



# **Integrating Esri Software With Third Party Solutions**

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# Third Party Integration at the City of Redlands

- **Cityworks – Permitting and Work Orders**
- **RoadVista Model 922 – Sign Retroreflectivity**
- **CitySourced – Citizen Engagement**

# Cityworks – made to work with Esri Products

- A map powered by ArcGIS Server is an integral part of Cityworks.



# Information from your GIS can be brought into Cityworks

- Here we have selected a parcel and the address information has been automatically added to our permit.

The screenshot displays the Cityworks software interface. The top navigation bar includes tabs for Summary, Main, Address (selected), Contractor, People, Case Data, Workflow, Rel Docs, Fees, Payment, Condition, and Flags. Below this, the Case Type is 1B-BBW, Number is B15-13269, and Status is SUBMITTED.

The 'Address' tab is active, showing a search for 'Parcel' with 'No Entries Found'. Below this is a section titled 'Add An Address' with the following fields:

- Asset Type: CWPARCELS
- Asset Id: 016780301
- Location: 1569 WOODBURY ST
- Parcel: 622745 (with a 'New Address' link)
- Address #: 1569
- Direction:
- Street:
- Fraction:
- Street Name: WOODBURY
- Street Type:
- Post-Dir:
- Suite:
- Cross Street:
- City, State: REDLANDS
- Zip: 92374
- Master: ☐

At the bottom of the 'Add An Address' section are 'Save' and 'Cancel' buttons.

On the right side, a 'Results' window shows a table of selected parcels:

FacilityID	OBJECTID	APN	Address	Site City State Zip
016780301	622745	016780301	1569 WOODBURY ST	REDLANDS, CA 92374

Below the table is a map showing a street grid. The selected parcel, 1569 WOODBURY ST, is highlighted in cyan. The map shows streets including WOODBURY ST and ELISE DR, with various lot numbers visible.

# Work Orders can be attached to assets to keep track of costs.

- A tree trim work order is attached to a tree in the GIS data.

The screenshot displays a GIS application interface. On the left is the 'Work Order' form, and on the right is the 'Results' window showing a map and a table of selected trees.

**Work Order Form:**

- Description: Tree - Trim
- Number: 10032
- Entity Type: FTREES
- Category: Trees
- Initiated By: DAWKINS, ANNETTE L
- Date: 2/28/2012 12:27 PM
- Status: Open
- Priority: Medium
- Requested By: ROBERTS, WILLIAM P
- Submit To: (empty)
- Projected Start: 2/28/2012 12:00 AM
- Projected Finish: (empty)
- Opened By: (empty)
- Closed By: (empty)
- Completed By: (empty)

**Results Window:**

Selected-Trees (1)

OBJECTID	LOCATION	DISTRICT	ADDRESS	STREET	SIDE	TREE
101457		8	68	NORWOOD ST	Front	1

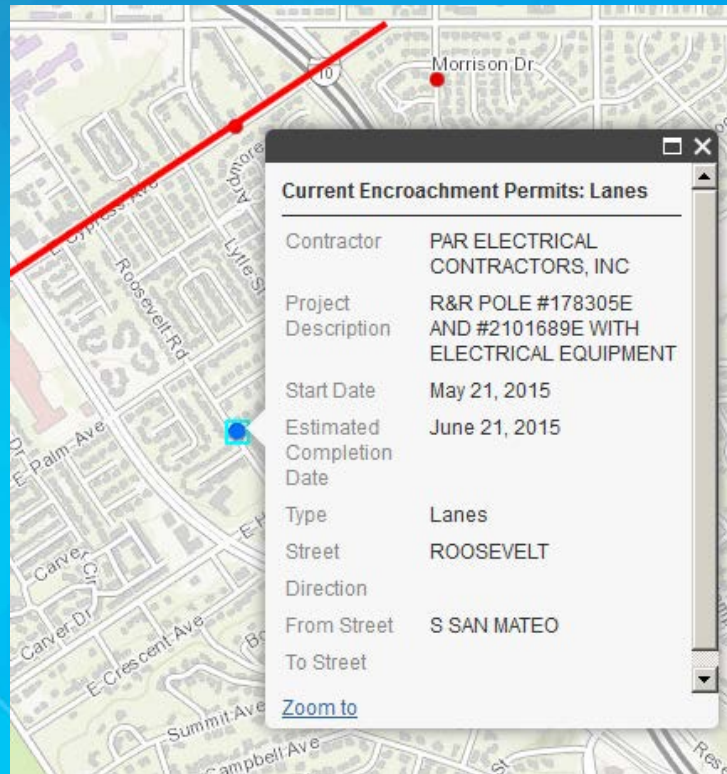
Below the table is a map showing a street grid with a red dot indicating the location of the selected tree.





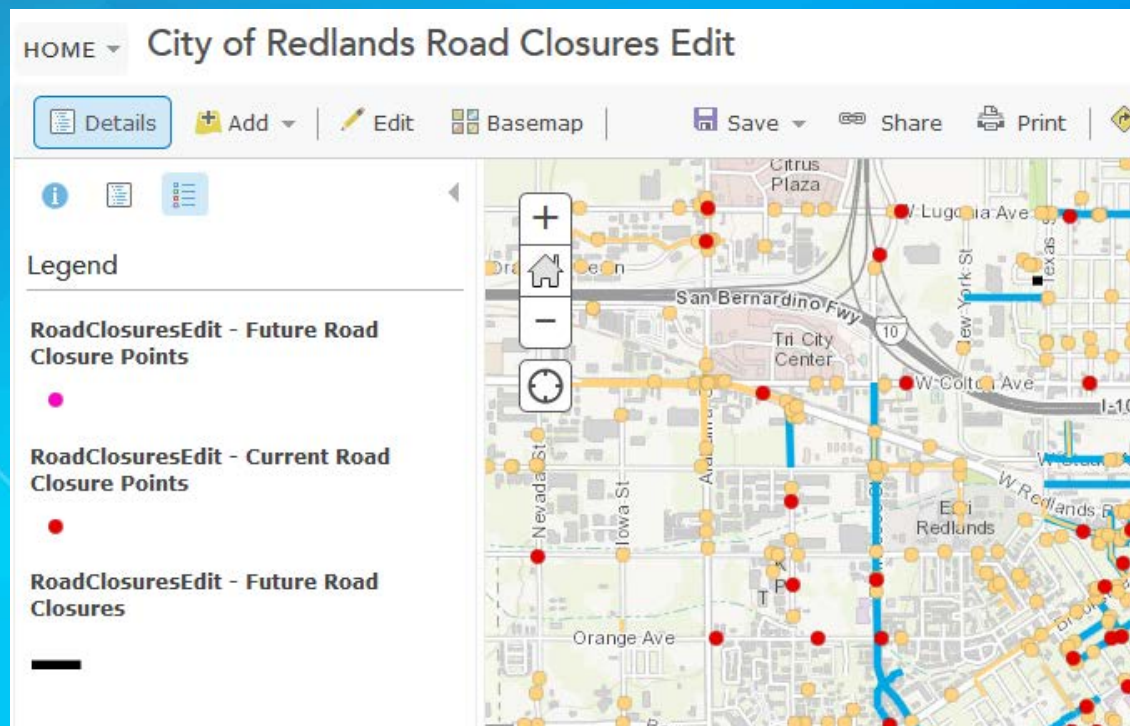
# Expanding on the out of the box capabilities.

- Adding Encroachment Permits to the Road Closure map.



# Old Method – ArcGIS Online Editing

- Staff maintains data adding locations and removing them when the permit is closed.





# Wait – All the information we need is in Cityworks

- Results of query that pulls all the data together.

	CompDate	StartDate	Type	Street	Direction	FromStreet	ToStreet
1	2015-06-22 00:00:00.000	2015-05-22 00:00:00.000	Lanes	ROOSEVELT	NULL	S SAN MATEO	NULL
2	2015-09-26 00:00:00.000	2015-06-26 00:00:00.000	Lanes	E LUGONIA	NULL	TRIBUNE	NULL
3	2015-06-01 00:00:00.000	2015-05-29 00:00:00.000	Other	CHISOLM TRAIL	NULL	OLIVE	NULL

ProjectDescription	x_coord	y_coord	Business_Name
R&R POLE #178305E AND #2101689E WITH ELECTRICAL E...	-13042806.658	4035100.863	PAR ELECTRICAL CONTRACTORS, INC
R&R POLE #4088699E WITH ELECTRICAL EQUIPMENT	-13044231.105	4038197.705	PAR ELECTRICAL CONTRACTORS, INC
INSTALLING FIBER OPTIC CABLE TO 168 CHISOLM TRAIL	-13047385.387	4034176.828	VERIZON

## The information we need is in four different tables.

TheTable	
1	CA_DATA_DETAIL

CA_DATA_DETAIL_ID	CASE_DATA_DETAIL_ID	CA_DATA_GROUP_ID	DETAIL_SEQUENCE	DETAIL_CODE	DETAIL_DESC
23709	530	1563	4	M-ENCDOS8	Anticipated Completion Date

TheTable	
1	CA_OBJECT

CA_OBJECT_ID	ORG_ID	CASE_TYPE_ID	SUB_TYPE_ID	SUB_TYPE_DEFAULT_TEXT	CASE_NUMBER	PROJECT_ID	CASE_NAME
260	1	85	NULL	PALM TREE TRIMMING	E11-4875	NULL	NULL

TheTable	
1	CA_ADDRESS

x_coord	y_coord	CA_ADDRESS_ID	CA_OBJECT_ID	ADDRESS_ID	LND_OBJECT_ID	OBJECT_ID	STREET_NUMBER	STREET_NAME
-13045560.855	4033572.965	1	260	NULL	NULL	60715	1200	E

TheTable	
1	Contractor

CONTRACTOR_ID	ORG_ID	USER_ID	BUSINESS_NAME	FIRST_NAME	LAST_NAME	ADDRESS_LINE1	ADDRESS_LINE2	ADDRESS_LINE3
1	1	NULL	SIGNRESOURCE	NULL	NULL	PO BOX 549	6235 DISTRICT BLVD	NULL

# Create a SQL view to extract the needed data.

- Advantage: always up to date.
- Disadvantage: slow, 1.7 million records, query takes 20 seconds.

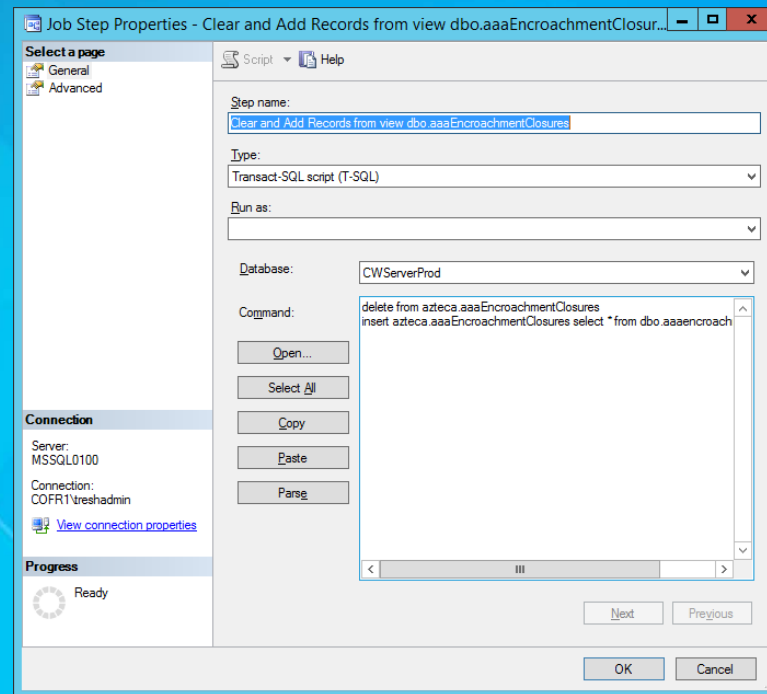
```

SELECT object_id, CompDate, StartDate, Type, Street, Direction, FromStreet, ToStreet, ProjectDescription, x_coord, y_coord, Business_Name
FROM (SELECT CAST(o.CA_OBJECT_ID AS int) AS object_id, MAX(CASE WHEN d.detail_desc = 'Anticipated Completion Date' THEN d.date_value END) AS CompDate,
      MAX(CASE WHEN d.detail_desc = 'Construction Start Date' THEN d.date_value END) AS StartDate, MAX(CASE WHEN d.detail_desc = 'Type of Closure' THEN d.LIST_VALUE END) AS Type,
      MAX(CASE WHEN d.detail_desc = 'Street Name' THEN d.COMMENT_VALUE END) AS Street, MAX(CASE WHEN d.detail_desc = 'Direction of Closure' THEN d.COMMENT_VALUE END) AS Direction,
      MAX(CASE WHEN d.detail_desc = 'From Cross Street' THEN d.COMMENT_VALUE END) AS FromStreet, MAX(CASE WHEN d.detail_desc = 'To Cross Street' THEN d.COMMENT_VALUE END)
      AS ToStreet, MAX(o.SUB_TYPE_DEFAULT_TEXT) AS ProjectDescription, MAX(a.X_COORD) AS x_coord, MAX(a.Y_COORD) AS y_coord, MAX(con.BUSINESS_NAME) AS Business_Name
FROM Azteca.CA_DATA_DETAIL AS d LEFT OUTER JOIN
      Azteca.CA_DATA_GROUP AS g ON g.CA_DATA_GROUP_ID = d.CA_DATA_GROUP_ID LEFT OUTER JOIN
      Azteca.CA_OBJECT AS o ON o.CA_OBJECT_ID = g.CA_OBJECT_ID LEFT OUTER JOIN
      Azteca.CA_ADDRESS AS a ON a.CA_OBJECT_ID = o.CA_OBJECT_ID LEFT OUTER JOIN
      Azteca.CA_CONTRACTOR AS c ON o.CA_OBJECT_ID = c.CA_OBJECT_ID LEFT OUTER JOIN
      Azteca.CONTRACTOR AS con ON con.CONTRACTOR_ID = c.CONTRACTOR_ID
WHERE (o.CASE_TYPE_ID IN (218, 144, 85, 11)) AND (o.CASE_STATUS_ID = 10 OR
      o.CASE_STATUS_ID = 4) AND (NOT (d.DATE_VALUE IS NULL)) AND (d.DETAIL_DESC = 'Anticipated Completion Date') AND (NOT (o.CASE_NUMBER LIKE 'X%')) OR
      (o.CASE_TYPE_ID IN (218, 144, 85, 11)) AND (o.CASE_STATUS_ID = 10 OR
      o.CASE_STATUS_ID = 4) AND (NOT (d.DATE_VALUE IS NULL)) AND (d.DETAIL_DESC = 'construction start date') AND (NOT (o.CASE_NUMBER LIKE 'X%')) OR
      (d.DETAIL_DESC = 'Street Name' OR
      d.DETAIL_DESC = 'Direction of Closure' OR
      d.DETAIL_DESC = 'From Cross Street' OR
      d.DETAIL_DESC = 'To Cross Street' OR
      d.DETAIL_DESC = 'Type of Closure') AND (NOT (o.CASE_NUMBER LIKE 'X%'))
GROUP BY o.CA_OBJECT_ID) AS t
WHERE (NOT (CompDate IS NULL))
    
```

object_...	CompDate	StartDate	Type	Street	Direction	FromStreet	ToStreet	ProjectDescript...	x_coord	y_coord	Business_Name
21074	2015-06-22 00:0...	2015-05-22 00:0...	Lanes	ROOSEVELT	NULL	S SAN MATEO	NULL	R&R POLE #178...	-13042806.658	4035100.863	PAR ELECTRIC...
21079	2015-09-26 00:0...	2015-06-26 00:0...	Lanes	E LUGONIA	NULL	TRIBUNE	NULL	R&R POLE #408...	-13044231.105	4038197.705	PAR ELECTRIC...
21091	2015-06-01 00:0...	2015-05-29 00:0...	Other	CHISOLM TRAIL	NULL	OLIVE	NULL	INSTALLING FI...	-13047385.387	4034176.828	VERIZON
21097	2015-05-29 00:0...	2015-05-29 00:0...	Other	E STATE STREET	NULL	ORANGE STREET	NULL	LOADING MET...	-13044694.703	4036384.356	B&G AMERICA...
21113	2015-06-08 00:0...	2015-06-08 00:0...	Lanes	SERPENTINE	NULL	MIRA MONTE	NULL	REPLACING TR...	-13045320.955	4032570.062	SCE

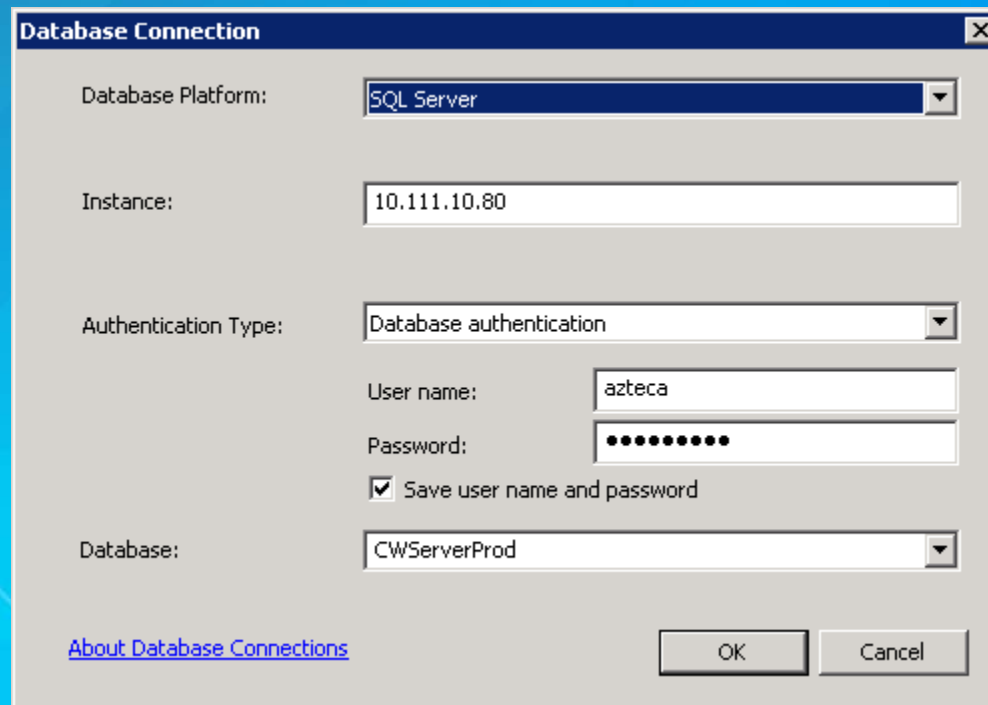
# Create a SQL Server Agent Job to copy the records to a table.

- Advantage: Once the table is made accessing the data is fast.
- Disadvantage: Will not always be up to date.



# Create the ArcGIS Service

- Create a database connection to the Cityworks database.



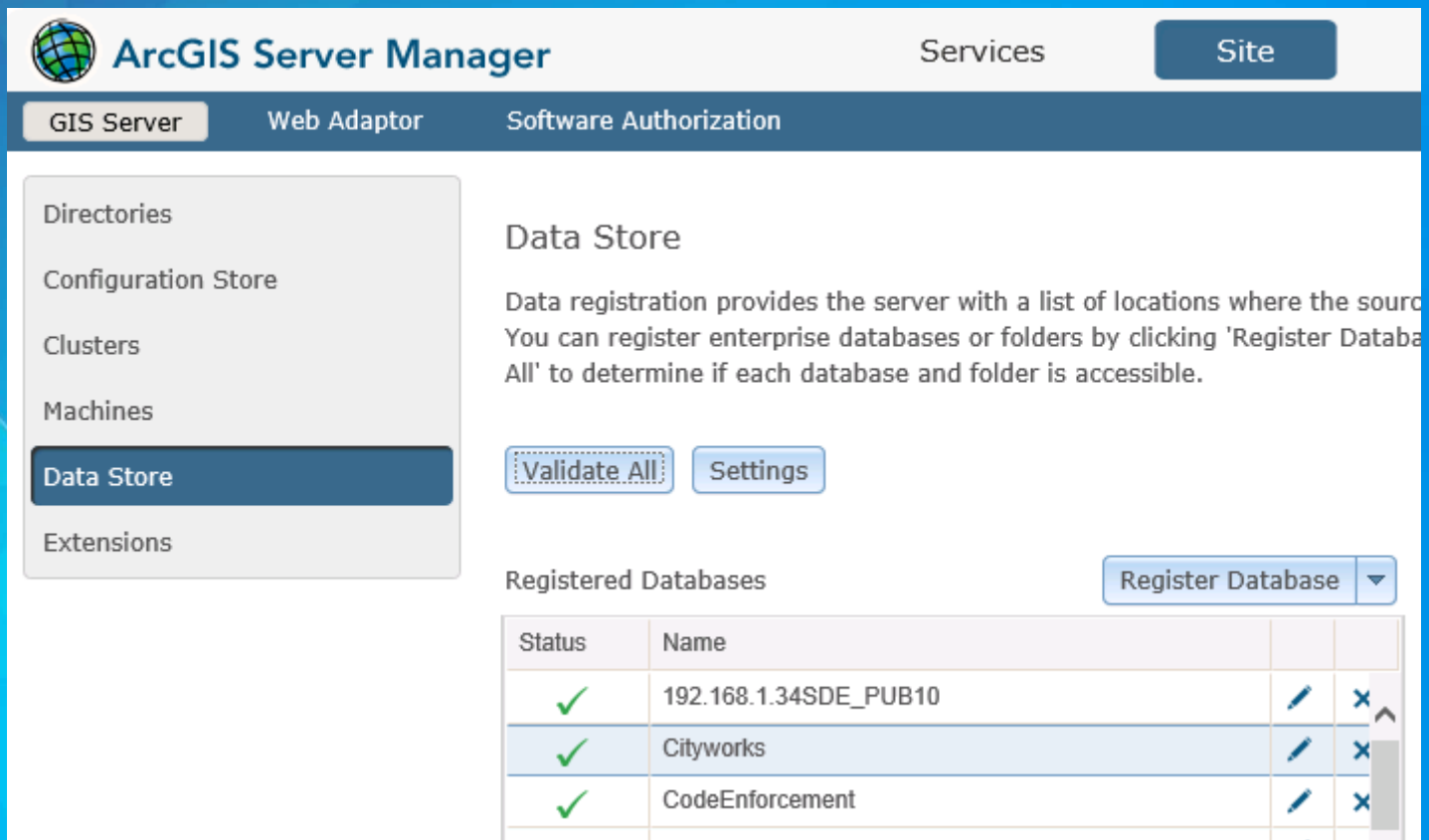
The screenshot shows a 'Database Connection' dialog box with the following fields and options:

- Database Platform:** A dropdown menu set to 'SQL Server'.
- Instance:** A text box containing '10.111.10.80'.
- Authentication Type:** A dropdown menu set to 'Database authentication'.
- User name:** A text box containing 'azteca'.
- Password:** A text box filled with 10 dots.
- Save user name and password:** A checked checkbox.
- Database:** A dropdown menu set to 'CWServerProd'.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom right.
- Link:** A blue underlined link labeled 'About Database Connections' at the bottom left.



# Create the ArcGIS Service

- Register the data with your server.



The screenshot displays the ArcGIS Server Manager web interface. The top navigation bar includes the ArcGIS logo, the title 'ArcGIS Server Manager', and tabs for 'Services' and 'Site'. Below this, a secondary navigation bar shows 'GIS Server' (selected), 'Web Adaptor', and 'Software Authorization'. On the left, a sidebar menu lists 'Directories', 'Configuration Store', 'Clusters', 'Machines', 'Data Store' (highlighted), and 'Extensions'. The main content area is titled 'Data Store' and contains a paragraph explaining data registration: 'Data registration provides the server with a list of locations where the source data is stored. You can register enterprise databases or folders by clicking 'Register Database' or 'Validate All' to determine if each database and folder is accessible.' Below the text are two buttons: 'Validate All' and 'Settings'. Further down, there is a section titled 'Registered Databases' with a 'Register Database' button and a dropdown arrow. A table lists the registered databases with columns for 'Status', 'Name', and two action columns (edit and delete).

Status	Name		
✓	192.168.1.34SDE_PUB10		
✓	Cityworks		
✓	CodeEnforcement		

# Create the ArcGIS Service

- Add the table created by the SQL Server Agent Job to ArcMap.

New Query Layer

Unique Identifier Field(s):

	Name	Type	Nullable
<input checked="" type="checkbox"/>	object_id	Long Integer	Yes
<input type="checkbox"/>	CompDate	Date	Yes
<input type="checkbox"/>	StartDate	Date	Yes
<input type="checkbox"/>	Type	Text	Yes
<input type="checkbox"/>	Street	Text	Yes
<input type="checkbox"/>	Direction	Text	Yes
<input type="checkbox"/>	FromStreet	Text	Yes

Spatial Properties

☐ Coordinates include M values. Used to store route data.

☐ Coordinates include Z values. Used to store 3D data.

Geometry Type:

Spatial Reference: UNKNOWN

SRID:

# Create the ArcGIS Service

- Display the data as an X Y Event Layer.

The screenshot shows the 'Display XY Data' dialog box in ArcGIS. The dialog has a title bar with a close button. Inside, there is a text box explaining that a table with X and Y coordinates can be added to the map. Below this, a section titled 'Choose a table from the map or browse for another table:' contains a dropdown menu showing 'CWServerProd.AZTECA.%aaaEncroachmentClosures' and a browse button. The next section, 'Specify the fields for the X, Y and Z coordinates:', has three dropdowns: 'X Field' set to 'x\_coord', 'Y Field' set to 'y\_coord', and 'Z Field' set to '<None>'. Below that, the 'Coordinate System of Input Coordinates' section includes a 'Description:' label and a text area showing 'Projected Coordinate System: Name: WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere' and 'Geographic Coordinate System: Name: GCS\_WGS\_1984'. There is a 'Show Details' checkbox (unchecked) and an 'Edit...' button. At the bottom, there is a checked checkbox for 'Warn me if the resulting layer will have restricted functionality', a link 'About adding XY data', and 'OK' and 'Cancel' buttons.

**Display XY Data**

A table containing X and Y coordinate data can be added to the map as a layer

Choose a table from the map or browse for another table:

CWServerProd.AZTECA.%aaaEncroachmentClosures

Specify the fields for the X, Y and Z coordinates:

X Field: x\_coord

Y Field: y\_coord

Z Field: <None>

Coordinate System of Input Coordinates

Description:

Projected Coordinate System:  
Name: WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere

Geographic Coordinate System:  
Name: GCS\_WGS\_1984

☐ Show Details

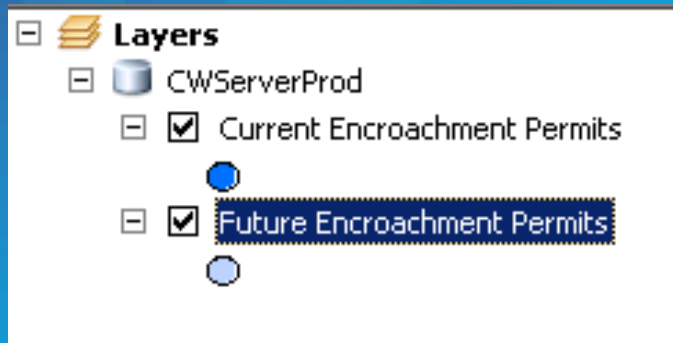
☒ Warn me if the resulting layer will have restricted functionality

[About adding XY data](#)

OK Cancel

# Create the ArcGIS Service

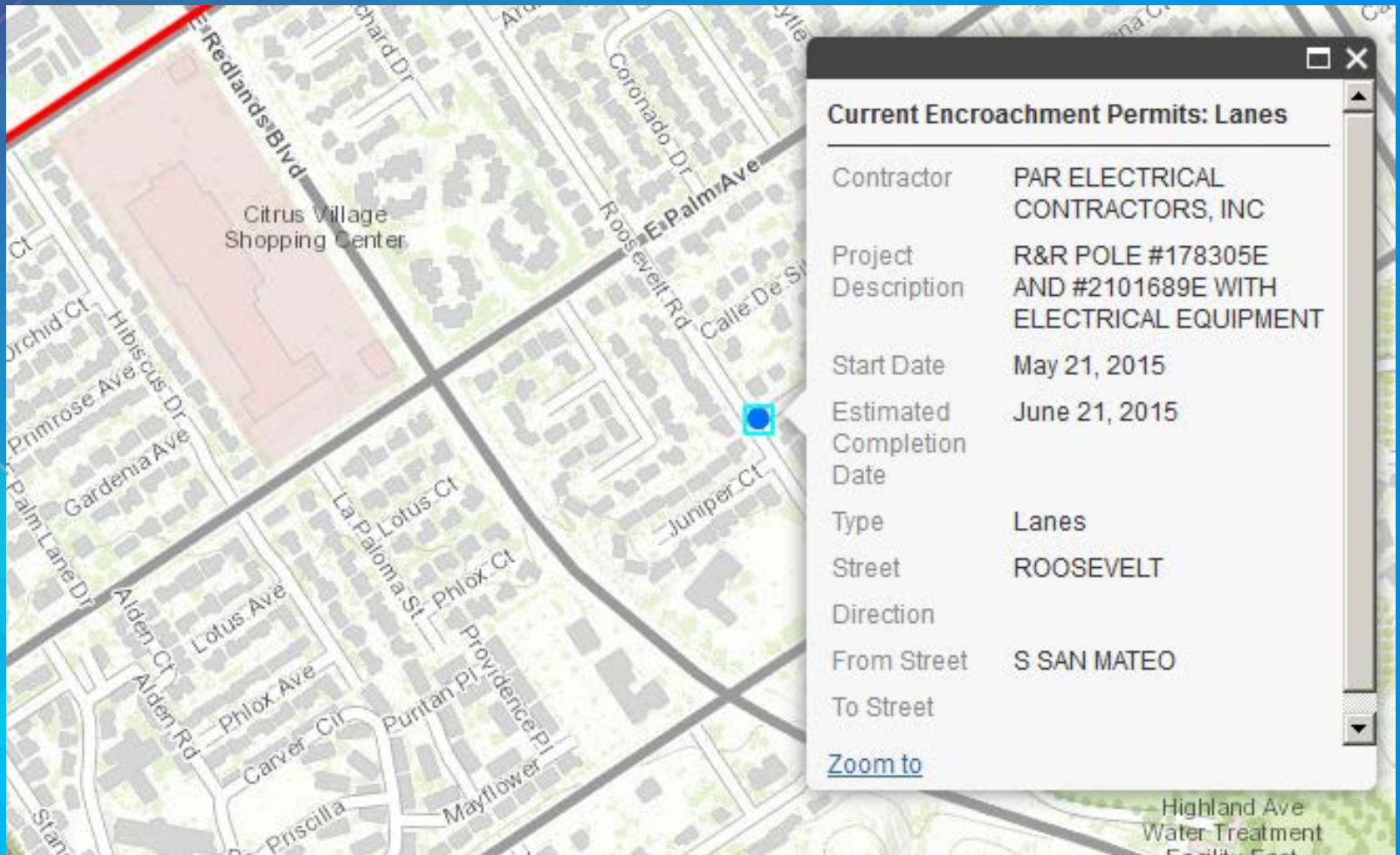
- Add definition query and symbolize as necessary.



Current Query  
StartDate <= getdate() and  
CompDate >= getdate()  
Future Query  
StartDate > getdate()

The SQL query that creates the table only selects permits that are not closed so the permit is automatically removed when the permit is closed.

# Map with Encroachment Permits Displayed





# Code Enforcement Cases

**Need to display Code Enforcement Cases so Building Permits will not be issued until case is cleared.**



# Code Enforcement Cases

Code Enforcement is kept in separate Cityworks database.

Permitting



Code Enforcement



# Code Enforcement Cases

## Create a View to Extract the Data

COFRSERVERGI...PermitCodes\* COFRSERVERGI...eEnforcement\* Object Explorer Details

```
SELECT CAST(Azteca.CA_DATA_DETAIL.CA_DATA_DETAIL_ID AS nvarchar(30)) AS ObjectID, Azteca.CA_DATA_DETAIL.DETAIL_CODE, Azteca.CA_DATA_GROUP.CA_OBJECT_ID, Azteca.CA_OBJECT.CASE_NAME, Azteca.CA_OBJECT.ACCEPTED_BY, Azteca.CA_OBJECT.DATE_ACCEPTED, Azteca.CA_OBJECT.ENTERED_BY, Azteca.CA_OBJECT.DATE_ENTERED
FROM Azteca.CA_DATA_DETAIL INNER JOIN
Azteca.CA_DATA_GROUP ON Azteca.CA_DATA_DETAIL.CA_DATA_GROUP_ID = Azteca.CA_DATA_GROUP.CA_DATA_GROUP_ID INNER JOIN
Azteca.CA_OBJECT ON Azteca.CA_DATA_GROUP.CA_OBJECT_ID = Azteca.CA_OBJECT.CA_OBJECT_ID
WHERE (Azteca.CA_DATA_DETAIL.DETAIL_CODE > '15.03' AND Azteca.CA_DATA_DETAIL.DETAIL_CODE < '15.53' OR
Azteca.CA_DATA_DETAIL.DETAIL_CODE > '18.' AND Azteca.CA_DATA_DETAIL.DETAIL_CODE < '19.') AND (Azteca.CA_OBJECT.STATUS_CODE = N'OPEN')
```

	ObjectID	DETAIL_CODE	CA_OBJECT_ID	CASE_NUMBER	CX	CY	STATUS_CODE	DATE_ACCEPTED
▶	868586	18.164.130	10562	13-660	-13040346.255	4037530.723	OPEN	2013-12-18 08:...
	868735	18.168.010	10572	14-670	-13045974.261	4033749.454	OPEN	2014-01-14 17:...
	868736	18.168.020	10572	14-670	-13045974.261	4033749.454	OPEN	2014-01-14 17:...

# Code Enforcement Cases

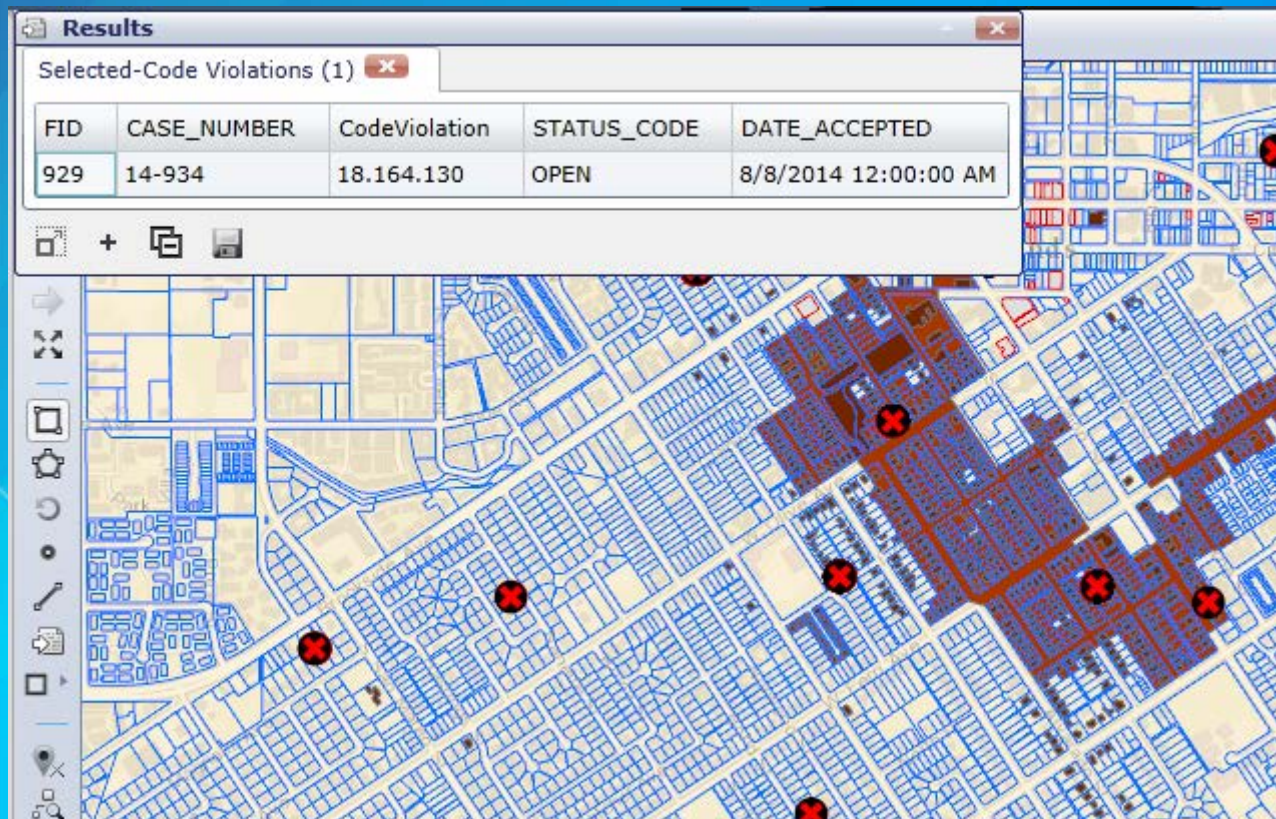
Python script creates a shapefile using MakeXYEventLayer

```
arcpy.MakeXYEventLayer_management(CodeEnforcement_  
dbo_aaaDenyPermitCodes, "CX", "CY", TheLayer,  
"PROJCS['WGS_
```



# Code Enforcement Cases

Use the shapefile in the service that is used by CityWorks Permitting.





# RoadVista Model 922 – Sign Retroreflectivity

Using the Collector App for better results

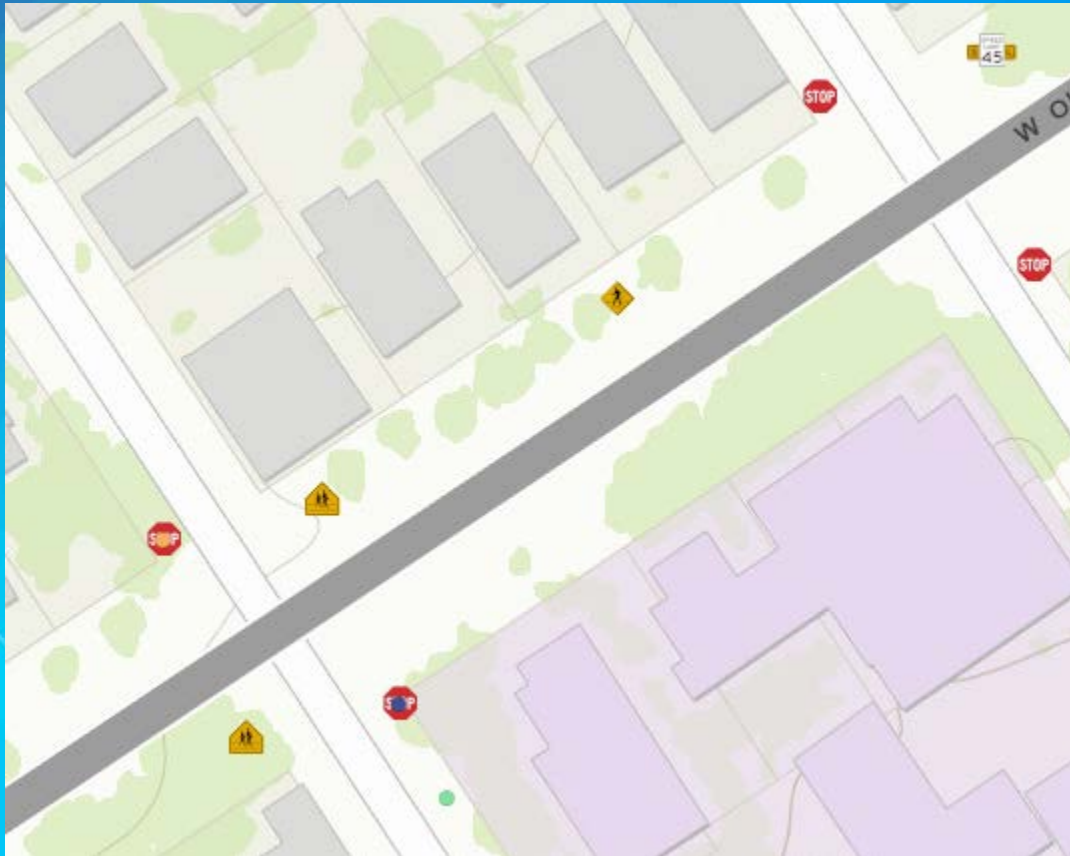


**RoadVista results are not always accurate.**



**Use existing sign data.**

**Add Barcode attribute to link to RoadVista results.**

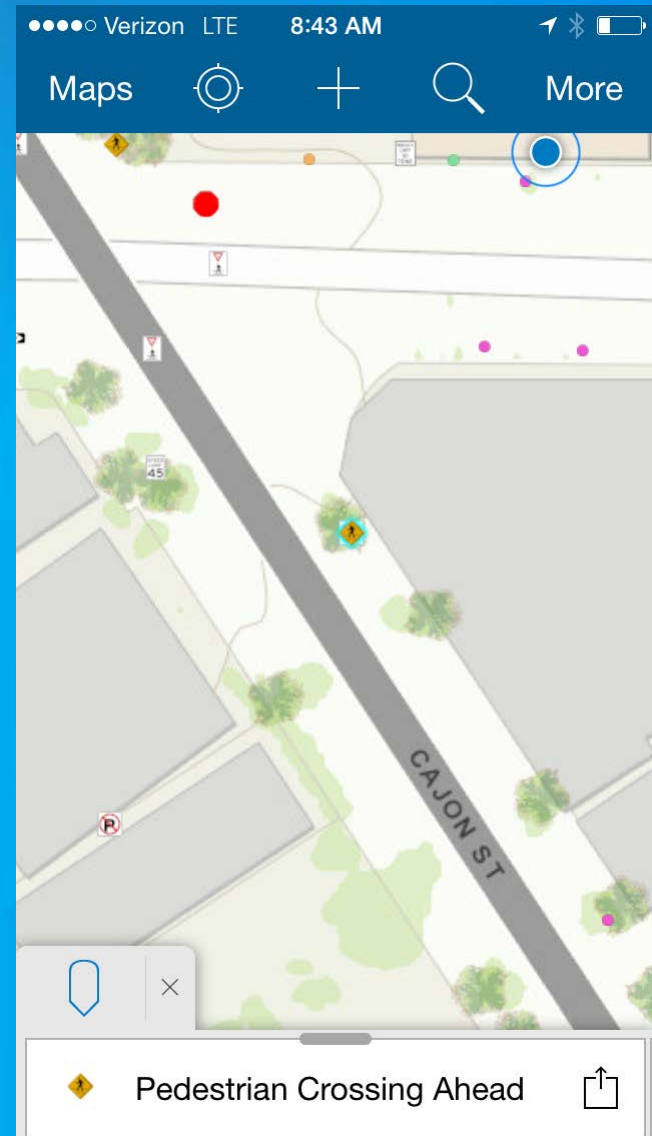




# Field Crew uses the Collector App

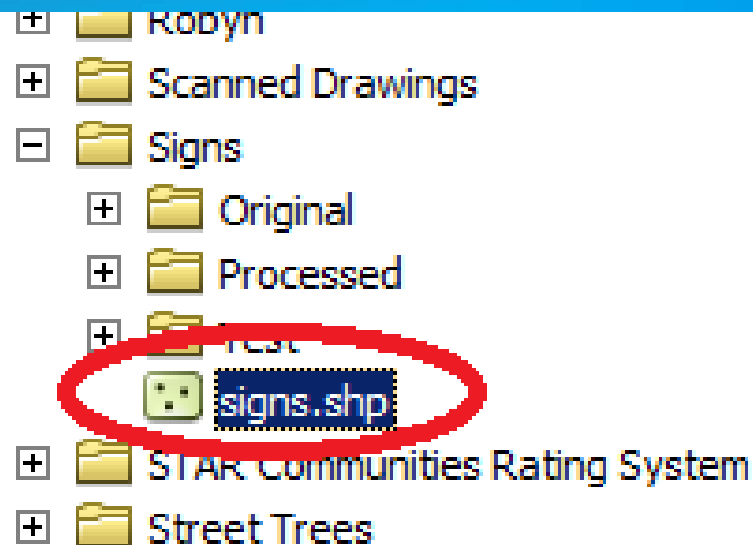
Select the sign  
and enter the barcode.

Can also add signs if necessary.



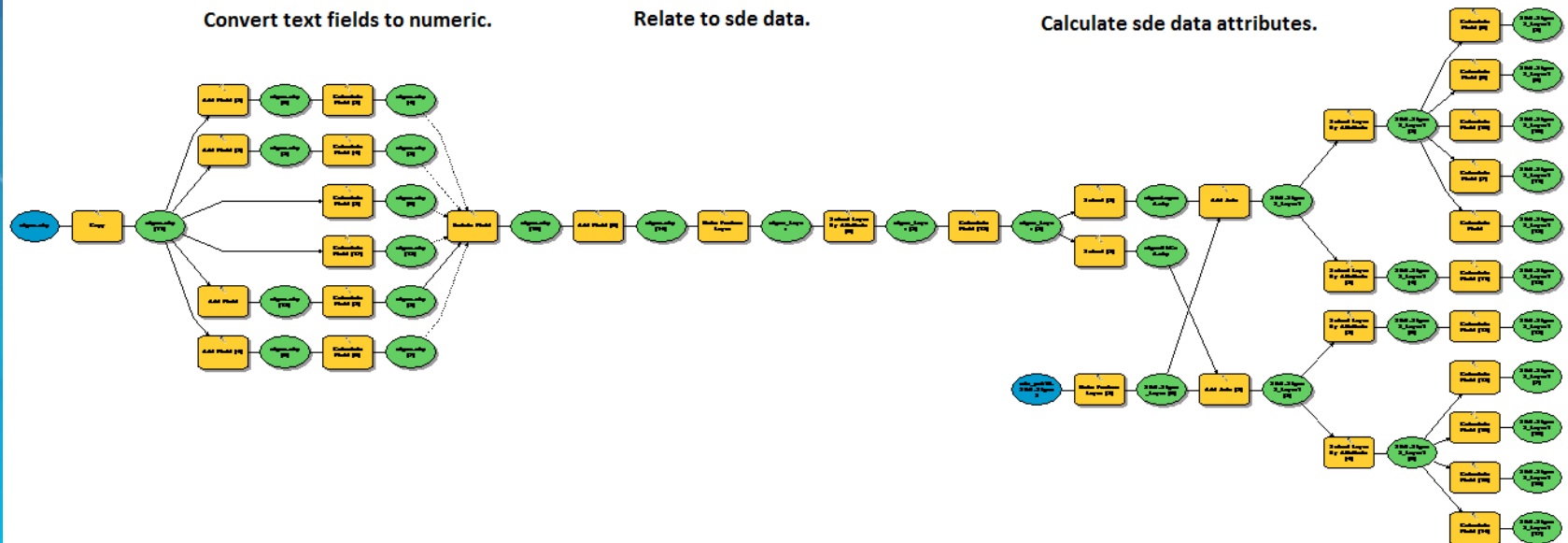
# Data is downloaded from the RoadVista

Exported as a shapefile.





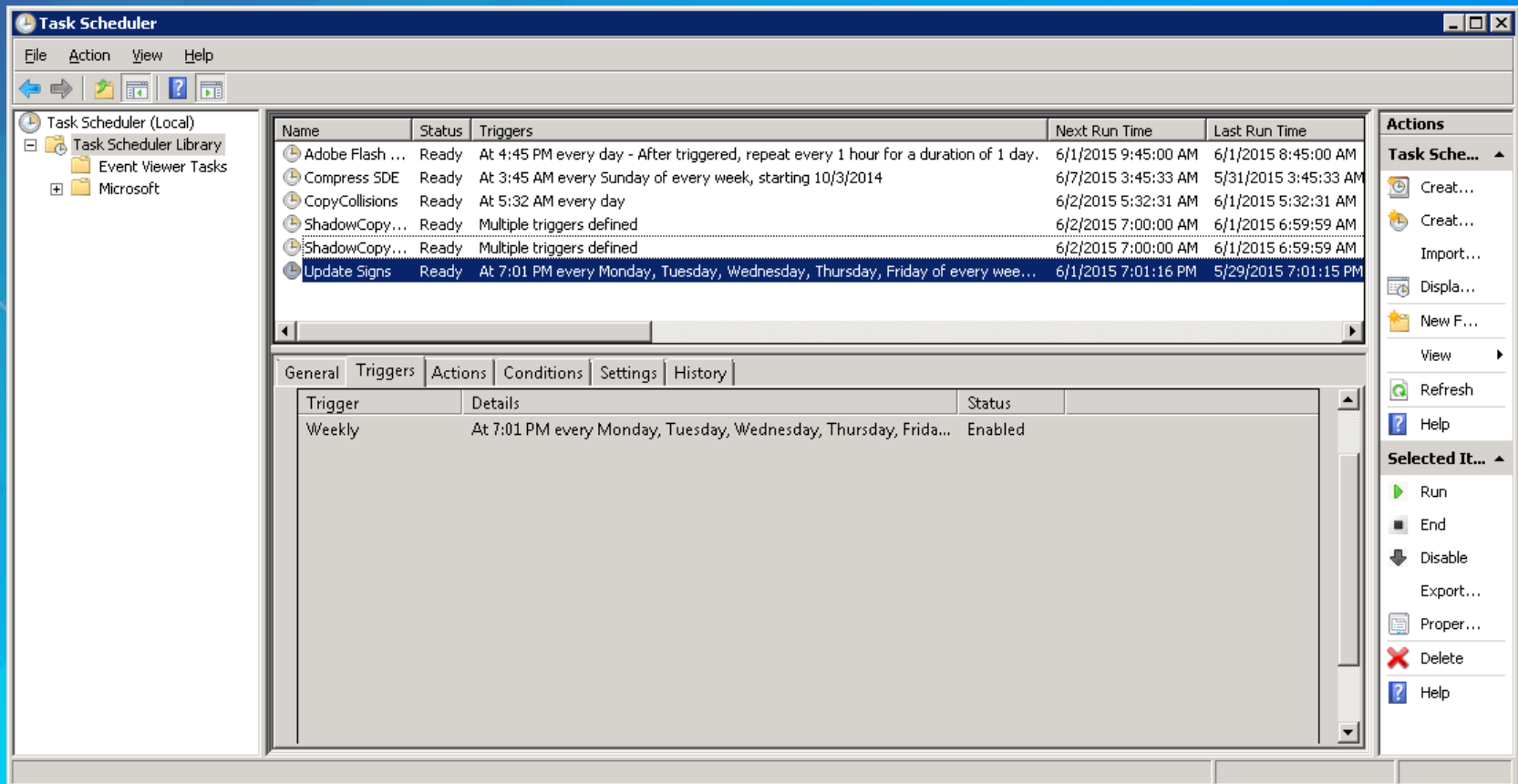
# Script transfers RoadVista info to sde database.



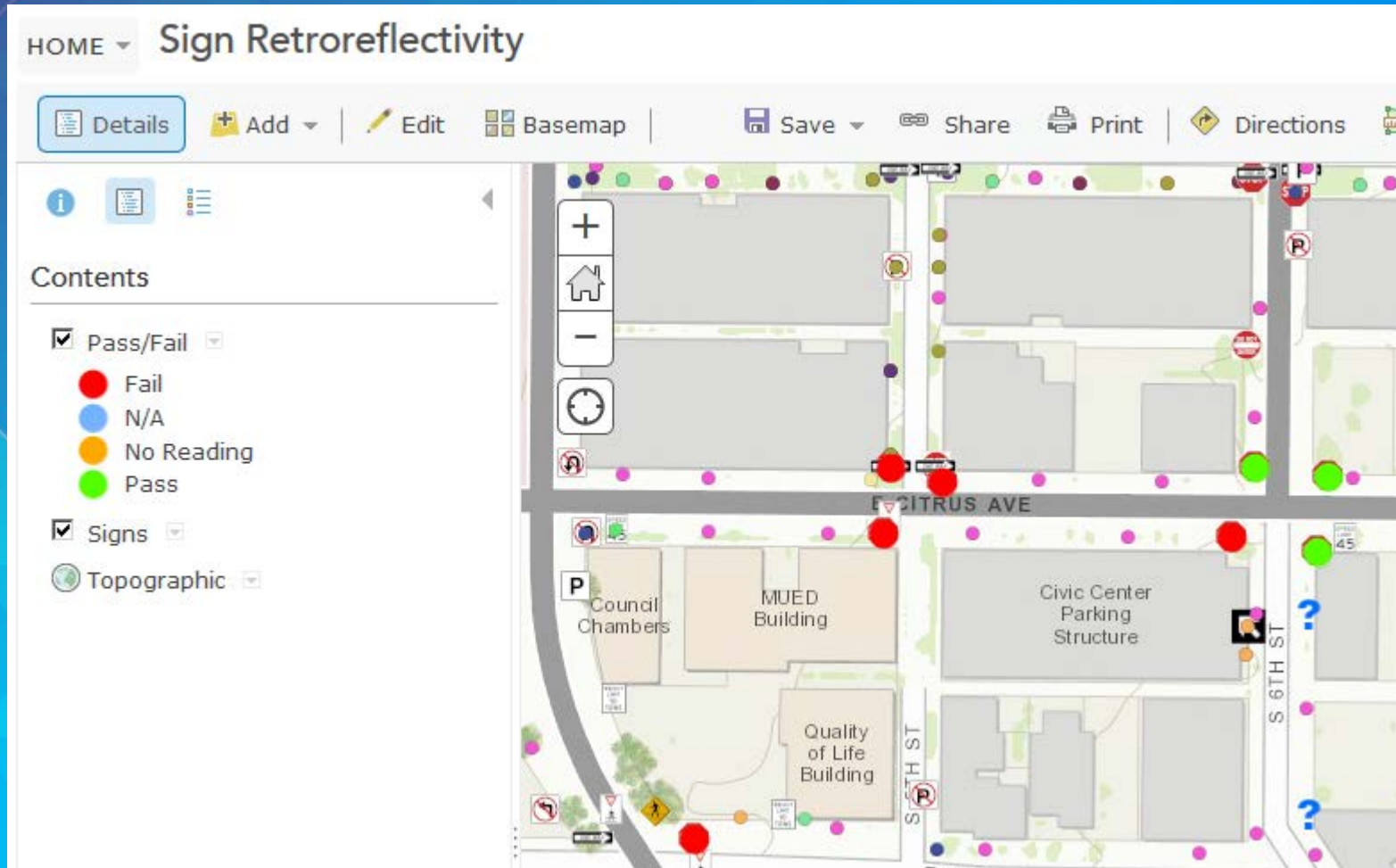
Another script applies the chart below to determine if the sign passes or fails.

Sign Color	Sheeting Type (ASTM D4956-04)				Additional Criteria
	Beaded Sheeting			Prismatic Sheeting	
	I	II	III	III, IV, VI, VII, VIII, IX, X	
White on Green	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W ≥ 250; G ≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120; G ≥ 15			Post-mounted
Black on Yellow or Black on Orange	Y*; O*	Y ≥ 50; O ≥ 50			2
	Y*; O*	Y ≥ 75; O ≥ 75			3
White on Red	W ≥ 35; R ≥ 7				4
Black on White	W ≥ 50				—
<sup>1</sup> The minimum maintained retroreflectivity levels shown in this table are in units of cd/lx/m <sup>2</sup> measured at an observation angle of 0.2° and an entrance angle of -4.0°.					
<sup>2</sup> For text and fine symbol signs measuring at least 48 inches and for all sizes of bold symbol signs					
<sup>3</sup> For text and fine symbol signs measuring less than 48 inches					
<sup>4</sup> Minimum sign contrast ratio ≥ 3:1 (white retroreflectivity ÷ red retroreflectivity)					
* This sheeting type shall not be used for this color for this application.					

# Scripts are scheduled to run every workday.



Results are displayed using ArcGIS online.



# CitySourced – Citizen Engagement





# CitySourced – Citizen Engagement





# CitySourced – Citizen Engagement


Issues are displayed in the CitySourced Console


View All Service Requests

List

Map

Total Issues: 471

 Download this Data

 Action Menu










Filter Options:

Report Types: All

Status: All

Boundaries: All

Date Range: Last 90 Days

	Id	Date Created	Report Type	Nearest Address	Boundary	Status	Privacy	<input type="checkbox"/>
	<a href="#">167127</a>	06/29/2015 @ 08:30 AM	<a href="#">Water Leak</a>	1510 South Center Street, Redlands, CA 92373	Redlands, CA	Received		<input type="checkbox"/>
	<a href="#">167096</a>	06/29/2015 @ 06:56 AM	<a href="#">Street Light</a>	20 San Gorgonio Drive, Redlands, CA 92373	Redlands, CA	Received		<input type="checkbox"/>
	<a href="#">167066</a>	06/28/2015 @ 10:04 PM	<a href="#">Other (Please Describe)</a>	1340 East Lugonia Avenue, Redlands, CA 92374	Redlands, CA	Received		<input type="checkbox"/>
	<a href="#">167036</a>	06/28/2015 @ 03:18 PM	<a href="#">TREE - INSECTS</a>	933 East Colton Avenue, Redlands, CA 92374	Redlands, CA	Referred To Dept		<input type="checkbox"/>
	<a href="#">167011</a>	06/28/2015 @ 12:01 PM	<a href="#">Other (Please Describe)</a>	1412 East Palm Avenue, Redlands, CA 92374	Redlands, CA	Received		<input type="checkbox"/>
	<a href="#">167005</a>	06/28/2015 @ 10:12 AM	<a href="#">Street Light</a>	20 San Gorgonio Drive, Redlands, CA 92373	Redlands, CA	Referred To Dept		<input type="checkbox"/>
	<a href="#">167000</a>	06/28/2015 @ 09:38 AM	<a href="#">Homeless Encampment</a>	120 East Colton Avenue, Redlands, CA 92374	Redlands, CA	Received		<input type="checkbox"/>
	<a href="#">166990</a>	06/28/2015 @ 08:29 AM	<a href="#">Parking Illegally</a>	415 Terracina Boulevard, Redlands, CA 92373	Redlands, CA	Received		<input type="checkbox"/>
	<a href="#">166984</a>	06/28/2015 @ 08:02 AM	<a href="#">Homeless Encampment</a>	Bluffs Trail, Redlands, CA 92374	Redlands, CA	Received		<input type="checkbox"/>

# CitySourced – Citizen Engagement


Service Requests can be created in Cityworks using the  
PUSH to option

## Report ID# 167127: Water Leak


Created: 06/29/2015 @ 08:30 AM PST Last Updated: 06/29/2015 @ 09:06 AM PST

Action Menu

### Assignment & Status


Assigned To: **MUED** 

---

Current Status: **Submitted** 

Status Last Updated By: MUED


### Report Details

Privacy: Public [ [Make Private](#) ] 

---

Description: Across the street from this address there is water bubbling up from the street.

### Attachments



### Author & Device

Tel: Unknown

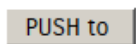
---

Submitted On: Apple iPhone 6

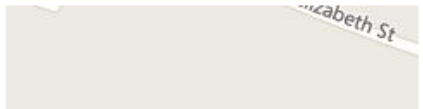
### Integration Details

Ticket ID: N/A

---



### Location Information



### Public Comments

**City of Redlands, CA** 06/29/2015 @ 08:31 AM PST  
This report has been submitted directly to Redlands, CA.

# CitySourced – Citizen Engagement

Data can be downloaded for further analysis.

Download Data...

Data Format:

SHP

▼

Recipient Email:

tresh@cityofredlands.org

For security, we can only deliver data to the email address we have stored for you.

Include Description?

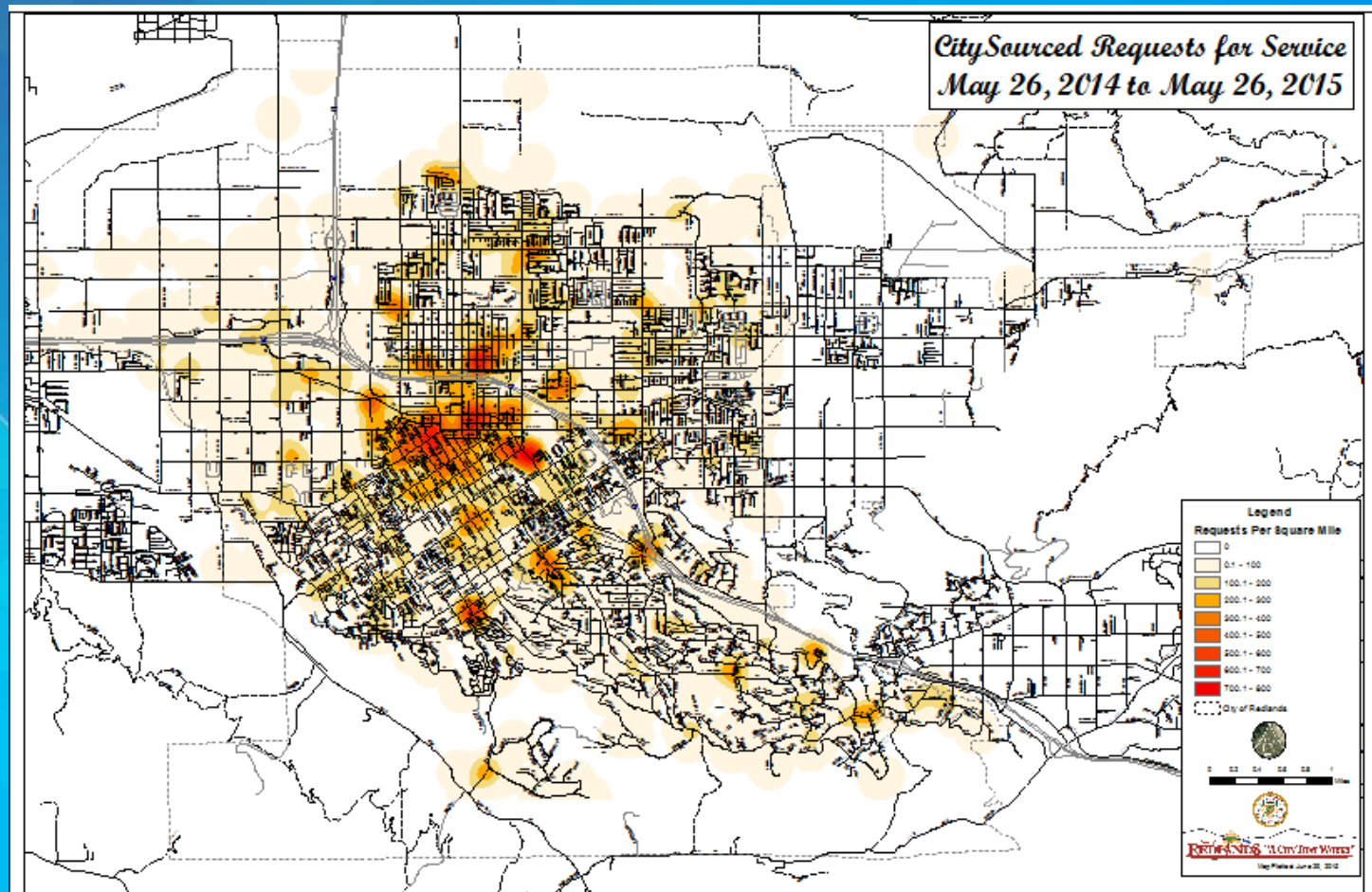
☐

Download Data

55078 | 06/08/2015 @ 07:22 AM | Trash Removal | 1920-1940 Judson Street, Redlands, CA 92374 | Redlands

# CitySourced – Citizen Engagement

Heat map showing the distribution of incidents reported.



## **Future possibilities:**

**Using the collector app to update the status of work orders.**


**Using the collector app to capture street light surveys and create a work order to record the results.**

# Future Possibilities

Using the collector app to update the status of work orders.

Using the collector app to capture street light surveys and create a work order to record the results.





Never let your stomach know  
you are a poor man.

Mark Caldwell – Bicycle Racer