

Achieving Operational Efficiency with Sound Asset Management Strategies

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UC

ACWD Background

- **Organized in 1914**
- **Serves Fremont, Newark, and Union City California**
 - Area – 104.8 square miles
 - Population – 343,499
 - Customers – 81,7009
 - Employees – 230 Full-time
- **Supply Sources**
 - State Water Project – 40%
 - San Francisco PUC (Hetch Hetchy) – 20%
 - Alameda Creek Watershed Runoff – 40%

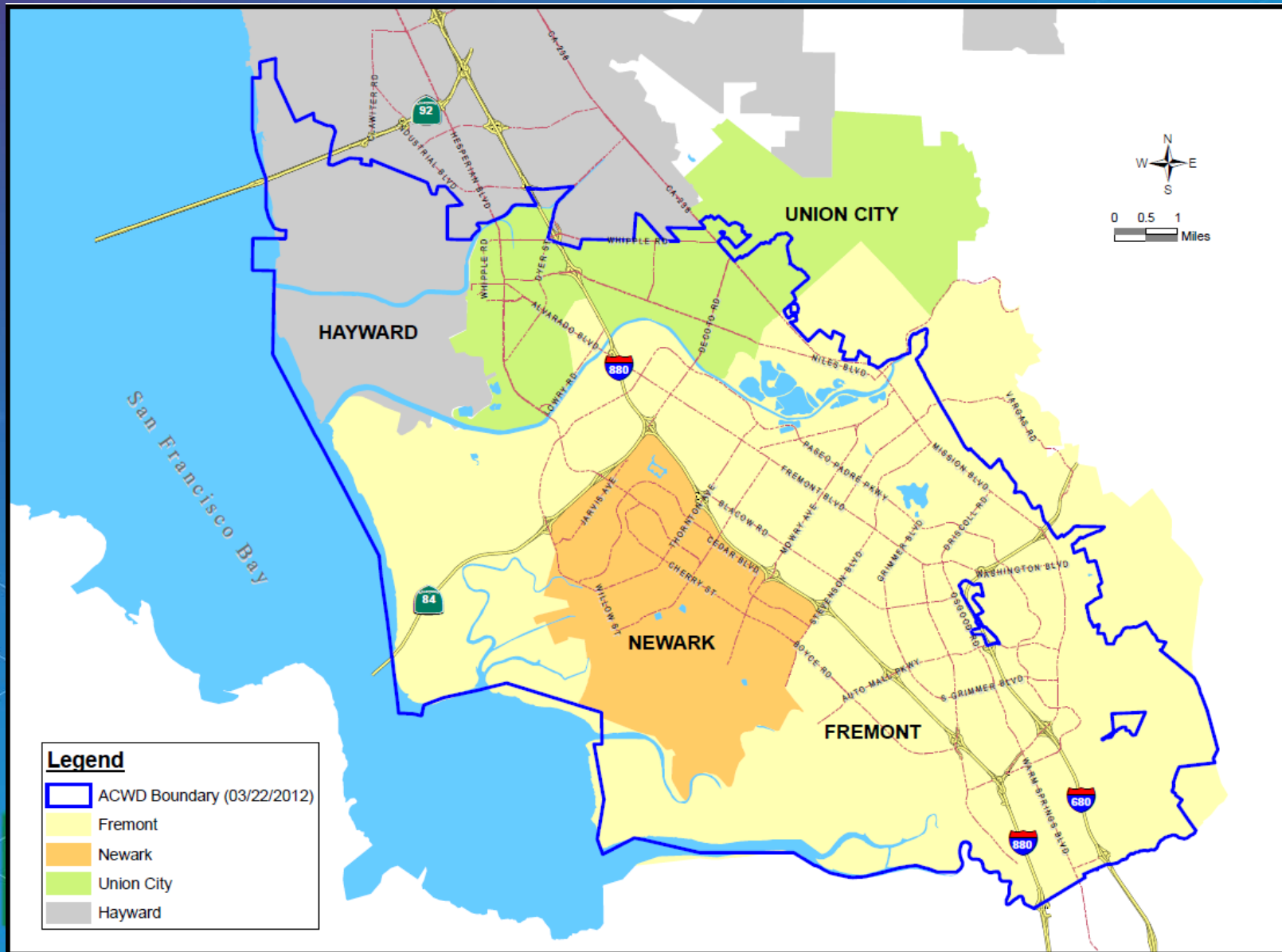


ACWD Background

- **Production**
 - Average Daily Production of 34.4 MGD (FY 2014-2015)
 - Maximum Daily Production of 52.3 MGD (FY 2014-2015)
- **880 Miles of Pipe**
- **12 Reservoirs and Tanks**
- **Three Active Treatment Facilities**
 - Water Treatment Plant # 2 – 26 MGD Capacity
 - Newark Desalination Facility – 12.5 MGD Capacity
 - Blending Facility – 48 MGD Capacity



ACWD Service Area



Software Environment

- **Windows Server 2008 R2**
- **SQL Server 2008 R2**
- **ArcGIS 10.2.2**
- **Cityworks 2014 SP6**
- **infraMap 7.1.34**
- **JD Edwards 9.1**
- **Cayenta 7.5**



ACWD Organization

- Office of the General Manager
- Engineering and Technology Services
 - Information Technology
 - GIS
- Operations & Maintenance
 - Distribution Maintenance
- Finance
- Water Resources



Project Goals

To address DMD unique business needs, the Asset Management System must:

- Reduce or control costs
- Improve or maintain service levels
- Ensure accurate and timely asset and maintenance data
- Integrate cleanly and cost-effectively with ACWD's existing applications



Project Goals

Reduce or Control Costs

- **Tailor systems to streamline processes**
- **Eliminate redundant data entry**
- **Track only what matters**
- **Support an evidence-based repair/replacement program**



Project Goals

Improve or Maintain Service Levels

- **Design the system to allow ACWD to be proactive in:**
 - **Maintenance**
 - **Customer response**
 - **Backlog management**
- **Tight integration with Cayenta**



Project Goals

Ensure Accurate and Timely Asset and Maintenance Data

- **Tight GIS integration**
- **Leverage the existing field GIS application, infraMAP**
- **Capture data in the course of doing work**
 - **Condition**
 - **As-built (new and corrections)**
 - **Relevant actuals**



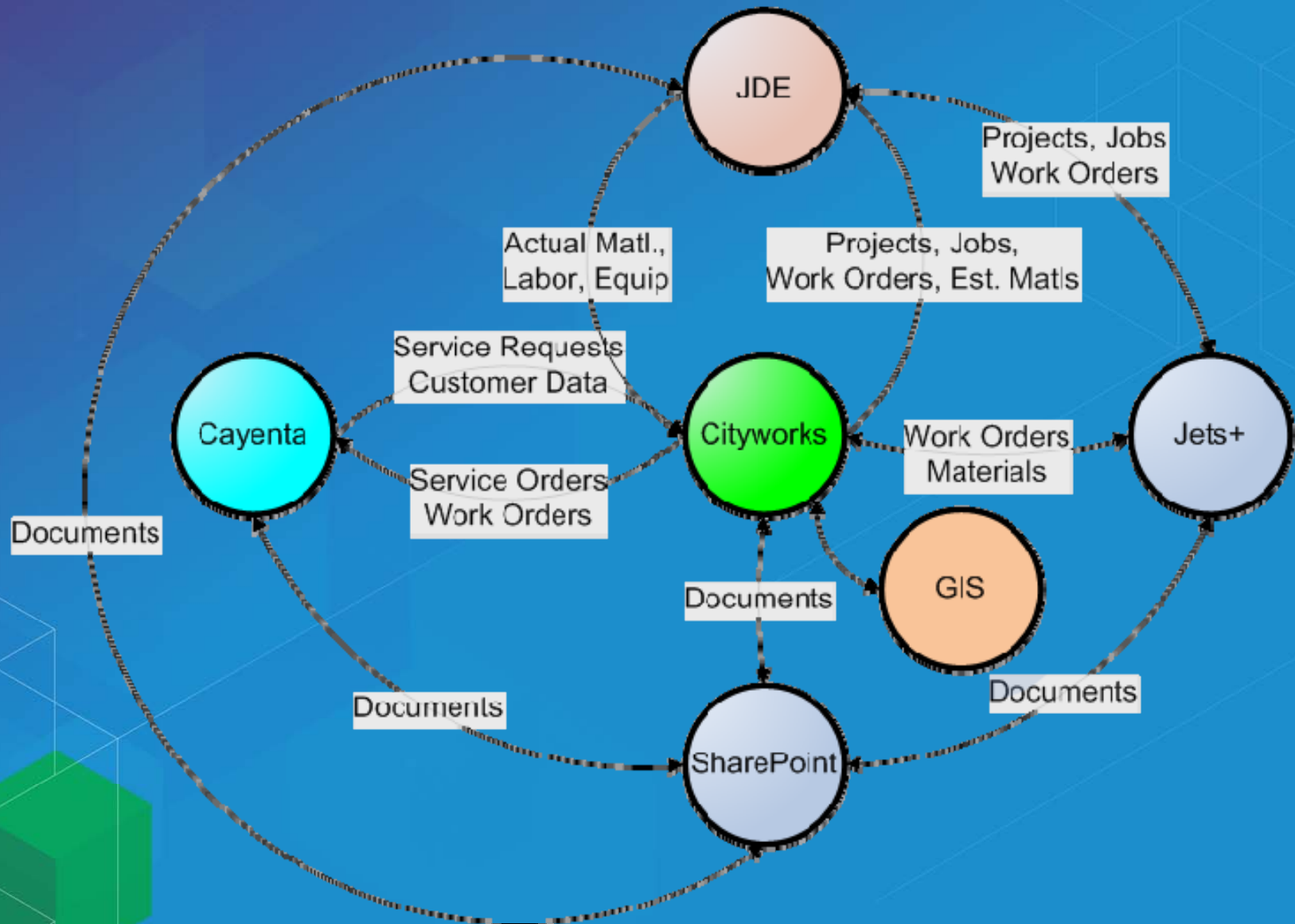
Project Goals

Integrate With ACWD's Existing Applications

- Eliminate redundant data entry
- Leverage strengths of existing technology
- Provide efficient end-to-end business processes by integrating Cityworks with other District systems:
 - Cayenta
 - JDE
 - SharePoint
 - DCJETS/JETS+

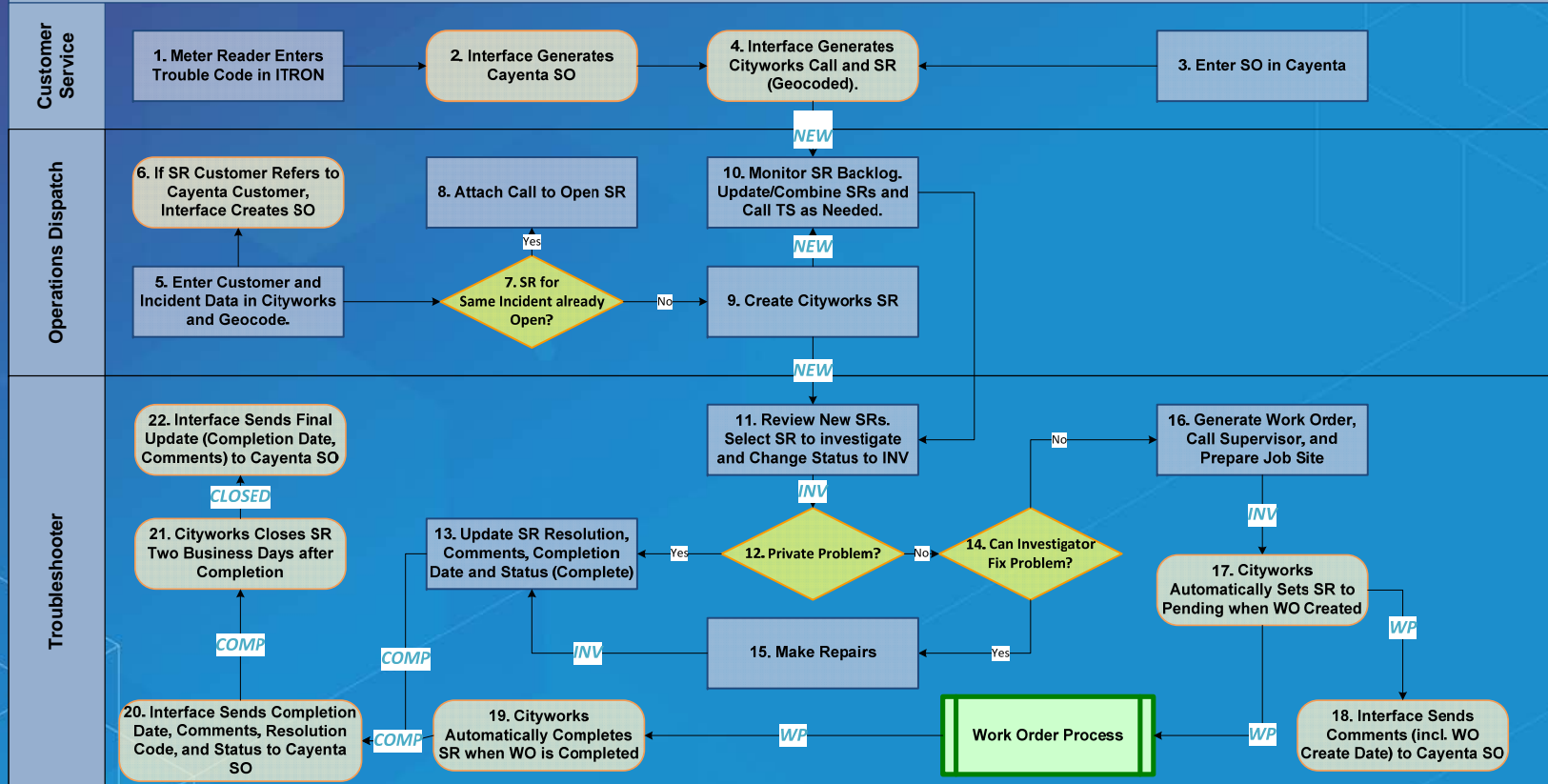


Integration Overview



Cayenta Integration

Customer Service Request Life Cycle



Cayenta Integration

Service Order to Service Request

Customer Service enters service order into CIS (Cayenta)

Service Request (SR) automatically created in Cityworks and is immediately available to the Trouble Truck, field crews or office staff

Cityworks shows SR location and provides crew with request information and GIS asset details. Crew updates the request with resolution

Resolution details immediately available via Cityworks to Dispatch and other Cityworks users

Interface updates the CIS (Cayenta) with resolution information and optionally closes the service order

Cayenta Integration

Service Request to Service Order

Dispatch creates Service Request in Cityworks and it is immediately available to the Trouble Truck, field crews or office staff

Service Order is automatically created in Cayenta.

Cityworks shows SR location and provides crew with request information and GIS asset details. Crew updates the request with resolution

Resolution details immediately available via Dispatch and other Cityworks users

Interface updates the CIS (Cayenta) with resolution information and optionally closes the service order



Cayenta Integration

Cayenta Meter Data In Cityworks

Request Incident Caller **Field Data** Related Attachments

Field Data

Current Meter Serial Number G17123828

Current Meter Size 3/4

Current Meter Date Installed

Last Cycle Read 14

Last Reading Register 1 632

Last Reading Register 2

Last Reading Register 3

Last Reading Date

Reading Type

Current Reading Register 1

Current Reading Register 2

Current Reading Register 3

New Meter Serial Number

New Meter Size

New Meter Reading Register 1

New Meter Reading Register 2

New Meter Reading Register 3

Resolution

Cayenta Integration

Barcode Scanning of Meter Number

Request Incident Caller **Field Data** Related Attachments

Field Data

Current Meter Serial Number N42835812

Current Meter Size 5/8

Current Meter Date Installed 9/16/1997

Last Cycle Read 39

Last Reading Register 1 2,603

Last Reading Register 2

Last Reading Register 3

Last Reading Date 1/26/2016

Reading Type OUT

Current Reading Register 1 2,610

Current Reading Register 2

Current Reading Register 3

New Meter Serial Number G127809178

New Meter Size 5/8

New Meter Reading Register 1 0

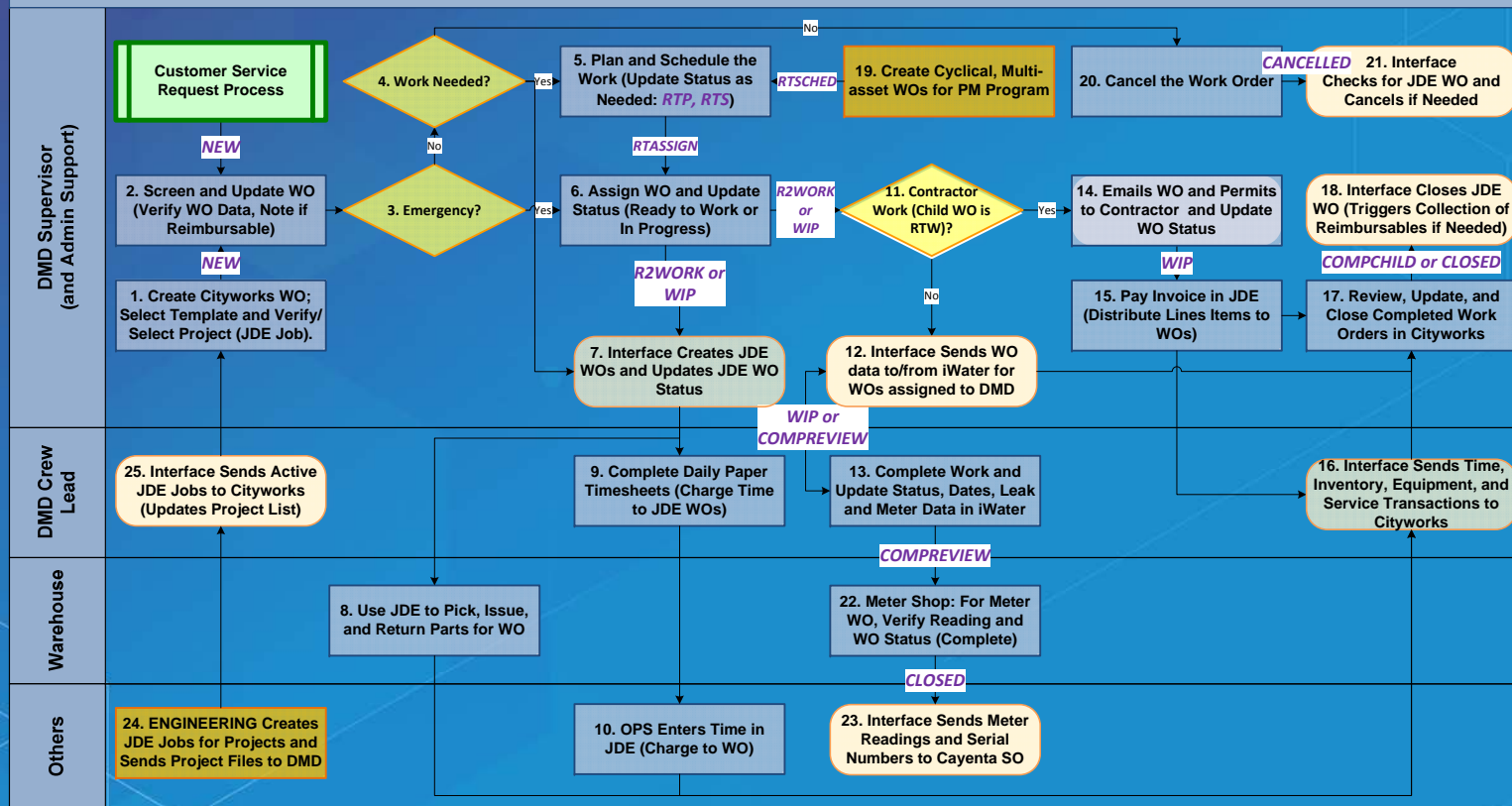
New Meter Reading Register 2

New Meter Reading Register 3

Resolution METER REPLACED

JD Edwards Integration

ACWD DMD Work Order Life Cycle



JD Edwards Integration

Work Orders

Work orders created in Cityworks by crew leads, supervisors, clerks

Estimated Bill of Material automatically transferred to JDE via Cityworks/JDE interface. Warehouse clerk loads material for crew

Cityworks map shows where work is required. Field crews have access to work order details and GIS asset details

Crew enters resolution information into Cityworks and material, labor, equipment info into JDE

Cityworks populated with actual costs for the work order

JD Edwards Integration

Work Order Bill of Material

Material

Work Order ID: 10024120 Repair/Replace - 8" AC/PVC Main Actual Estimated

<input type="checkbox"/>	Material Id	Description	Units	Cost	Task	Asset Id	Asset	Account
<input type="checkbox"/>	15224	8 PVC PIPE C-900 CERTAINTEEDW/COUP & SPLINE (BLUE) - CL1	6.00	\$96.57				
<input type="checkbox"/>	35144	8" AC FULL CIRCLE LEAK BANDRANGE: 8.99-9.39 15" LONG	1.00	\$77.26				
<input type="checkbox"/>	35141	8" AC FULL CIRCLE LEAK BANDRANGE: 8.99-9.39 7.5" LONG	1.00	\$79.03				
<input type="checkbox"/>	35158	8" AC FULL CIRCLE LEAK BANDRANGE: 9.30 - 9.70 16" LONG	1.00	\$124.02				
<input type="checkbox"/>	29141	8" MULTI RANGE FLEX COUPLINGROMAC XR501	2.00	\$336.62				

New Delete

JD Edwards Integration

Work Orders/Service Orders

Meter related work orders created in Cityworks by crew leads.

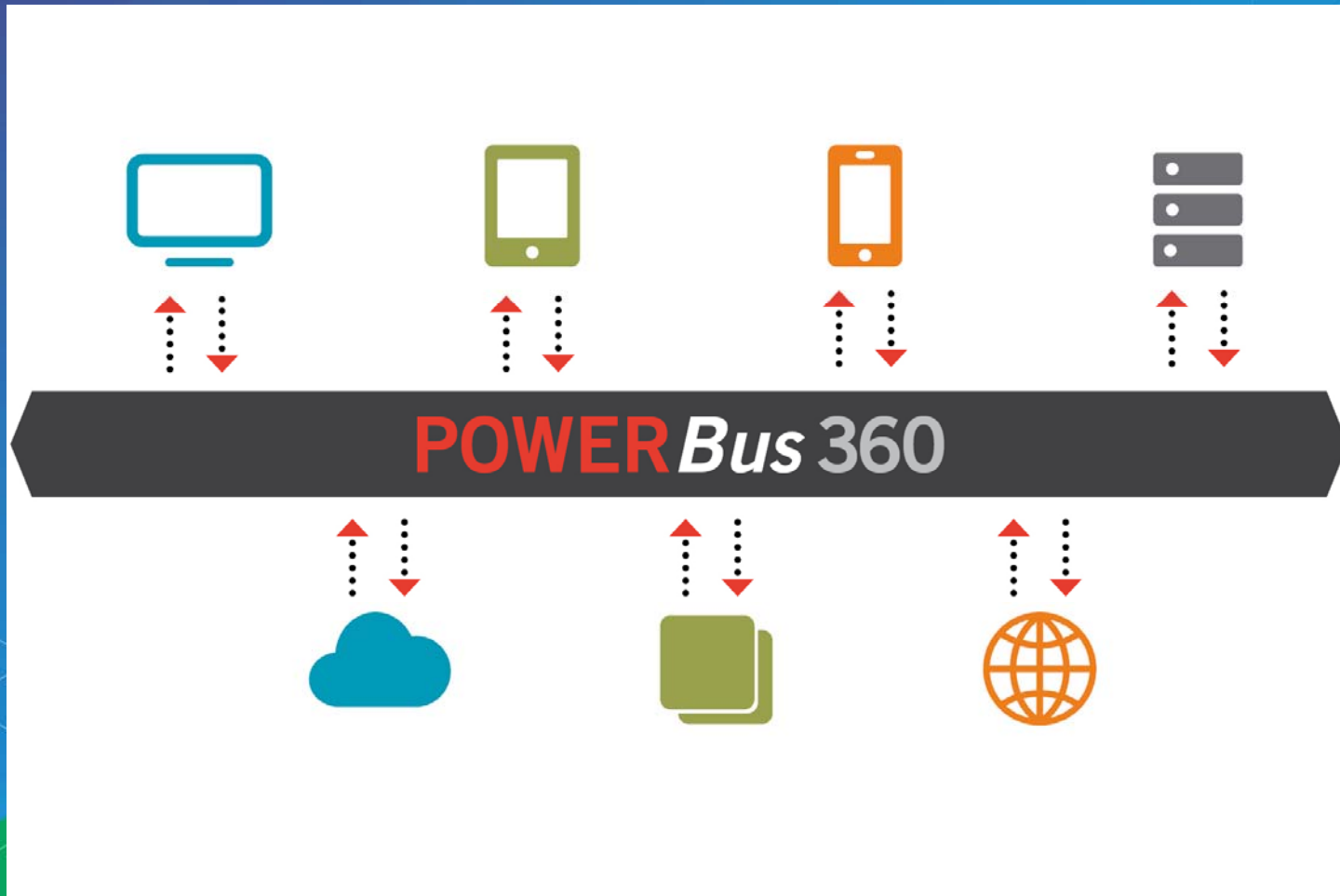
Service Request automatically created in Cityworks and Service Order automatically created in Cayenta

Cityworks map shows where work is required. Field crews have access to work order details. Crew completes work and closes work order.

Cityworks Service Request automatically closed

Cityworks/ Cayenta interface sends meter information to Cayenta for manual processing.

Integration Approach

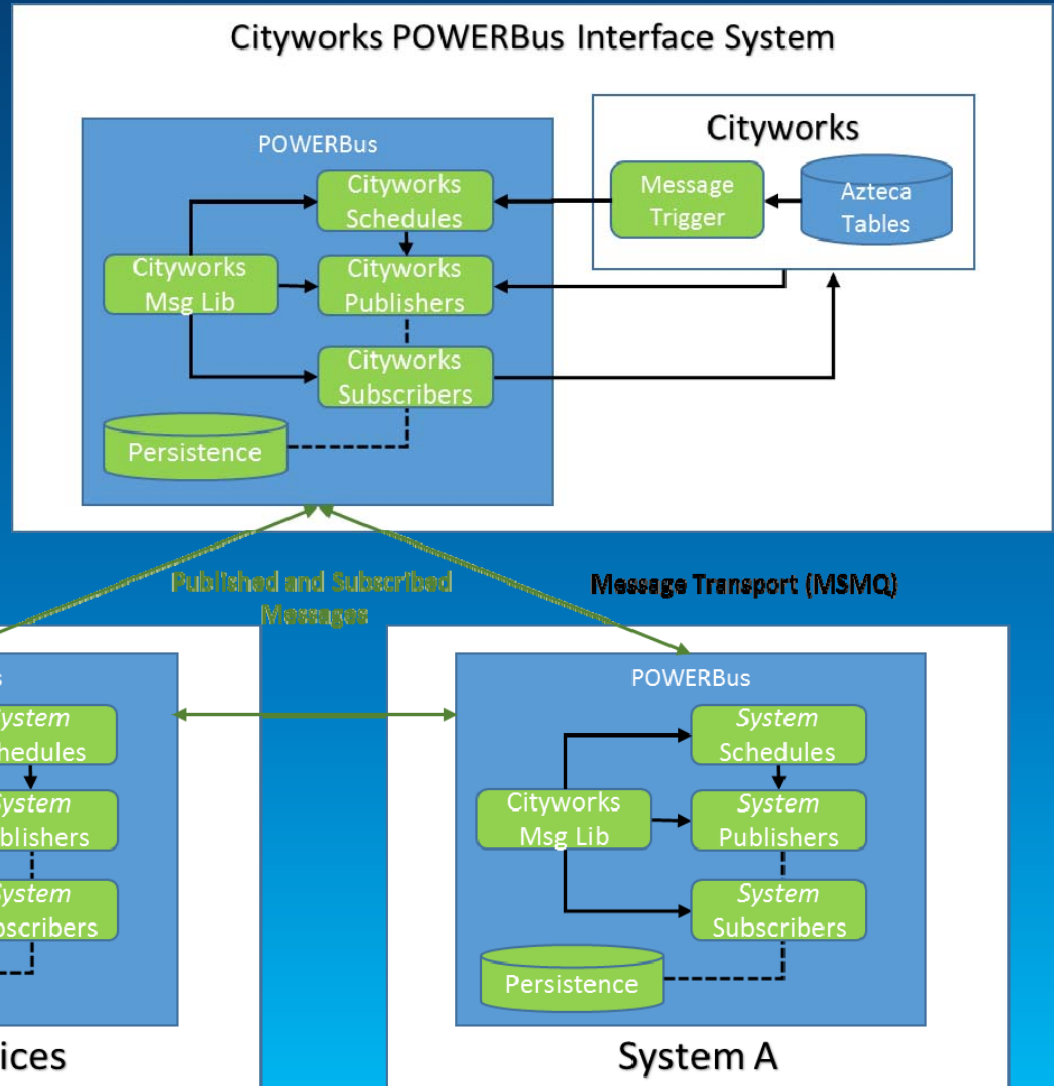


Integration Approach

Details

- **NET solution built on top of NServiceBus (Open Source).**
 - Licensed with *POWERBus360*
 - Web services for integrating non-.NET solutions
- **Cityworks adapter and standard Cityworks messages**
- **High performance and scalability**
 - Async Messaging, Failover, and Performance Monitoring
- **Reliable integration with automatic retries**
 - Reliable transports (MSMQ, SQL Server transports and more).
 - Automatic retries and failure notifications.
 - Reliable persistent message storage.
- **Workflow (long-running Sagas) and background task scheduling**
- **Centralized auditing of messages**

Integration Approach Architecture



GIS Integration Map Display

File Edit View Favorites Tools Help

Cityworks **Inbox** New Request New Work Order Recently Activity GIS Search Search...

My Work Orders Gary Martin Tim Mathews

Troubleshooter/Duty 3 Crew

Tools Legend Locate Bookmarks

WO - Status 65 Assigned (19 records)

<input type="checkbox"/>	Id	Address	Description	Date Initiated	Crew Lead	Actual Start
<input type="checkbox"/>	10024117	40866 terry terr	Replace PB Incidental - 1" PB Svc w			
<input type="checkbox"/>	10024109	1873 Sherman Dr	Replace - 3/4" Copper Svc/3/4" Me			
<input type="checkbox"/>	10024108	35200 Aquado Ct	Repair/Replace - 2" Blow-Off			
<input type="checkbox"/>	10024089	33814 10TH ST	Replace - 1" Copper Svc w/3/4" Me			
<input type="checkbox"/>	10024081	4055 MERGANSER DR	Repair/Replace - 1" and Smaller Me			
<input type="checkbox"/>	10024080	3959 ADAMS AVE	Redline			
<input type="checkbox"/>	10024053	40840 INGERSOLL TER, FREMONT	Meter Leak			
<input type="checkbox"/>	10024052	123 Sobrante St	Redline			
<input type="checkbox"/>	10024020	5508 Azalea Way	Meter Set - 3/4" Meter			
<input type="checkbox"/>	10024000	6238 Market Ave, Newark	Replace - 1" PB Svc w/ 3/4" Copper			

Page 1 of 2, items 1 to 10 of 19.

WO - Status 65 Unassigned (96 records)

<input type="checkbox"/>	Id	Address	Description	Date Initiated	Crew Lead
<input type="checkbox"/>	10024125	43885 S Grimmer blvd	Repair/Replace - 6" Gate Val		
<input type="checkbox"/>	10024124	43885 s grimmer blvd	Repair/Replace - Other Main		
<input type="checkbox"/>	10024123	43885 S grimmer blvd	Repair/Replace - Other Sizes		
<input type="checkbox"/>	10024121	4840 Davenport	Repair/Replace - 1-1/2" Galv		
<input type="checkbox"/>	10024120	ADD	Repair/Replace - 8" AC/PVC		
<input type="checkbox"/>	10024118	1361 BEDFORD ST, FREMONT, CA 94539	Replace - 3/4" Copper Svc/3/4"		
<input type="checkbox"/>	10024116	40860 Terry Ter	Replace - 1" PB Svc w/ 3/4" C		
<input type="checkbox"/>	10024113	44967 winding In	Concrete Replacement Interr		
<input type="checkbox"/>	10024112	44967 winding In	Pavement Repair Contracted		
<input type="checkbox"/>	10024111	44967 winding In	Repair/Replace - 6" AC/PVC		

Page 1 of 10, items 1 to 10 of 96.

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GIS Integration

AGS Services

Map Services

CityworksFacilities

<https://cityworks.acwd.com/arcgis/rest/services/CityworksFacilities/MapServer>

CityworksBasemap

<https://cityworks.acwd.com/arcgis/rest/services/CityworksBasemap/MapServer>

Geometry Service

<https://cityworks.acwd.com/arcgis/rest/services/Utilities/Geometry/GeometryServer>

Geocode Service

CityworksCompositeLocator

<https://cityworks.acwd.com/arcgis/rest/services/CityworksCompositeLocator/GeocodeServer>



GIS Integration

Asset Data Capture

WO Assets Location USA/BMP **Field Data** Tasks Related/Child Attachments

Field Data

CROSS STREETS	
PIPE SIZE	12 IN
PIPE MATERIAL	ACP 150
PIPE LINING	Unlined
PIPE COATING	Unknown
PIPE YEAR	1976
PIPE ID#	E4064
LOCATION (SADDLE, ETC.)	
LOCATION (OTHER)	
EXISTING BACKFILL	
LEAK SIZE	
LEAK TYPE	
LEAKING PIPE DIAMETER	12 IN
LENGTH OF PIPE REPLACED	
MATERIAL OF NEW PIPE	
DISTANCE FROM NEAREST VALVE	
ANODE ADDED	
PIPE DEPTH (INCHES) BELOW WATER TABLE	
CORROSION CAUSED	

GIS Integration

Location in Polygon

Request **Incident** Caller Field Data Related Attachments

Address: 46922 CRAWFORD ST, FREMONT, CA 94539

City: FREMONT

Location: 4020999 **Account:** 40209995

Number:

Pressure: 2MS **Valve Sector:** 9

Zone:

ACWD Grid: I23 **District:** Warm Springs

Location:



Key Performance Indicators

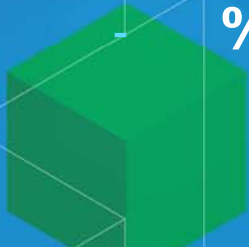
Identified 27 key performance indicators to track with the integrated system. Examples include:

- **Large Valves Exercised on Schedule**
 - % of 12-inch and Larger Valves Exercised in Last Two Years
- **Water Loss Due to Leaks and Breaks**
 - Gallons of Water Lost due to Main Breaks
- **Leak Detection Program Pace**
 - Miles of Main for which Leak Detection Completed



Key Performance Indicators

- **Service Restoration Time**
 - % of Confirmed Leaks and Breaks for which Service Restored within 6 Hours
- **Main Break Repair Cost**
 - Median Cost to Repair Emergency Main Break
- **On-time Construction Planning**
 - % of Customer Projects Started within 10 Business Days of being Ready to Assign
- **Meter Mapping**
 - % of meter locations that are field-verified



Status

- **Soft Launch Go Live – June 3**
 - **Subset of users (12)**
- **Hard Launch Go Live – June 27**
 - **All Users (52)**



Questions?



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