Integrating Esri Software With Third Party Solutions

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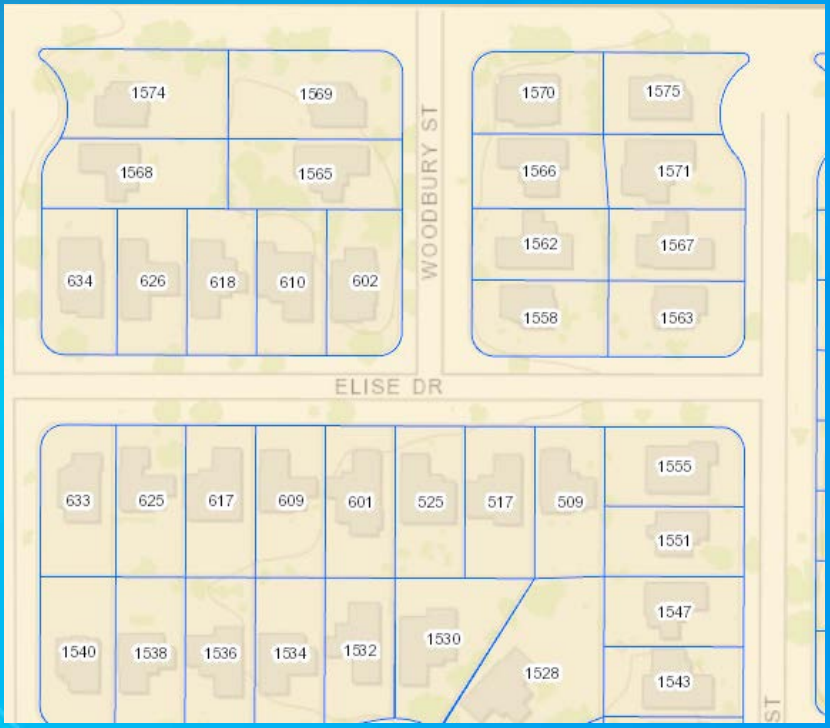
Third Party Integration at the City of Redlands

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

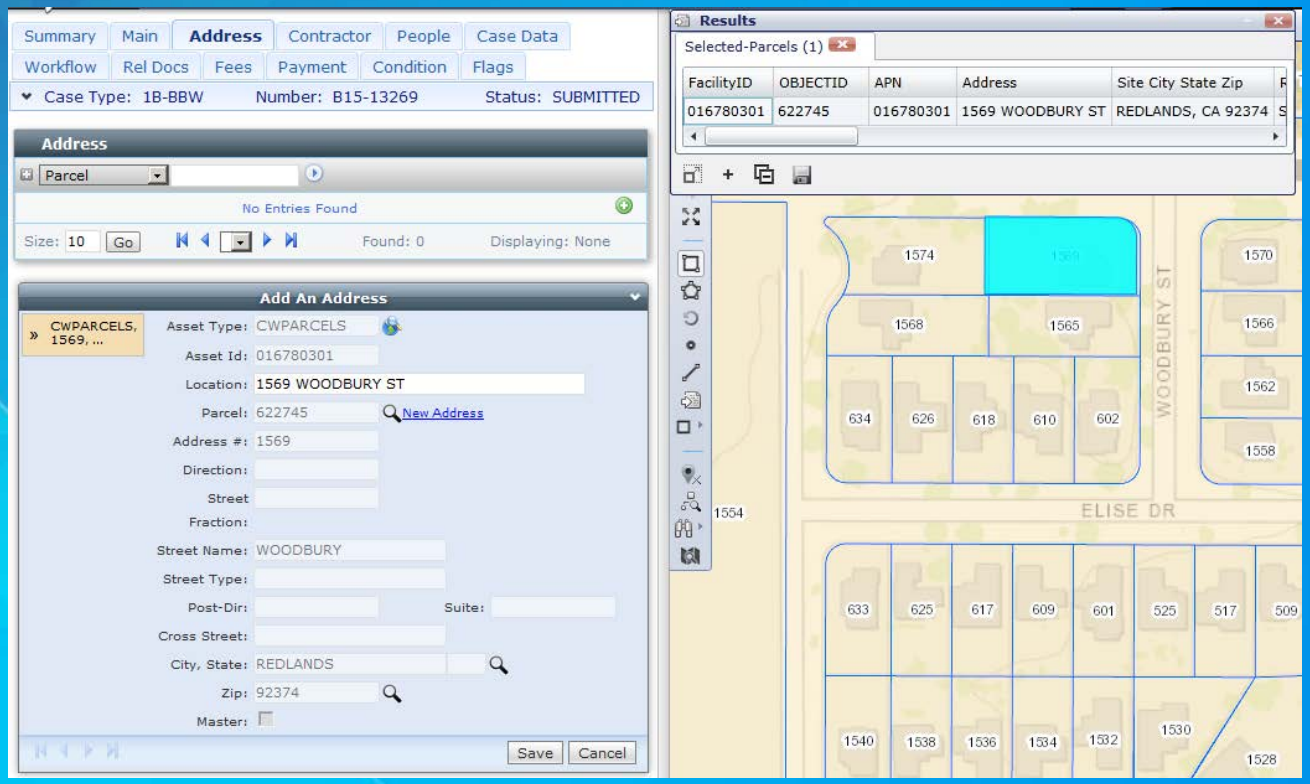
Cityworks – made to work with Esri Products

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



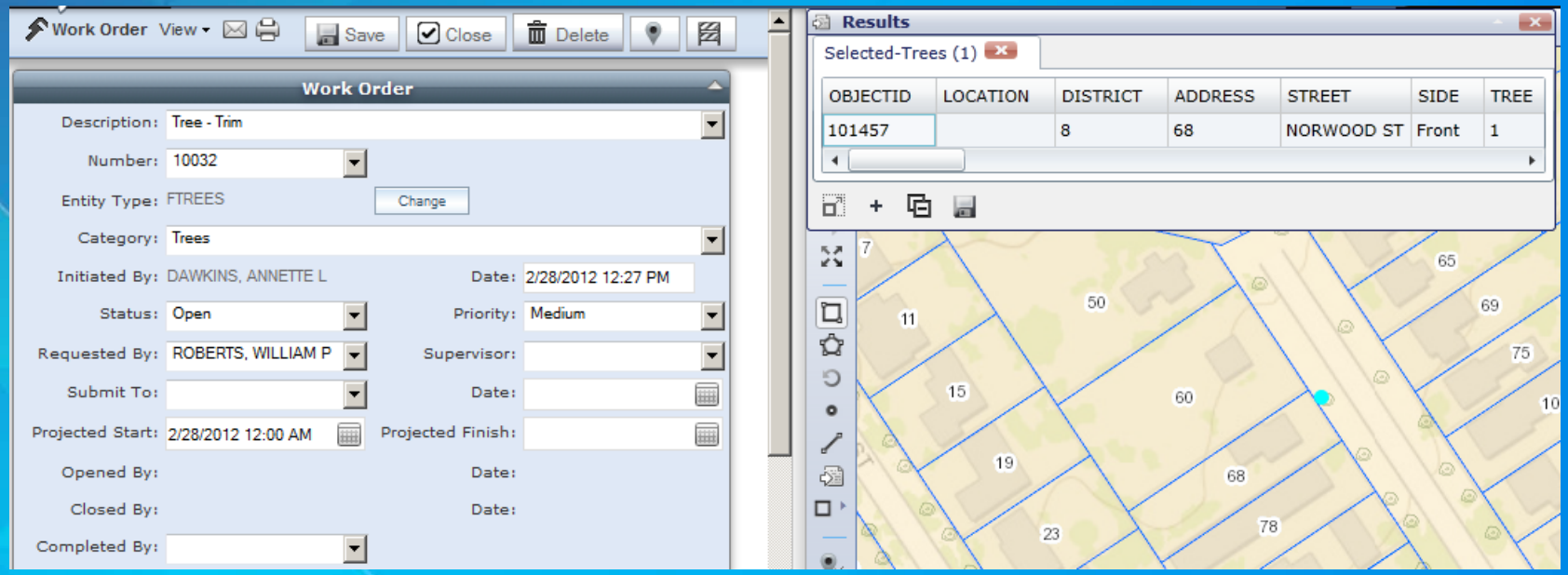
Information from your GIS can be brought into Cityworks

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



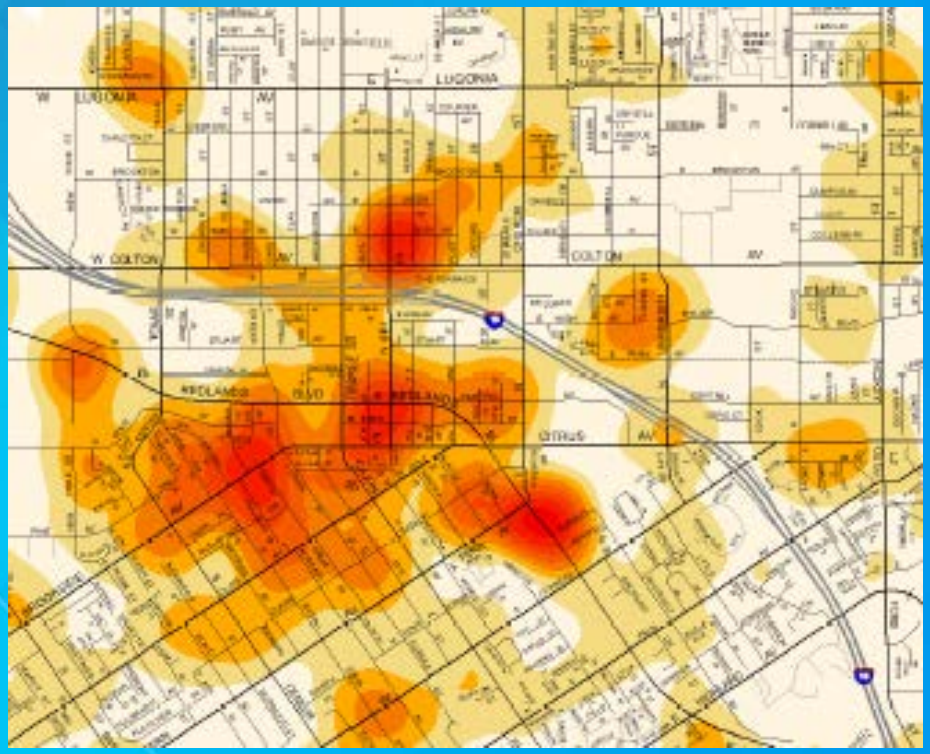
Work Orders can be attached to assets to keep track of costs.

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



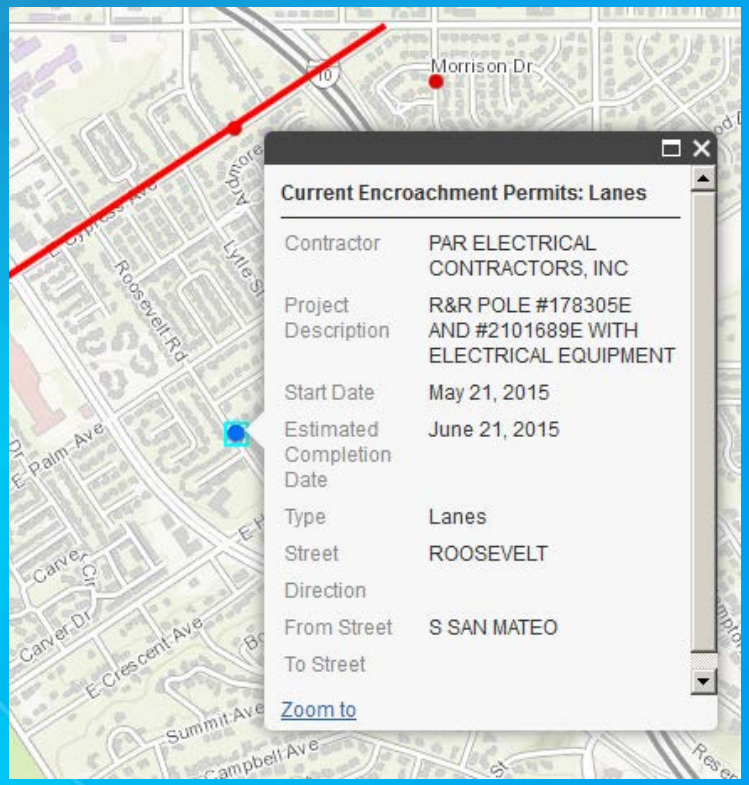
ArcGIS can be used for further analysis.

- A heat map is generated to show where tree maintenance costs are the highest.



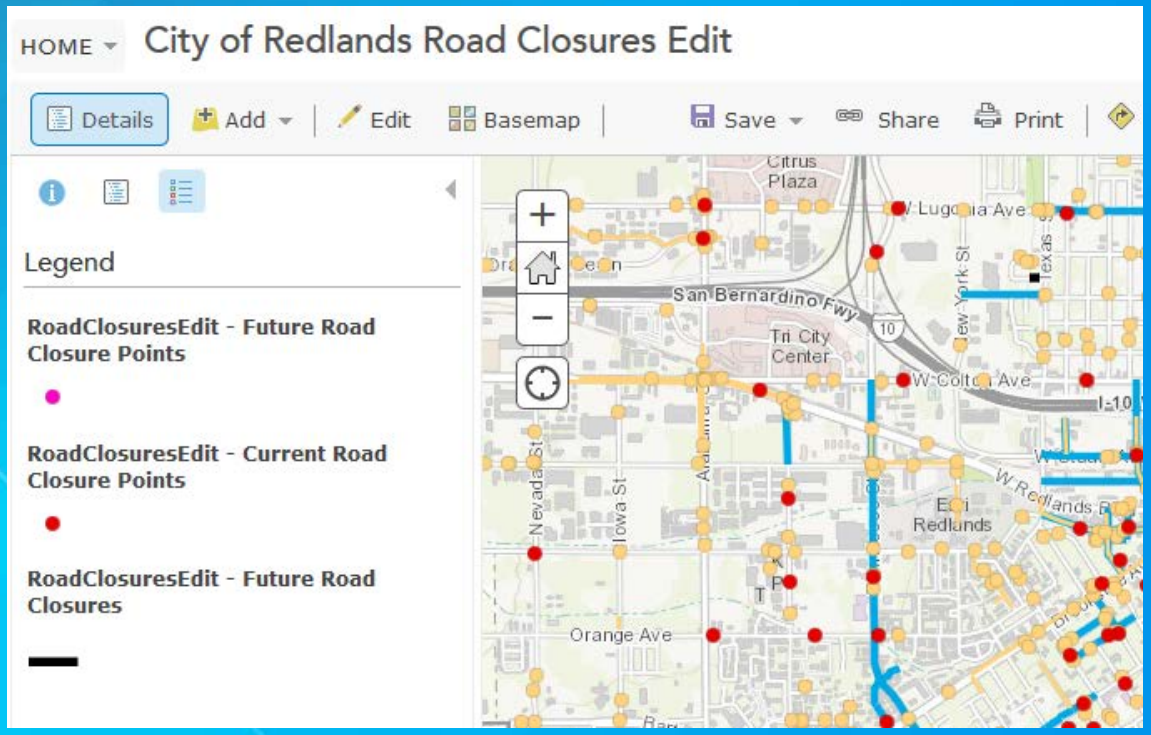
Expanding on the out of the box capabilities.

- **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
1	23709	530	1563	4	M-ENCDOCS8	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
1	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	STF
1	-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	ADDRE
1	1	1	NULL	SIGNRESOURCE	NULL	NULL	PO BOX 549	6235 DISTRICT BLVD	NULL

Create a SQL view to extract the needed data.

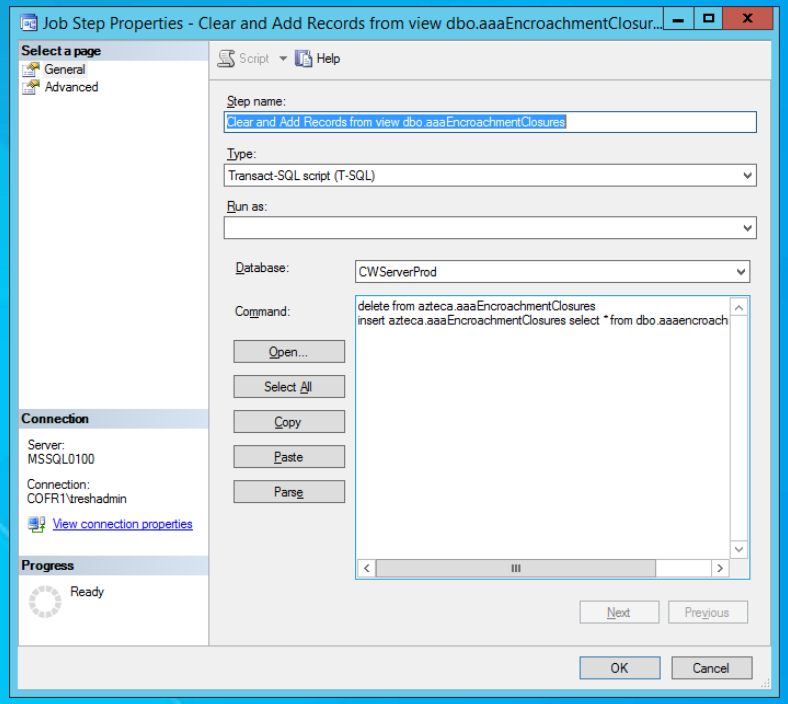
- **Advantage: always up to date.**
- **Disadvantage: slow, 1.7 million records, query takes 20 seconds.**

```
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

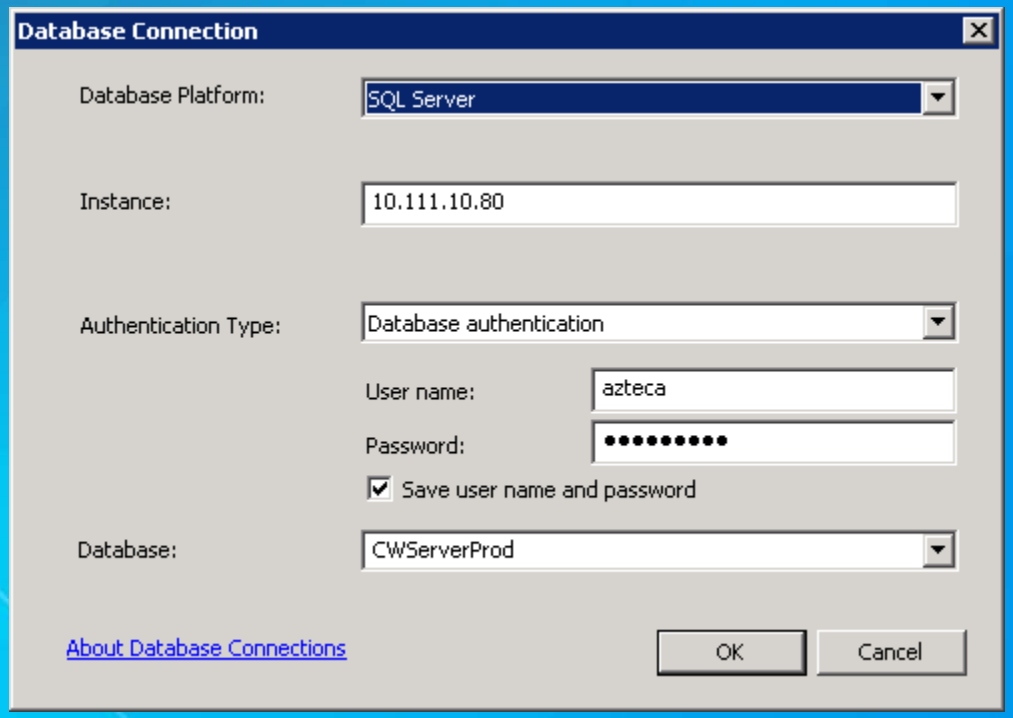
Create a SQL Server Agent Job to copy the records to a table.

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



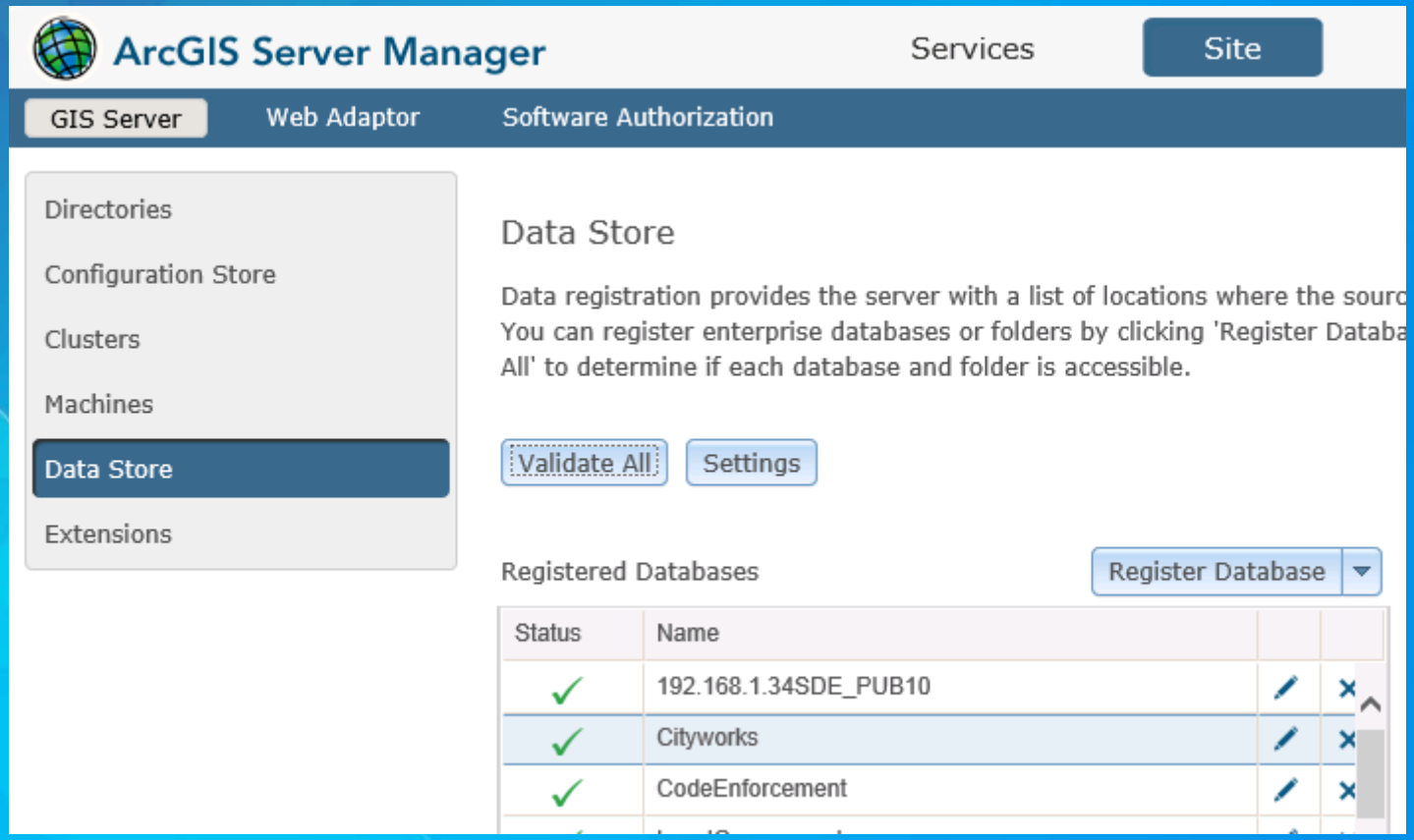
Create the ArcGIS Service

- **Create a database connection to the Cityworks database.**



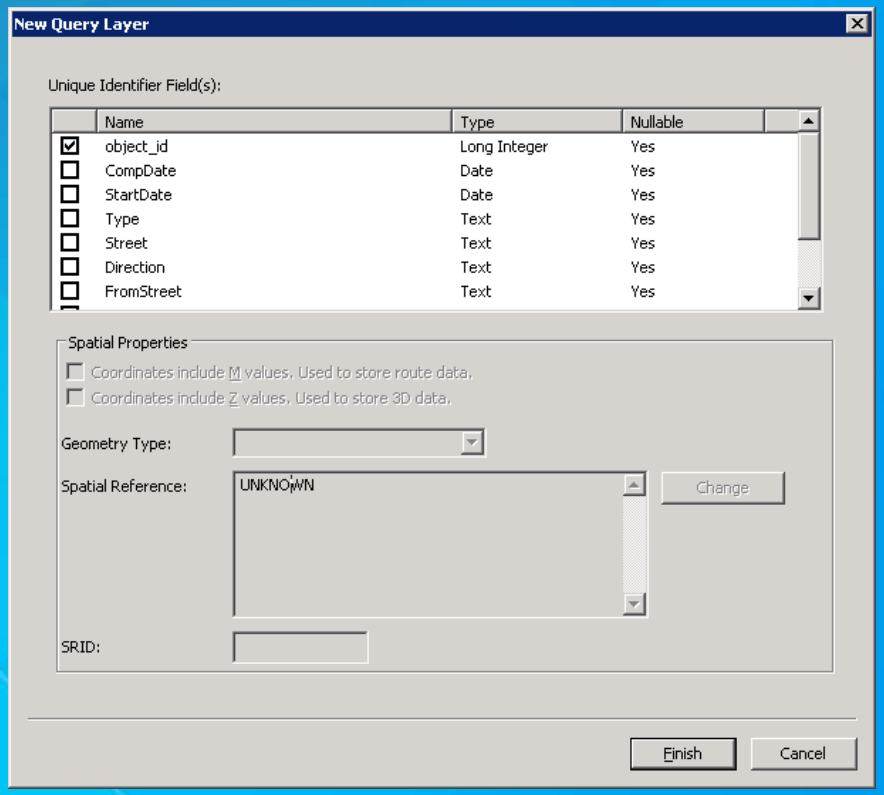
Create the ArcGIS Service

- **Register the data with your server.**



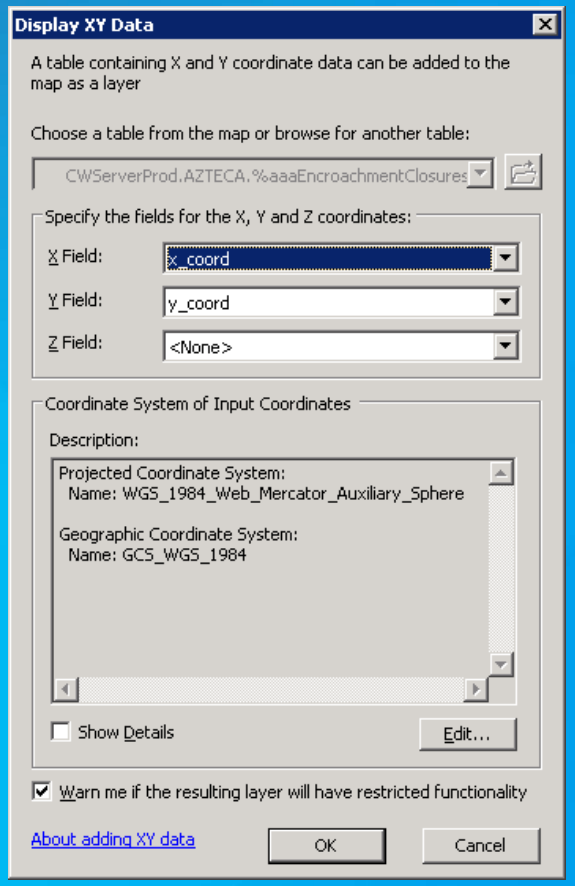
Create the ArcGIS Service

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



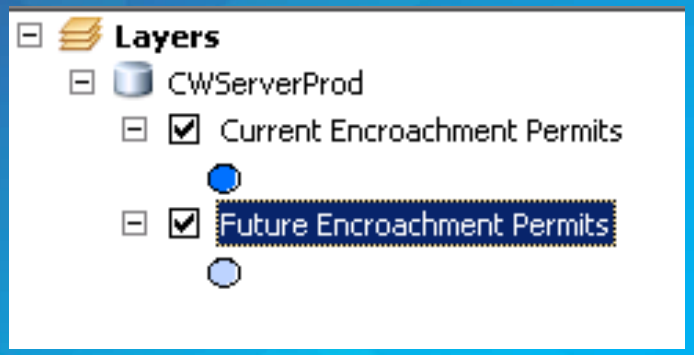
Create the ArcGIS Service

- **Display the data as an X Y Event Layer.**



Create the ArcGIS Service

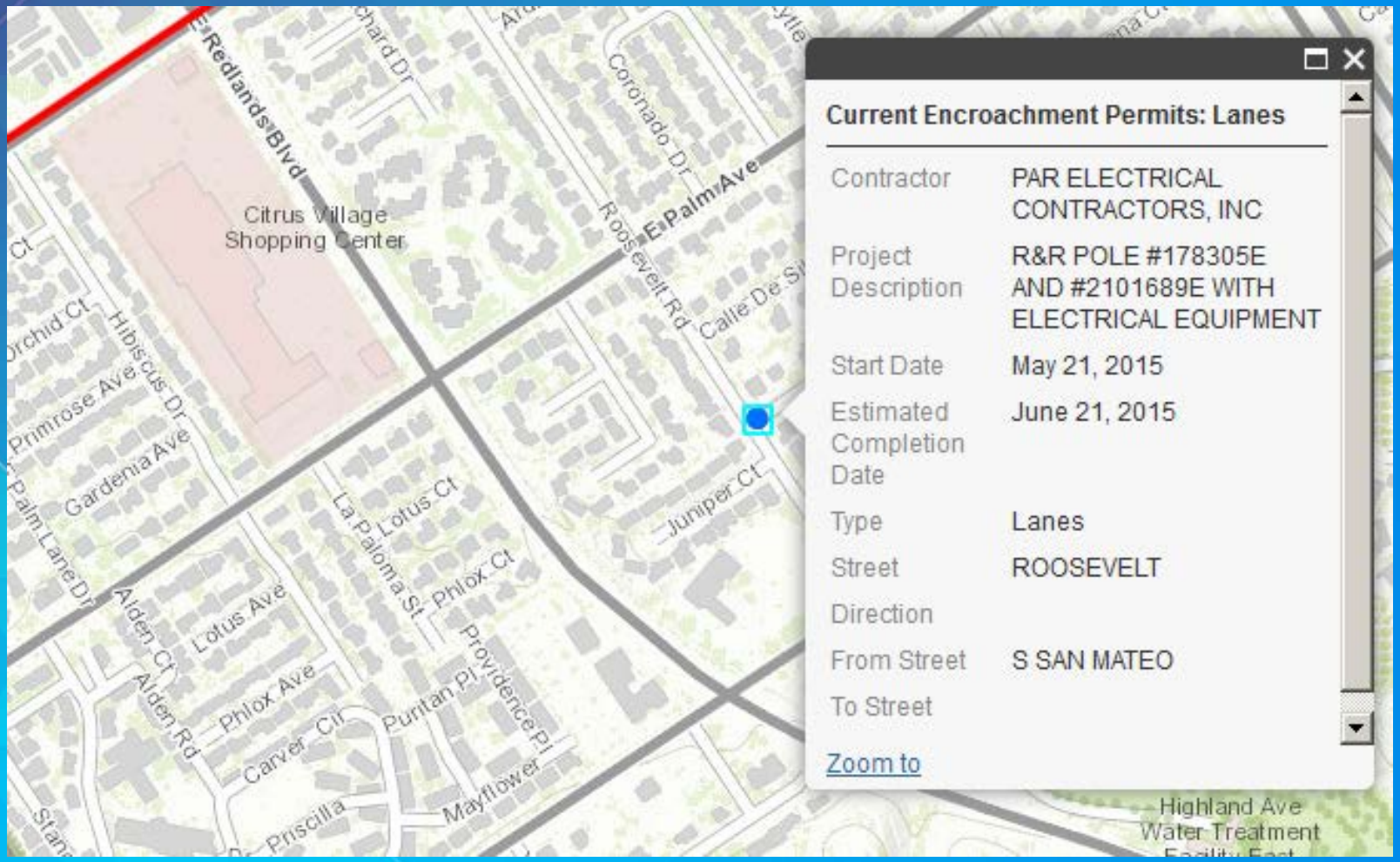
- **Add definition query and symbolize as necessary.**



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_OBJE
            Azteca.CA_OBJECT.CASE_NUMBER, Azteca.CA_OBJECT.CX, Azteca.CA_OBJECT.CY, Azteca.CA_OBJECT.STATUS_CODE, Azteca.CA_OBJECT.DATE_ACCEPTED
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:...

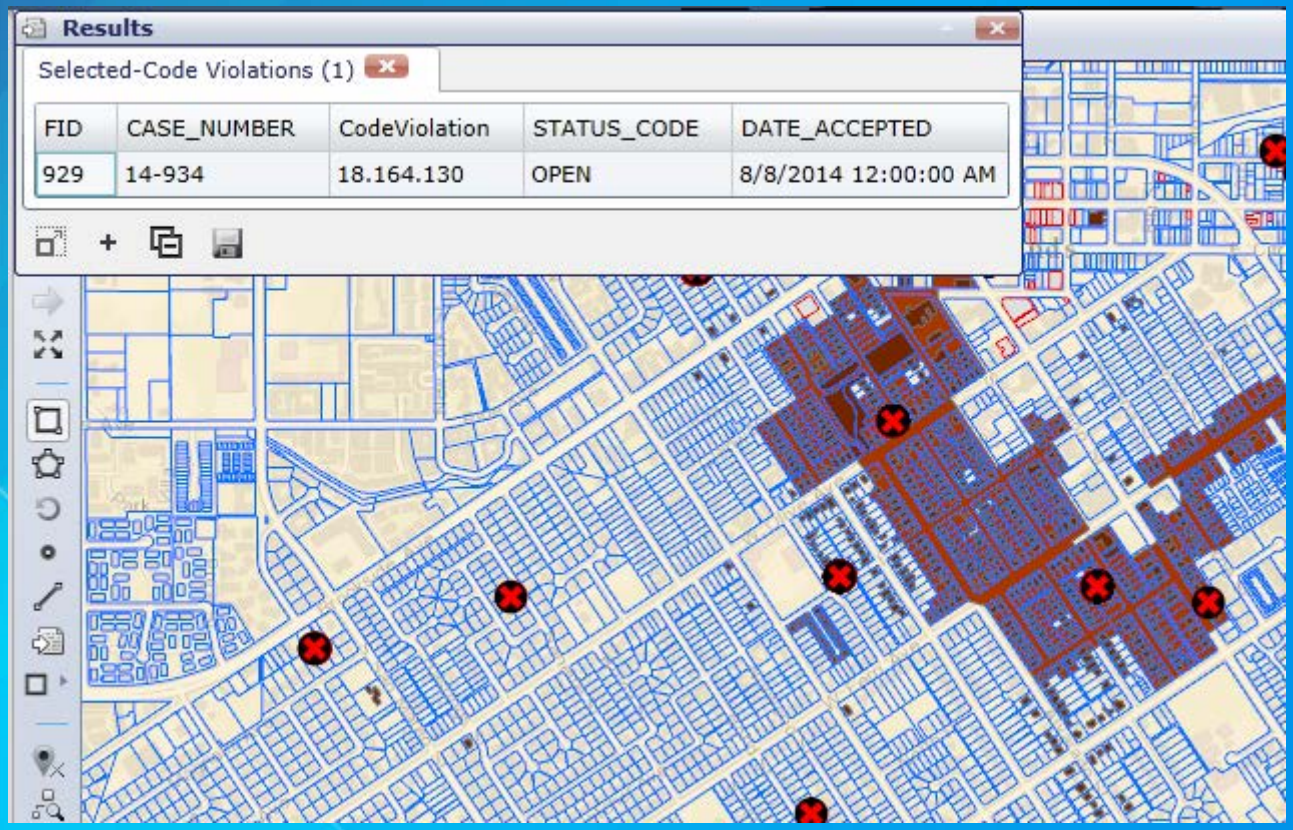
Code Enforcement Cases

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.



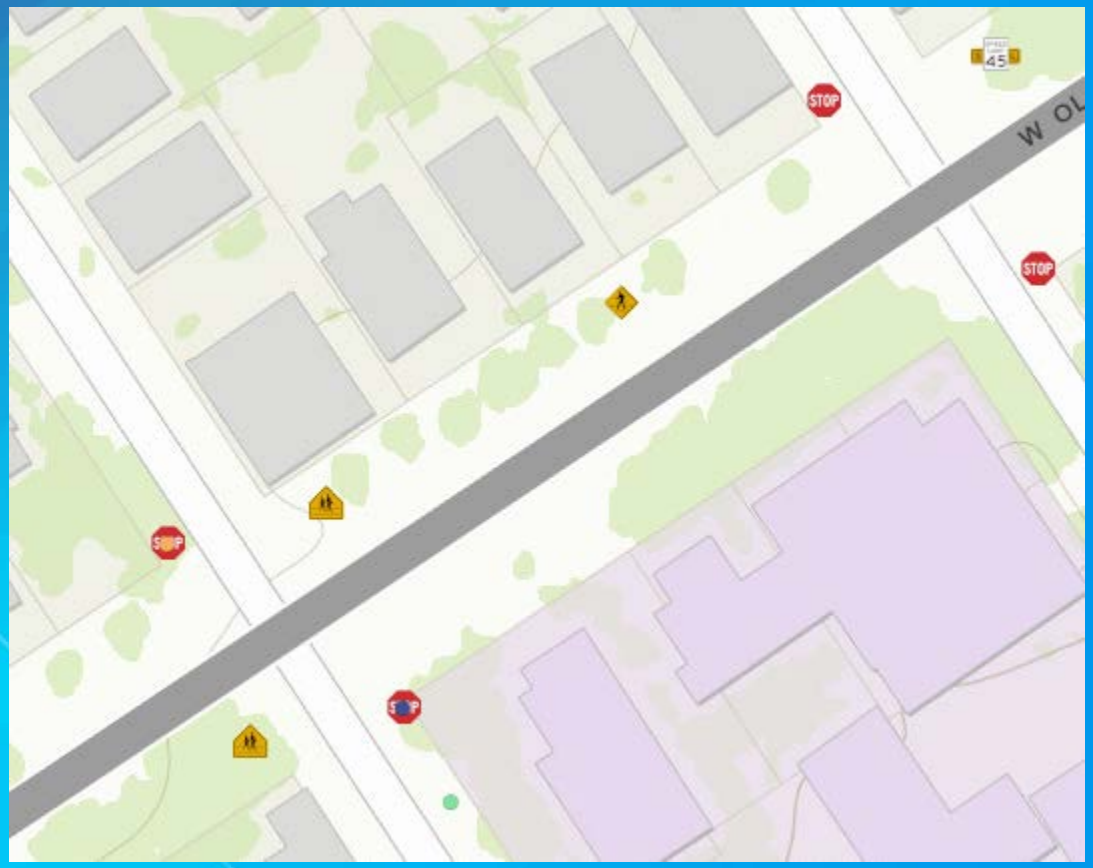
RoadVista Model 922 – Sign Retroreflectivity

Using the Collector App for better results

RoadVista results are not always accurate.

Use existing sign data.

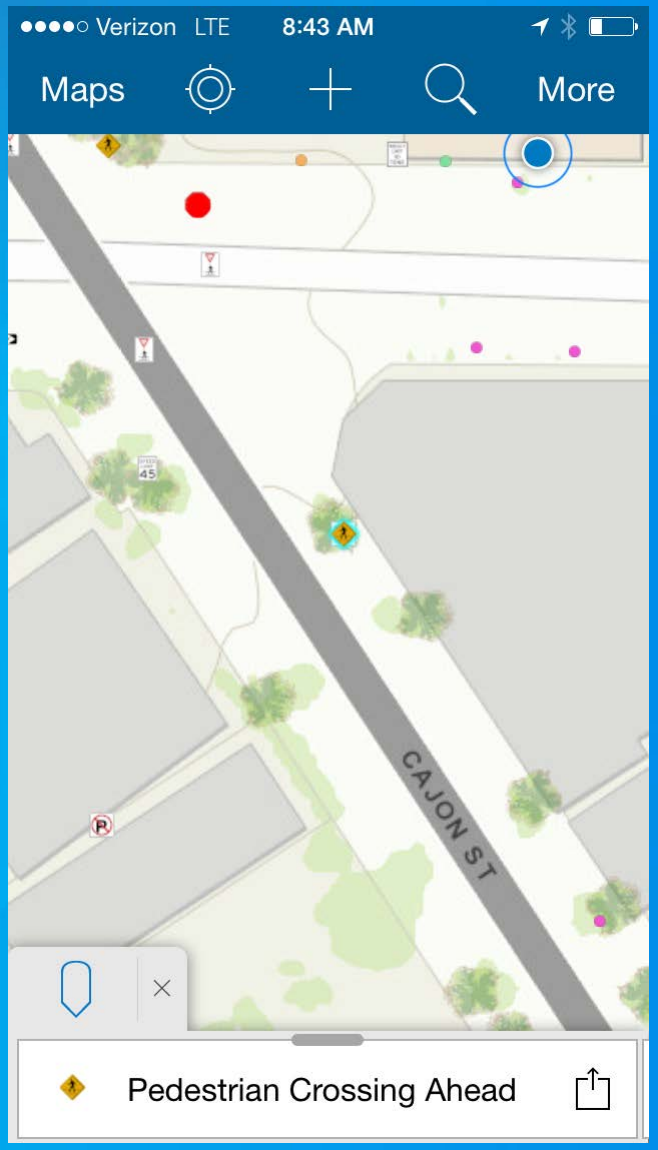
Add Barcode attribute to link to RoadVista results.



Field Crew uses the Collector App

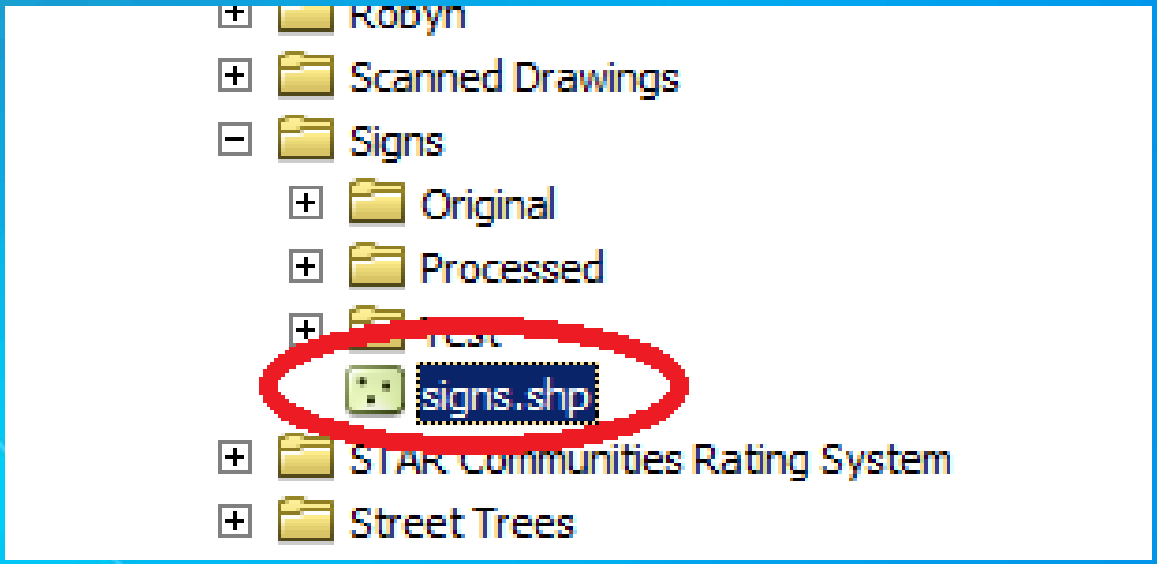
Select the sign
and enter the barcode.

Can also add signs if necessary.

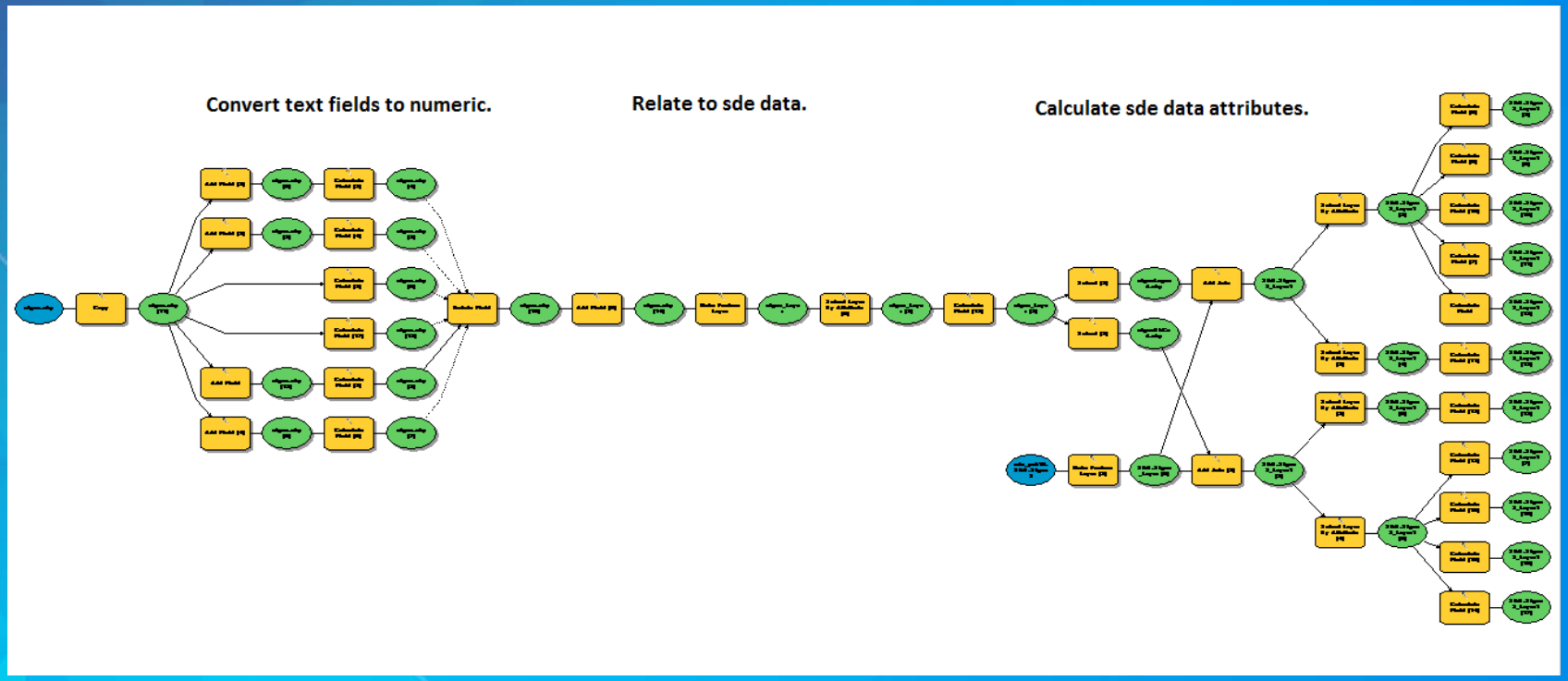


Data is downloaded from the RoadVista

Exported as a shapefile.



Script transfers RoadVista info to sde database.

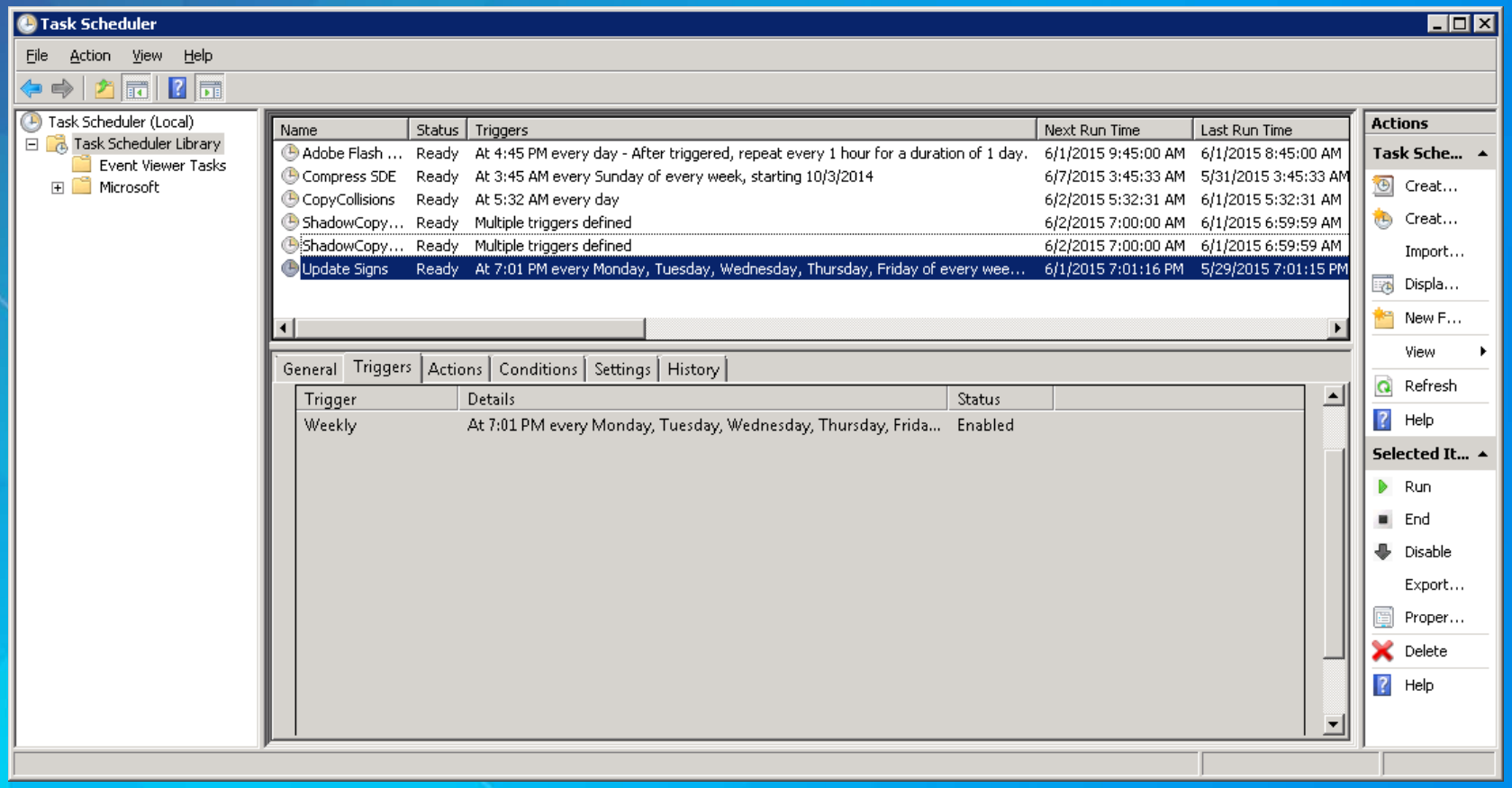


Another script applies the chart below to determine if the sign passes or fails.

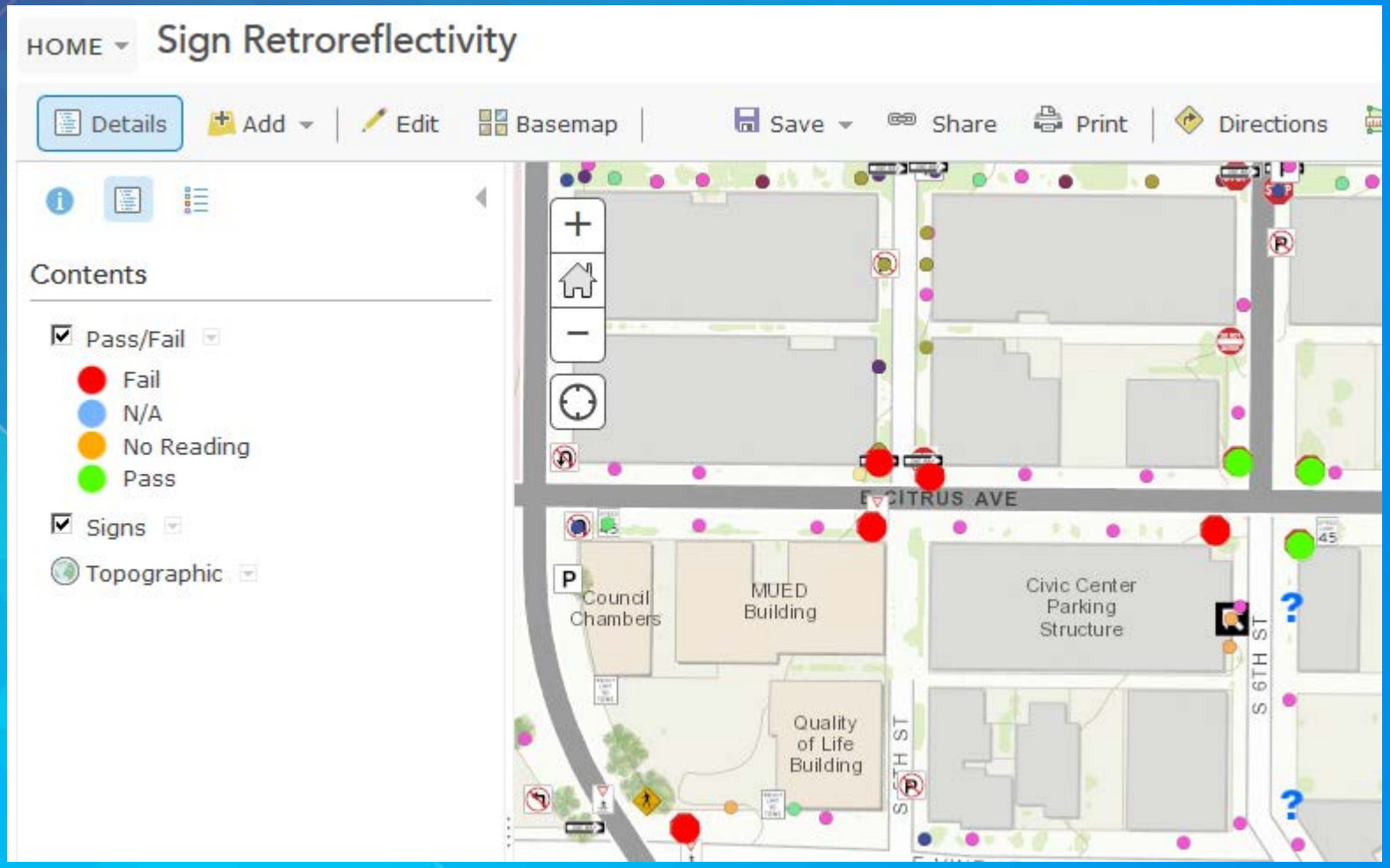
Sign Color	Sheeting Type (ASTM D4956-04)				Additional Criteria
	Beaded Sheeting			Prismatic Sheeting	
	I	II	III	III, IV, VI, VII, VIII, IX, X	
White on Green	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W ≥ 250; G ≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120; G ≥ 15			Post-mounted
Black on Yellow or Black on Orange	Y*; O*	Y ≥ 50; O ≥ 50			[2]
	Y*; O*	Y ≥ 75; O ≥ 75			[3]
White on Red	W ≥ 35; R ≥ 7				[4]
Black on White	W ≥ 50				–

[1] The minimum maintained retroreflectivity levels shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2° and an entrance angle of -4.0°.
[2] For text and fine symbol signs measuring at least 48 inches and for all sizes of bold symbol signs
[3] For text and fine symbol signs measuring less than 48 inches
[4] 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

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Issues are displayed in the CitySourcced Console

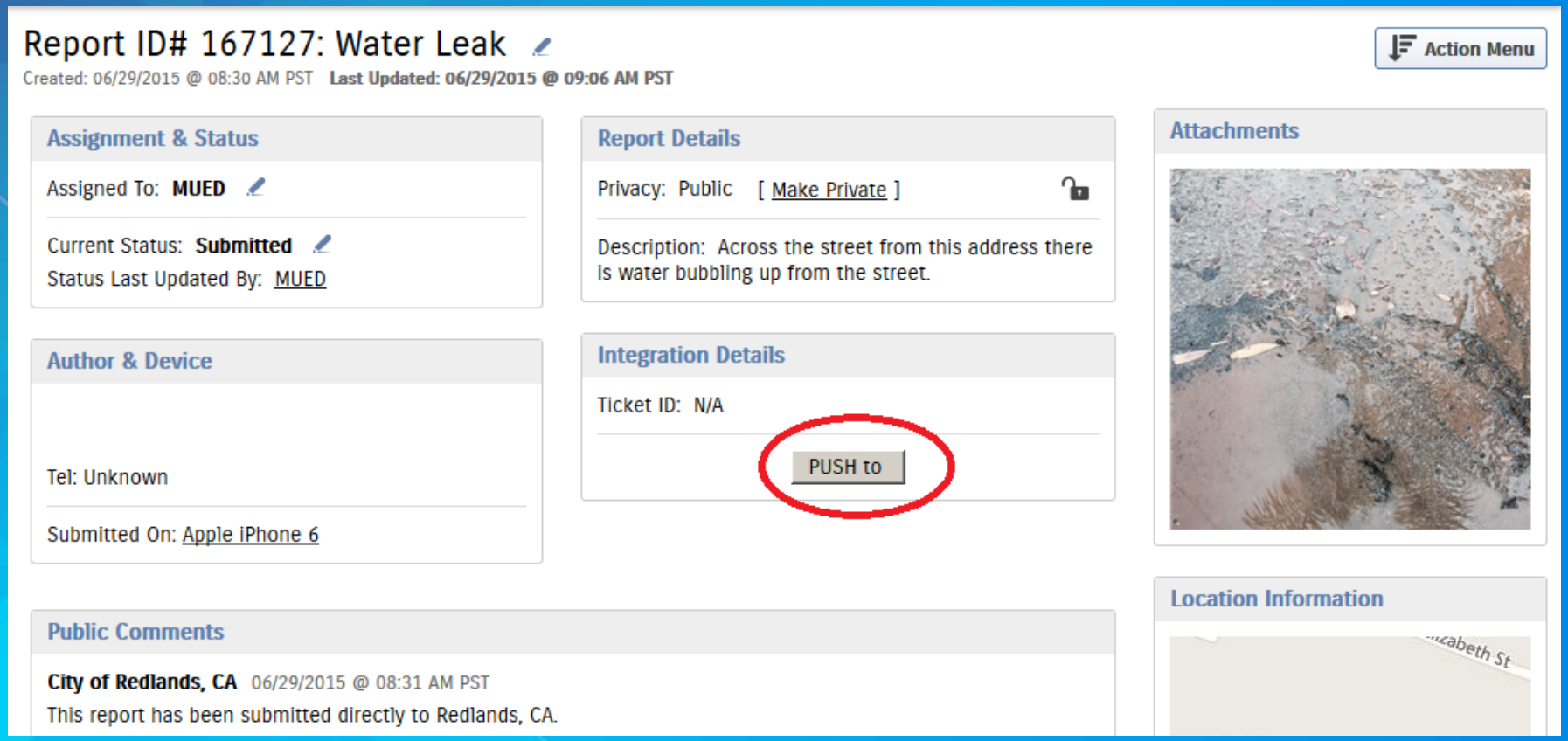
View All Service Requests | List | Map | Total Issues: 471 | Download this Data | Action Menu

Filter Options: Report Types: All | Status: All | Boundaries: All | Date Range: Last 90 Days

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

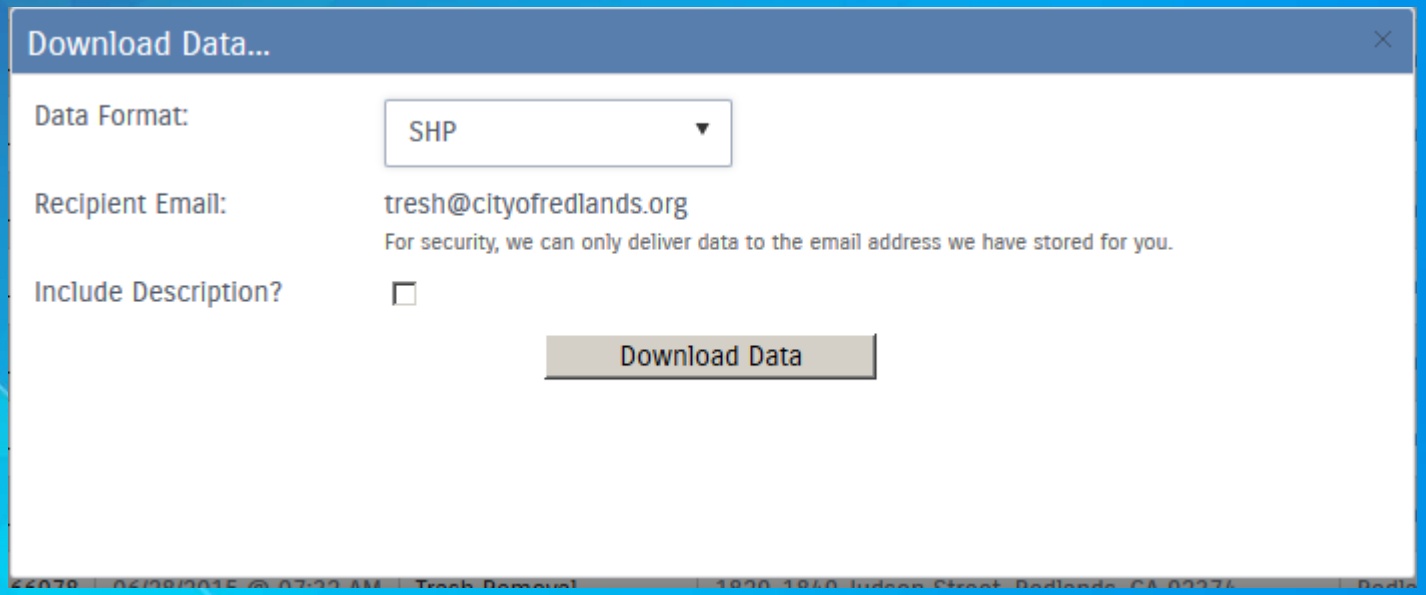
CitySourced – Citizen Engagement

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



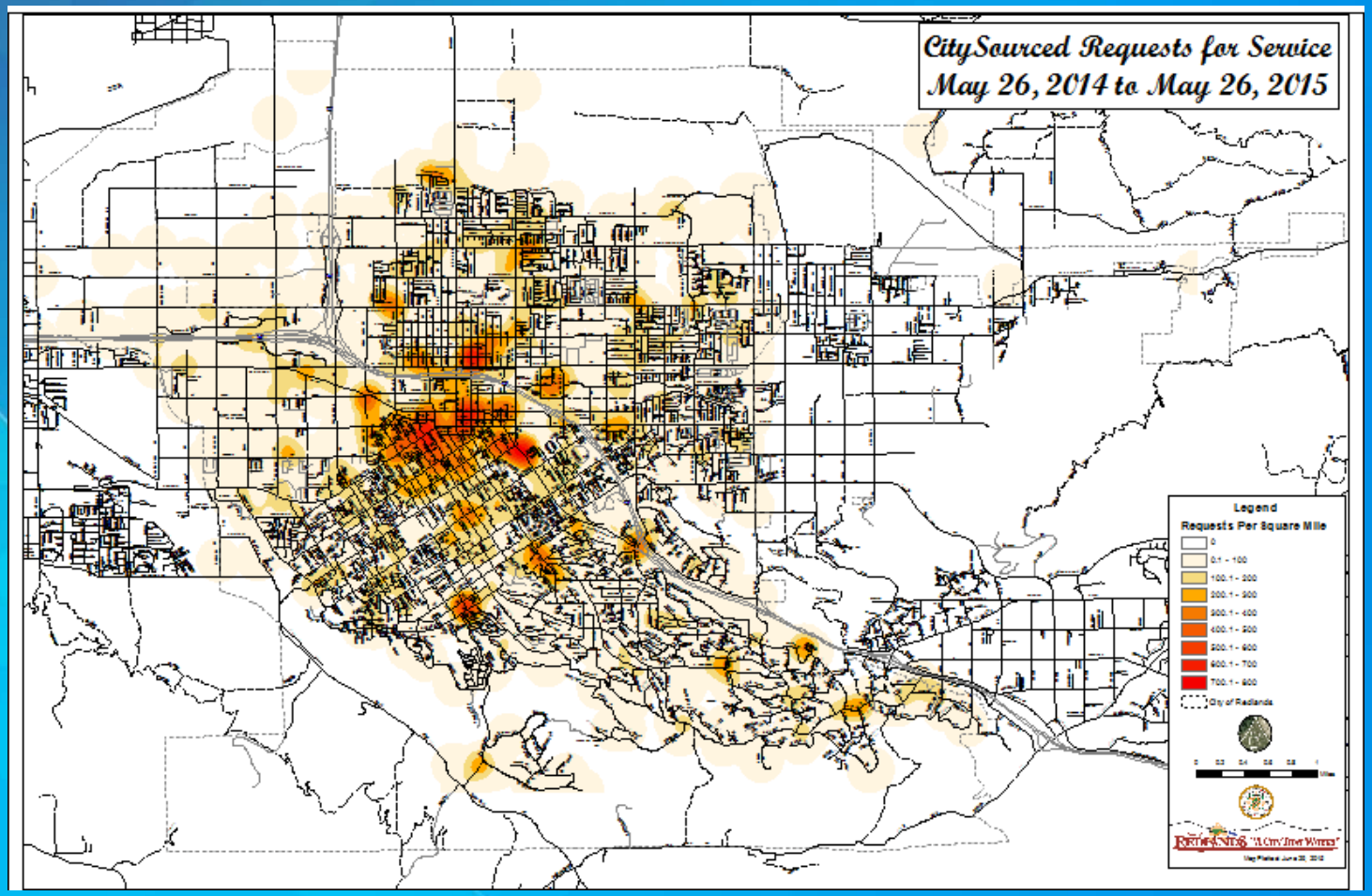
CitySourced – Citizen Engagement

Data can be downloaded for further analysis.



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.

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

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Never let your stomach know you are a poor man.

Mark Caldwell – Bicycle Racer