop	Shelf	2 CH	(11) Shelf mount		(1) 12 SMFO	2U 12 port wall	IFS D9130-B												Opticom	562 Chassis	2	NWC	III-CF	*Shared with the City of Palm Desert
32	Washington St & Country Club Dr	P-44, PNG	18" Raised	SEC	Econolite	ASC 2S-1000		MMU	16 E	Loop	Econolite	2 CH	(16) Model G					(2) 6pr #19	FSK										Opticom	562	2	SEC	III-CF	*Shared with the City of Palm Desert
33	Washington St & Avenue 41	R, PNG	4" Raised	NEC	Econolite	ASC 3-2100		MMU	16 LE	Loop	Econolite	2 CH	(10) G-68		(1) 12 SMFO	1U 12 port wall	IFS D9130-B									Myers	side mount cabinet	4 EA	Opticom	452	2	NEC	III-CF	*Shared with the City of Palm Desert
34	Adams St & Fred Waring Dr	P-44, PNG	18" Raised	NWC	Econolite	ASC 3-2100		MMU	16 LE	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ LCD Monitor				(1) 12pr #19	FSK	Econolite					Dimensions	side-mount cabinet	4	Opticom	764	1	NEC	III-CF	*Shared with the City of La Quinta
35	Dune Palms Rd & Fred Waring Dr	P-44	18" Raised	SWC	Econolite	Cobalt		MMU	16 E	Video / Loop	Iteris	Edge 2	(4) RZ4 Camera	TS2 Interface Module/ LCD Monitor				(1) 12pr #19	FSK						Dimensions	side-mount cabinet	4	Opticom	752	2	SWC	III-CF	*Shared with the City of La Quinta

Regional Traffic Signal Synchronization Program

County of Riverside
Equipment Matrix

Intersection Identification No.	Intersection	Controller Cabinet			Controller Unit			MMU / CMU		Detection System					Communication System									CCTV System	Battery Back-Up System			EVP			Service Enclosure		Comments
		Cabinet Type	Foundation	Location	Type	Model	Master Controller	Type	Model	Loops or Video	Type / Model	Unit Type / Model	Detection Sensor Units No. of Units / Type / Model	Misc. Detector Sensor Units / Communication Units No. of Units / Type / Model	Fiber Optic Cable	Fiber Patch Panel	Fiber Switch (Type/Model)	Twisted-pair Copper (SIC)	Telemetry	D Panel	Ethernet over Copper (Type/Model)	Wireless (Type)	Wireless Modem (Type/Model)	Ethernet Switch		Model	Location	Batteries	Type	Model	Quantity	Location	Type	
36	Palm Dr & Dillon Rd	333 JP	18"	SEC	McCain	170E Quad w/200		CMU	210	Loops	EDI	2 CH	(12) 222						GDI 400 DS						Dimensions	Inside Cabinet	4	Opticom	m262	2	SEC	III-CF	*Shared with the City of Desert Hot Springs Stand Alone, Phone Drop (Aban)
37	Miles Ave & Madison St	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	3	LCD- Rackmount											Dimensions	Sidemount Cabinet		Opticom	452	2	SWC	III-CF	*Shared with the City of Indio Stand Alone. McCain GPS not working
38	Miles Ave & Swingle Ave	332	2"	SWC	McCain	170E Quad w/200		CMU	2010 ECL	Video	Iteris	Vantage Edge 2	4	LCD - Rackmount				(1) 6 Pr							Dimensions	Sidemount Cabinet		Opticom	752	2	SWC	III-CF	*Shared with the City of Indio Twisted Pair not Connected
39	Clinton St & Miles Ave	332	2"	NEC	IDC	170E w/200		CMU	210E	Video	Iteris	Vantage Edge 2		LCD - Rackmount				(2) 6 Pr	Controller GDI 400						Dimensions	Sidemount Cabinet		Opticom	m262	2	NEC	III-CF	*Shared with the City of Indio McCain GPS / SIC not in use
40	Clinton St & Palmyra Ave	332	2"	SEC	McCain	170E Quad w/200		CMU	210	Video	Iteris	Vantage Edge 2		LCD Monitor				(2) 6 Pr	Controller GDI 400						Dimensions	Sidemount Cabinet		Opticom	752	2	SEC	III-CF	*Shared with the City of Indio Twisted Pair not Connected

Appendix B:

Intersection Field Survey Checklist Forms

Appendix B1.1:

Controller Cabinet and Intersection Field Survey Checklist

CONTROLLER CABINET AND INTERSECTION FIELD SURVEY CHECKLIST

AGENCY _____ **FIELD SURVEY DATE:** _____

INTERSECTION No . _____ **SURVEY BY** _____

N/S STREET NAME _____

E/W STREET NAME_____

NOTES:

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CONTROLLER CABINET INVENTORY			
	Item	**Manufacturer/ Model/Description**	**Quantity**
√	Cabinet Type		
	Cabinet Location		
	Foundation/Conduit Entering Cabinet		
	#6E Pull Box		
	Controller Unit:		
	Type / Model		
	Master Controller (Type/Model)		
	Detection System (Video / Loops):		
	Video Detection: Type and Model		
	Video Detection Monitor: Type and Model		
	Detector Sensor: Type / Model		
	Battery Back-Up System:		
	BBS Type / Model/Side Mounted Cabinet		
	Battery Location		
	Communication System:		
	Type (Phone, Wireless, Twisted Pair, Fiber)		
	Communication Equipment (Modem, Switch)		
	Fiber Patch Panel/No. of Fiber Strands		
	Terminal Block (SIC) / No. of Terminations		
	Splice Enclosure		
	D-Panel		
	Service Enclosure:		
	Location		
	Type		
	Other Equipment:		
	Duplex Outlet/Power Strip		
	Vehicle Pre-emption		
	Conflict Monitor (MMU or CMU)		

CONTROLLER CABINET AND
INTERSECTION FIELD SURVEY CHECKLIST

INTERSECTION REVIEW		
√	**Traffic Signal Mast-Arm Poles:**	
	Location 1: Pole Type / Signal M. A. Length	
	Location 2: Pole Type / Signal M. A. Length	
	Location 3: Pole Type / Signal M. A. Length	
	Location 4: Pole Type / Signal M. A. Length	
	Traffic Signal Luminaire:	
	Location 1: Luminaire M. A. Length	
	Location 2: Luminaire M. A. Length	
	Location 3: Luminaire M. A. Length	
	Location 4: Luminaire M. A. Length	
	Video Detection System:	
	Location 1: Camera (Location)	
	Location 2: Camera (Location)	
	Location 3: Camera (Location)	
	Location 4: Camera (Location)	
	Conduit Runs for Communications:	
	Conduit Sizes	
	Fill %	
	Communication System:	
	Wireless Antenna (Type)	
	Microwave Antenna (Type)	
	Fiber Optic Cable (No. of Fibers)	
	Twisted Pair (No. of Pairs/ Conductor Size)	
	Phone Drop	
	Cell Modem	
	Other:	
	Bluetooth	
	EVP Detectors	
	CCTV Cameras	

PHOTO LOG		
√	**Controller Cabinet:**	
	Front Open Cabinet	
	Back Open Cabinet	
	Traffic Signal As-Built Plan (Inside Cabinet)	
	Traffic Signal Mast-Arm Poles:	
	Pole Locations and Mast Arms	
	CCTV Cameras	
	Curb Returns	
	Intersection – Each Approach	
	Intersection – Travel Lanes	

Appendix B1.2:

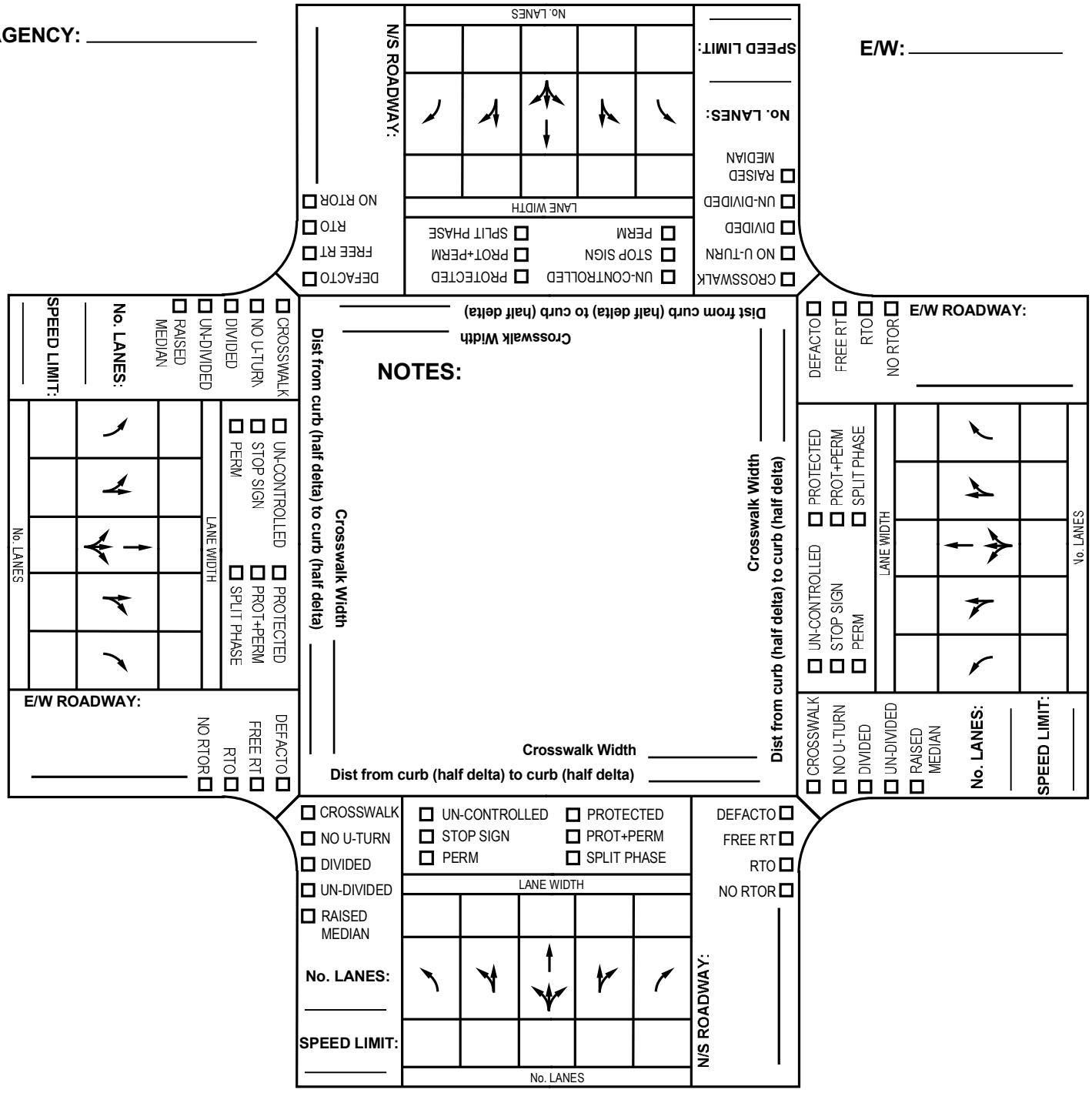
Signal Timing Field Survey Sheet

ADVANTEC
Consulting Engineers

DATE: _____ **INTERSECTION No.:** _____

PROJECT#: _____ **N/S:** _____

AGENCY: _____ **E/W:** _____



NORTH

SURVEYOR: _____

Signal Timing Field Survey Sheet