



Connected Corridors Face-to-Face Meeting

Tuesday, Nov 14th, 2017 – 1:30 – 3:30 pm
Arcadia

Nov 14th, 2017



Agenda

2

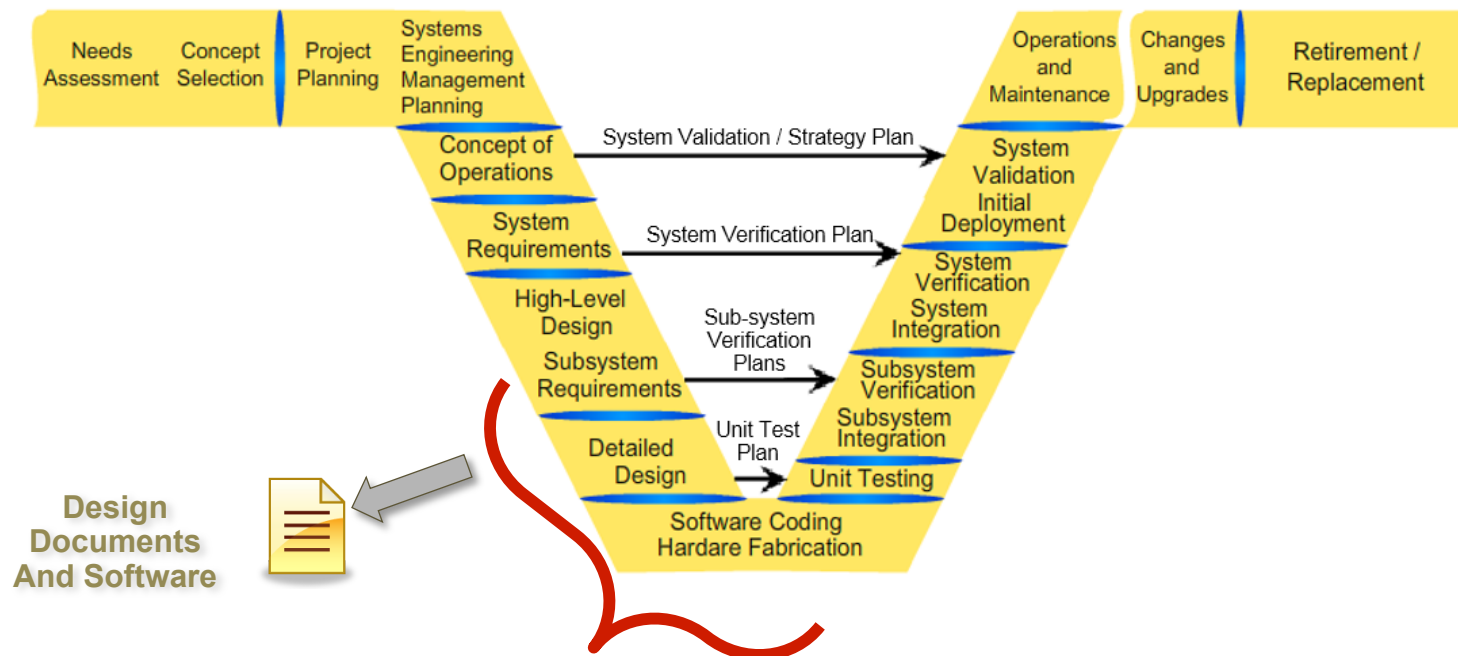
- ❑ **1:30-2:00 - Summary of program**
- ❑ **2:00-2:10 - Approval of charter - Joe**
- ❑ **2:10-2:30 - Update on communications – Kali, Jesus, Erlan**
- ❑ **2:30-3:00 - Call for projects requirements - Parsons**
- ❑ **3:00-3:20 - Sign requirements - Erlan**
- ❑ **3:20-3:30 - Closing: Next meeting location in Monrovia or Duarte**



Systems Engineering Next Steps

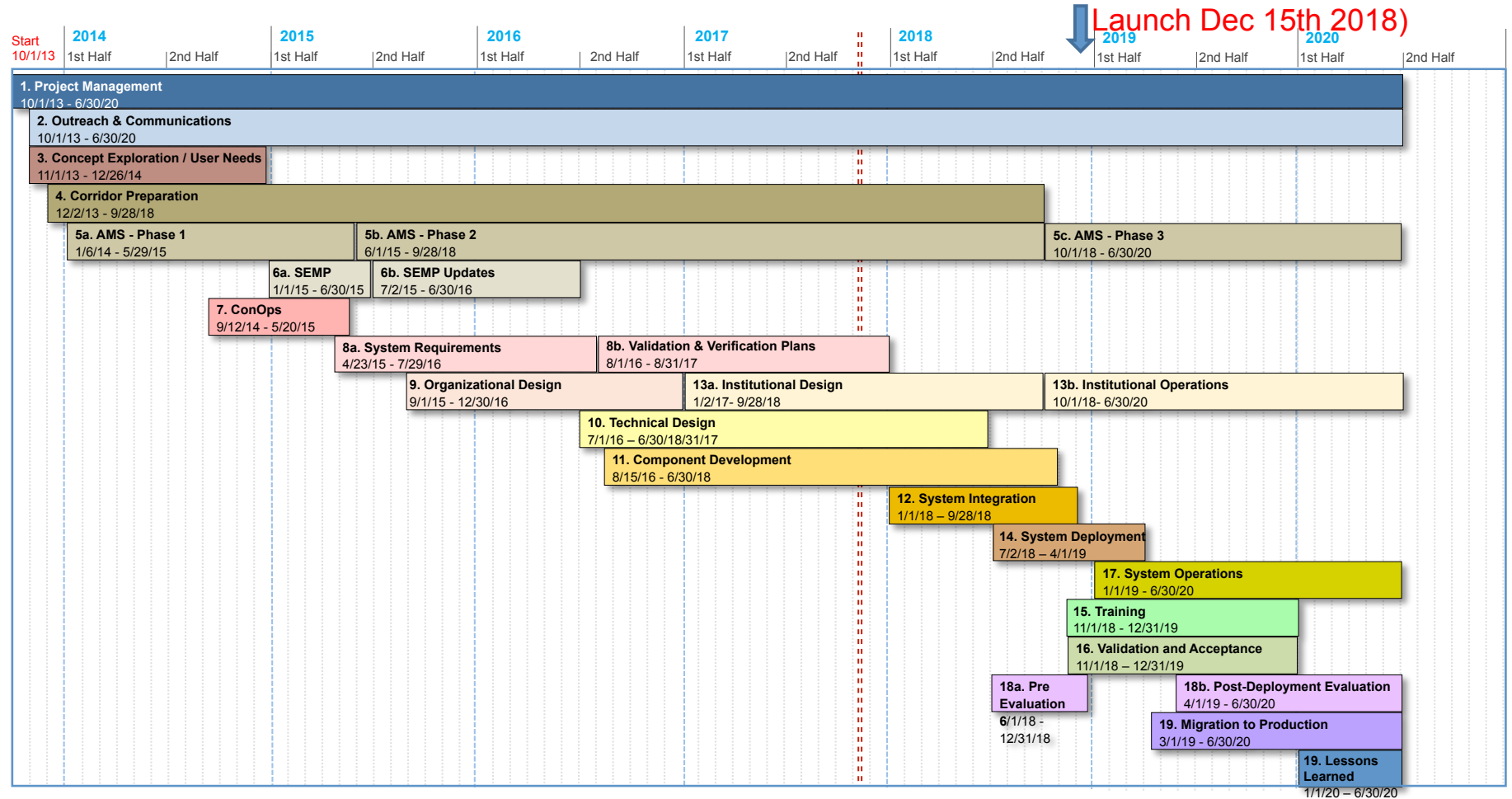
3

- **Design Documents – How will the requirements be met**
- **Hardware and Software – Building the system**



Schedule

4



Risks

5

□ Short Term Risks

- ▣ Dynamic Message Sign Design and Purchasing
- ▣ Other Call for Projects ITS Design and Purchasing
- ▣ Contracting items

□ Launch Risks

- ▣ Data being available for testing
- ▣ Integration at a rapid pace
- ▣ Shortage of resources
- ▣ COTS Integration
- ▣ Contracting



6

Summary

Outreach

7

- **New format for face to face**
- **Next two face to face meetings in Monrovia and Duarte**
- **Next Connected Newsletter under review**
- **Mort and Farid onboarding**
 - Mort, Farid, Steve, Ed and Joe met with Pasadena, Arcadia and LA County. Meetings went well.
 - Are setting up similar meetings with Monrovia and Duarte (Will the week of Nov 27th work?)
- **Charter – To be discussed later**
- **Presentations**
 - Francois to present on the Data Hub at TRB – Title is UC Berkeley's and Caltrans' new cloud based data hub
 - Joe presented to AASHTO Center for Excellence on Workforce Management for TSM&O
 - Joe to present at ITS Southern Ca Luncheon on Big Data at Berkeley



MOU

8

□ Mort is working on it

□ Tentative Schedule

- - Assigned to Mort October 23, 2017;
- - Draft Outline due January 10, 2018;
- - Draft MOU due April 20, 2018;
- - Draft MOU Circulation for Review April 27, 2018;
- - All comments Due back by May 30, 2018;
- - Final draft MOU Due July 11, 2018;
- - Submit for Signature July 25, 2018;
- - Final Signed MOU September 22, 2018



Human and Organizational Design

9

- **Caltrans D7 provided prioritization comments on additional sections of the Roles and Responsibilities document.**
- **Tarek met with San Diego Association of Governments (SANDAG)**
 - ▣ Will await his report to share results
 - ▣ Alex Estrella indicated he would like to be more involved with the I-210 effort
- **Tarek met with Caltrans District 11 – San Diego**
 - ▣ Will await his report to share details
- **Tarek setting up meeting with Caltrans District 4 – Bay Area**



Systems Engineering

10

- **Released on CC Website yesterday**
 - ▣ Draft data hub core system design document
 - ▣ Detailed design architecture picture (large and detailed).
 - ▣ Continual updates to System Interface Doc/Data Dictionary
- **Under development**
 - ▣ Core system validation document
 - ▣ Kali and Jesus building communication design document



TMDD Interfaces

11

□ External NTCIP/TMDD Interfaces

□ Kimley Horn

- Caltrans working on contract

□ TransCore

- Have started development. Will check in with them next week.

□ McCain

- Caltrans working on contract

□ ATMS – Caltrans (CMS Signs, Loops, Ramps)

- Provided comments on the design document.

- Overall it looked pretty good.



COTS (Purple Box)

12

□ Companies who are participating:

- ▣ Kapsch
- ▣ Parsons
- ▣ Telegra

□ Update

- ▣ Good meeting with Telegra. Everyone seems reasonably comfortable with the process.
- ▣ Meeting with Parson's next week
- ▣ Folks want to make sure that the official procurement will be completed by first half of 2020



Design and Construction

13

- **210 TMS Upgrade**
 - ▣ Heading for on time completion at end of year
- **Network Communication**
 - ▣ To be discussed in detail later
- **Call for Projects (ITS Elements) – Allen**
 - ▣ To be discussed in detail later
- **Call for Projects – Signs and Sign Software**
 - ▣ To be discussed in detail later



Data Quality

14

□ Freeway - Data Quality Meeting

- I-210 PM 25 - 52.44
 - Eastbound 79.4% (6-month average: 82%)
 - Westbound 84.2% (6-month average: 84%)
- I-10 PM 19.4 - 29.65
 - Eastbound 98.3% (6-month average: 93%)
 - Westbound 97.4% (6-month average: 91%)
- I-605 PM 22.93 - 28
 - Northbound 87.6% (6-month average: 79%)
 - Southbound 88.4% (6-month average: 80%)

□ IEN Data

- IEN has been up and down this month so difficult to report on data quality for County, Monrovia and Duarte

□ Pasadena Data

- Received one week of Pasadena data
- Will be processing this week. Yes!

□ Arcadia

- Rising to 79%.



Estimation of Corridor Traffic State

15

□ Freeway

- Hope to have working by end of year
- Improving data quality is enabling this

□ Arterial

- Integrating Pasadena data
- Continuing migration of Matlab code to Java
- Hope to have first corridor wide arterial estimation running by end of year

□ Estimation is needed for

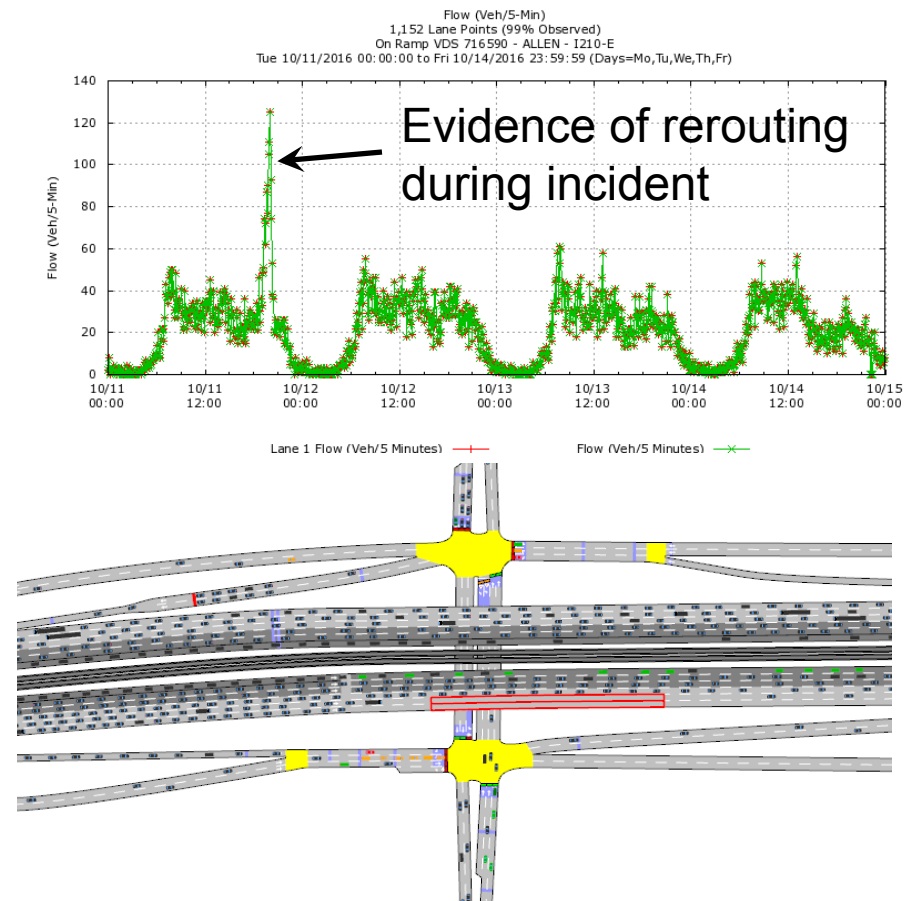
- Display of current state
- Possible information for rules
- Seeding of prediction simulations



Incident simulation and response planning

16

- ❑ Matching traffic patterns during historical incidents
- ❑ Comparing available freeway and arterial data to confirm simulation veracity
- ❑ Adjusting flush plans and ramp meter plans to improve traffic outcomes
- ❑ Greg met with TMC staff to review response planning process
- ❑ Dec 5th – Next response plan and modeling review (Actual incident and response)



Data Hub and DSS Software

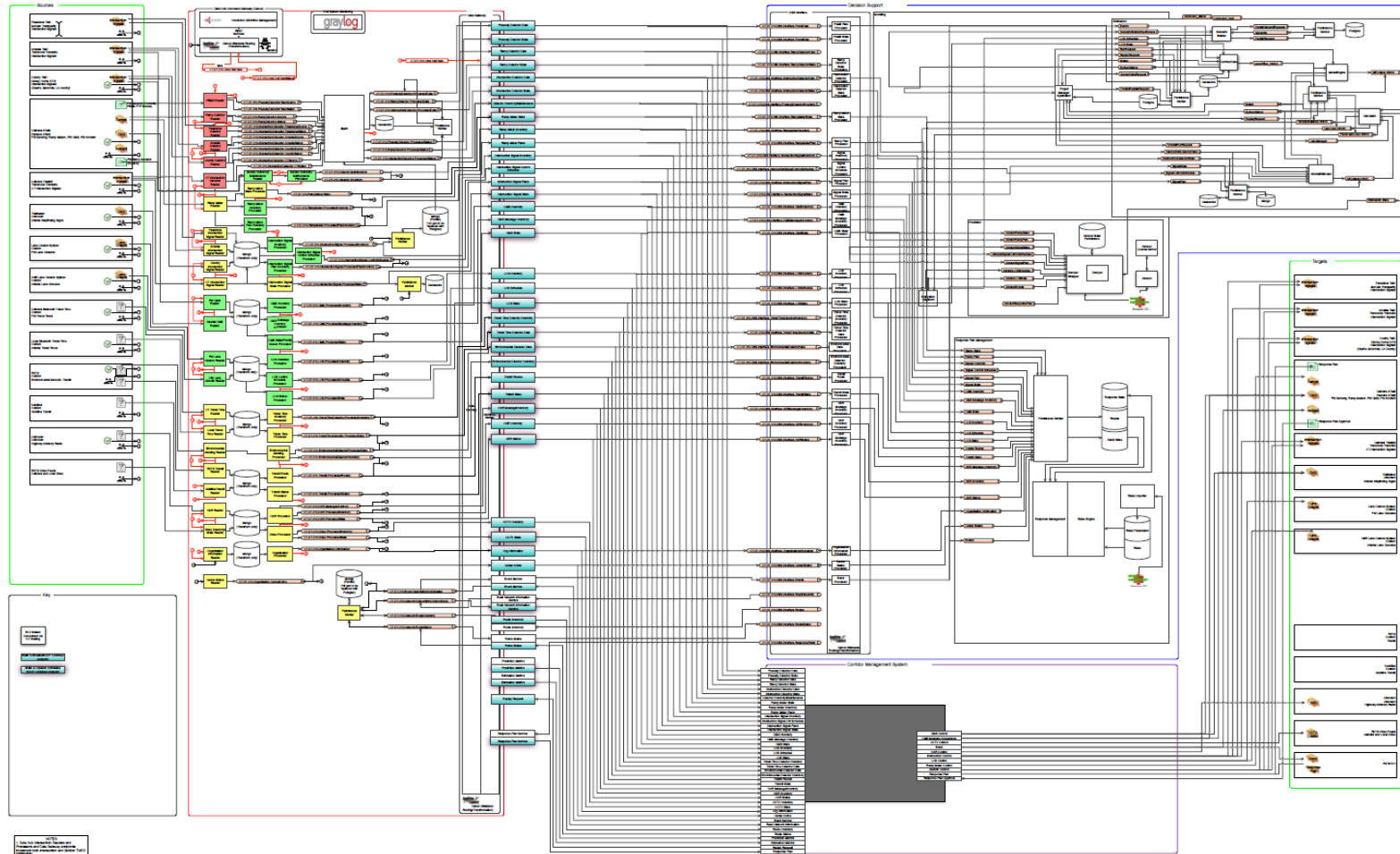
17

- ❑ **Cloud networking address space identified**
- ❑ **Command and control - Improved simple and complex workflow implementations**
- ❑ **Data Hub hardening (reliability improvements)**
- ❑ **Beginning design of response plan management in DSS**
- ❑ **Integration meetings with COTS vendors**



Data and DSS Detailed Design (Draft)

18



Other Items

19

□ 511

- ▣ 511 Integration – We reviewed the interface definitions and will now setup a meeting with Kali to discuss initial implementations.
- ▣ Began reviewing the “REGIONAL INTEGRATION OF ITS MODERNIZATION TRANSPORTATION STANDARDS SYSTEM DESIGN”

□ Arterial Lane Closure – Arterials

- ▣ I think we have agreed to use the Caltrans arterial lane closure system.
- ▣ Do people want more time to review it?

□ PEMS

- ▣ Expecting proposal in near future



Charter Changes – Page 1 of 2

20

2. THE CORE STAKEHOLDERS NOW DESIRE TO AMEND THE PROJECT CHARTER AS FOLLOWS:

A. The following Primary Contact Persons shall be updated as follows:

- i. Caltrans District 7 – ~~Mort Fehrtash~~ Rafael Molina

F. Core Stakeholders will now include LA SAFE (the Los Angeles County Service Authority for Freeway Emergencies) and RIITS (the Regional Integration of Intelligent Transportation Systems program).

- i. LA SAFE includes the ~~Metro Freeway Service Patrol (FSP)~~, SoCal 511 Traveler Information System, and the Kenneth Hahn Call Box Program System and is managed by LA Metro's Congestion Reduction department Business Unit.
- ii. LA Metro administers ~~the RIITS network~~ with information provided from government agencies in Southern California and other sources of transportation data available through RIITS. ~~by Caltrans, the City of Los Angeles Department of Transportation, the California Highway Patrol, Long Beach Transit, and Foothill Transit.~~
- iii. Additional Core Stakeholders may be added without amendment to the Project Charter with verbal approval of Caltrans, LA Metro, PATH, LA SAFE, LA County and the cities (Pasadena, Arcadia, Monrovia, and Duarte).



Charter Changes – Page 2 of 2

21

3. The following will be added to the table of contacts and roles/responsibilities starting on Page 4:

Core Stakeholder	Primary Contact Person	Primary Roles and Responsibilities
RIITS	Kali Fogel	Real-time information exchange network between LA County, freeway and arterial data, traffic, transit and emergency services agencies. Provide equipment, hardware, maintenance, and/or management for interfaces and video, as agreed.
LA SAFE	Iain Fairweather Kenneth Coleman	Develop the software, accept and display data, disseminate incident information. Integrate with existing programs such as Freeway Service Patrol.

All other terms and conditions contained in the June 25, 2015 Project Charter are unaffected by this Amendment No. 1 and shall remain in full force and effect.

IN WITNESS WHEREOF, the Core Stakeholders have executed this Amendment. The latest signature date is the date of the Amendment.



Communication



Status Update

23

- ❑ **Finalizing Phase 2 network design**
 - ▣ Network capable of splitting a single fiber optic into multiple channels each with dedicated bandwidth
 - ▣ IP address and protocol independent
 - ▣ Provides a medium for organizations to transport data
 - ▣ Network components do not include switches, routers, or firewalls
- ❑ **Generated draft Bill of Materials using MRV as an example but have not selected a vendor**
- ❑ **Require fiber distances, fiber power and loss budget to finalize design**



IP Address and Protocol Independent

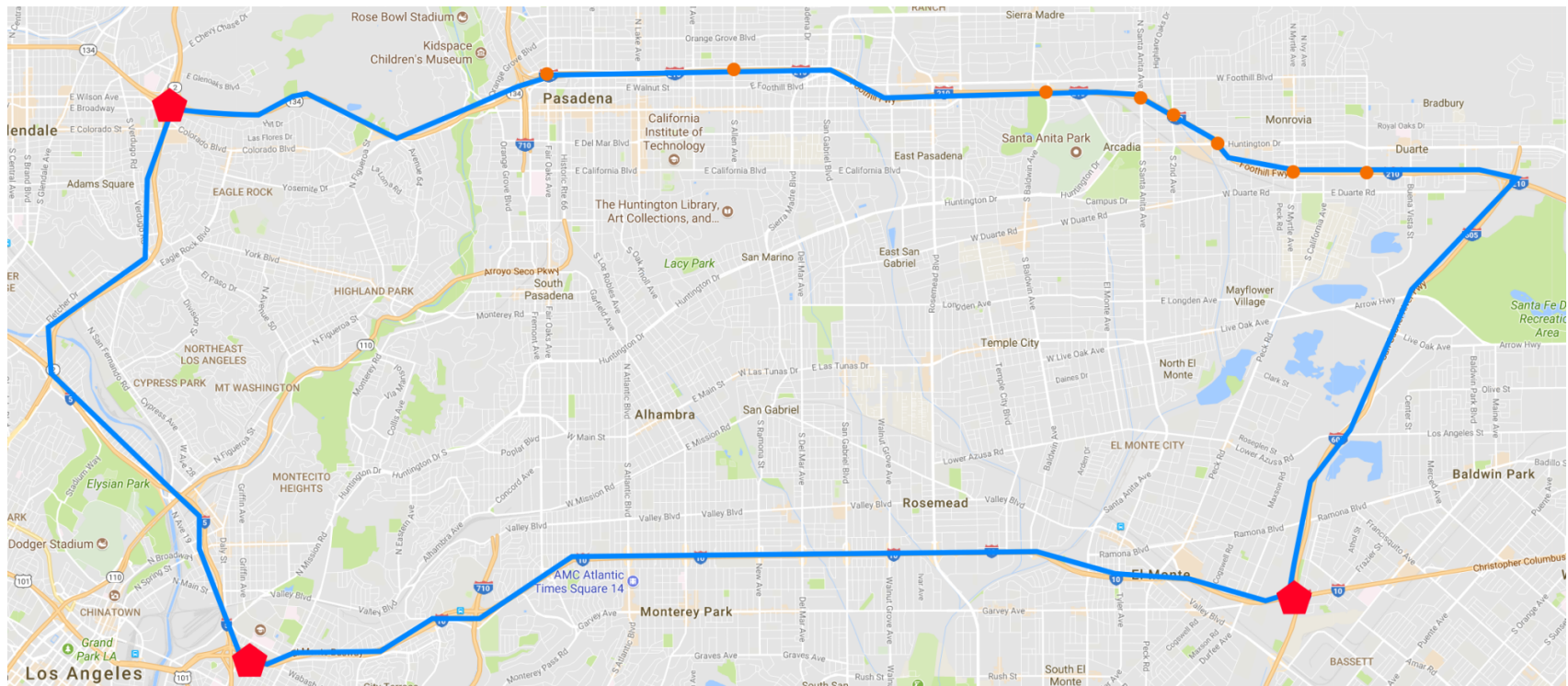
24

- ❑ **Fiber network provides physical connectivity between the agencies**
- ❑ **RIITS will provide and manage the physical demarcation where Caltrans and agencies connect**
- ❑ **Logical part of the network such as routing and IP address numbering will not be managed by RIITS**
- ❑ **Routing and IP address schemes required for logical connectivity needs to be defined**



Phase 2 Overview

25



Phase 2 Components

26

Chassis Physical Specifications

	OD-48-HD	OD-32	OD-16	OD-12	OD-6	OD-4
Rack Space	10 RU	9 RU	3 RU	3 RU	2 RU	1 RU
Weight	18 lbs	37 lbs	28.5 lbs	28.5 lbs	12.5 lbs	1.6 lbs
App Slot	46	30	15	11	5	3
Mgr Slot	2	2	1	2	1	1

Hub Sites

Field Sites



Phase 2 Components

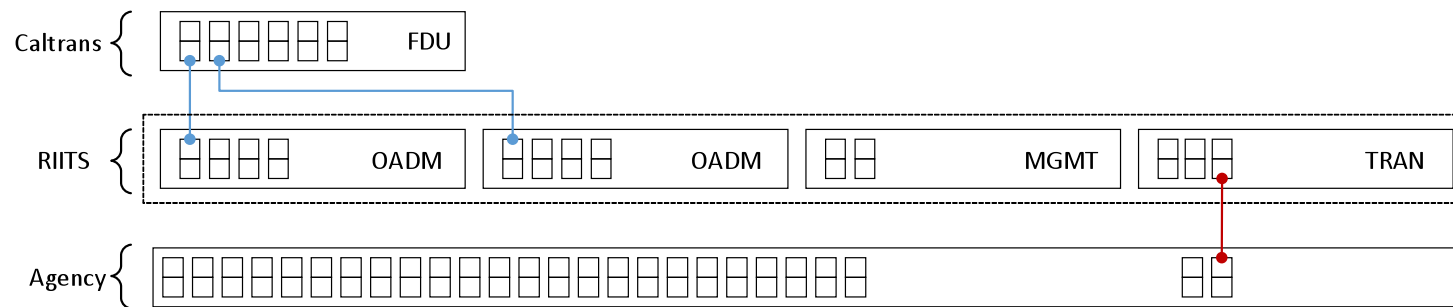
27

Modules	Function
OADM	Separate physical fiber into multiple data channels Protocol and topology independent
Network Management	Provide management control for self-healing switch
Optical Self Healing Switch	Provide full path protection Capable of switching between a primary and secondary (backup) link
Amplifier	Extended optical link Use only when needed
Transceiver	Enables agencies to connect into the optical network



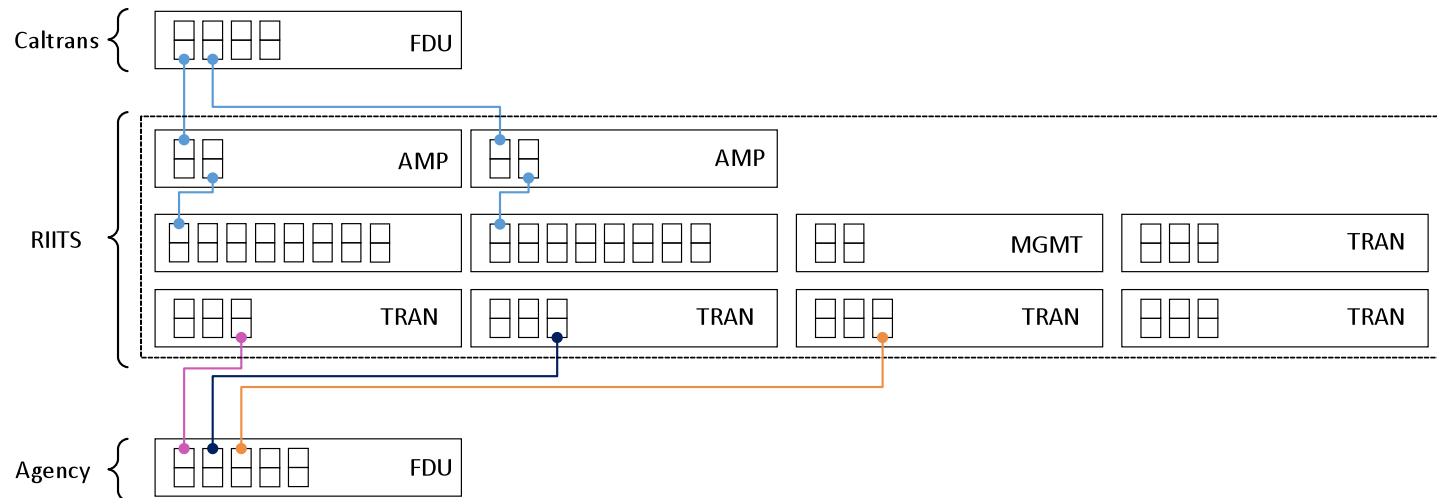
Phase 2 Sample Connectivity – 1 service

28



Phase 2 Sample Connectivity – 3 services

29



Design Option 1: Channel per Agency

30

Pros	Cons
Dedicated bandwidth for each agency	Reduce scalability for the region due to finite number of channels
Dedicated bandwidth for data and video	Increases fiber and switch port requirement for agencies
Protocol independent	Most expensive solution
Minimize concerns with IP address conflicts between agencies	
Security based on physical separation	



Design Option 2: Channel per Function

31

Pros	Cons
Dedicated bandwidth for data and video	Shared bandwidth between agencies
Increase channel scalability for the region	Agencies need to agree on protocol and IP address scheme
	Security based logical separation (VLANs and firewall)



Design Option 3: Single Channel for ICM

32

Pros	Cons
Increase channel scalability for the region	Shared bandwidth between agencies and function (data/video)
Reduce fiber and switch port requirement for agencies	Agencies need to agree on protocol and IP address scheme
Least expensive solution	Security based logical separation (VLANs and firewall)



Design Comparisons

33

Benefits	Option 1: Separate channels/ agency	Option 2: Separate channels/ function	Option 3: Single channel for ICM
Availability (Most)	★ ★ ★	★ ★ ★	★ ★ ★
Agency Impact (Least)	★	★ ★	★ ★ ★
Capacity (Most)	★ ★ ★	★ ★	★
Cost (Least)	★	★ ★	★ ★ ★
Logical Config (Least)	★ ★ ★	★ ★	★
Scalability (Most)	★	★ ★	★ ★ ★
Security (Most)	★ ★ ★	★ ★	★ ★



Good



Better



Best



Next Steps

34

- ❑ **Identify connectivity points between Caltrans and agencies**
- ❑ **Issue Statement of Work to complete fiber connectivity**
- ❑ **Obtain fiber distances and estimates on fiber power/loss budgets**
- ❑ **Finalize number of channels need per location**
- ❑ **Issue procurement for network components**



Communication – Other Items

35

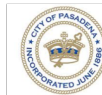
- **Assignment of IP Ranges for CC**
 - ▣ Caltrans HQ has assigned 10.X subnet to ICM efforts in the districts. Excellent. Provides sufficient addresses for production, test, dev and research.
 - ▣ PATH divided the network up as needed and results were provided to Caltrans and RIITS
- **Erlan working on Caltrans fiber to city fiber connections**
- **Call for Projects Communication Under Bridge at Huntington and Encino**
 - ▣ Allen, Kali and Joe discussed. Kali will move forward with a design that meets Jane's requirements



CC IP Ranges

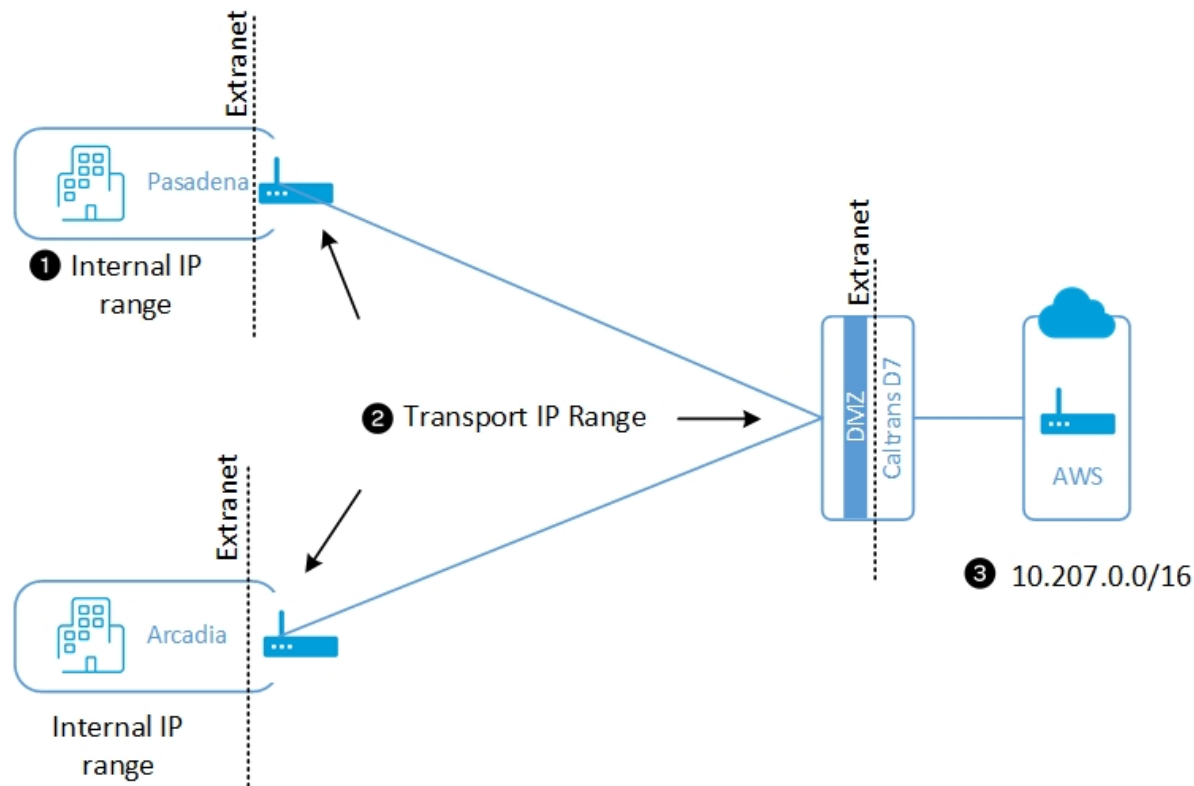
36

- 10.207.0.xxx == ROOT of PROD stack
- 10.207.0.xxx = PROD Datahub ROOT >> PROD Datahub Public (*)
- 10.207.1.xxx = >> PROD Datahub Shared
- 10.207.2.xxx = >> PROD Datahub Private
- 10.207.3.xxx = PROD CMS ROOT >> PROD CMS Public (#)
- 10.207.4.xxx = >> PROD CMS Shared
- 10.207.5.xxx = >> PROD CMS Private
- 10.207.6.xxx = PROD AWS RDS subnet in second Availability Zone
- 10.207.7.xxx >> SPARE <<
- 10.207.8.xxx = PROD DSS1 ROOT >> PROD DSS1 Modeling Shared
- 10.207.9.xxx = >> PROD DSS1 Modeling Private
- 10.207.10.xxx = >> PROD DSS1 RPM Shared
- 10.207.11.xxx = >> PROD DSS1 RPM Private
- 10.207.12.xxx = PROD DSS2 ROOT
- 10.207.16.xxx = PROD DSS3 ROOT
- ...
- 10.207.60.xxx = PROD DSS14 ROOT



Next Step: Select Transport IP Addresses

37



Call for Projects

Parsons to Discuss



PARSONS

PARSONS

Caltrans D7 I-210 Connected Corridors

Procurement Support

Dan Lukasik
Vice President



delivering a better world

delivering a better world

Timeline

- Met Face-to-Face with Stakeholders August 2 – 21
- Distributed Updated Equipment List September 1
- Distributed Procurement Packages to Stakeholders September 7
- Integrated updates / comments Sept 21 – Oct 31
- Provided Caltrans with Engineering Cost Estimate October 10
- Distributed Updated Procurement Packages November 2
- Provided Updated Engineering Cost Estimates November 8
- Finalize Procurement Packages (within Budget) November 22

Status

Well Defined Procurement Packages with scope reviewed by Stakeholders

Procurement Summary – 7 Procurement Packages

Budget = \$ 1,629,800

Requested = \$ 2,150,643

Requested Quantities Exceeded Budget by over 30% (or \$ 521,000)

To Meet Project Funding - Forced to Reduce Quantities to original budget totals
Reductions have been spread across all packages / jurisdictions

Each Jurisdiction must provide Updated LOCATIONS (reflecting reduced quantities)

Procurement List & Quantity

		Pasadena	Arcadia	Monrovia	Durante	LA County	Total		Original	Requested	In Budget
Package 1 - Bluetooth (Velocity)											
	Original	-	5	-	-	-	5		\$ 15,200		
	Requested	-	4	-	-	-	4			\$ 18,024	
	In Budget	-	4	-	-	-	4				\$ 15,124
	Reduction	-	-	-	-	-	-				
Package2 - Bluetooth (BlueToad)											
	Original	12	0	6	3	5	26		\$ 122,000		
	Requested	11	0	4	2	5	22			\$ 208,708	
	In Budget	6	0	2	1	3	12				\$ 115,620
	Reduction	-5	-	-2	-1	-2	-10				
Package 3 - New Cabinets											
	Original	7	1	-	-	-	8		\$ 222,500		
	Requested	7	1	-	-	-	8			\$ 271,897	
	In Budget	5	1	-	-	-	6				\$ 206,689
	Reduction	-2	-	-	-	-	-2				
Package 4 - Communication Upgrade											
	Original	-	0	15	5	2	22		\$ 302,500		
	Requested	-	2	27	11	5	45			\$ 417,038	
	In Budget	-	2	16	8	3	29				\$ 301,058
	Reduction	-	-	-11	-3	-2	-16				

Procurement List & Quantity

		Pasadena	Arcadia	Monrovia	Durate	LA County	Total	Original	Requested	In Budget
Package 5 - Controllers										
	Original	8	6	3	-	-	17	\$ 109,600		
	Requested	7	2	3	-	-	12		\$ 114,063	
	In Budget	7	1	3	-	-	11			\$ 110,263
	Reduction	-	-1	-	-	-	-1			
Package 6 - Video Detection System										
	Original	9	3	5	3	2	22	\$ 730,000		
	Requested	9	3	5	3	2	22		\$ 924,416	
	In Budget	8	2	4	2	1	17			\$ 712,363
	Reduction	-1	-1	-1	-1	-1	-5			
Package 7 - Data Comm Module / VDS SW Upgrades										
	Original	11	13	2	1	4	31	\$ 128,000		
	Requested	8	15	3	1	4	31		\$ 196,497	
	In Budget	7	7	3	1	4	22			\$ 127,771
	Reduction	-1	-8	-	-	-	-9			
								\$ 1,629,800	\$ 2,150,643	\$ 1,588,889
									\$ 520,843	
									Over Budget	



ALTERNATE ROUTE UPDATE



Locations Update

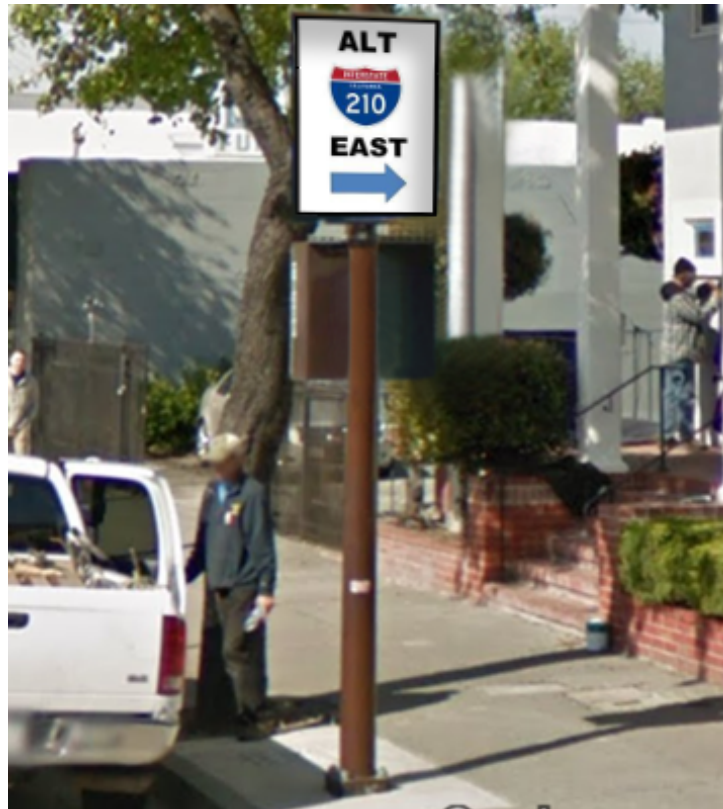
Bid Estimate

Bid Specifications

Next Steps

Equipment Update (CMS)

Sign: Full Matrix LED (3' x 4')



☐ **Pole: Modified Pole from San Mateo Project**



DMS Sign Location Update

- ❑ **15 Locations, 17 Signs in Pasadena**
 - ▣ 3 locations are at Caltrans-owned signals
- ❑ **6 Locations, 8 Signs in Arcadia**
 - ▣ Includes Huntington at Santa Anita (low priority)
- ❑ **4 Locations, 6 Signs in Monrovia**
 - ▣ 2 locations are at Caltrans-owned signals
- ❑ **3 Locations, 3 Signs in Unincorporated County Land**
 - ▣ 3 locations on Rosemead owned by LACO
- ❑ **1 Location, 2 Signs in Duarte**
- ❑ ***TOTAL = 36 signs***



Static Sign Location Update

- **Four locations will have static painted signs**
 - ▣ Three in Caltrans ROW
 - ▣ One in Pasadena

CODE 078

NOTE:
On overhead mounted signs, with lighting and catwalks, bottom border shall be omitted.

NOTE:
For destinations in line 2 use 6 & 4½ (078-1), 8 & 6 (078-2), or 10.67 & 8 (078-3).

ALL DIMENSIONS ARE IN INCHES

SUFFIX	SIZE	BORDER		LETTER SIZE, SERIES & STROKE WIDTH					COR RAD
		WIDTH	MARGIN	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	
-1.2	Var x42	1	-	8 NUM	6 CAP				6
-2.3	Var x54	1½	-	10 NUM	8 CAP				6
-3.2	Var x66	1½	-	10 NUM	10 CAP				6

SUFFIX	SIZE	DIMENSIONS											
		A	B	C	D	E	F	G	H	I	J	K	L
-1.2	Var x42	6	6										
-2.3	Var x54	8	7										
-3.2	Var x66	10	10½										

Green BACKGROUND WITH White BORDER & SYMBOL Reflective message & border

Refer to standard arrow sheet & post spacing table

APPROVED: *[Signature]* 11/15/11 *[Signature]* 7/15/12 *[Signature]* 7/15/12

HT-89 REV 12 30 89

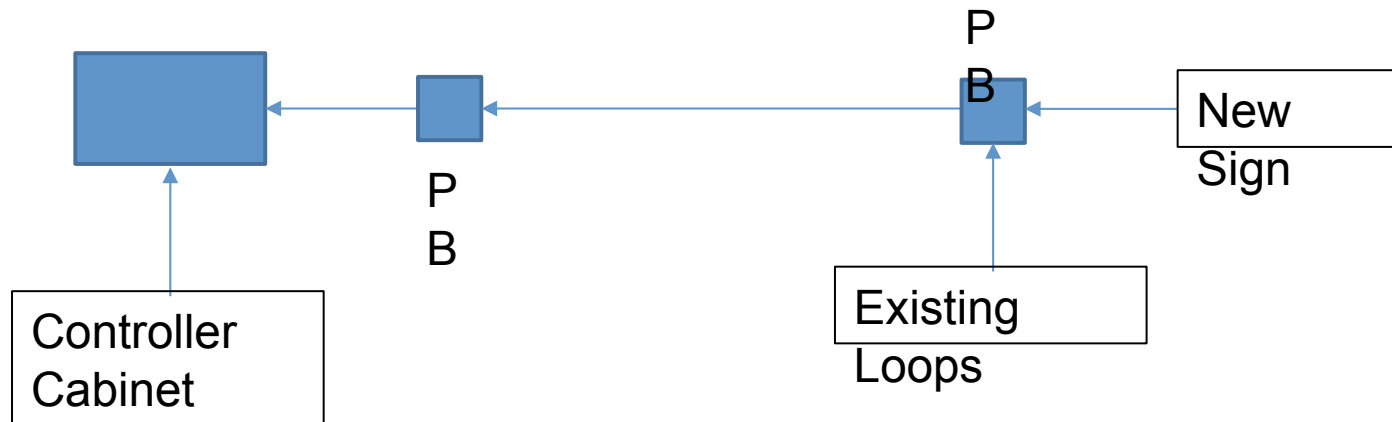


Sign Location Field Review

□ Conduit Capacity

▣ Performed conduit fill calculations based on the MUTCD

- 25% fill for new runs
- 35% for existing runs



Field Review Results

□ Feasible

- ▣ Any location where there is sufficient conduit capacity between the controller cabinet and the proposed sign location

□ Not Feasible

- ▣ Any location that does not have sufficient capacity and will require some or all of the following:

- Wireless Communication
- Solar Power
- New Conduit

□ Existing

- ▣ Locations where a sign is already in place



Bid Estimate

- **Hardware**

- Signs, Poles, Pull Boxes, Wireless Equipment, Extenders, Power & Comm Cables, Static Sign

- **Software**

- Three F2C Licenses, C2C Software

- **5% for Traffic Control**

- **5% for Mobilization**

- **20% Contingency**

- **~\$1.1 million**



Bid Specifications

- **A shorter scope-of-work**
 - ▣ Procuring & installing equipment
 - Comm and Power
 - ▣ F2C Sofw
 - ▣ C2C
 - ▣ Static Sign
- ▣ 2 Drafts
 - With and without details



What we are trying to avoid



Basic Fun

Lite Brite Magic Screen

★★★★☆ 373 customer reviews | 39 answered questions

List Price: \$27.00

Price: **\$21.16** ✓prime

FREE Shipping on orders over \$25—or get **FREE Two-Day Shipping** with Amazon Prime

You Save: **\$5.84 (22%)**

In Stock.

Want it Friday, Nov. 10? Order within **1 hr 18 mins** and choose **Two-Day Shipping** at checkout. [Details](#)
Ships from and sold by Amazon.com. Gift-wrap available.

- Lite Brite was the original creator of combining peg art with light and is still the leader in providing tl
- Easy and fun for anyone of all ages, just follow the template or Art Guide pictures to put the corresp anyone can create beautiful pictures that glow
- The sleek tablet with black board has light behind it. Just push the button to see the 4 different light your art – blinking, pulsing, steady and random – offer a new & exciting experience
- Comes with 156 round pegs in white, yellow, blue, pink, orange and green, 1 transparent removable : Guide with 9 more pictures to follow (not placed on the tablet)
- Requires 3 AA batteries (not included); Ages 4 to adult; works well and long with Polaroid Batteries

Used & new (33) from \$13.89 & FREE shipping on orders over \$25.00. [Details](#)

prime student

College student? Get **FREE shipping** and exclusive deals

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Next Steps

- **Josh and Erlan will visit all proposed sign locations to measure distance between proposed sign and corresponding Intersection**
- **Meet with Pasadena and Arcadia to discuss possible service access points**
- **Examine Caltran's cabinet locations, conduits and pull boxes**
- **Include information gathered from the tasks above onto the Bid Specifications**



**Thank You
and
Next Meeting
(Suggest Jan 16th
in Duarte)**

