

# Maximo Scheduler and Spatial

...a powerful combination

*September 1, 2016*



Unlocking potential.  
Achieving results.

# Agenda

- **Introductions**
- **What is Maximo Spatial Asset Management?**
- **What is Maximo Asset Management Scheduler?**
- **Use case 1:** How these integrated solutions add value?
- **Use case 2:** How these integrated solutions add value?

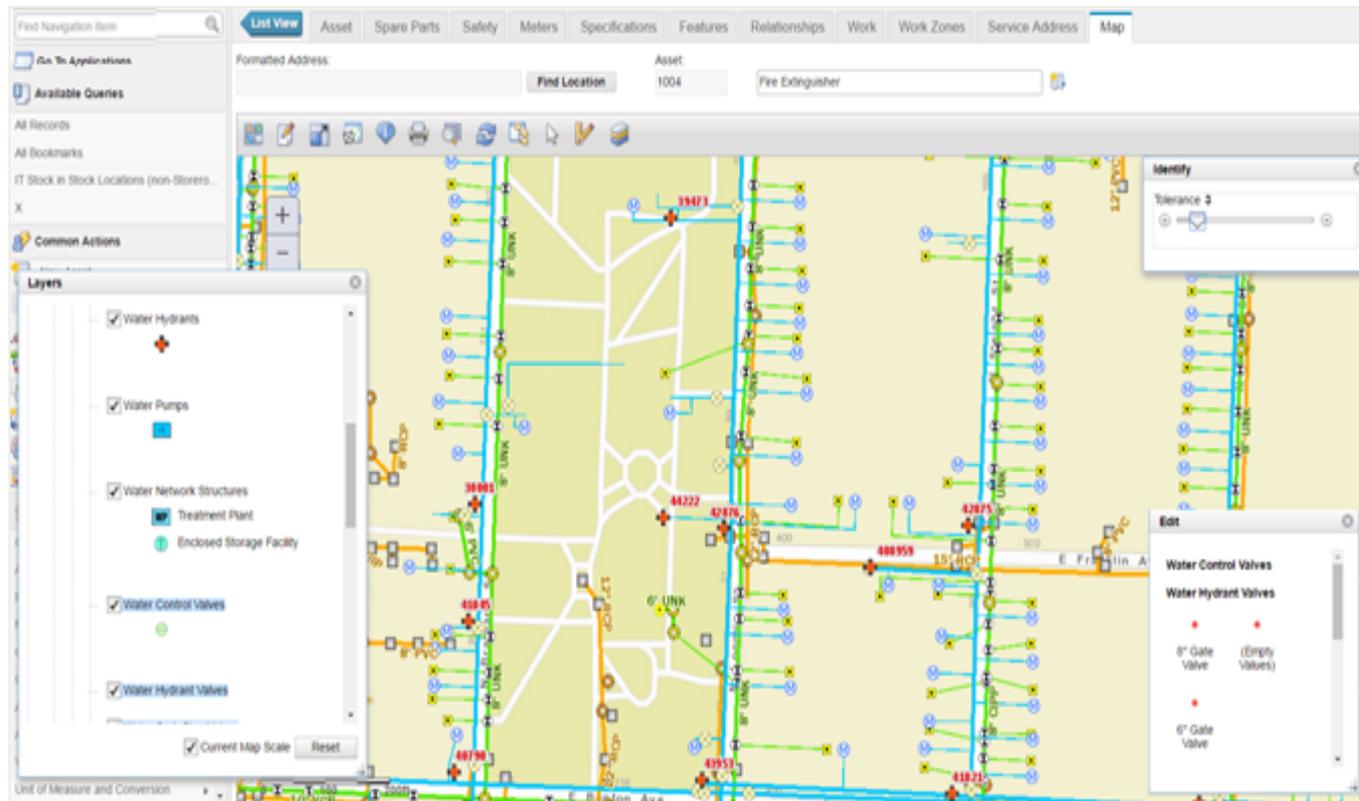
# Introduction

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- **Mike Beasley**
  - Vice President – Utilities



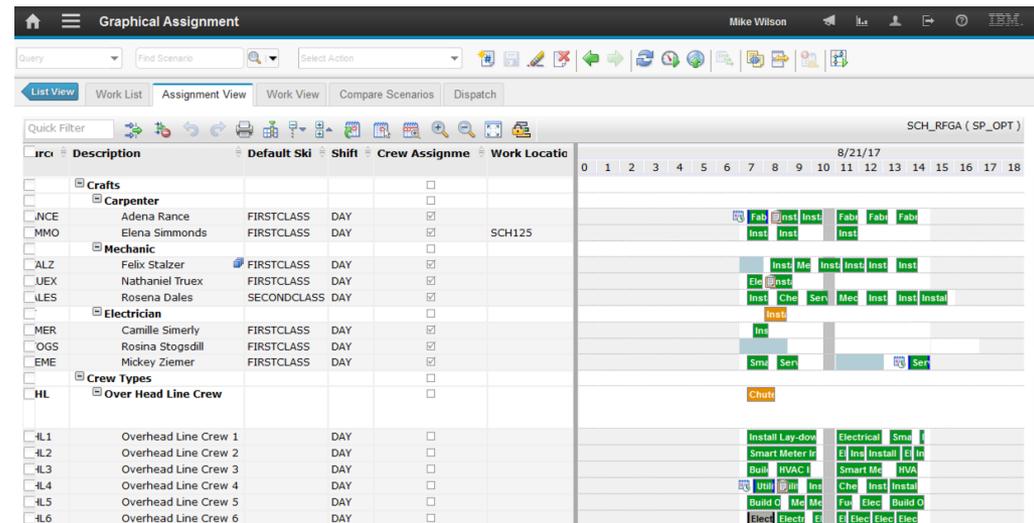
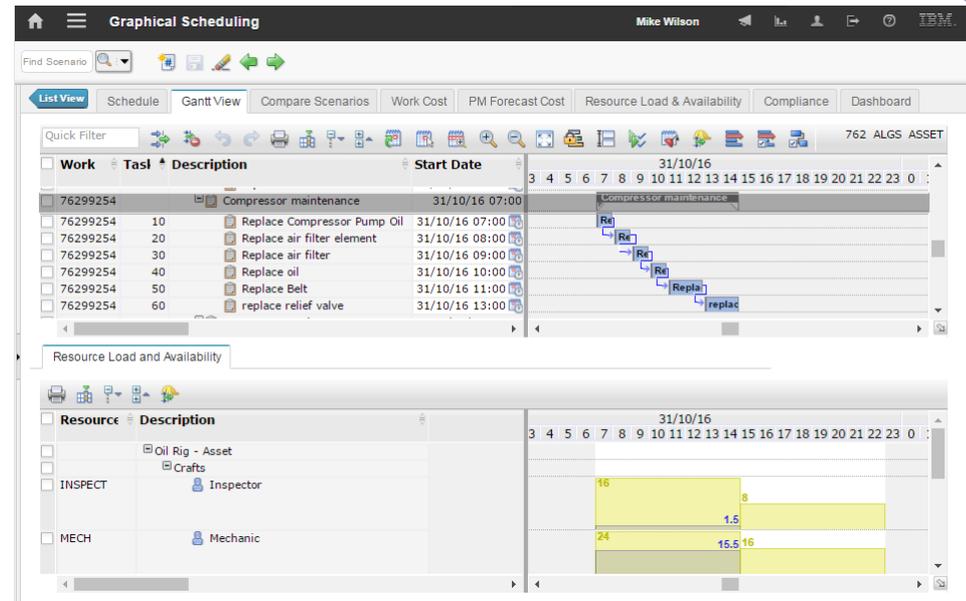
# What is Maximo Spatial Asset Management

- Provides a GIS solution that allows users to ‘visualize, question, analyze, and interpret data to understand relationships, patterns, and trends.’
- Allows users to look at data in a way that is quickly understood and easily shared on a map.
- Creates a level of awareness and insight that tabular systems without graphics cannot provide.



# What is Maximo Asset Management Scheduler

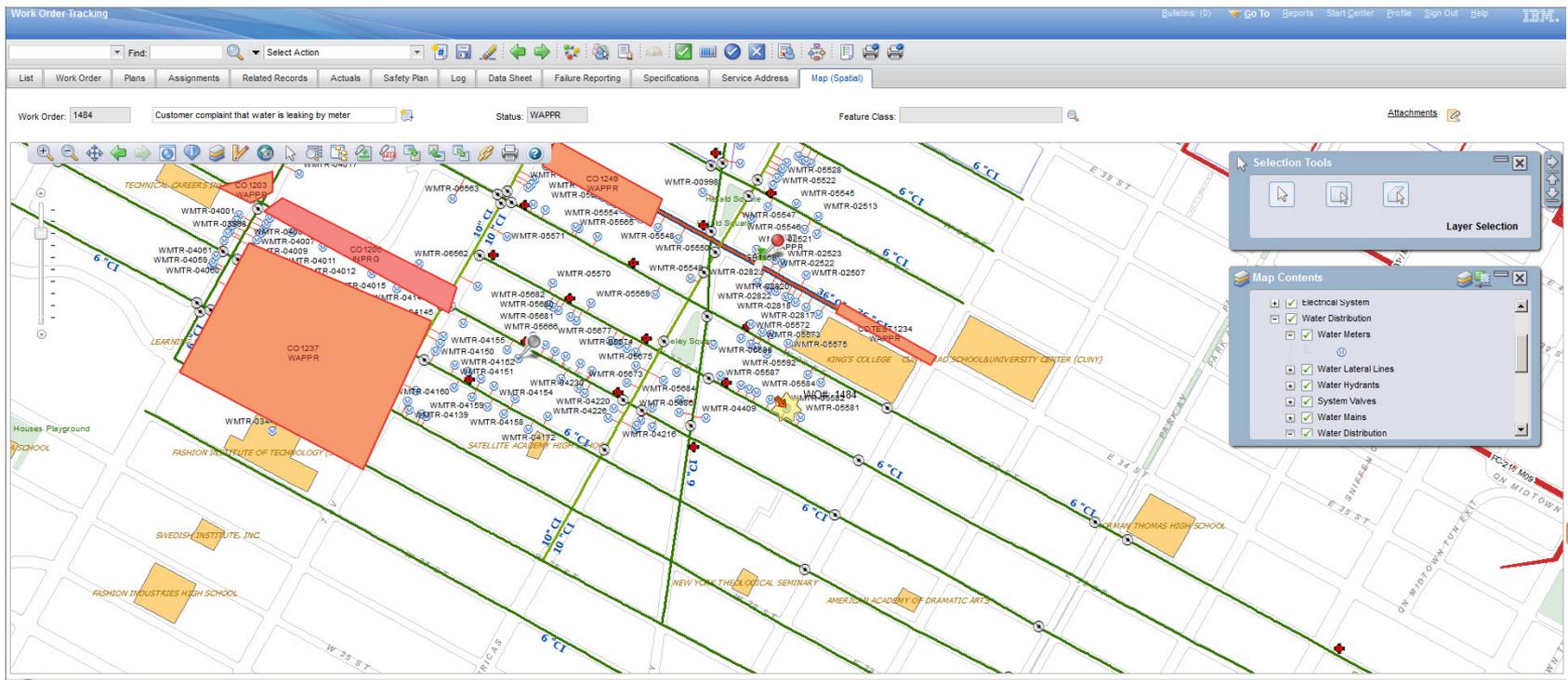
- Maximo Asset Management Scheduler is an end-to-end work management tool that accommodates many roles in the work management lifecycle
  - Planners and schedulers can view work orders and PMs graphically on a Gantt chart, compare the required resources against those available, and adjust accordingly
  - Supervisors can manage work order assignments graphically and drag and drop to assign to labor and crews
  - Dispatchers can use maps to graphically monitor field technicians, work in progress, and status
  - Field technicians can receive work and provide real time status updates to the dispatcher
- Optimization models help gain significant efficiencies by automating work management tasks





# Work order created from service request

- A work order is created from the service request
- Map position of the work order can be determined from related information
- Map feature for work order can automatically be created



# Work order is assigned

- The supervisor is notified of the work order by the dispatcher
- The supervisor utilizes the Graphical Assignment application to view availability of technicians and assign the work through a graphical drag and drop view
- Once assigned, the supervisor locks the work and enters notes

The screenshot displays the 'Graphical Assignment' application interface. The top navigation bar includes a home icon, a menu icon, the title 'Graphical Assignment', and the user name 'Mike Wilson'. Below the navigation bar is a search and filter section with a 'Query' dropdown, a 'Find Scenario' input field, and a 'Select Action' dropdown. The main interface features a tabbed view with 'List View', 'Work List', 'Assignment View' (selected), 'Work View', 'Compare Scenarios', and 'Dispatch'. A 'Quick Filter' section is located above the resource grid. The resource grid shows a list of resources on the left and a calendar view for August 2017 (Week 34) on the right. The resources are categorized into Crafts, Electrician, and Carpenter. The calendar view shows work assignments for each resource across the days of the week. A context menu is open over the grid, listing various actions: Split Work According to Shifts, Split Work, Split Work into Three Records, Create Assignment, Delete Assignment, Lock, Add/View Notes (highlighted by a mouse cursor), Available Labor, Unassign, Move to Next Hour, Move to Today, Move to Next Day, Move to Day, Set Work to Day, Go To Quick Reporting, Go To Work Order Tracking, and Go To Maximo Anywhere.

Resource	Description	Default Ski	S	Aug 2017		
				W34		
				21	22	23
	<b>Crafts</b>					
	<b>MECH</b>					
	<b>Mechanic</b>					
SCHSTALZ	Felix Stalzer	FIRSTCLASS	D			
SCHTRUEX	Nathaniel Truex	FIRSTCLASS	D			
SCHDALES	Rosena Dales	SECONDCLASS	D			
	<b>Electrician</b>					
SCHSIMER	Camille Simerly	FIRSTCLASS	D			
SCHSTOGS	Rosina Stogsdill	FIRSTCLASS	D			
SCHZIEME	Mickey Ziemer	FIRSTCLASS	D			
	<b>Carpenter</b>					
SCHRANCE	Adena Rance	FIRSTCLASS	D			
SCHSIMMO	Elena Simmonds	FIRSTCLASS	D			
	<b>Crew Types</b>					
	<b>Snow Plow Crew</b>					
BOSSNOW	Snow Plow Crew 1		D			
	<b>Over Head Line Crew</b>					
BOSOHL	Over Head Line Crew 1		D			
BOSOHL1	Over Head Line Crew 1		D			
BOSOHL2	Over Head Line Crew 2		D			
BOSOHL3	Over Head Line Crew 3		D			

# Work order is executed

- Tailored Everyplace applications allow technicians to see a summarized view of their required materials and tools
- Visualize their daily route of work orders, get turn by turn directions, see other labor and crews nearby and unassigned work nearby
- Start and stop a work order through a single tap, create labor and tool transactions, capture log notes, meter readings, failure codes and more

The screenshot displays a mobile application interface for work orders. At the top, there's a navigation bar with 'My Work' and 'Details' tabs. Below it, a search bar and 'Save Query' button are visible. The main section is titled 'Work Orders' and shows a list of 10 work orders. The first work order, ID 6011, is highlighted. Below the list, there's a 'Select Records' checkbox and a pagination control showing '1 - 10 of 10'. At the bottom, there's a 'Map View' section showing a map with a blue route and a 'Required Materials' section with a pagination control showing '1 - 6 of 10'. A dialog box titled 'Query Unassigned Work Orders' is open, showing search criteria for 'Scheduled Start' from 8/23/16 to 8/27/16, and fields for 'From', 'To', 'Status', 'Work Type', and 'Priority'. A 'Find' button is at the bottom right of the dialog. A separate window shows a list of directions: 1. Head north on Sitka Spruce Street toward Bristlecone Dr (0.2 mi), 2. Continue onto Anna's Ln (0.2 mi), 3. Turn right onto W Milham Ave (1.4 mi), 4. Turn left onto Oakland Dr (0.5 mi). A 'Close' button is at the bottom right of this window.

Work Order	Description
6011	HVAC Quarterly Inspections & Certification
1650	PLUMBING, Plugged Toilet
1660	PLUMBING, Plugged Toilet
1668	Forklift #1 Quarterly Inspection and Certification
1004	Generator Overhaul
1002	Rebuild Feedwater Pump
2128	Pump overhaul
2165	STATION INSPECTION, Y, N, Y
2544	Crane Quarterly Inspection and Certification
2545	Monthly Rope, Chain, and Hook Inspection

Direction	Distance
1. Head north on Sitka Spruce Street toward Bristlecone Dr	0.2 mi
2. Continue onto Anna's Ln	0.2 mi
3. Turn right onto W Milham Ave	1.4 mi
4. Turn left onto Oakland Dr	0.5 mi

# Progress of work is monitored

- The dispatcher can view work order progress
- View location of labor and crews
- View unassigned work and assign it to the nearest

The screenshot displays the 'Graphical Assignment' software interface. On the left, a list of labor and crew types is shown, including Crafts (Carpenter, Electrician, Mechanic), Crew Types (Over Head Line Crew, Snow Plow Crew, Water Maintenance Crew), and various crew members like Adena Rance, Elena Simmonds, Camille Simerly, etc. The central map shows a city street grid with several work order locations marked by colored pins and icons. A legend on the right, titled 'Work Orders Status Legend', lists various work order statuses with corresponding icons: Approved (green checkmark), Canceled (orange pin), Close Work Order (blue pin with X), Completed (blue pin with checkmark), In Progress (green pin with vertical bars), Waiting on Approval (blue pin with X), and (Others) (blue pin). The legend also includes 'Back', 'Reset', and 'Close' buttons.

# Use case 2: work is initiated to relocate overhead lines

- Due to a road widening initiative, overhead lines must be moved on 50 feet to the right
- From within the map view in the Assets application, all assets along the corridor of road are identified and a work package is created from a single Select Action

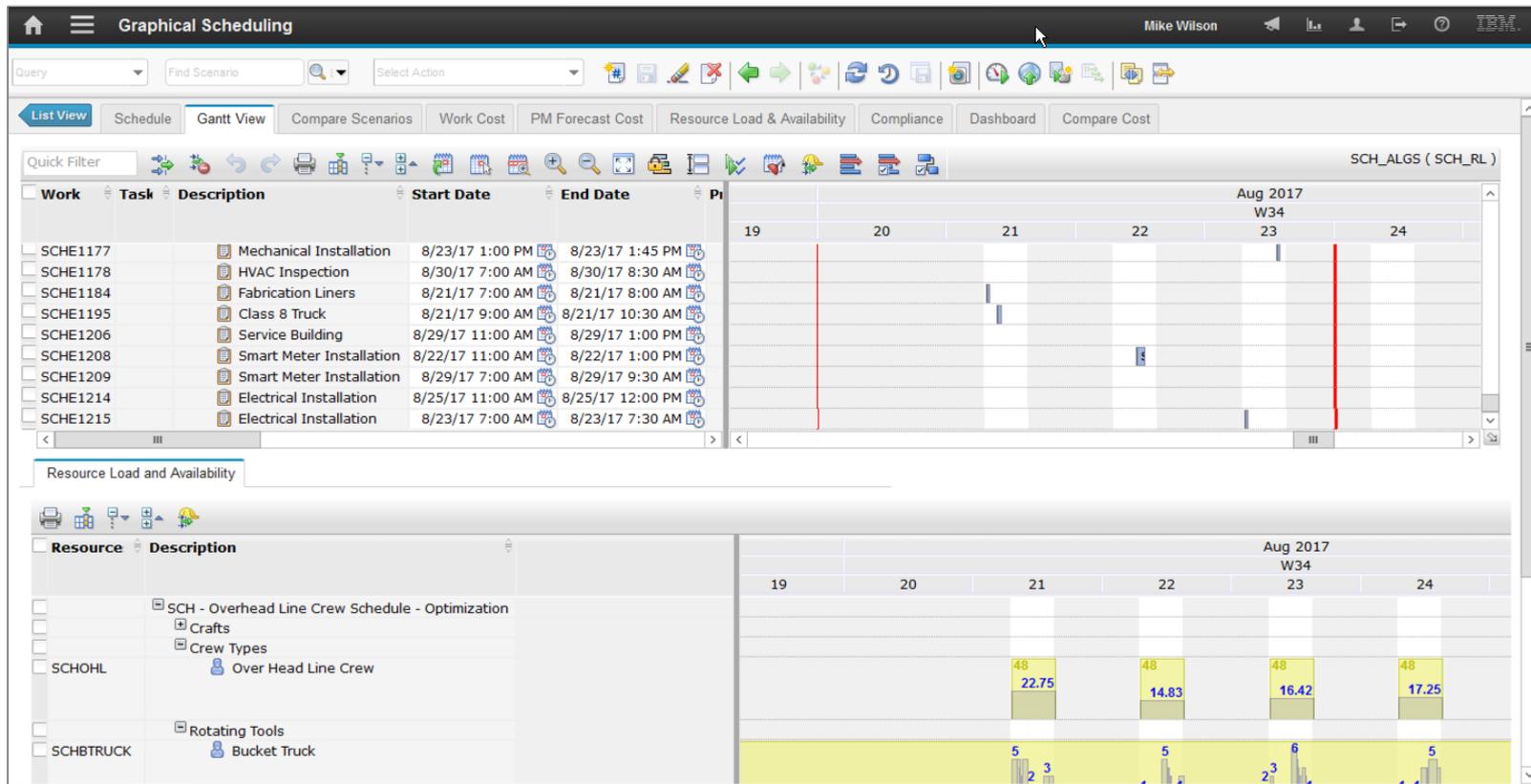
The screenshot displays the Assets application interface. The main map area shows a street grid with various utility assets represented by colored dots and lines. A specific asset, labeled 'Primary: M13', is highlighted with a yellow circle. A pop-up window for this asset shows the following details:

Property	Value
OBJECTID	13
Enabled	True
Creation User	
Date Created	
Last User	
Date Modified	
Subtype	Three Phase Primary Underground
Measured Length	
Length Source	Mapping System

Other visible elements include the 'Selection Tools' panel, the 'Draw and Measure' panel, the 'Query by Attributes' panel, and the 'Results' panel. The 'Query by Attributes' panel shows a search for 'OBJECTID = 13'. The 'Results' panel shows 13 results. The map also features a text annotation: 'Road will be widened by one lane'.

# Work is scheduled

- After the work is designed, work is scheduled in the Graphical Scheduling application
- Resource load and availability and other resource availability including assets, locations, items and tools can be taken into consideration when scheduling work
- Date constraint windows and task dependencies can be adhered to



# Work is assigned

- Work can be assigned to crews within the Graphical Assignment application

The screenshot displays the 'Graphical Assignment' application interface. The top navigation bar includes a home icon, a menu icon, the title 'Graphical Assignment', the user name 'Mike Wilson', and various utility icons. Below the navigation bar is a toolbar with a 'Query' dropdown, a 'Find Scenario' search field, and a 'Select Action' dropdown. The main interface is divided into several sections:

- Navigation Tabs:** 'List View', 'Work List', 'Assignment View' (selected), 'Work View', 'Compare Scenarios', and 'Dispatch'.
- Quick Filter:** A search bar for filtering the data.
- Table:** A table with columns: 'Resource', 'Description', 'Default Ski', 'Shift', 'Crew Assignme', and 'Work'. The table lists various crew types and individual crew members, with 'BOSOHL2' highlighted in yellow.
- Gantt Chart:** A visual representation of work assignments over time, spanning from 8/21/17 to 8/22/17. The chart shows bars for different tasks and resources, with a tooltip for 'SCHB1172 - Electrical Installation(SCHOHL)'.

The tooltip for 'SCHB1172 - Electrical Installation(SCHOHL)' provides the following details:

- Start Date: 8/21/17 12:00 PM
- End Date: 8/21/17 1:00 PM
- Duration: 1:00
- Status: WAITASGN
- Asset: SCH109
- Location: SCH109

# Assignment of work may be optimized

- The assignment of work can be optimized by a spatial scheduling optimization model

Spatial Scheduling Optimization

Scenario:  
SP\_OPT SCH - Overhead Line Crew GA and Dispatch - Optimization

Schedule

Immediate Run in Background Mode?

At this Time  Refresh Project Data?

Recurring

E-Mail Address Notification:

\* Name:  
1008

Objectives Constraints Variables

Minimize Task Interruptions? <input type="checkbox"/>	Maximize the Sum-product of Prioritized Work Orders? <input checked="" type="checkbox"/>	Minimize Travel Time? <input checked="" type="checkbox"/>
Maximize the Number of Assigned Work Orders? <input type="checkbox"/>	Minimize Task Completion Time? <input type="checkbox"/>	Complete High Priority Work First? <input checked="" type="checkbox"/>

Last Run

Save Submit Close

Spatial Scheduling Optimization

Scenario:  
SP\_OPT SCH - Overhead Line Crew GA and Dispatch - Optimization

Schedule

Immediate Run in Background Mode?

At this Time  Refresh Project Data?

Recurring

E-Mail Address Notification:

\* Name:  
1008

Objectives Constraints Variables

Match Skills? <input checked="" type="checkbox"/>	Include Travel Time in Total Time? <input checked="" type="checkbox"/>
Schedule Window? <input type="checkbox"/>	* Travel Time Buffer %: <input type="text" value="5"/>

Last Run

Save Submit Close

# Daily shuffle of crews is managed

- Supervisor builds and manages crews graphically – day by day or a weekly look ahead

The screenshot displays the 'Graphical Crew Management' software interface. At the top, the user 'Mike Wilson' is logged in. The interface includes a search bar for 'Find Scenario' and a 'Select Action' dropdown. Below this are tabs for 'List View', 'Crew List', 'Crew View', and 'Assignments', with 'Crew View' currently selected. A 'Quick Filter' section is visible above the main data table. The table lists various crew types and their descriptions, including 'Overhead Line Crew 1-6', 'Labor' (with sub-roles like DRIVER/DRIVER, HELPER/ELECT, LEADER/ELECT), and 'Tool' (TS1/SCHBTRUCK). The 'Status' column shows 'ACTIVE' for all listed crews. To the right of the table is a weekly schedule grid for the week ending 8/21/17, with days 7 through 6. Each crew row has a corresponding colored bar in the grid, indicating their assignment for that day. The colors used are green, orange, and yellow.

Crew Typ	Crew	Description	Status	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6
		Crews																									
	SCHOHL	SCHOHL1 Overhead Line Crew 1	ACTIVE																								
	SCHOHL	SCHOHL2 Overhead Line Crew 2	ACTIVE																								
	SCHOHL	SCHOHL3 Overhead Line Crew 3	ACTIVE																								
		Labor																									
		DRIVER/DRIVER																									
		DRIVER/DRIVER/SCHLAPOR	A																								
		HELPER/ELECT																									
		HELPER/ELECT/SCHRIDER	C																								
		LEADER/ELECT																									
		LEADER/ELECT/SCHDEANS	T																								
		Tool																									
		TS1/SCHBTRUCK	B																								
	SCHOHL	SCHOHL4 Overhead Line Crew 4	ACTIVE																								
	SCHOHL	SCHOHL5 Overhead Line Crew 5	ACTIVE																								
	SCHOHL	SCHOHL6 Overhead Line Crew 6	ACTIVE																								

# Introducing – Scheduler Plus!

Advanced work management solution, built on top of Maximo Scheduler



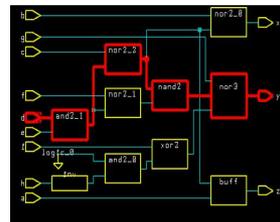
## Weather integration

- Incorporate weather data into planning/scheduling and dispatching
- Weather alerts / notifications



## Appointment scheduling

- Make customer appointments within a schedule window
- Customer notifications – cancel / reschedule



## Managing large projects

- Dependencies across work orders and tasks
- Highlight critical path, backward pass, % complete



## Dynamic dispatching

- Auto refresh, re-optimization based on real-time progress
- Incorporate real-time traffic conditions

# Back-up

# Why do clients chose Maximo Scheduler?

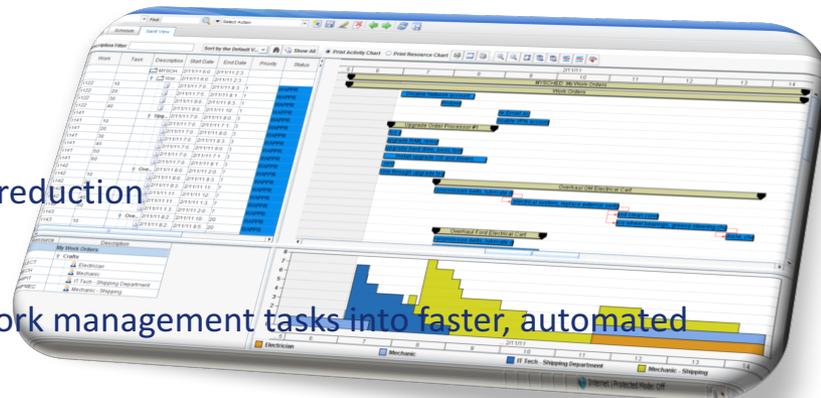
- Embedded in Maximo
  - No third-party product integrations required
    - Save time and capital
  - Work without leaving Maximo
    - Right-click actions provide further efficiencies
  - Company mandate (or personal preference) on tool reduction

- Optimization

- Transform laborious, manual and time consuming work management tasks into faster, automated processes with meaningful results
- Included with the Scheduler license
- Option to build custom models

- Other important factors

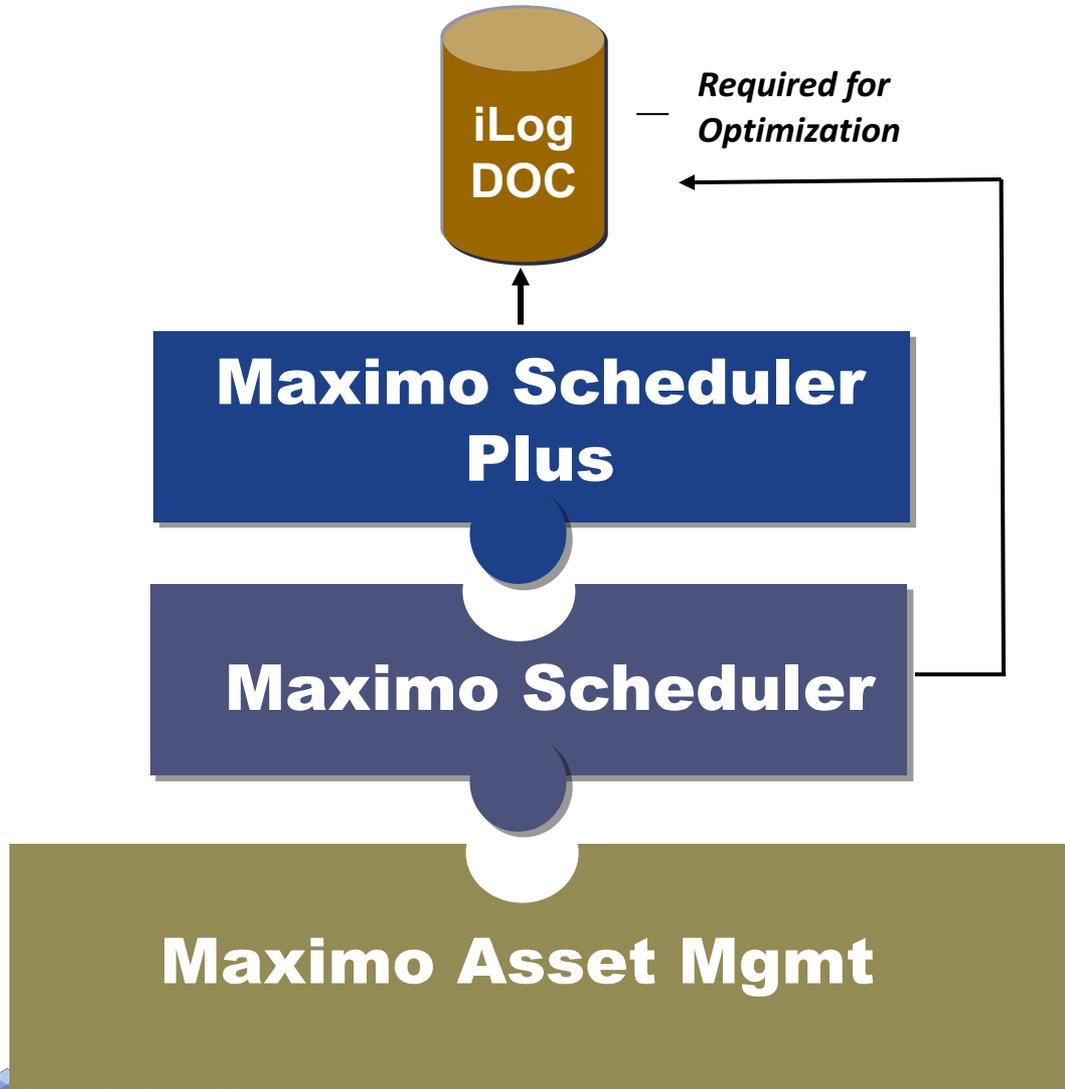
- Asset / Location availability
- SQL query builder
- Low cost = quick ROI



# About Cohesive Solutions

- Cohesive Solutions operates out of Kennesaw, Georgia (*metro Atlanta*). Cohesive provides business process transformation and consulting services which enables organizations to achieve higher ROI from their assets and the information technology that manages and maintains those assets. Cohesive's professionals have been serving clients since 1990.
- For more information visit [www.cohesivesolutions.com](http://www.cohesivesolutions.com) or contact Mike Beasley at [mbeasley@cohesivesolutions.com](mailto:mbeasley@cohesivesolutions.com) or (678) 601-5478.

# Scheduler Plus – also embedded in Maximo



- Advanced scheduling solution
- Add-on product to Maximo Scheduler, code embedded in core Maximo therefore still a single install
- On-prem and via SaaS
- Requires a separate license purchase
- Includes the optimization models

# Maximo Scheduler and Scheduler Plus – Roadmap

## Weather

- Configurable weather views
- Weather alerts / notifications

## Appointment Scheduling

- Make customer appointments within a schedule window, see tech availability, incorporate weather
- Customer notifications - cancel, reschedule

## Network dependencies (Phase 1)

- Link across WOs and tasks
- Pert chart

## Weather impact on Assets

- Weather overlay on maintenance/operational windows

## Weather impact on Job Plans

- Adding weather requirements to conditional job plans
- Variable length condition (ex: weather impacted)
- Go or No Go criteria
- Applying conditional job plan tasks to existing WOs

## Network dependencies (Phase 2)

- Backward pass
- Highlight critical path
- Introduce % complete

## Dynamic Dispatching

- Auto refresh for improved tracking of progress
- Re-optimization based on real-time progress, including emergent work
- Real-time road conditions and traffic
- Continuous weather updates and weather event notifications
- Everyplace template updates - weather

## Weather based assignments

- Manual clearing of decks
- Optimization – reschedule planned and emergency

## Enhanced resource availability

- WO outside schedule, shifts/breaks

## Performance

- Support high volume operations

## Qualifications at WO & Task Level

- Manual and Optimization

## Weekly and Monthly planning buckets

## Performance

## PM display

- Constraint window
- Compare PM scenarios
- Emergency template (ex. Weather event activity)

## Performance

### Release 1

H2 2016

### Release 2

H1 2017

### Release 3

H1 2017

## 4 Role Based Applications

- 1) Graphical Scheduling
- 2) Graphical Assignment
- 3) Graphical Assignment – Repair Facilities
- 4) Graphical Crew Management

Also includes the Everyplace mobile templates to support the Field Technicians and the Supervisor

# Roles We Accommodate in Managing Work

- Assign scheduled work
- Monitor and assign emergencies
- Build daily crews
- View and adjust crew work in the field



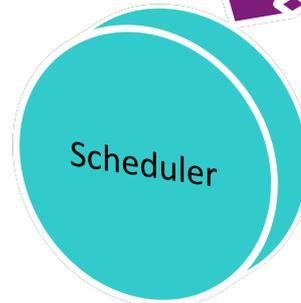
- Receives, completes and reports on work



- Model work steps in Job Plans and Routes
- Define PM frequencies
- Forecast long term work and cost
- Use historical data to adjust the plan



- Assign WOs of a mobile asset to a facility
- Assign work within the repair facility



- Create rolling work schedule
- Resource level
- Schedule windows
- CPM
- Monitor schedule compliance