Smarter Work Zones Webinar Series

Webinar #7: Work Zone Project Coordination Guide and Examples

Martha Kapitanov, Gerald (Jerry) Ullman, Murdo M. Nicolson, Jr. and Chip Eitzel

December 2, 2015 2:00-3:30pm EST

Efficiency through technology and collaboration

innovation ingenuity imagination invention Every Day Counts

U.S. Department of Transportation
Federal Highway Administration

Smarter Work Zones

Introduction and Today's Speakers

Today's Speakers

Martha C. Kapitanov
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Smarter Work Zones Webinar Series

- This is the seventh in a series of bi-weekly SWZ webinars
- Topics based on **what matters most to you!**
- Previous Webinars include:
  - Webinar #1: A Comprehensive Overview of the SWZ Initiative (9/9/2015)
  - Webinar #2: Implementing Technology Application Solutions (9/29/2015)
  - Webinar #3: SWZ Corridor-Based Project Coordination (10/15/15)
  - Webinar #4: SWZ Technology Showcase – Queue Warning Systems (10/26/15)
  - Webinar #5: SWZ Program-Based Project Coordination (11/2/15)
  - Webinar #6: Technology Application Case Studies: Variable Speed Limit and Dynamic Lane Merge (11/12/15)
- Recordings and materials for previous webinars are available on The National Work Zone Safety Information Clearinghouse website: https://www.workzonesafety.org/swz/webinars
- Coming Up:

December 2015	12/15	Webinar #8: Integrating Project Coordination and Technology Applications – Iowa DOT
January 2016	1/21	Webinar #9: Technology Application Strategies: Performance Measurement and System Health Monitoring

Purpose of Today's Webinar

Provide a comprehensive overview of the Project Coordination Guide and discuss real-world examples of successful SWZ project coordination strategies.

Topics include:

1. SWZ Project Coordination Initiative
   - Show how the SWZ Project Coordination initiative can be used by agencies to enhance their current work zone management practices
2. Project Coordination Guide
   - Review key concepts of road project coordination including dimensions and challenges of road project coordination
3. Project Coordination Examples
   - Provide real-world examples of successful SWZ project coordination strategies which resulted in:
     - Minimized travel delays
     - Enhanced safety for all road users and workers
     - Maintenance of business and resident access

Smarter Work Zones

Project Coordination Initiative

What are Smarter Work Zones (SWZ)?

Innovative strategies designed to optimize work zone safety and mobility

- Policies and practices used to incrementally and continuously improve WZ operations
- Tools to reduce WZ crashes and delays
- Tools to enhance WZ management strategies

Two Identified SWZ Initiatives:

Project Coordination

Coordination within a single project and/or among multiple projects within a corridor, network, or region, and possibly across agency jurisdictions

Today's Focus of Discussion

Technology Application

Deployment of Intelligent Transportation Systems (ITS) for dynamic management of work zone traffic impacts, such as queue and speed management

Project Coordination – What is it?

Coordination within a single project and/or among multiple projects within a corridor, network, or region, and possibly across agency jurisdictions to minimize work zone traffic impacts.

Benefits:

- *For transportation agencies include*:
  - Ability to reduce and manage traffic disruptions from road work
  - Earlier identification of project impacts
  - Dynamic adjustments to schedule
  - Improved communications within and cross agencies
  - Cost savings
- *From the driver's perspective*:
  - Fewer numbers of work zones and street cuts
  - Better quality road surfaces
  - Increased customer satisfaction

Source: FHWA

SWZ Project Coordination Goals:

Goal 1

By December 2016, 25 State DOTs have incorporated work zone project coordination strategies into agency documentation and business processes.

What does this mean?

- Review of:
  - Existing PC-related policies/practices to identify strengths and weaknesses
  - Other agencies' PC-related best practices
- Identify and implement of SWZ PC strategies
- Develop agency documentation and business processes

SWZ Project Coordination Goals:

Goal 2

By December 2016, 5 State DOTs have volunteered to pilot the Work Zone Implementation Strategies Estimator (WISE) software.

What does this mean?

- Use WISE tool to optimize project schedules and analyze mitigation strategies to minimize work zone traffic impacts
- Pilot, evaluate, suggest enhancements, and demonstrate WISE's value for work zone management

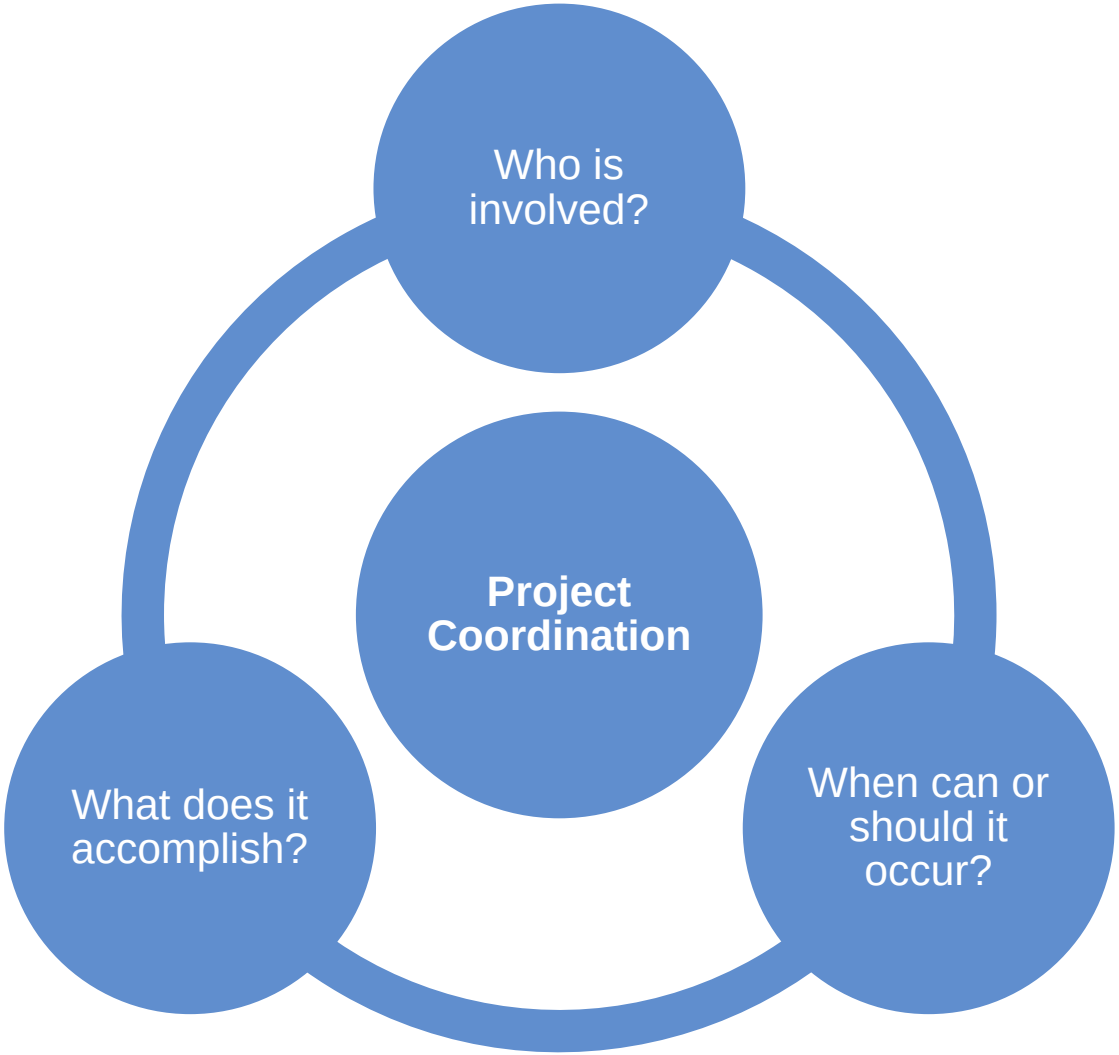
Smarter Work Zones

PROJECT COORDINATION GUIDE

Project Coordination Challenges

- Establishing and maintaining accurate information about project schedules, plans, day-to-day activities
- Effects on individual project schedules
- Quantifying the benefits of coordination, or the negative effects if a lack of coordination
- Institutional constraints regarding the availability of funds and when those funds must be spent
- Agency missions and charters with respect to routes of responsibility, stakeholders, and users

Dimensions of Project Coordination



Examples

		Phase at Which Coordination is Occurring	
		Planning/Design	Operations
Agencies Involved	Single		
	Multiple		

Examples of Possible Activities

		Phase at Which Coordination is Occurring	
		Planning/Design	Operations
Agencies Involved	Single	• Developing a database of agency planned projects over next 3-5 years • Developing a map showing project locations in the region, possibly color-coded to illustrate current, near-term, and long-term schedules • Determining the sequence of the projects that will minimize total delays and disruptions to the traveling public in the corridor or region (i.e., WISE tool)	
	Multiple		

Examples of Possible Activities (cont'd)

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	Multiple		

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	Multiple	• Expand project database and mapping tool to include other agencies in region, utility companies, and private-sector developer projects • Establish a web-based approach to sharing and providing appropriate access to the database and map	

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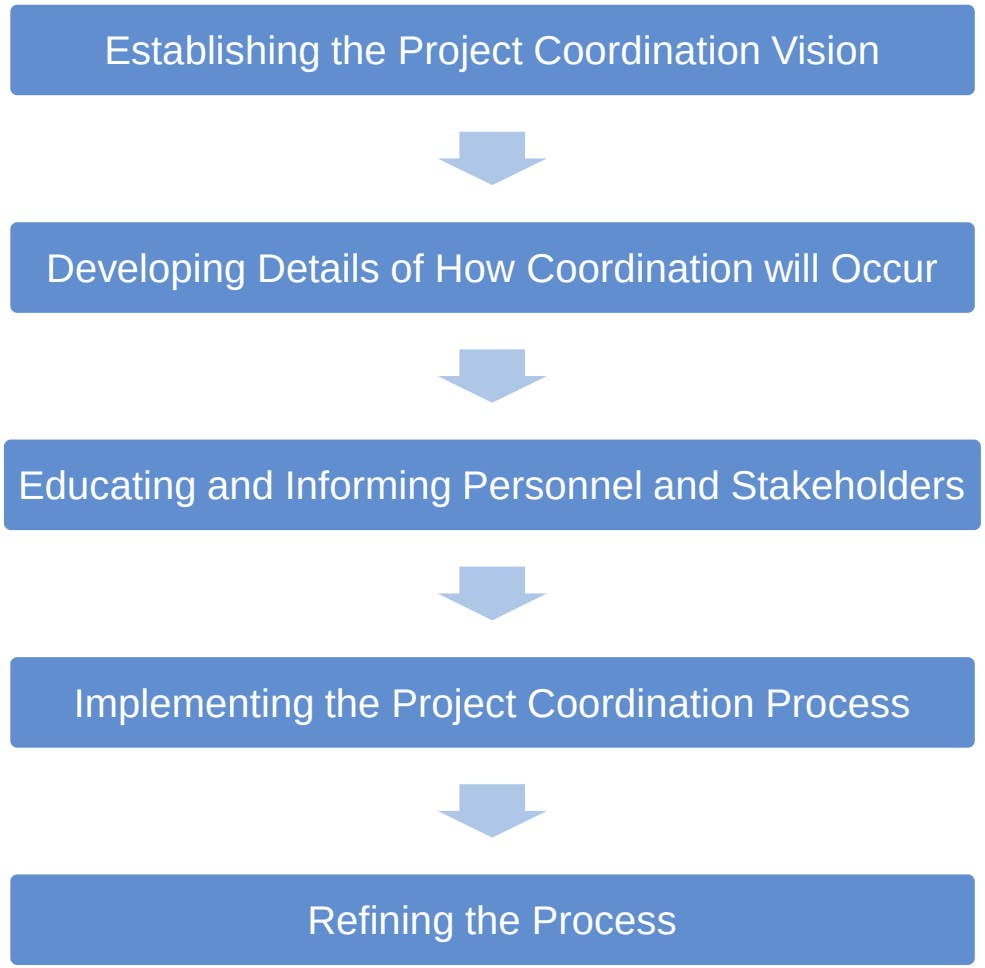
	Multiple	• Expand project database and mapping tool to include other agencies in region, utility companies, and private-sector developer projects • Establish a web-based approach to sharing and providing appropriate access to the database and map	• Implementing regional transportation management plan that considers and addresses projects being performed by all agencies and other stakeholders in the region • Conducting regular regional coordination meetings between stakeholders to resolve lane closure conflicts and other coordination issues as they arise

Five Steps for Achieving Project Coordination



Step 1: Establish the Vision

- Get support by upper management
- Develop Memorandums of Understanding (MOUs)
- Develop a coordination committee

Source: Microsoft Office

Step 2: Develop Details of How Coordination will Occur

- Identify data needed to allow coordination to occur
- Obtain tools committee needs to plan, monitor, manage coordination
  - Database software
  - Mapping
  - Traffic impact analyses
  - Scheduling
- Establish decision-making process for how PC vision will be achieved amongst stakeholders

Step 3: Educate and Inform Personnel and Stakeholders

- Provide reasons for and benefits to be gained by coordination
- Provide information on the decision-making process that will be followed

Step 4: Implement the Process

- Conduct regular coordination meetings to track progress of projects
- Regularly update the project database and tracking/monitoring/analysis tools

Source: Microsoft Office

Step 5: Refine the Process

- Updates and changes to the process may be fairly frequent initially
- Changes decrease over time as process becomes institutionalized

Example #1: Texas DOT (TxDOT)

- Example of single agency project coordination during operational phase of work
- I-35 Corridor
  - 17 projects
  - 96 miles
- Nighttime lane and/or full freeway closures possible in each project
- Ramp, frontage road, and driveway closures also possible

Source: TxDOT

Steps for Achieving Project Coordination – Texas DOT (TxDOT) (1 of 3)

- Step 1: Establishing the Vision
  - TxDOT upper management directives to manage cumulative impacts to through travelers, as well as local resident and business inconveniences
  - Coordination between projects and with multiple contractors
  - Establishing a 30-minute cumulative delay threshold
- Step 2: Develop How Coordination will Occur
  - Creation of mobility coordinator positions within the corridor
  - Creation of data collection, analysis processes to estimate anticipated cumulative impacts
  - Encouraging cooperative collaboration between contractors

Closure Impact Assessment Report

Construction on I-35
Southbound
Full-Lane Closure
From: At FM 436, Bell (Mile Marker: 293.0)
To: At Tahuaya Rd, Bell (Mile Marker: 289.0)
As of 3/28/2015

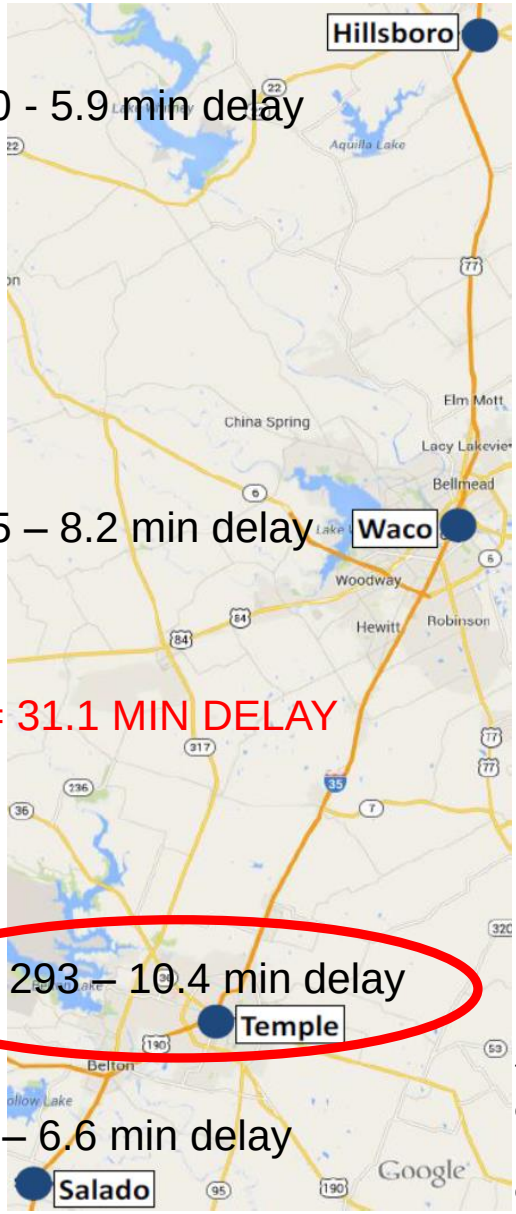
Closure ID: 2822
Last Modified: 3/28/2015 5:17:35 PM by d-middleton@tamu.edu
Planned Start Time: 4/1/2015 07:00 PM
Planned End Time: 4/2/2015 07:00 AM
Duration: Nightly
Number of Main Lanes: 2
Lane(s) Closed: Left Lane; Right Lane
Closure Length: 4.0 mi.

Date: Wednesday, 4/1/2015
Maximum Queue Length

- Expected: 1.3 mi.
- Worse Case*: 3.7 mi.

From	To	Expected Queue (mi)	Expected Delay (min/veh)	Worse Case* Queue (mi)	Worse Case* Delay (min/veh)
07:00 PM	08:00 PM	0.9	8.0	1.7	13.7
08:00 PM	09:00 PM	1.0	9.1	2.6	19.7
09:00 PM	10:00 PM	1.3	10.8	3.5	26.8
10:00 PM	11:00 PM	0.9	9.1	3.7	30.5
11:00 PM	12:00 AM	0.0	0.0	3.3	29.3
12:00 AM	01:00 AM	0.0	0.0	2.6	25.5
01:00 AM	02:00 AM	0.0	0.0	1.8	19.4
02:00 AM	03:00 AM	0.0	0.0	0.9	11.2
03:00 AM	04:00 AM	0.0	0.0	0.0	0.0
04:00 AM	05:00 AM	0.0	0.0	0.0	0.0
05:00 AM	06:00 AM	0.0	0.0	0.1	4.1
06:00 AM	07:00 AM	0.6	6.6	1.5	12.5

* Worse case analyses are based on volumes 10% higher than expected and a work zone capacity 10% lower than expected.



Source: Google

Steps for Achieving Project Coordination – Texas DOT (TxDOT) (2 of 3)

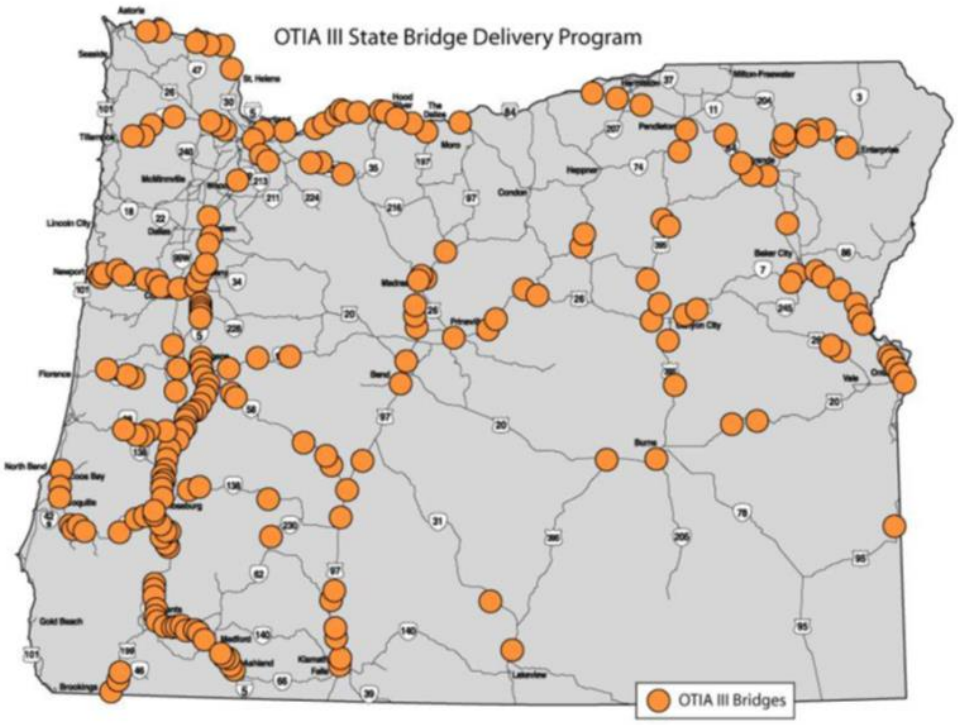
- Step 3: Educate/Inform Personnel and Stakeholders
  - Mobility coordinators participation in weekly project meetings
  - Outreach to local communities and key stakeholder groups
- Step 4: Implement the Process
  - Regular presentations to city councils, shipping companies, local community meetings, etc.
  - One-on-one contact with businesses prior to major access disruptions
  - Cooperative resolution of multiple lane closure nights when excessive cumulative delays anticipated

Steps for Achieving Project Coordination – Texas DOT (TxDOT) (3 of 3)

- Step 5: Refine the Process
  - Initial hesitancy to changes in lane closure schedules
  - Cooperation increased as trust between mobility coordinator and contractors increased

Example #2: Oregon (ODOT)

- Single agency project coordination during planning phase of work
- Historic bridge repair and replacement effort
  - Over 300 bridges statewide
  - Five regions
  - Eight years
  - $1.3 billion



Source: Oregon DOT

Steps for Achieving Project Coordination – Oregon DOT (ODOT) (1 of 5)

- Step 1: Establishing the Vision
  - Top management directive to agency
  - Establish coordinating committee (construction, maintenance, design, operations, traffic, contracting, PI)
    - Key decision makers in each group
    - Authority to speak for their group
  - Develop overall guide and associated memorandums

Steps for Achieving Project Coordination – Oregon DOT (ODOT) (2 of 5)

- Step 2: Develop How Coordination will Occur
  - Identified what needed to be managed in the work zones
    - Travel Times
    - Traffic Volumes/Capacity
    - Load Sizes/Hole in the Air
  - Develop tools to plan, manage and monitor
  - Develop guidance
    - Corridor-level or statewide transportation management plans (TMPs)
    - Project-level TMP guidance document used when developing individual project TMPs
    - Acceptable delay thresholds across various route segments
    - Delay estimation tools, lane closure charts to maintain near free-flow conditions

Steps for Achieving Project Coordination – Oregon DOT (ODOT) (3 of 5)

- Step 3: Educate and Inform Personnel/Stakeholders
  - Agency staff
    - Know what is expected
    - Know what to do
    - Re-educate for updates and staff turnover
  - Stakeholders participation
    - Understand what to expect
    - Share their perspective
  - Train
    - Importance of and how to use of tools
    - Importance of and how to develop project-Level TMPs

Steps for Achieving Project Coordination – Oregon DOT (ODOT) (4 of 5)

- Step 4: Implement the Process
  - Tools
  - TMPs
  - Coordination Meetings
    - Sharing information on process updates
    - Sharing project information between affected stakeholders (project scope, schedules)
    - Identify conflicts
    - Work to resolve conflicts
  - Escalation Process
  - Tracking Projects through their lives
    - Long term plans: general traffic impacts and schedule as known
    - Nearer term plans: refined traffic impacts/staging and schedule
    - Short term and current construction

Steps for Achieving Project Coordination – Oregon DOT (ODOT) (5 of 5)

- Step 5: Refine the Process
  - Early on: from overall committee and technical subcommittees
  - During training: challenges and issues identified by participants
  - During implementation: as unusual conflicts/challenges arose

For more information:

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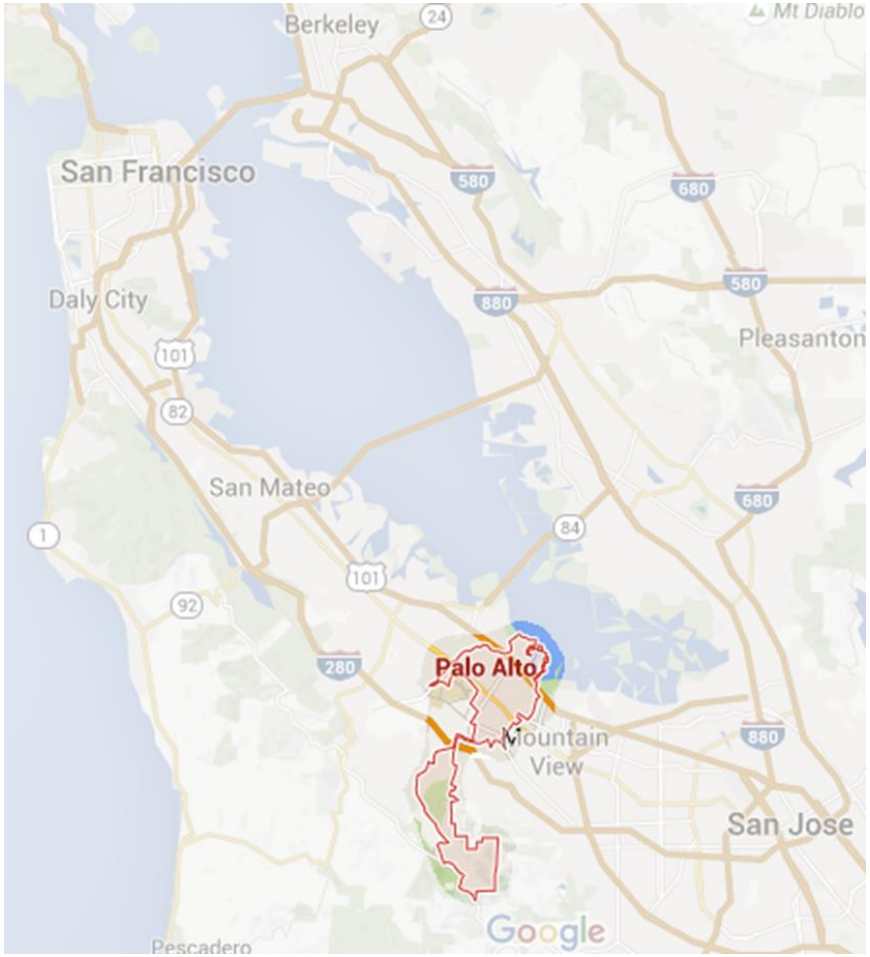
Smarter Work Zones

City of Palo Alto Work Zone Project Coordination

Example #3: City of Palo Alto – Project Coordination Tool

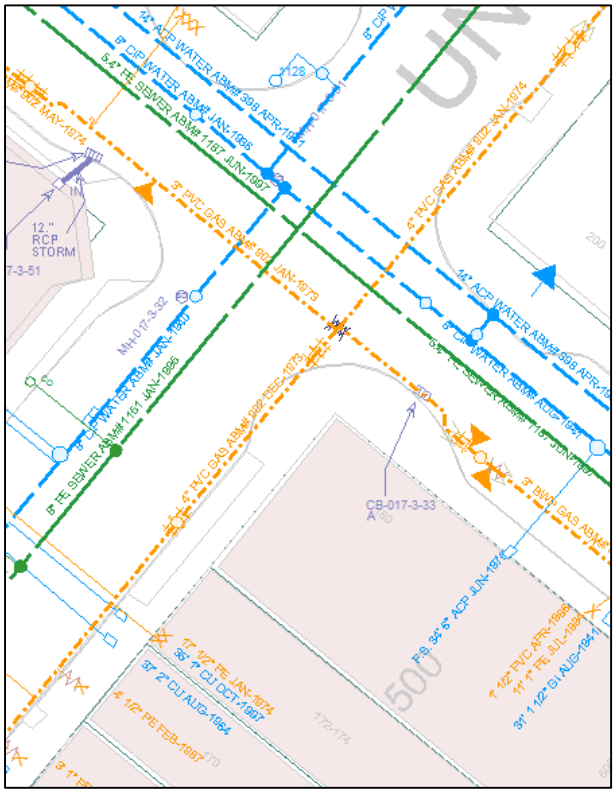
- Palo Alto Background
  - Located in Silicon Valley south of San Francisco
  - ~66,000 residents with a daytime population of >100,000
  - 198.4 miles of streets in 2,158 pavement sections
  - Geographic Information System (GIS) based project coordination first used in 1996



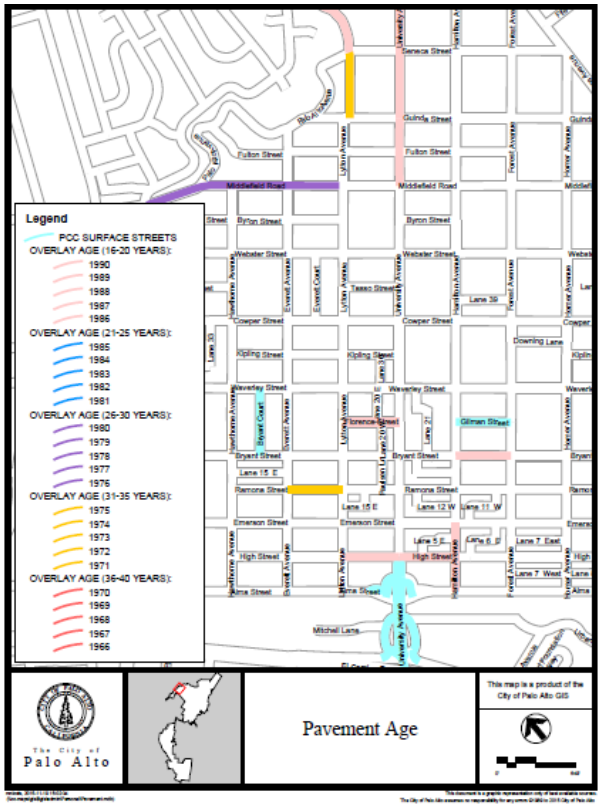
Source: Google

GIS as the Authoritative Database (1 of 2)

- Started in 1987
- Based on high-resolution orthophotos tied to a survey network
- Parcels entered using Coordinate Geometry (COGO)



Source: City of Palo Alto



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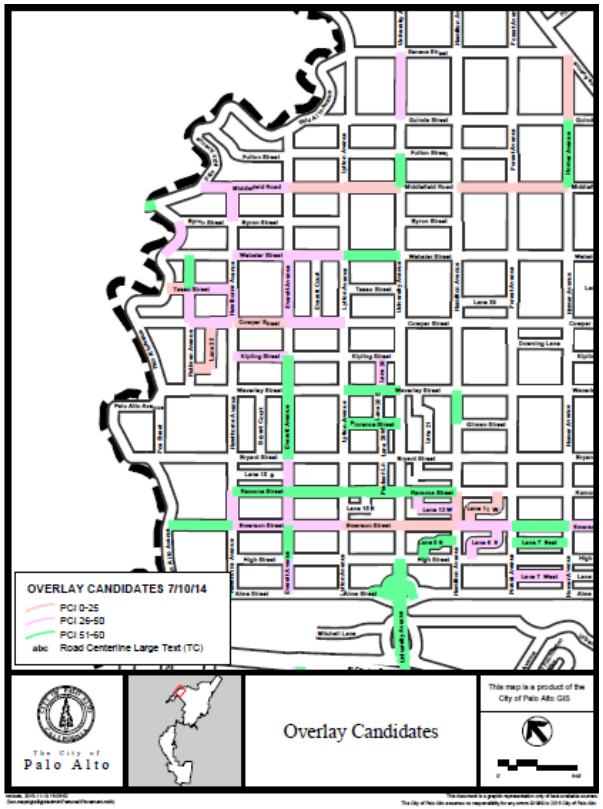
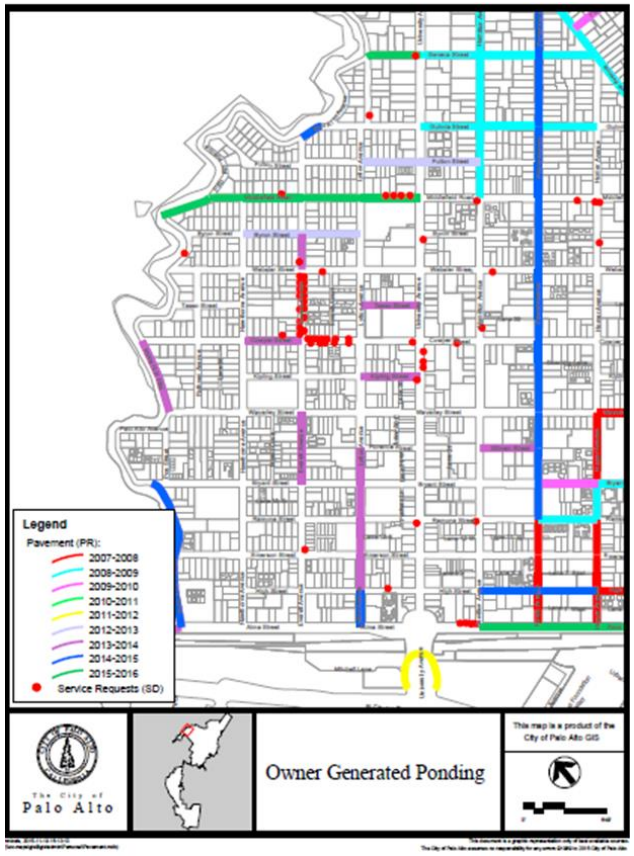


Source: City of Palo Alto

GIS as the Authoritative Database (2 of 2)

- 673 feature classes supporting Utilities and Public Works Engineering and Operations, Planning, etc.



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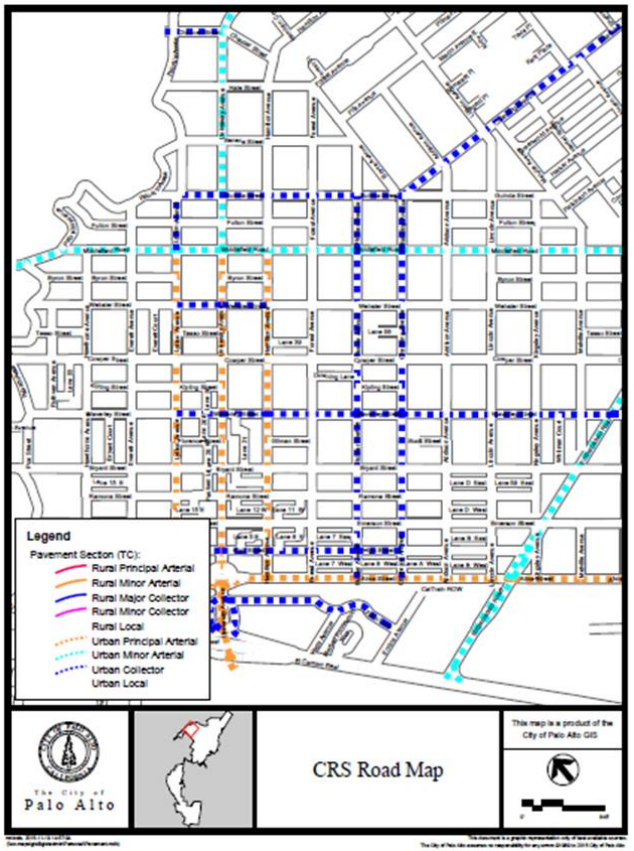
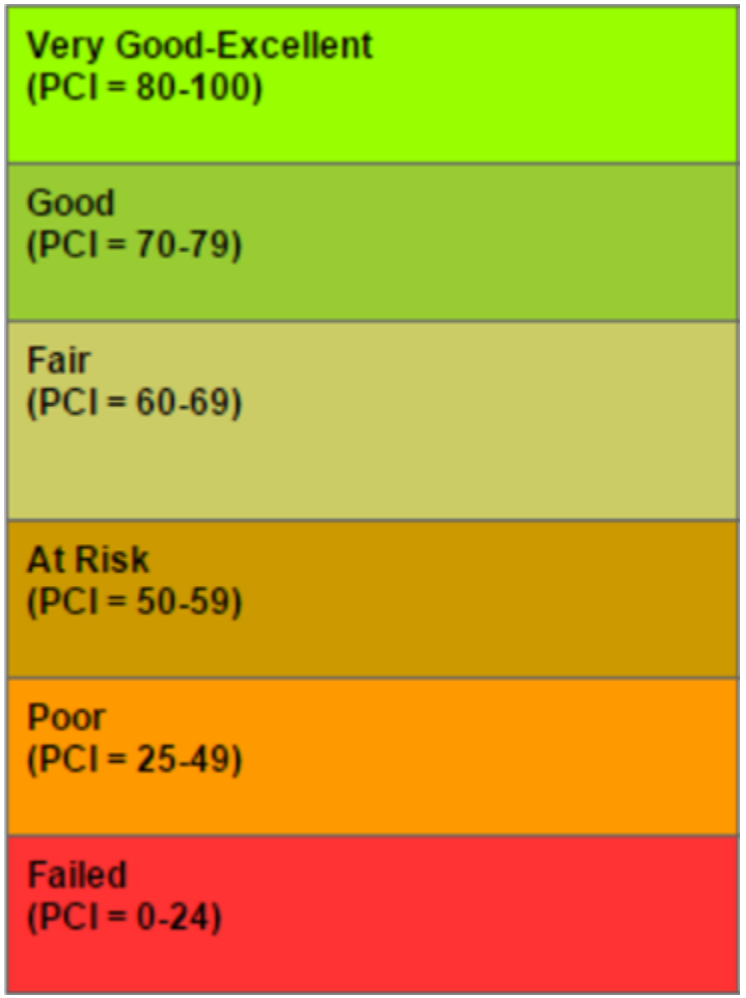


Source: City of Palo Alto

Goals

- Regional goal: have the best Pavement Condition Index (PCI)
- Local goal: PCI average of 85 with no section under 60 by 2019
- Minimize waste and reduce citizen inconvenience
- Avoid trenches in new pavement



Source: Metropolitan Transportation Commission

Approach

- Survey and inspect city infrastructure, analyze, and prioritize maintenance via pavement management software (GIS and StreetSaver)
- Use Project Coordinator to find potential conflicts and hold monthly meetings to resolve them
- Toughen regulations: no trench fee if project is coordinated. Otherwise, charge higher fees to meet increased restoration standards
- Triple the funding through 2021
- Trench fees are based on existing PCI scores
- Coordinate during construction

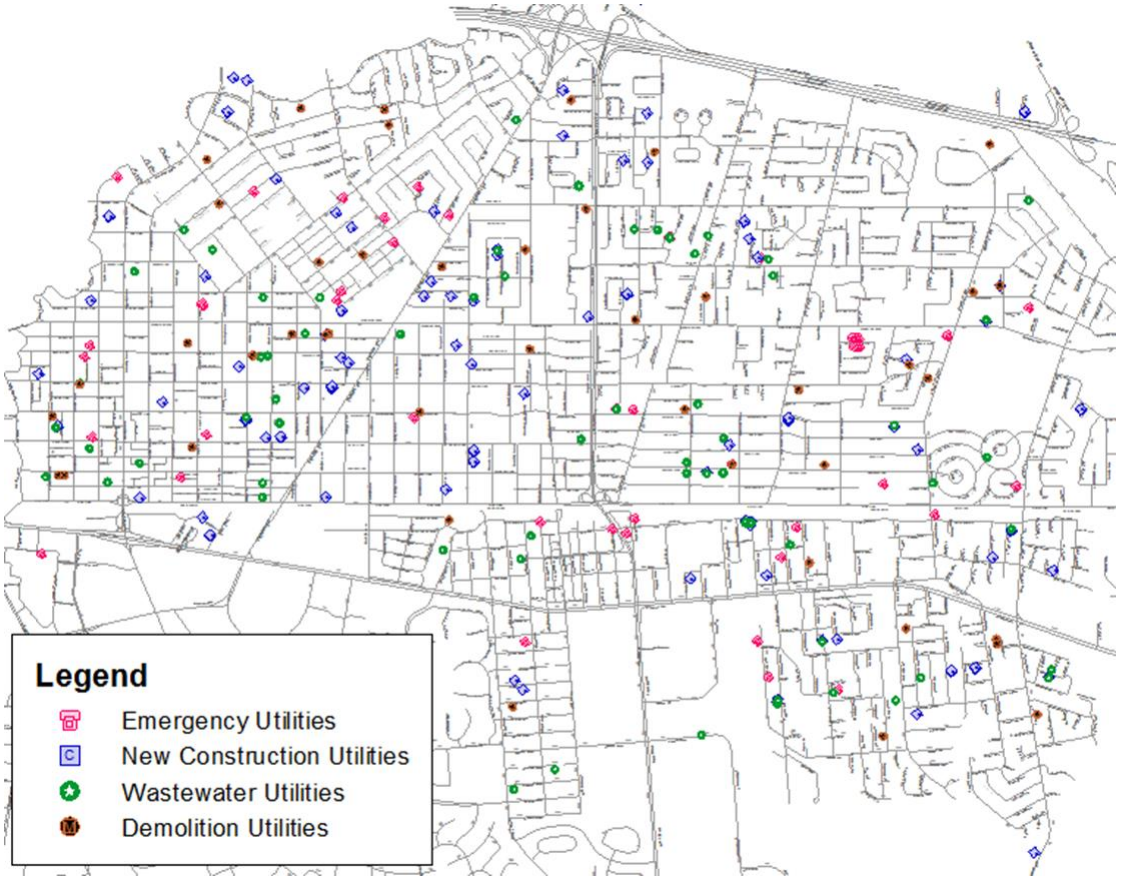
Source: City of Palo Alto

Source: City of Palo Alto

Pavement Predators

Track Unplanned Incursions

- Main leaks and collapses, valve repair, customer initiated projects, etc.
- Tracking these incursions aid in identifying candidates for enhanced or accelerated maintenance



Source: City of Palo Alto

Stakeholders

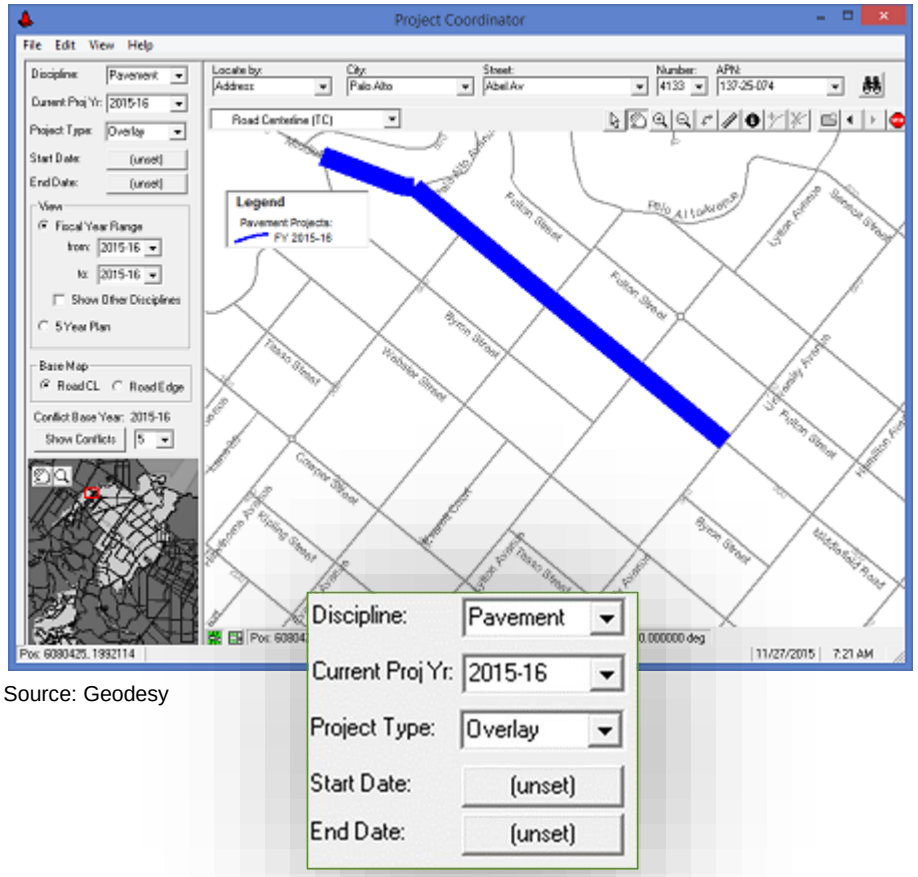
- Internal
  - Sidewalks (Public Works Engineering Department)
  - Storm Drain (Public Works Engineering Department)
  - Pavement (Public Works Engineering Department)
  - PW Ops (Public Works Operations Department)
  - Transport (Transportation/Planning Department)
  - Gas (Water, Gas, Wastewater Engineering Department)
  - Water (Water, Gas, Wastewater Engineering Department)
  - Wastewater (Water, Gas, Wastewater Engineering Department)
  - WGW Ops (Water, Gas, Wastewater Operations Department)
  - Electric (Electrical Engineering/Operations Department)
  - Parks/Open Spaces (Associated Services Department)
- External
  - Pacific Gas and Electric (PG&E)
  - Santa Clara County Roads Division
  - Caltrans (State of California highway, bridge, and rail)
  - Caltrain (commuter rail between San Francisco and San Mateo and Santa Clara counties)
  - Cable companies
  - Contractors
  - Citizens

Project Coordinator's Foundational Concepts

- A pavement section is based on a single-block road centerline
- A project represents all the centerline segments acted on for a single discipline in a single year
- Data entry is kept as simple as possible
- A broad conflict definition: any work planned on a road centerline segment (a block) within a given number of years of a paving project is considered a potential conflict
- Data is stored in a Relational Database Management System (RDBMS) and Structured Query Language (SQL) is used for analysis
- Feature class definitions, user authorizations, and app capabilities are all metadata driven

Street Project Data Entry

- App configuration set at startup based on user: discipline and project year are set, optional start and end dates may be set
- Click on road centerline segments to add or remove them from the project



Source: Geodesy

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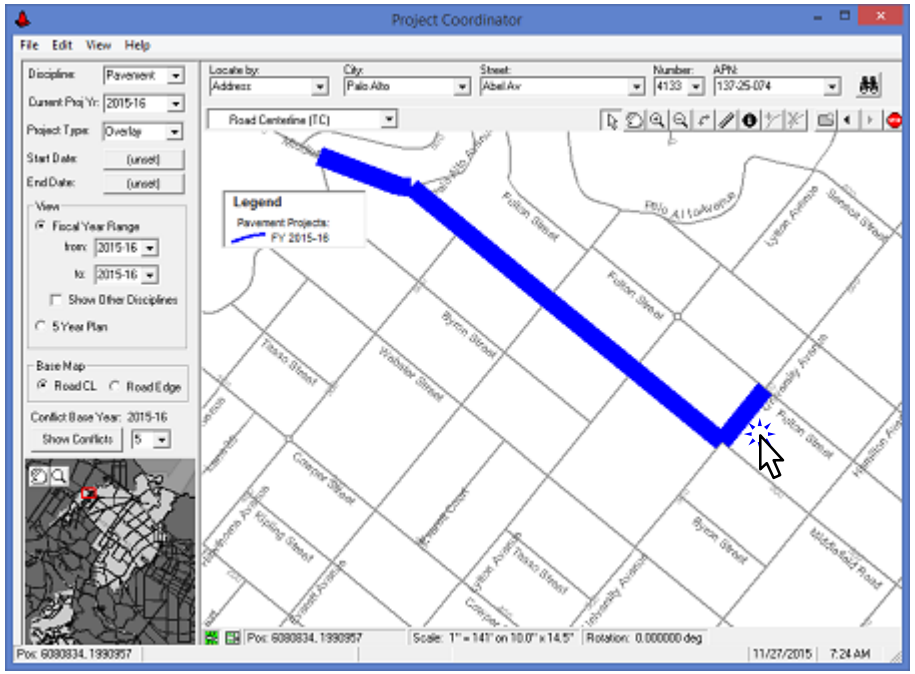

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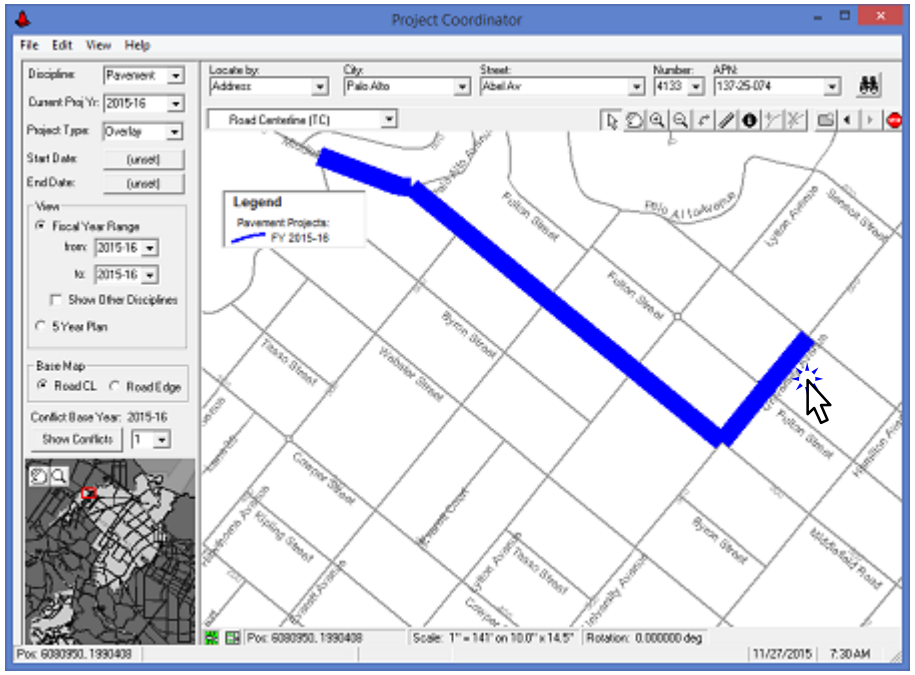

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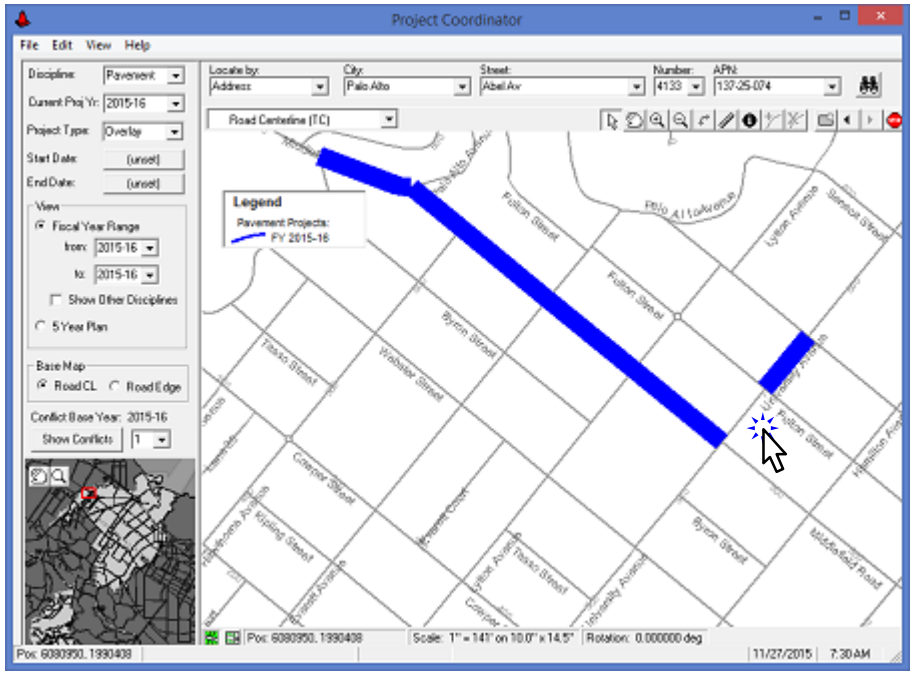
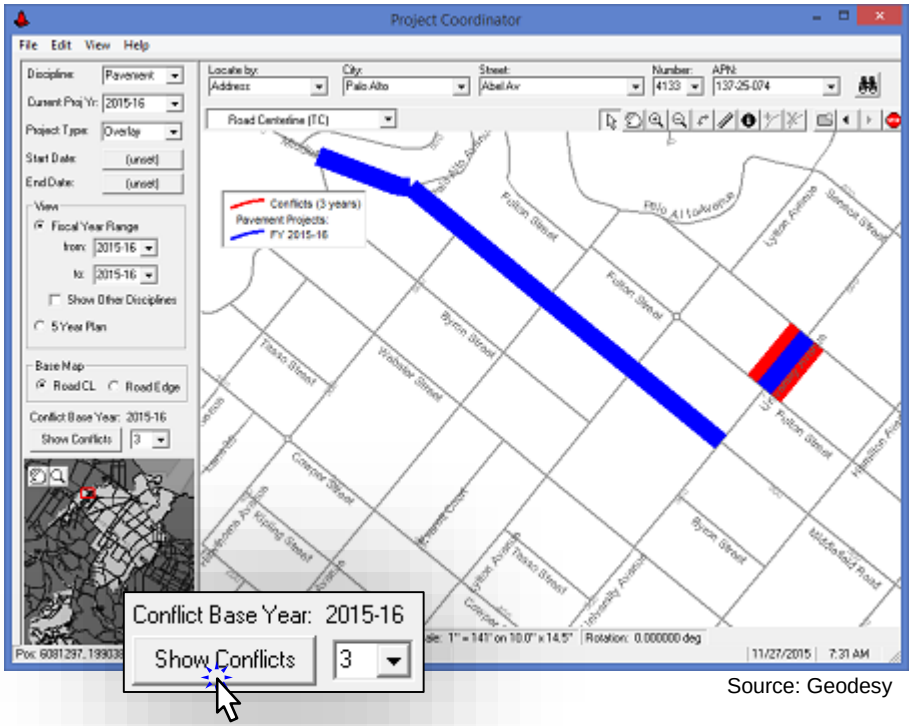


Source: Geodesy

Street Project Review

- Check for potential conflicts
- 5-year Pavement Capital Improvement Projects (CIP)
- 5-year Pavement CIP with Utility projects



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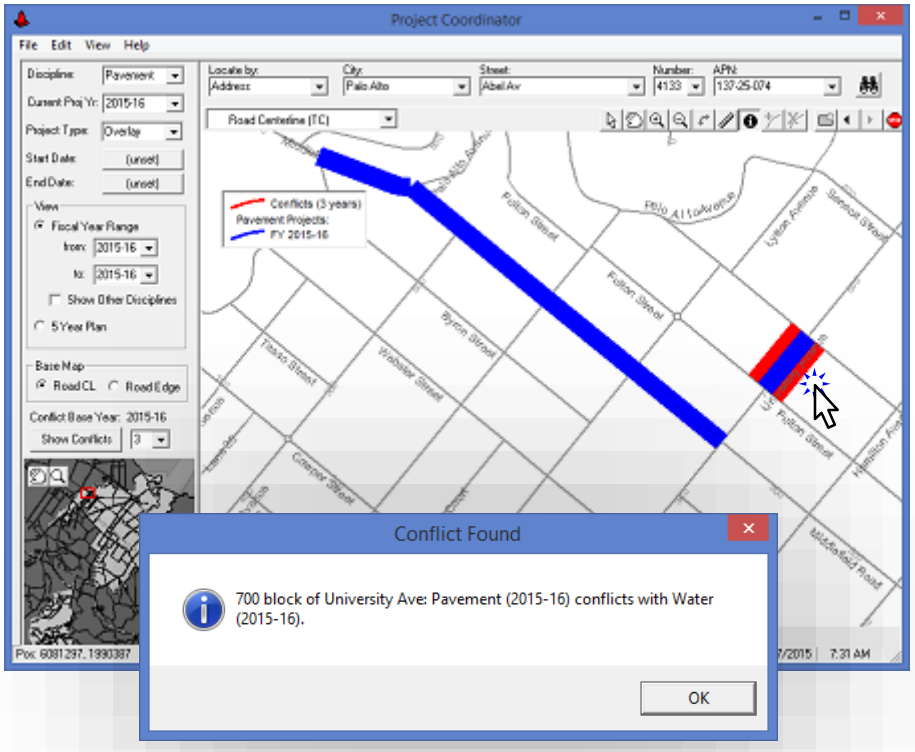

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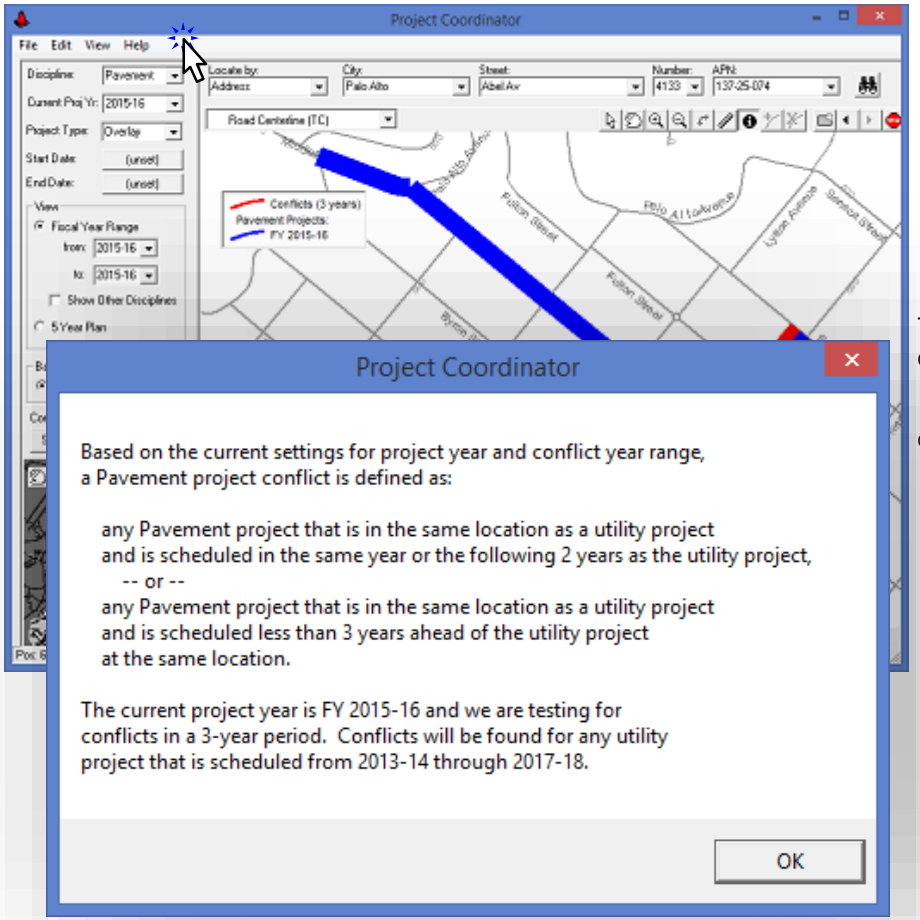

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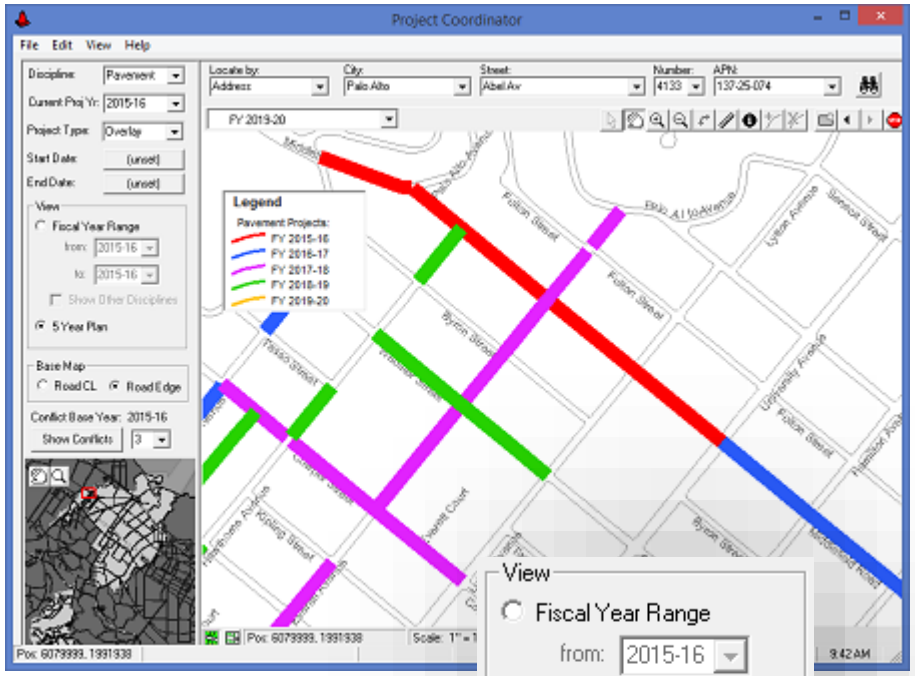
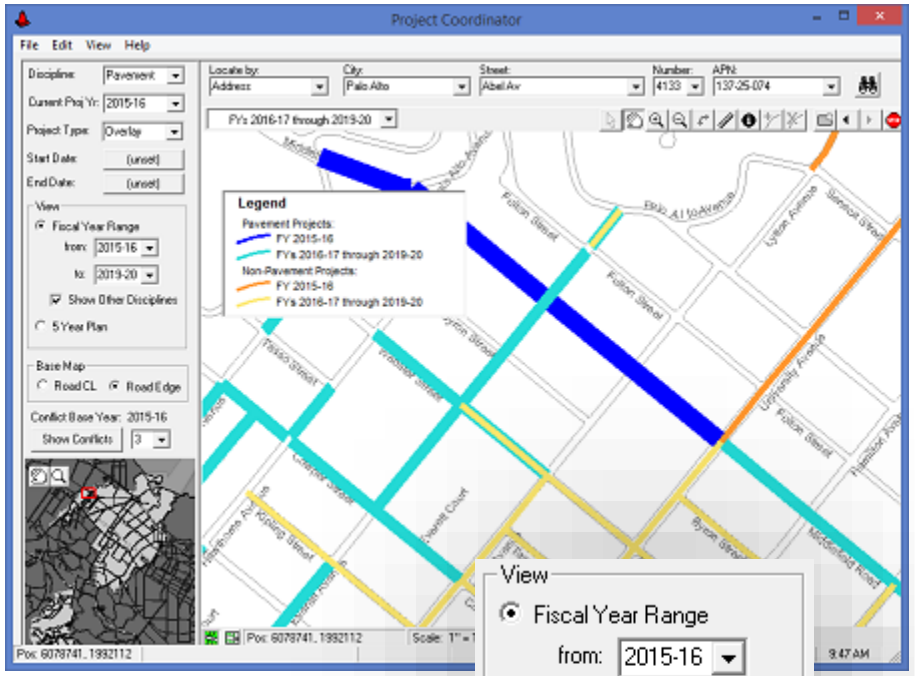


Source: Geodesy

Street Project Review

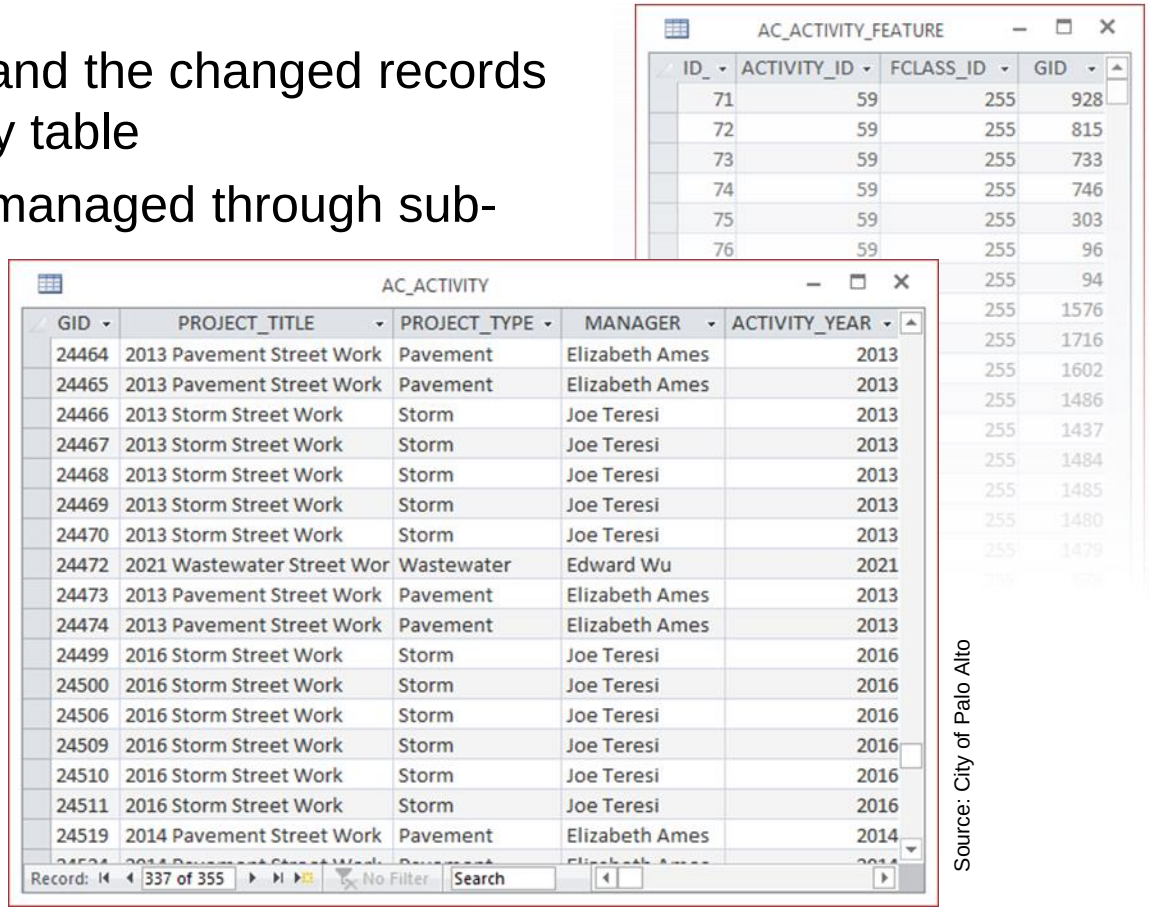
- Check for potential conflicts
- 5-year Pavement Capital Improvement Projects (CIP)
- 5-year Pavement CIP with Utility projects



Source: Geodesy

Street Project Data Model

- A single authoritative database is used to store all data
- Projects are stored in a single table and related to road centerlines in another table
- Every edit is logged and the changed records are stored in a history table
- User authorities are managed through sub-classed views



AC_ACTIVITY_FEATURE

ID_	ACTIVITY_ID	FCLASS_ID	GID
71	59	255	928
72	59	255	815
73	59	255	733
74	59	255	746
75	59	255	303
76	59	255	96
		255	94
		255	1576
		255	1716
		255	1602
		255	1486
		255	1437
		255	1484
		255	1485
		255	1480
		255	1479

AC_ACTIVITY

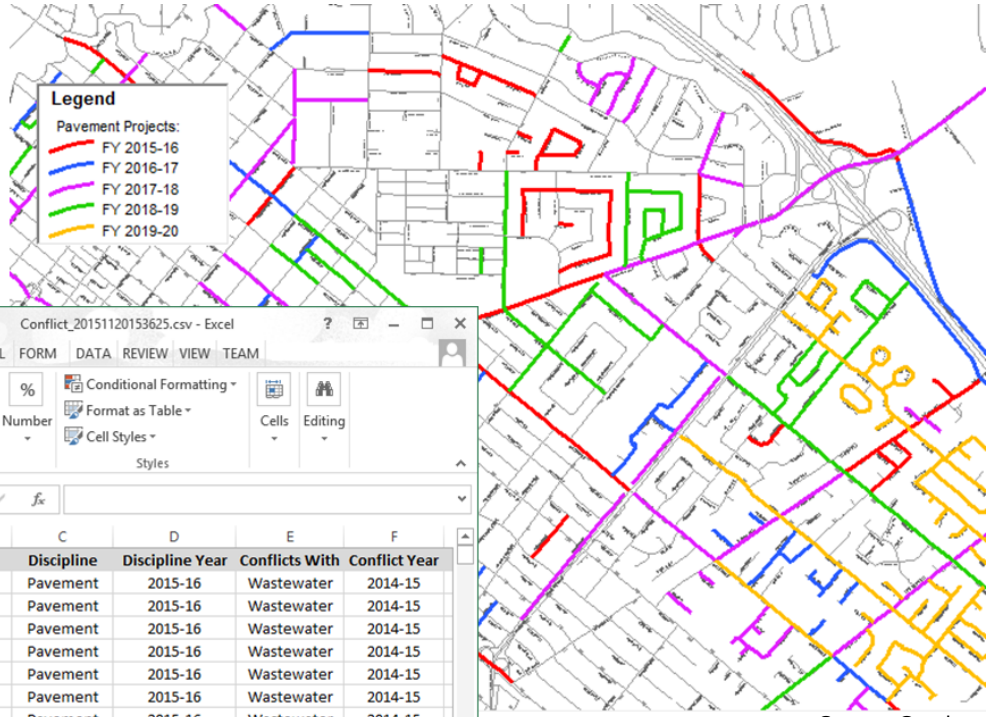
GID	PROJECT_TITLE	PROJECT_TYPE	MANAGER	ACTIVITY_YEAR
24464	2013 Pavement Street Work	Pavement	Elizabeth Ames	2013
24465	2013 Pavement Street Work	Pavement	Elizabeth Ames	2013
24466	2013 Storm Street Work	Storm	Joe Teresi	2013
24467	2013 Storm Street Work	Storm	Joe Teresi	2013
24468	2013 Storm Street Work	Storm	Joe Teresi	2013
24469	2013 Storm Street Work	Storm	Joe Teresi	2013
24470	2013 Storm Street Work	Storm	Joe Teresi	2013
24472	2021 Wastewater Street Wor	Wastewater	Edward Wu	2021
24473	2013 Pavement Street Work	Pavement	Elizabeth Ames	2013
24474	2013 Pavement Street Work	Pavement	Elizabeth Ames	2013
24499	2016 Storm Street Work	Storm	Joe Teresi	2016
24500	2016 Storm Street Work	Storm	Joe Teresi	2016
24506	2016 Storm Street Work	Storm	Joe Teresi	2016
24509	2016 Storm Street Work	Storm	Joe Teresi	2016
24510	2016 Storm Street Work	Storm	Joe Teresi	2016
24511	2016 Storm Street Work	Storm	Joe Teresi	2016
24519	2014 Pavement Street Work	Pavement	Elizabeth Ames	2014

Record: 337 of 355 | No Filter | Search

Source: City of Palo Alto

Output – Maps and Reports

- Single line (centerline) and double line (road edge) maps displaying a single year's project or a 5-year CIP suitable for submission to City Council
- A map of potential conflicts
- Tabular conflicts and project reports (Excel)



Source: Geodesy

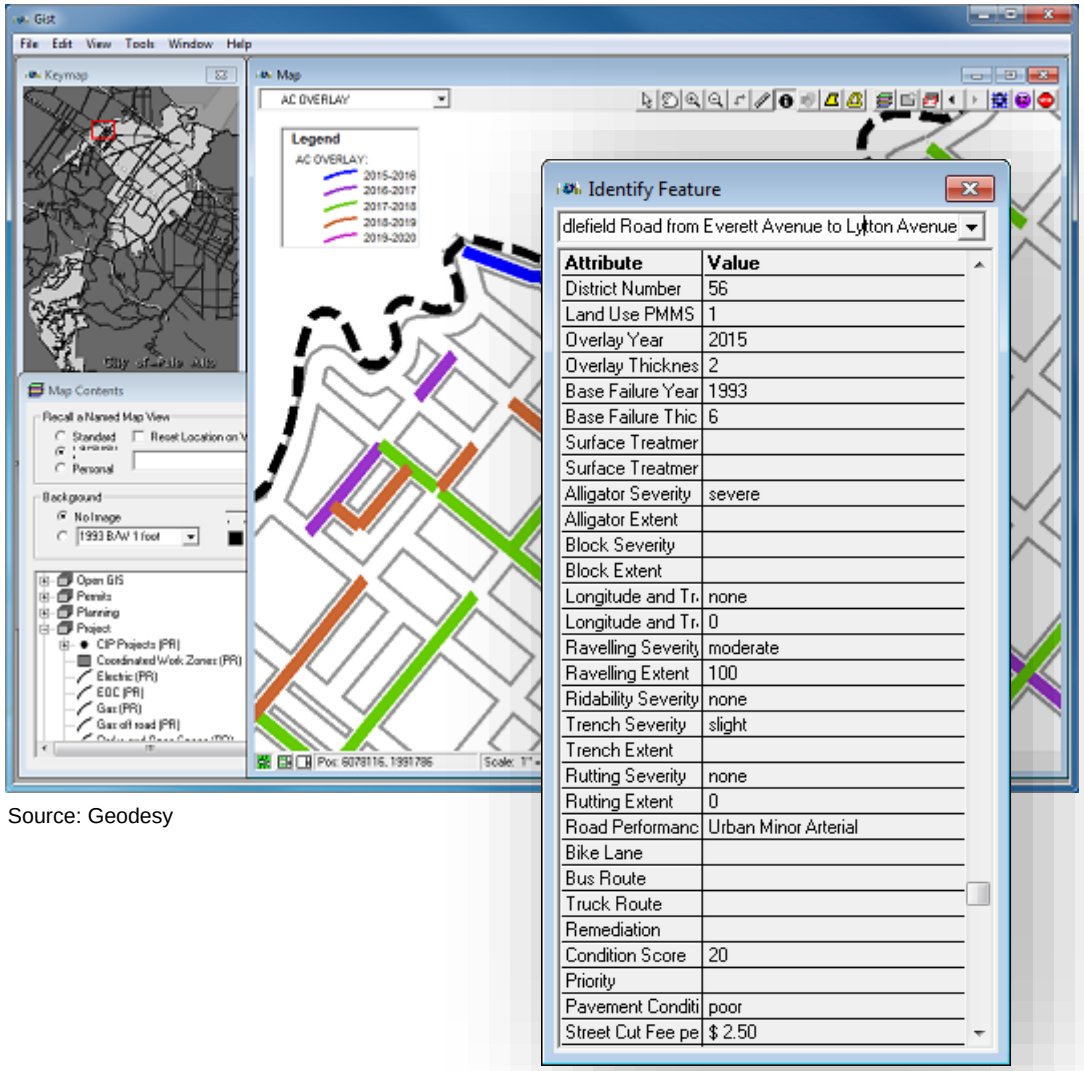
Conflict_20151120153625.csv - Excel

	A	B	C	D	E	F
1	Street	Block	Discipline	Discipline Year	Conflicts With	Conflict Year
2	Alma St	700	Pavement	2015-16	Wastewater	2014-15
3	Alma St	800	Pavement	2015-16	Wastewater	2014-15
4	Alma St	900	Pavement	2015-16	Wastewater	2014-15
5	Alma St	1000	Pavement	2015-16	Wastewater	2014-15
6	Alma St	1100	Pavement	2015-16	Wastewater	2014-15
7	Alma St	1200	Pavement	2015-16	Wastewater	2014-15
8	Alma St	1300	Pavement	2015-16	Wastewater	2014-15
9	Alma St	1400	Pavement	2015-16	Wastewater	2014-15
10	Alma St	2000	Pavement	2015-16	Wastewater	2013-14
11	Alma St	2100	Pavement	2015-16	Wastewater	2013-14
12	Alma St	2200	Pavement	2015-16	Wastewater	2013-14

Source: City of Palo Alto

Other Internal Uses of Project Data

- Pavement data
- Utilities detail vs 2015 overlay
- Traffic signal loops vs 2015 overlay



Attribute	Value
District Number	56
Land Use PMMS	1
Overlay Year	2015
Overlay Thicknes	2
Base Failure Year	1993
Base Failure Thic	6
Surface Treatmer	
Surface Treatmer	
Alligator Severity	severe
Alligator Extent	
Block Severity	
Block Extent	
Longitude and Tr	none
Longitude and Tr	0
Ravelling Severity	moderate
Ravelling Extent	100
Ridability Severity	none
Trench Severity	slight
Trench Extent	
Rutting Severity	none
Rutting Extent	0
Road Performanc	Urban Minor Arterial
Bike Lane	
Bus Route	
Truck Route	
Remediation	
Condition Score	20
Priority	
Pavement Conditi	poor
Street Cut Fee pe	$ 2.50

Source: Geodesy

Other Internal Uses of Project Data

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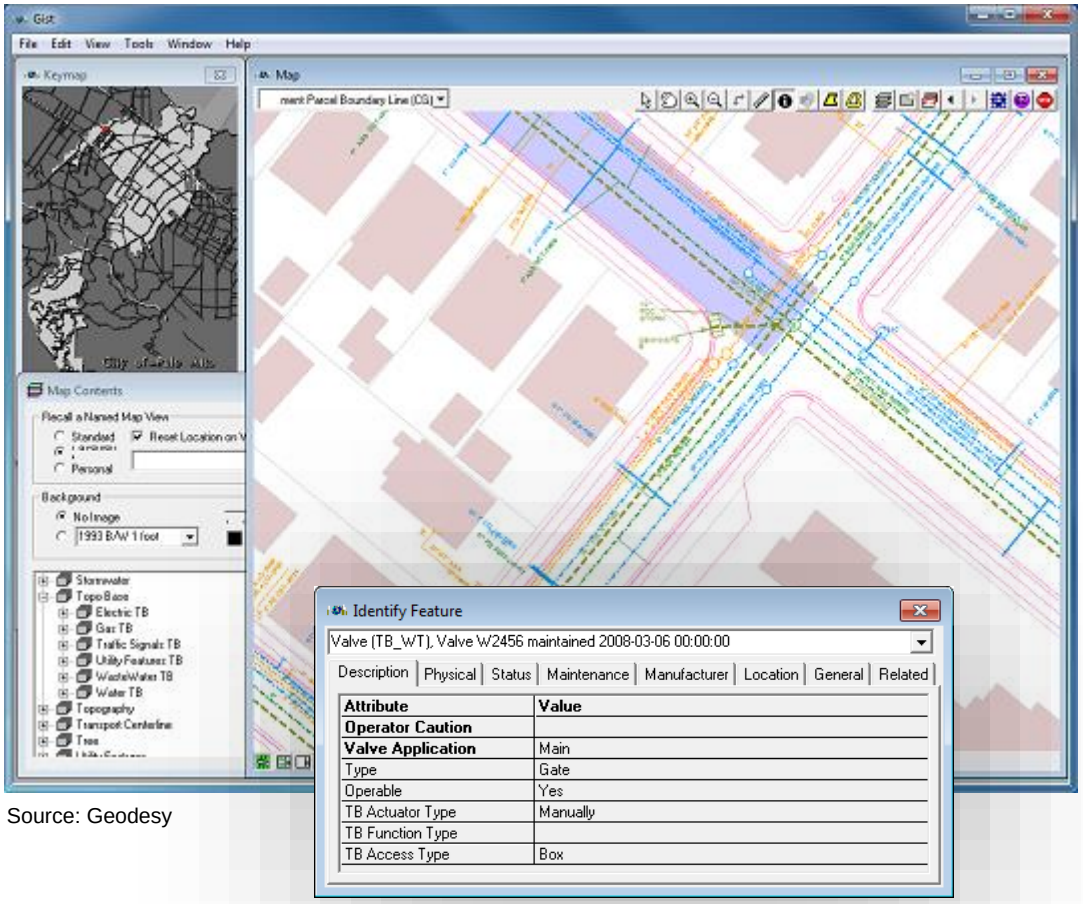

Source: Geodesy

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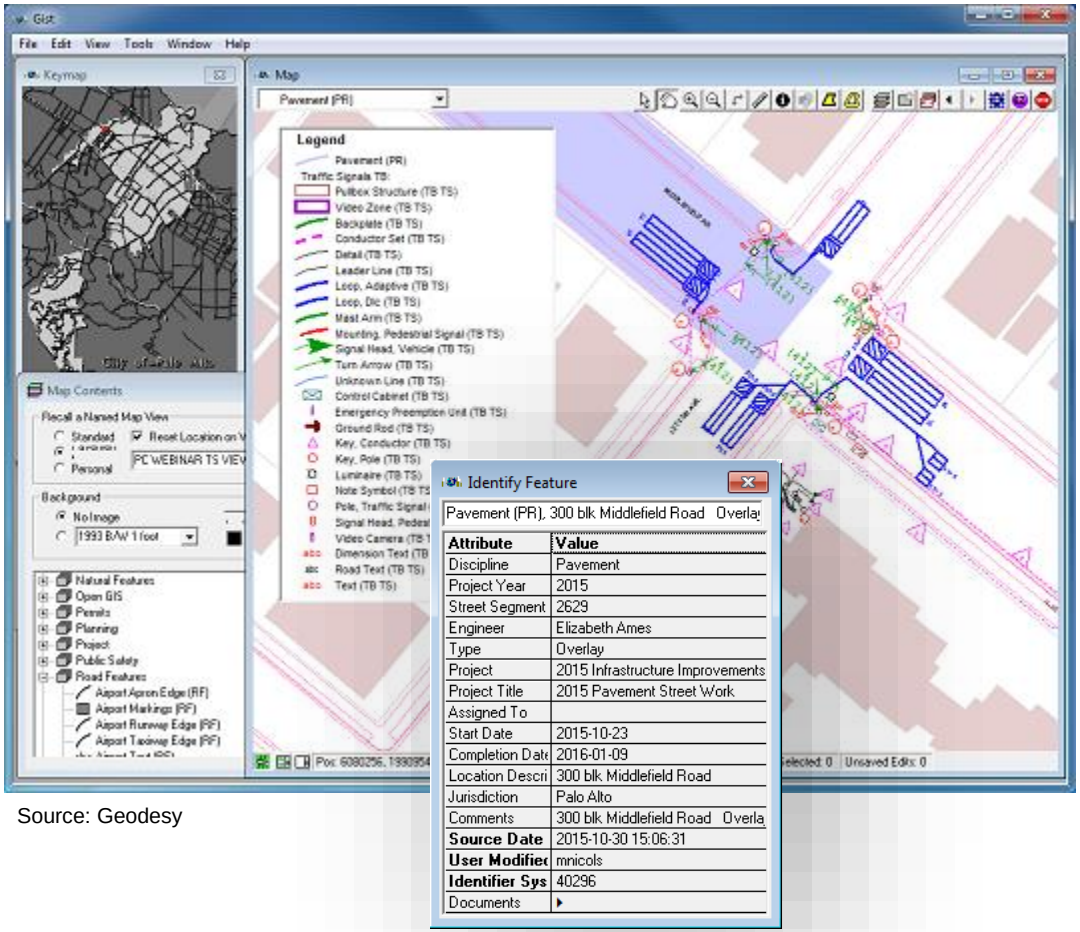


Source: Geodesy

Coordination During Construction

Contract Special Provisions:

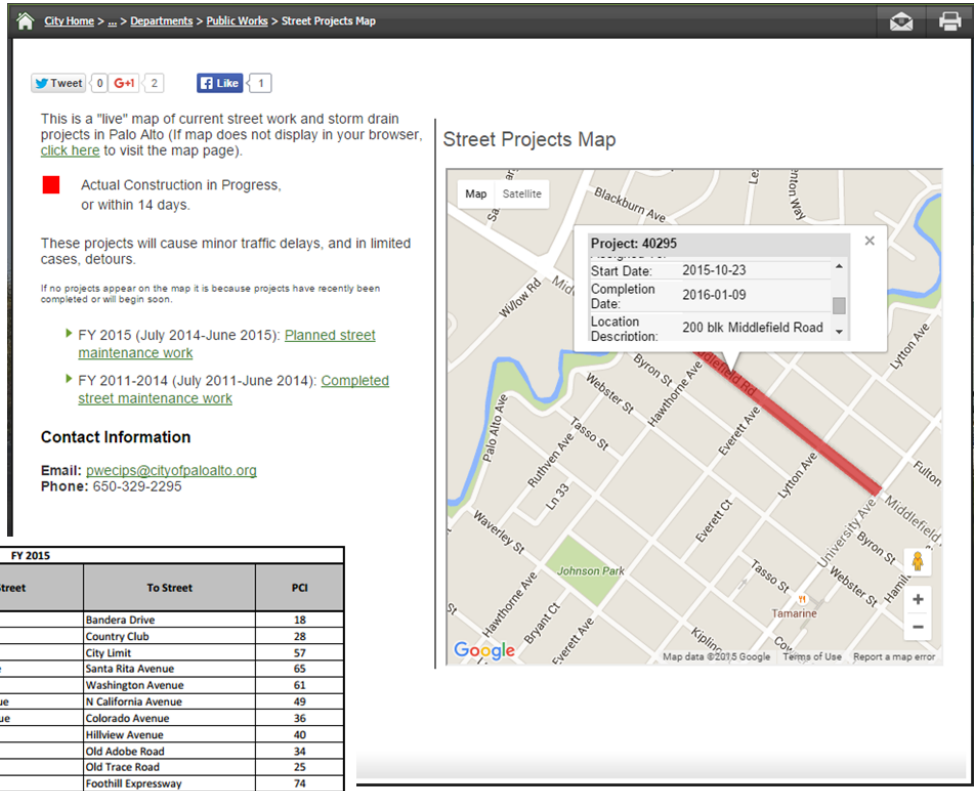
- Contractor shall coordinate his activities with the WGW Engineer, prior to beginning pavement work
- Contractor shall provide a weekly rolling 3-week look ahead schedules that are tied to the baseline schedule

I. These dates are entered into Project Coordinator for the web based map, and

II. For Contractors to coordinate their construction activities via the Engineers involved such that the pavement restoration appears to be seamless even though more than one CIP project is under way…i.e., paving immediately after trenching is complete on Utility projects

Citizen Involvement

- Web map of active street projects
- Open Data data.cityofpaloalto.org/home
- PaloAlto311



FY 2015			
Street	From Street	To Street	PCI
Alexis Drive	Laurel Glen Drive	Bandera Drive	18
Alexis Drive	Bandera Drive	Country Club	28
Alexis Drive	Country Club	City Limit	57
Alma Street	Rinconada Avenue	Santa Rita Avenue	65
Alma Street	Santa Rita Avenue	Washington Avenue	61
Alma Street	Washington Avenue	N California Avenue	49
Alma Street	N. California Avenue	Colorado Avenue	36
Arastradero Road	Deer Creek Road	Hillview Avenue	40
Arastradero Road	Hillview Avenue	Old Adobe Road	34
Arastradero Road	Old Adobe Road	Old Trace Road	25
Arastradero Road	Old Trace Road	Foothill Expressway	74
Bandera Drive	Alexis Drive	End	30

Source: City of Palo Alto

Citizen Involvement

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- Open Data data.cityofpaloalto.org/home
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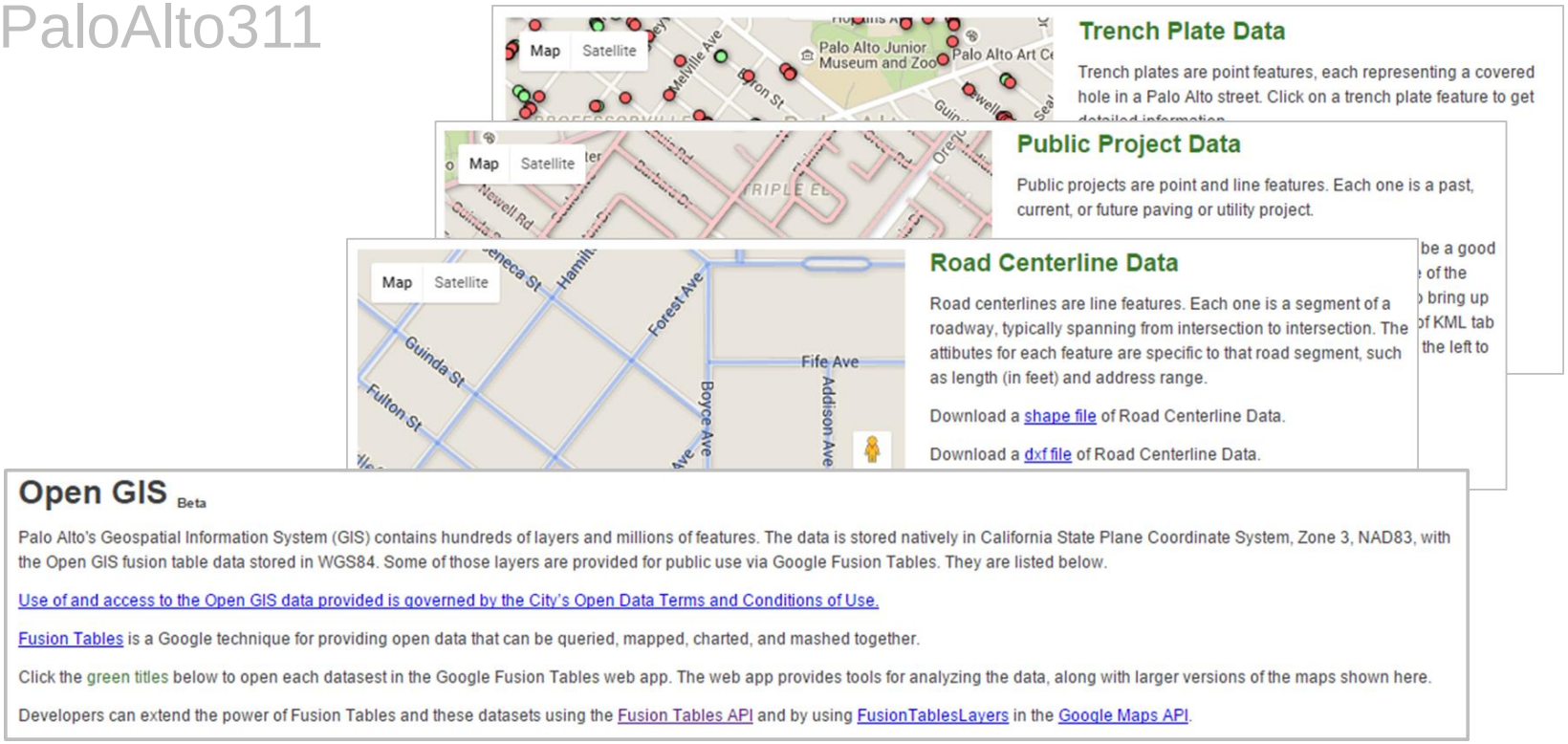


Source: City of Palo Alto

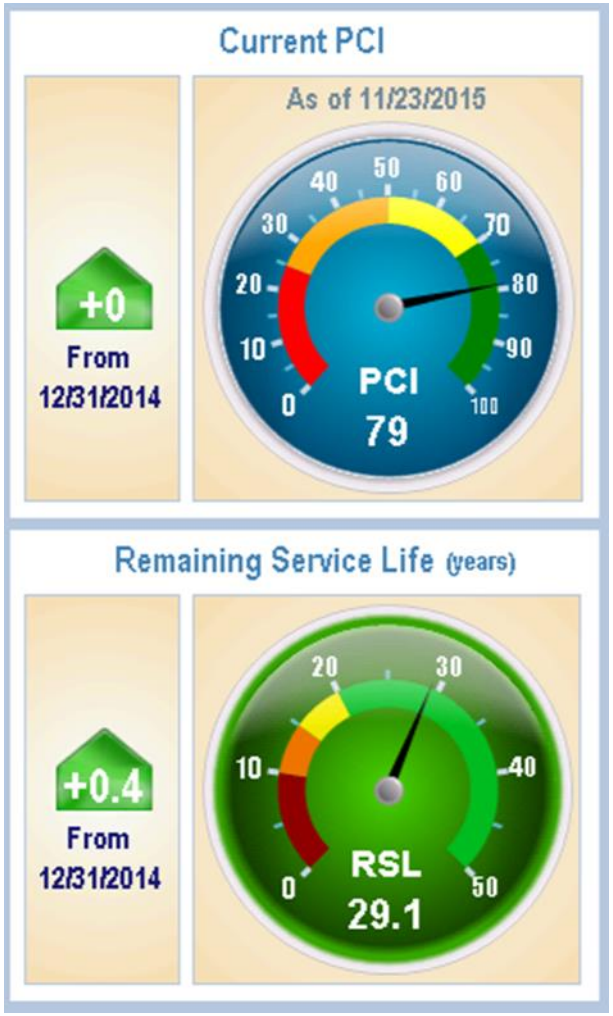
Citizen Involvement

- Web map of active street projects
- Open Data data.cityofpaloalto.org/home
- PaloAlto311

Source: City of Palo Alto

Project Coordination = Success

- Improved citizen's quality of life
- All infrastructure is targeted, not just pavement
- Supports Targeted Work Zones
- Provides routine communications and buy-in between stakeholders
- Provides a working examples to neighboring cities
- Easy to get started: simple approach only needs road centerlines



Source: StreetSaver/City of Palo Alto

Accolades (1 of 2)

Recognized at the state level for increasing the PCI from 72 to 78 in five years

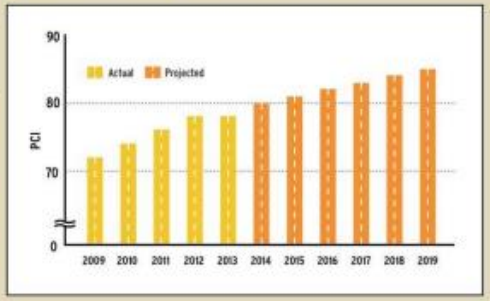
Located 35 miles south of San Francisco and 14 miles north of San Jose, Palo Alto is a community of approximately 61,200 residents. Part of the San Francisco Metropolitan Bay Area and Silicon Valley, Palo Alto is located within Santa Clara County and borders San Mateo County.

The City of Palo Alto Public Works Department maintains 200 miles of streets. The City has used its own Pavement Maintenance Management System (PMMS) since the mid 1970's. In 2009, Palo Alto successfully completed a correlation between PMMS and StreetSaver and calculated the City's first pavement maintenance score at 72. Since then, Palo Alto has been focused on improving pavement conditions across the City's 200 mile network.

In October 2010, the City Council appointed a 17-member Infrastructure Blue Ribbon Commission (IBRC) to examine the City's infrastructure and determine a plan to keep the existing infrastructure in good condition. By 2010, Palo Alto's average rating for streets was 73, placing it below many neighboring communities. The IBRC determined that nearly 20% of all Palo Alto's streets were rated under 60.

The IBRC recommended that, by 2021, no street should have a PCI rating below 60 and the City Council established a goal of achieving an average citywide PCI of 85 by 2021. Since 2009, Palo Alto's PCI score has gone from a 72 to a 78 (end of FY 2014) and we expect to reach a citywide average of 85 by 2019.

Annual funding has increased from $1.7M to $5.1M for street maintenance since FY 2009. In FY 2011, the City Council approved a $2 million annual increase in the paving budget an effort to step-up and address aging City streets. This resulted in an annual budget of $3.7M and in FY 2014, the street resurfacing program budget was increased again to $5.1M to accelerate the timeline for meeting the goal of a citywide PCI of 85 prior to 2021.

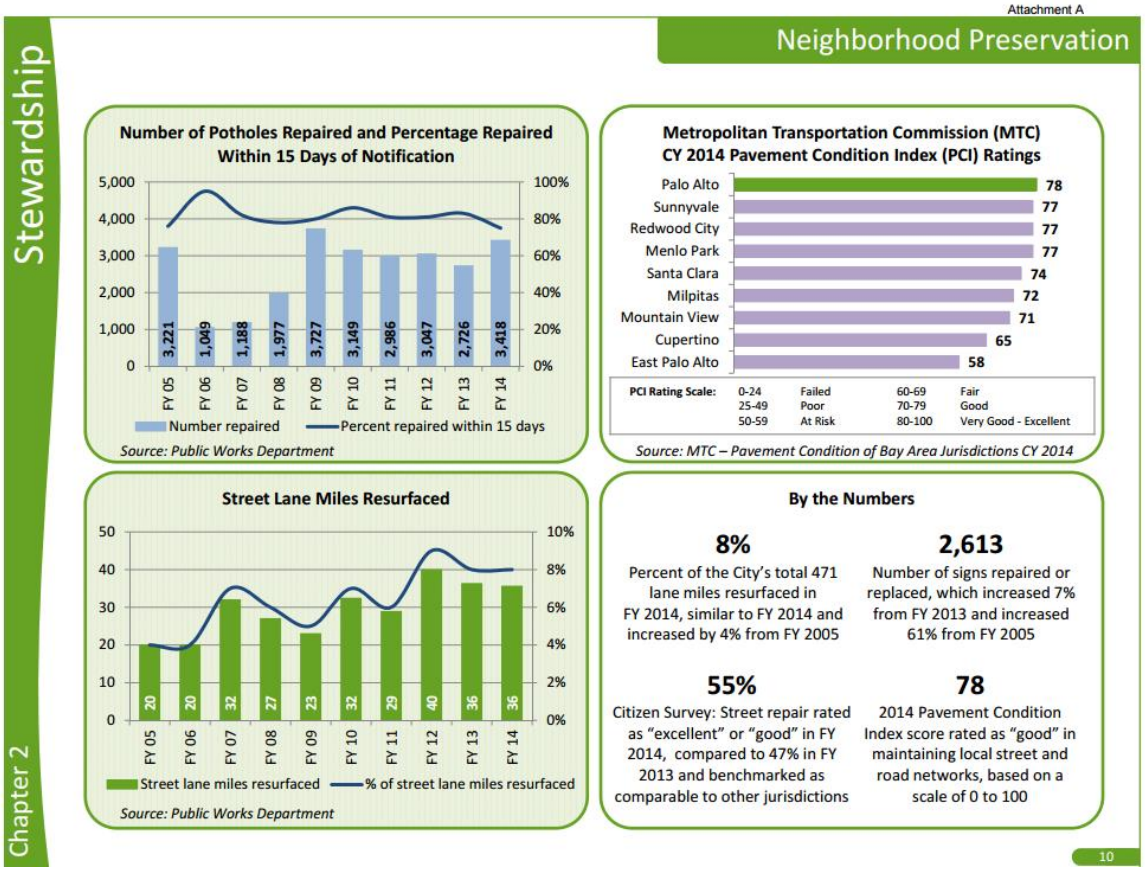


California Local Streets & Roads Needs Assessment 2014 Update
City of Palo Alto: A Case Study

Source: California Local Streets & Roads Needs Assessment 2014 Update
City of Palo Alto: A Case Study

Accolades (2 of 2)

Most improved rating for infrastructure management among city departments as rated by citizens

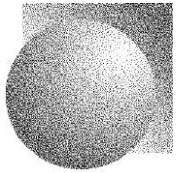


City of Palo Alto 2014 Performance Report: National Citizen Survey™, and Citizen Centric Report

Source: City of Palo Alto 2014 Performance Report: National Citizen Survey™, and Citizen Centric Report

About the Software

- The Encompass GIS suite, including Project Coordinator, is provided by Geodesy www.geodesy.net
- StreetSaver is provided by Metropolitan Transportation Commission www.streetsaveronline.com
- PaloAlto311 was created by PublicStuff www.publicstuff.com



Source: Geodesy

StreetSaver®

Source: StreetSaver

Source: PublicStuff

For more information:

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City of Palo Alto
murdo.nicolson@cityofpaloalto.org

Chip Eitzel
Geodesy
ce@geodesy.net

Smarter Work Zones

FHWA Resources

SWZ Interactive Toolkit Available!

https://www.workzonesafety.org/SWZ/main

Other Resources

Project Coordination Resources	
FHWA	• FHWA Work Zone Mobility and Safety Program – Project Coordination http://www.ops.fhwa.dot.gov/wz/construction/crp/index.htm • FHWA Work Zone Mobility and Safety Program – Peer-to-Peer Program http://www.ops.fhwa.dot.gov/wz/p2p/index.htm
TRB SHRP2	• WISE Software Users Guide http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2_S2-R11-RW-2.pdf
NCHRP	• NCHRP Synthesis 413: Techniques for Effective Highway Construction Projects in Congested Urban Areas http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_41.pdf
Others	• Highway Construction Coordination to Minimize Traffic Impacts http://planning.transportation.org/Documents/8-36/NCHRP8-36(56)FinalReport.pdf
WSDOT Example Documents	• Data Sharing Agreement between Washington State DOT and Seattle DOT https://www.workzonesafety.org/files/documents/SWZ/WSDOT-SDOT_data_sharing_agreement.pdf • Washington State DOT Memorandum of Understanding – Construction Traffic Coordination and Mitigation https://www.workzonesafety.org/files/documents/SWZ/MOU_10-25-09.pdf

Thanks for joining us!

- **Upcoming Events**
  - Webinar #8: Integrating Project Coordination and Technology Applications – Iowa DOT
    - Tuesday, December 15, 2015, 1:00-2:30pm EST
    - Registration: **https://connectdot.connectsolutions.com/e1qfd7myore/event/event_info.html**
  - Webinar #9: Technology Application Strategies: Performance Measurement and System Health Monitoring
    - Thursday, January 21, 2016, 1:00-2:30pm EST
  - Check The National Work Zone Safety Information Clearinghouse website for updates https://www.workzonesafety.org/SWZ/main
- **Questions or Comments?**
  - Jawad Paracha (FHWA Operations, WZ Team) Jawad.Paracha@dot.gov