Oakland County
Department of Information Technology
Project Scope and Approach

Project Name: RCOC Traffic Signal Management **Project ID: D19182SM**

Leadership Group: Land		
Department: Information Technology	**Division:** Application Services	
Project Sponsor: Aaron Verhelle/Tammi Shepherd	**Date Requested**: 2/26/2018	**PM Customer No.** 182
Request Type: ***New Development X*** ***Enhancement*** ***Customer Support*** ***Planned System Maintenance or Upgrade***		
IT Team Name: Land Management Infrastructure and GIS	**IT Team No**: 1	
Project Manager/Leader: Dennis Faustich		
Account Number: 36555	**Account Description:** RCOC Signal Management	**Customer Name:** Road Commission for Oakland County
Grant Funded? Yes **No** X	**Mandate?** **Yes** **No** X **Mandate Source:**	

Project Goal

To replace the existing MS2 traffic signal management application so that RCOC staff can more easily manage their traffic signal inventory.

Business Objectives

- Migrate spatial data from legacy system to Oakland County's Collaborative Asset Management System
- Store all the signal locations and attributes in a single database with regularly scheduled backups.
- Create a mobile data collection workflow to allow field staff to view and update asset information.
- Provide field crews an electronic, user-friendly application for performing preventive maintenance on traffic signal assets.

Major Deliverables

- Detailed Project Plan
- Application Requirements
- Application Configuration
- User Acceptance Test Plan
- Training Plan & User Guides
- Implementation Plan
- Disaster Recovery Toolkit

Approach

- Develop Detailed Project Plan
- Review current business process and conduct needs assessment with customer
- Document business requirements
- Determine and document data conversion strategy
- Assess User Hardware and Software Requirements
- Perform data conversion
- Develop new system
- Develop User Acceptance Test Plan
- Test new system
- Acquire User Acceptance Sign off
- Conduct Change Control
- Develop User Documentation & Disaster Recovery Toolkit
- Train users on new system
- Release new system into production
- Post Implementation Support

Research & Analysis

Gartner Research Recommendation

Cool Vendors in Smart City Applications and Solutions, 2017

Published: 19 July 2017 ID: G00326058
Analyst(s): Bettina Tratz-Ryan | Dean Freeman | Anshul Gupta

Smart city applications and solutions tend to be integrated holistically to optimize around the efficiency of Internet of Things (IoT) benefits. The vision and governance framework of smart cities and regions focus on the delivery of a life cycle approach to governance to improve citizens' lives, stimulate the economy and protect the environment. Real-time data analytics result in operational efficiency in urban infrastructure, such as buildings and transportation domains, as well as mobility service delivery. CIOs need to evaluate the selection of technology and innovative solutions not only for their coolness factor, but also for their contribution to a citizen "bottom line" — environmental, social and economic benefits that distinctly improve citizen quality of life. One significant tool to build operational efficiency and citizen services is to more efficiently utilize Internet of Things (IoT)-based smart city applications and solutions. The impact from these applications and solutions depends on how well they can leverage contextual data for optimization.

Gartner defines a "smart city" as an urbanized area where multiple sectors cooperate to achieve sustainable outcomes through the analysis of contextual real-time information, which is shared among sector-specific IT and operational technology systems. The smart city is an urban planning and city topology design utilizing a comprehensive IT-supported framework

Benefits

See Return on Investment (ROI) Analysis Document

Project Name: RCOC Traffic Signal Management **Project ID: D19182SM**

Impact

Number of Users ~40-50

Divisions Road Commission for Oakland County

Leadership Groups Land

Risk

Business Environment Medium - Project will require some changes to existing business processes.

Technical Environment Medium – Previously implemented technologies with new aspects and/or new requirements.

Assumptions

Staffing IT Staffing: resources will be available for the hours indicated per the attached project plan.

Other Staffing: additional staffing will be available as follows:

Role:	Name	Hours per Day
Project Sponsor:	Aaron Verhelle	As needed.

Facilities

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Technical

- No additional hardware purchases will be required specifically for this work.

Funding

- Road Commission for Oakland County

Other

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Priority

- TBD

Constraints

- None

Exclusions

- None

Oakland County
Department of Information Technology
Project Scope and Approach

Project Name: RCOC Traffic Signal Management **Project ID: D19182SM**

PROJECT PHASE AUTHORIZATION

Phase(s):		
Total Estimated Application Services	**Hours: 664**	
Total Estimated Technical Systems	**Hours: 18**	
Total Estimated CLEMIS	**Hours:**	
Total Estimated Internal Services	**Hours:**	
IT Application Services Division Manager Approval:		**Date:**
IT Technical Systems Division Manager Approval:		**Date:**
IT CLEMIS Division Manager Approval:		**Date:**
IT Internal Services Division Manager Approval:		**Date:**
IT Management Approval:		
Approved: Yes No		Date:
Reason:		
Project Sponsor Approval:		
Title:		Date:

PROJECT SUMMARY

Authorized Development (see above)	**Hours:**	
Preliminary Estimated Development for Future Phases	**Hours:**	
Grand Total Estimated Development	**Hours: 682**	**Cost: $112,530**

Oakland County
Department of Information Technology
Project Scope and Approach

Project Name: RCOC Traffic Signal Management **Project ID: D19182SM**

PROJECT COMPLETION AUTHORIZATION

Customer Acceptance of Product:	
Title:	Date:
Project Office Review:	Date:

RCOC Traffic Signal Management - Size Estimate (+/- 10% to 50%)

	Type	ID	Task Name	Estimated
2				Hours
3	**3**	**000000**	**PROJECT MANAGEMENT**	**176**
4	**Phase**	**200000**	**DEFINE BUSINESS REQUIREMENTS**	**59**
5	**Phase**	**300000**	**DESIGN SYSTEM ARCHITECTURE**	**7**
6	**Phase**	**500000**	**DEVELOP APPLICATION**	**346**
7	**Phase**	**600000**	**IMPLEMENTATION PHASE**	**59**
8	**Phase**	**080000**	**POST IMPLEMENTATION SUPPORT**	**35**
9				682

D19182SM

RCOC Traffic Signal Management

Return on Investment Analysis

As Of: 2/26/18

Project Summary

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Benefits/Savings:							
Tangible Benefits Subtotal:	0	0	0	0	0	0	0
Cost Avoidance Subtotal:	200,000	200,000	200,000	200,000	200,000	200,000	1,200,000
Costs:							
Development Services Subtotal:	112,530	3,300	3,300	3,300	3,300	3,300	129,030
Hardware Subtotal:	2,500	0	0	0	0	0	2,500
Software Subtotal:	0	0	0	0	0	0	0
Infrastructure Subtotal	0	0	0	0	0	0	0
Training Subtotal:	0	0	0	0	0	0	0
Other Subtotal:	0	0	0	0	0	0	0
Annual Statistics:							
Annual Total Savings	200,000	200,000	200,000	200,000	200,000	200,000	1,200,000
Annual Total Costs	115,030	3,300	3,300	3,300	3,300	3,300	131,530
Annual Return on Investment	84,970	196,700	196,700	196,700	196,700	196,700	1,068,470
Annual Costs/Savings Ratio	57.52%	1.65%	1.65%	1.65%	1.65%	1.65%	
Project Cumulative Statistics:							
Cumulative Total Savings	200,000	400,000	600,000	800,000	1,000,000	1,200,000	1,200,000
Cumulative Total Costs	115,030	118,330	121,630	124,930	128,230	131,530	131,530
Cumulative Return on Investment	84,970	281,670	478,370	675,070	871,770	1,068,470	1,068,470
Cumulative Cost/Savings Ratio	57.52%	29.58%	20.27%	15.62%	12.82%	10.96%	10.96%
Year Positive Payback Achieved	Year 1						Year 1
State or Federal Mandate?							
Signatures:							
Benefits Reviewed By Project Sponsor				Date:			
Costs (including IT Resources) Reviewed By Information Technology Project Manager				Date:			

REV: January 22, 2018

RCOC Traffic Signal Management

Return on Investment Analysis

Savings Detail

Benefit/Savings Description	Project Savings Category	Budget Category/Funding Source	Unit Desc	Units	Rate per Unit	Total Savings	Annual Multiplier
Providing a mobile-friendly way for staff to view and enter data in the field will save RCOC field staff 1250 hours per year of duplicate data entry.	Cost Avoidance			1,250	100	125,000	
Using an internally-developed application to maintain traffic signals will provide more flexibility for adding new signal attributes in the future.	Intangible Benefit					0	
Office Staff would save a combined 1,500 hours per year in administrative tasks such as scanning, copying, filing, signal timings, researching maintenance records, troubleshooting and asset management planning.	Cost Avoidance			1,500	50	75,000	
Uses RCOC's existing CAMS and/or AGO licensing.	Intangible Benefit					0	
						0	
						0	
						0	

RCOC Traffic Signal Management

Return on Investment Analysis

Savings Detail

Benefit/Savings Description	Project Savings Category	Affects Project ROI? Y1	Y2	Y3	Y4	Y5	Y6	Potential Savings Extensions Y1	Y2	Y3	Y4	Y5	Y6
Providing a mobile-friendly way for staff to view and enter data in the field will save RCOC field staff 1250 hours per year of duplicate data entry.	Cost Avoidance	x	x	x	x	x	x	125,000.00	125,000.00	125,000.00	125,000.00	125,000.00	125,000
Using an internally-developed application to maintain traffic signals will provide more flexibility for adding new signal attributes in the future.	Intangible Benefit												
Office Staff would save a combined 1,500 hours per year in administrative tasks such as scanning, copying, filing, signal timings, researching maintenance records, troubleshooting and asset management planning.	Cost Avoidance	x	x	x	x	x	x	75,000.00	75,000.00	75,000.00	75,000.00	75,000.00	75,000
Uses RCOC's existing CAMS and/or AGO licensing.	Intangible Benefit												

RCOC Traffic Signal Management

Return on Investment Analysis

Savings Summary

Benefit/Savings Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Tangible Benefit:							
Tangible Benefits Subtotal:							
Cost Avoidance:							
Using an internally-developed application to maintain traffic signals will provide more flexibility for adding new signal attributes in the future.	125,000	125,000	125,000	125,000	125,000	125,000	750,000
Office Staff would save a combined 1,500 hours per year in administrative tasks such as scanning, copying, filing, signal timings, researching maintenance records, troubleshooting and asset management planning.	75,000	75,000	75,000	75,000	75,000	75,000	450,000
Cost Avoidance Subtotal:	***200,000***	***200,000***	***200,000***	***200,000***	***200,000***	***200,000***	***1,200,000***
Intangible Benefit:							
Using an internally-developed application to maintain traffic signals will provide more flexibility for adding new signal attributes in the future.							
Uses RCOC's existing CAMS and/or AGO licensing.							
Savings Total:	***200,000***	***200,000***	***200,000***	***200,000***	***200,000***	***200,000***	***1,200,000***

RCOC Traffic Signal Management

Return on Investment Analysis

Cost Detail

Cost Description	Project Cost Category	Budget Category/Funding Source	Unit Desc	Units	Rate per Unit	Total Cost	Annual Multiplier	Affects Project ROI? Y1	Y2	Y3	Y4	Y5	Y6
IT Hours - New Development	Development Svcs			682	165	112,530	1.000	x					
IT Hours - System Maintenance	Development Svcs				165	0							
IT Hours - Customer Support	Development Svcs			20	165	3,300			x	x	x	x	x
IT Hours - Planned Maintenance	Development Svcs				165	0							
User Hours - New Development	Development Svcs					0							
User Hours - PTNE/OT	Development Svcs					0							
Contractor Professional Services	Development Svcs					0							
PC System - Acquisition	Hardware				814	0							
PC System - Maintenance	Hardware				2,304	0							
Notebook - Acquisition	Hardware				1,223	0							
Notebook - Maintenance	Hardware				2,372	0							
Tablet/iPad - Acquisition	Hardware			5	500	2,500		x					
Tablet Notebook - Maintenance	Hardware					0							
Laserprinter - Acquisition	Hardware				1,432	0							
Laserprinter - Maintenance	Hardware				1,104	0							
Image Workstations - Acquisition	Hardware					0							
Image Workstations - Maintenance	Hardware				3,496	0							
PC Maintenance User Owned	Hardware				2,304	0							
Printer Maintenance User Owned	Hardware				1,072	0							
File Space (100GB)	Hardware		ANN		173	0							
Internet Bandwidth per MB	Hardware		ANN		750	0							
Package Software - Acquisition	Software					0							
Package Software - Maintenance	Software					0							
Business Objects Access	Software					0							
Term Emulation SFTW-Acquisition	Software					0							
Term Emulation SFTW-Maintenance	Software					0							
Server - Acquisition/Upgrade	Infrastructure				8,000	0							
Server - Maintenance	Infrastructure				360	0							
Server Sftwre - Acquisition/Upgrade	Infrastructure				335	0							
Server Sftwre - Maintenance	Infrastructure					0							
Server Rack Mount	Infrastructure				400	0							
Oracle Enterprise Per Processor - Includes Year 1 Maintenance	Infrastructure				21,372	0							
Oracle Enterprise Per Processor - Year 2 and Beyond	Infrastructure				3,432	0							

RCOC Traffic Signal Management

Return on Investment Analysis

As Of: 2/26/18

Cost Detail

Cost Description	Project Cost Category	Budget Category/Funding Source	Unit Desc	Units	Rate per Unit	Total Cost	Annual Multiplier	Affects Project ROI? Y1	Y2	Y3	Y4	Y5	Y6
SQL Server Enterprise - Per Processor (4 cores) - Purchased Sept 2016-Aug 2017 - Includes Maintenance thru Aug 2019	Infrastructure				24,533	0							
SQL Server Enterprise - Per Processor (4 cores) - Purchased Sept 2017-Aug 2018 - Includes Maintenance thru Aug 2019	Infrastructure				20,759	0							
SQL Server Enterprise - Per Processor (4 cores) - Purchased Sept 2018-Aug 2019 - Includes Maintenance thru Aug 2019	Infrastructure				16,985	0							
SQL Server Enterprise - Maintenance, Per Processor (4 cores) - Sept 2019 and Beyond	Infrastructure				4,218	0							
SQL Server Standard - Per Processor (4 cores) - Purchased Sept 2016-Aug 2017 - Includes Maintenance thru Aug 2019	Infrastructure				6,398	0							
SQL Server Standard - Per Processor (4 cores) - Purchased Sept 2017-Aug 2018 - Includes Maintenance thru Aug 2019	Infrastructure				5,414	0							
SQL Server Standard - Per Processor (4 cores) - Purchased Sept 2018-Aug 2019 - Includes Maintenance thru Aug 2019	Infrastructure				4,429	0							
SQL Server - Standard Maintenance, Per Processor (4 cores) - Sept 2019 and Beyond	Infrastructure				1,100	0							
Websphere Basic Per Processor Single/Dual Core - Includes Year 1 Maintenance	Infrastructure				3,506	0							

RCOC Traffic Signal Management

Return on Investment Analysis

Cost Detail

Cost Description	Project Cost Category	Budget Category/Funding Source	Unit Desc	Units	Rate per Unit	Total Cost	Annual Multiplier	Affects Project ROI? Y1	Y2	Y3	Y4	Y5	Y6
Websphere Basic Per Processor Single/Dual Core - Year 2 and Beyond	Infrastructure				701	0							
Websphere ND Per Processor Single/Dual Core - Includes Year 1 Maintenance	Infrastructure				13,180	0							
Websphere ND Per Processor Single/Dual Core - Year 2 and Beyond	Infrastructure				2,635	0							
SSL Certificate	Infrastructure				845	0							
Internet Access	Infrastructure				180	0							
Imperva Web Application Firewall (External Web Applications Only)	Infrastructure		ANN		500	0							
App Code Directories on Consolidated IIS Server (Virtual)	Infrastructure		ANN		415	0							
Database (5 GB) on Consolidated SQL Instance Server	Infrastructure		ANN		930	0							
Database Instance (125 GB DB) on Consolidated SQL Server	Infrastructure		ANN		2,395	0							
Database SQL Maint Server	Infrastructure		ANN		834	0							
Database SQL Server Physical	Infrastructure		ANN		19,158	0							
DB Maintenance (Annual Cycle $610)	Infrastructure		ANN		610	0							
DB Maintenance (Semi-Annual Cycle $1220)	Infrastructure		ANN		1,220	0							
DB Maintenance (Semi-Annual Cycle $2440)	Infrastructure		ANN		2,440	0							
Dedicated Virtual Server	Infrastructure		ANN		4,150	0							
DB Instance Setup	Infrastructure				976	0							
DBA MS SQL Database Creation on Exisitng Instance	Infrastructure				366	0							
Extra Small - 2 Core 8GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $601 On Premise Physical Server = N/A	Infrastructure		ANN			0							

RCOC Traffic Signal Management

Return on Investment Analysis

Cost Detail

Cost Description	Project Cost Category	Budget Category/Funding Source	Unit Desc	Units	Rate per Unit	Total Cost	Annual Multiplier	Affects Project ROI? Y1	Y2	Y3	Y4	Y5	Y6
Small - 4 Core 16GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $951 On Premise Physical Server = $9,288	Infrastructure		ANN			0							
Medium - 8 Core 32GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $1,702 On Premise Physical Server = $9,751	Infrastructure		ANN			0							
Large - 16 Core 64GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $3,167 On Premise Physical Server = $10,446	Infrastructure		ANN			0							
Extra Large - 40 Core 160GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $7,564 On Premise Physical Server = $12,906	Infrastructure		ANN			0							

RCOC Traffic Signal Management

Return on Investment Analysis

Cost Detail

Cost Description	Project Cost Category	Potential Cost Extensions					
		Y1	Y2	Y3	Y4	Y5	Y6
IT Hours - New Development	Development Svcs	112,530.00					
IT Hours - System Maintenance	Development Svcs						
IT Hours - Customer Support	Development Svcs		3,300.00	3,300.00	3,300.00	3,300.00	3,300.00
IT Hours - Planned Maintenance	Development Svcs						
User Hours - New Development	Development Svcs						
User Hours - PTNE/OT	Development Svcs						
Contractor Professional Services	Development Svcs						
PC System - Acquisition	Hardware						
PC System - Maintenance	Hardware						
Notebook - Acquisition	Hardware						
Notebook - Maintenance	Hardware						
Tablet/iPad - Acquisition	Hardware	2,500.00					
Tablet Notebook - Maintenance	Hardware						
Laserprinter - Acquisition	Hardware						
Laserprinter - Maintenance	Hardware						
Image Workstations - Acquisition	Hardware						
Image Workstations - Maintenance	Hardware						
PC Maintenance User Owned	Hardware						
Printer Maintenance User Owned	Hardware						
File Space (100GB)	Hardware						
Internet Bandwidth per MB	Hardware						
Package Software - Acquisition	Software						
Package Software - Maintenance	Software						
Business Objects Access	Software						
Term Emulation SFTW-Acquisition	Software						
Term Emulation SFTW-Maintenance	Software						
Server - Acquisition/Upgrade	Infrastructure						
Server - Maintenance	Infrastructure						
Server Sftwre - Acquisition/Upgrade	Infrastructure						
Server Sftwre - Maintenance	Infrastructure						
Server Rack Mount	Infrastructure						
Oracle Enterprise Per Processor - Includes Year 1 Maintenance	Infrastructure						
Oracle Enterprise Per Processor - Year 2 and Beyond	Infrastructure						

RCOC Traffic Signal Management

Return on Investment Analysis

Cost Detail

Cost Description	Project Cost Category	Potential Cost Extensions					
		Y1	Y2	Y3	Y4	Y5	Y6
SQL Server Enterprise - Per Processor (4 cores) - Purchased Sept 2016-Aug 2017 - Includes Maintenance thru Aug 2019	Infrastructure						
SQL Server Enterprise - Per Processor (4 cores) - Purchased Sept 2017-Aug 2018 - Includes Maintenance thru Aug 2019	Infrastructure						
SQL Server Enterprise - Per Processor (4 cores) - Purchased Sept 2018-Aug 2019 - Includes Maintenance thru Aug 2019	Infrastructure						
SQL Server Enterprise - Maintenance, Per Processor (4 cores) - Sept 2019 and Beyond	Infrastructure						
SQL Server Standard - Per Processor (4 cores) - Purchased Sept 2016-Aug 2017 - Includes Maintenance thru Aug 2019	Infrastructure						
SQL Server Standard - Per Processor (4 cores) - Purchased Sept 2017-Aug 2018 - Includes Maintenance thru Aug 2019	Infrastructure						
SQL Server Standard - Per Processor (4 cores) - Purchased Sept 2018-Aug 2019 - Includes Maintenance thru Aug 2019	Infrastructure						
SQL Server - Standard Maintenance, Per Processor (4 cores) - Sept 2019 and Beyond	Infrastructure						
Websphere Basic Per Processor Single/Dual Core - Includes Year 1 Maintenance	Infrastructure						

RCOC Traffic Signal Management

Return on Investment Analysis

Cost Detail

Cost Description	Project Cost Category	Potential Cost Extensions					
		Y1	Y2	Y3	Y4	Y5	Y6
Websphere Basic Per Processor Single/Dual Core - Year 2 and Beyond	Infrastructure						
Websphere ND Per Processor Single/Dual Core - Includes Year 1 Maintenance	Infrastructure						
Websphere ND Per Processor Single/Dual Core - Year 2 and Beyond	Infrastructure						
SSL Certificate	Infrastructure						
Internet Access	Infrastructure						
Imperva Web Application Firewall (External Web Applications Only)	Infrastructure						
App Code Directories on Consolidated IIS Server (Virtual)	Infrastructure						
Database (5 GB) on Consolidated SQL Instance Server	Infrastructure						
Database Instance (125 GB DB) on Consolidated SQL Server	Infrastructure						
Database SQL Maint Server	Infrastructure						
Database SQL Server Physical	Infrastructure						
DB Maintenance (Annual Cycle $610)	Infrastructure						
DB Maintenance (Semi-Annual Cycle $1220)	Infrastructure						
DB Maintenance (Semi-Annual Cycle $2440)	Infrastructure						
Dedicated Virtual Server	Infrastructure						
DB Instance Setup	Infrastructure						
DBA MS SQL Database Creation on Exisitng Instance	Infrastructure						
Extra Small - 2 Core 8GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $601 On Premise Physical Server = N/A	Infrastructure						

RCOC Traffic Signal Management

Return on Investment Analysis

Cost Detail

Cost Description	Project Cost Category	Potential Cost Extensions					
		Y1	Y2	Y3	Y4	Y5	Y6
Small - 4 Core 16GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $951 On Premise Physical Server = $9,288	Infrastructure						
Medium - 8 Core 32GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $1,702 On Premise Physical Server = $9,751	Infrastructure						
Large - 16 Core 64GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $3,167 On Premise Physical Server = $10,446	Infrastructure						
Extra Large - 40 Core 160GB RAM, 500GB Drive, 10 GB NIC - Cloud/Virtual = $7,564 On Premise Physical Server = $12,906	Infrastructure						

RCOC Traffic Signal Management

Return on Investment Analysis

Cost Summary

Cost Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
Development Services:							
IT Hours - New Development	112,530						112,530
IT Hours - System Maintenance							
IT Hours - Customer Support		3,300	3,300	3,300	3,300	3,300	16,500
IT Hours - Planned Maintenance							
User Hours - New Development							
User Hours - PTNE/OT							
Contractor Professional Services							
Development Services Subtotal:	***112,530***	***3,300***	***3,300***	***3,300***	***3,300***	***3,300***	***129,030***
Hardware:							
Tablet/iPad - Acquisition	2,500						2,500
Hardware Subtotal:	***2,500***						***2,500***
Software:							
Software Subtotal:							
Infrastructure:							
Infrastructure Subtotal							
Training:							
Training Subtotal:							
Other:							
Other Subtotal:							
Costs Total:	***115,030***	***3,300***	***3,300***	***3,300***	***3,300***	***3,300***	***131,530***

RCOC Traffic Signal Management

Return on Investment Analysis

Assumptions

Date	Assumption Description
16-Mar-18	*Field:* *D8 crews visit 5000 signals per year (4 tasks per day x 5 crews x 5 days x 50 weeks). Assume we save 5 mins at each, this would be approx. 400 hours saved @ $250/hr (2 electricians and a truck) would be approx $100k* *Equipment – not needlessly swapping out good equipment – assume trouble crew only (1000 signals / year) – assume $20k* *D8 shop – not needlessly bench testing controllers and monitors / restore settings – assume trouble crew only (1000 signals / year) – say 100 hours @ $50/hr – say $5k* *Total Field = $100k + $20k + $5k = $125k*
16-Mar-18	Office: D8 Office (filing / scanning / copying etc) – 10 hrs/week x 50 weeks = 500 hours TOC Office – assume 50% of D8 = 250 hours T/S Office – assume 50 hours TOC engineers – FOIAs, timing requests – 100 hours TOC engineers – troubleshooting – 500 hours Asset management / Planning – 100 hours Total Office = 1500 hours @ say $50 / hr = $75k
06-Jun-18	Project will leverage the CAMS application.
06-Jun-18	Field crews will need CAMS capable devices such as tablets.
06-Jun-18	Project will leverage ArcGIS Online to support data collection.
06-Jun-18	RCOC will purchase field devices