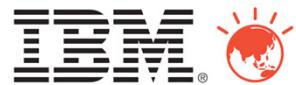


IMAC 2014

Maximo Asset Management Scheduler

A Revised Approach to Work Management

Dave Calvert – Product Manager, Mobile Solutions
Lori Pilgrim – Sr. Design Architect



Our Work Management focus areas

Work Planning

- Forecast Work
- Planned Work
- Create schedules

Resource Planning

- Availability/Gaps
- Assets
- Location
- Material
- Tools
- Labor/Crews

Assignment

- Assign using a Graphical UI
- Labor and Crews
- Accommodate vacation/break

Dispatching

- Graphical UI
- Public Map Control
- Route Visualization
- Labor and Crews

Real-time Communication

- Assign Emergency Work
- Communication to Field Technicians
- Update Work Status and Progress

Optimization

Capacity Planning

Resource Leveling

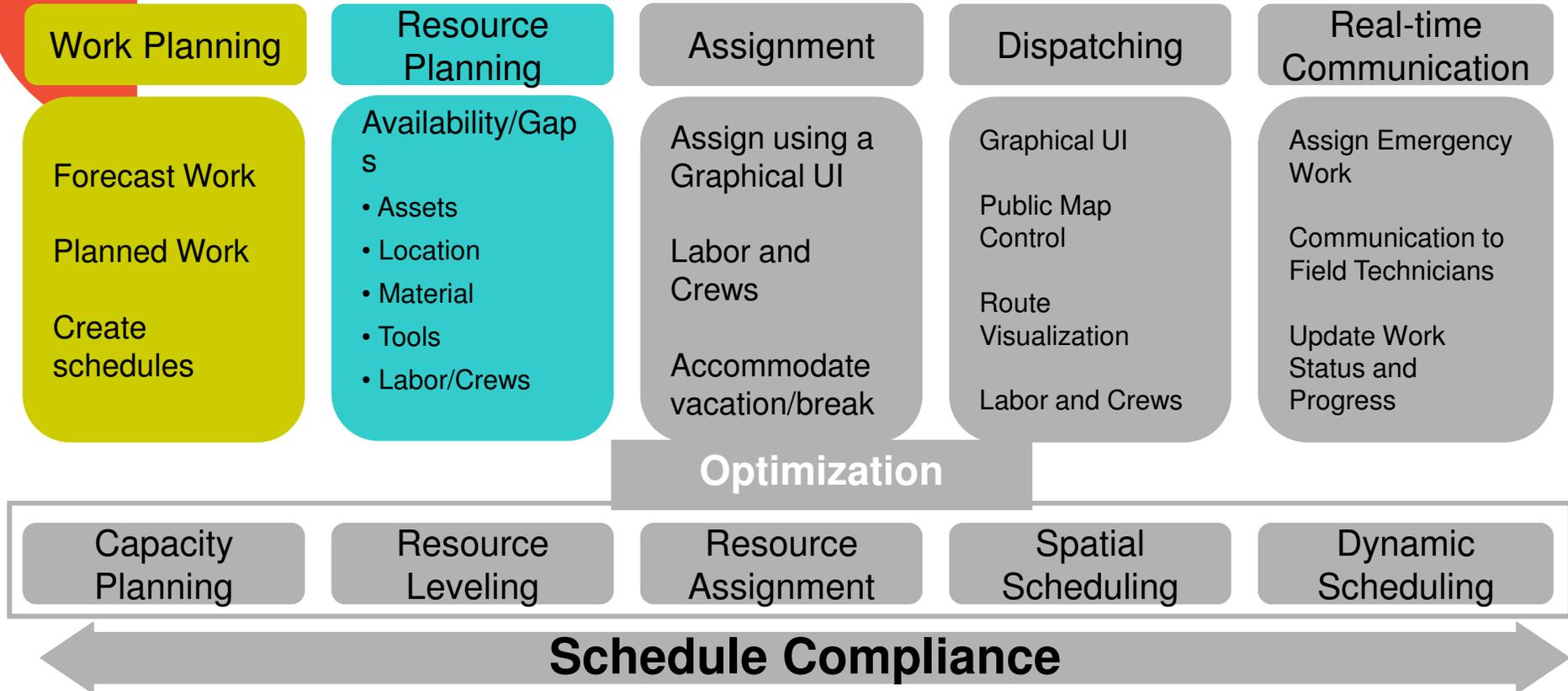
Resource Assignment

Spatial Scheduling

Dynamic Scheduling

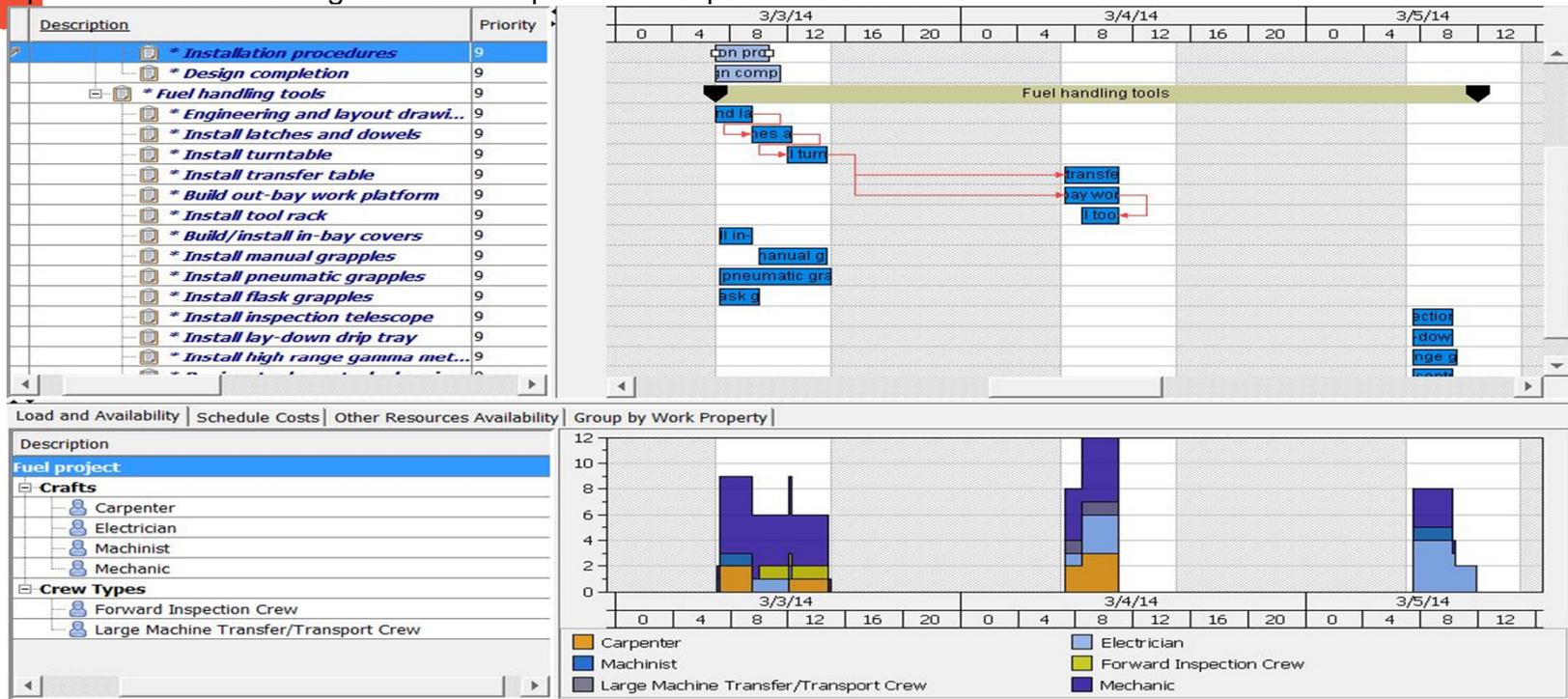
Schedule Compliance

Scheduler focus areas



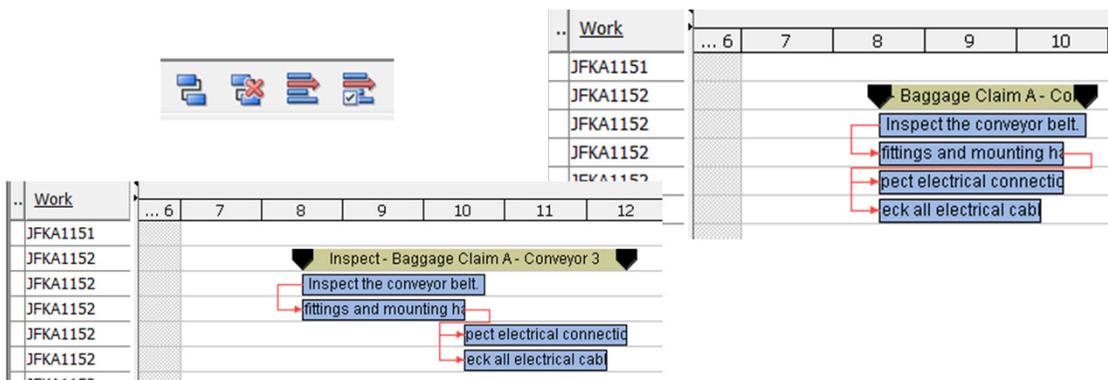
Gantt Chart Visualization

- Intuitive view of forecasted PMs along with planned work orders
- Drag and drop work orders as well as forecasted PMs
- Compare available crafts against skills required to complete work orders



CPM and Schedule Windows

- Critical Path Method (CPM) compliance
- Schedule window violation indicated



Edit Constraint

Define the relationship between the work records, which will determine the scheduling order. [More information](#)

Predecessor and Successor Activities

Predecessor:

Successor:

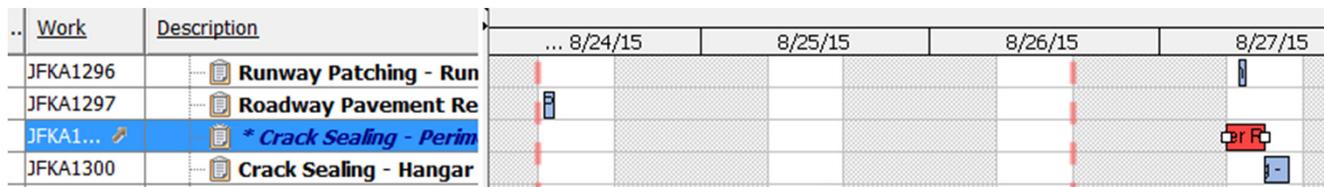
Constraint Type

Finish to Finish
 Finish to Start
 Start to Finish
 Start to Start

Lead and Lag

Lead and Lag Time (Hours):

OK Cancel



Interactive to Maximo applications

Single Work Order Actions

- BO Change Status
- BO Initiate Workflow
- BO Modify Work Details
- BO Select Owner
- BO Create Communication
- BO Publish Selected Records
- BO View Item Availability
- BO Create Work Order
- BO Create Job Plan
- BO Assign to New Parent
- BO Create SR
- BO Create Incident
- BO Create Problem
- es0 Create Change
- iesc Create Release
- Commit Selected Work Records
- Remove Task from Schedule
- Go To Quick Reporting
- Go To Work Order Tracking

Multiple Work order actions

- BOSA Change Status
- BOSA Initiate Workflow
- BOSA Modify Work Details
- BOSA Select Owner
- BOSA Publish Selected Records
- BOSA Assign to New Parent
- BOSA Commit Selected Work Records
- BOSA Remove Task from Schedule

Modify Work Details

Modify Work Details

Modify existing work record data by entering or modifying information in any field. A value entered into a field in the mass update section updates all selected work rows with that value.

Work Order Description	Priority	Supervisor	Lead	Work Group	Target Start	Target Finish	Crew
JFKA1301 Driveway Pavement Repair - Building 9		JFKMCCRE	>>	>>			>>
JFKA1300 Crack Sealing - Hangar Road	1	JFKMCCRE	>>	>>			>>
JFKA1299 Crack Sealing - Perimeter Road - near Runway 13R	5	JFKMCCRE	>>	>>			>>
JFKA1303 Driveway Patching - Building 68	5	JFKMCCRE	>>	>>			>>
JFKA1302 Parking Lot Pavement Repair - Building 147	9	JFKMCCRE	>>	>>			>>

Mass Update

Priority: Clear?

Supervisor: >> Clear?

Lead: >> Clear?

Work Group: >> Clear?

Target Start: Clear?

Target Finish: Clear?

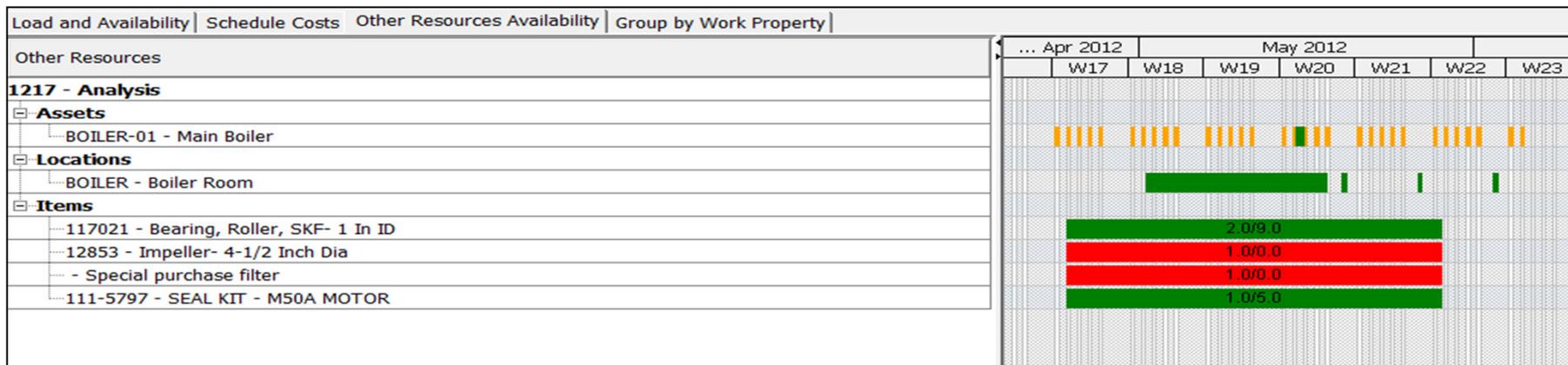
Crew: >> Clear?

OK Apply Cancel

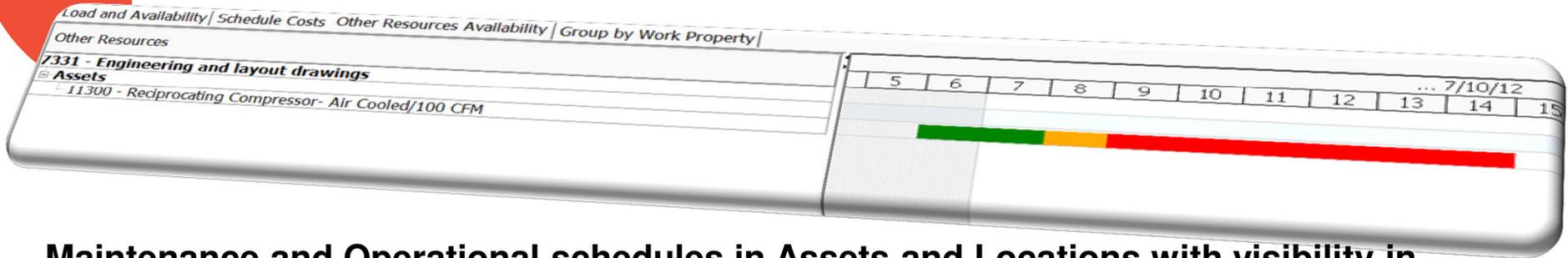
Material Availability

Other Resource Availability tab shows:

- Maintenance/Operational/Calendar availability of Asset and Location
- Material Availability for planned materials
 - Shows required quantity vs available quantity
 - Green bar shows materials are available, red bar shows materials are unavailable
- Planners & Schedulers know when not to schedule work based on material availability

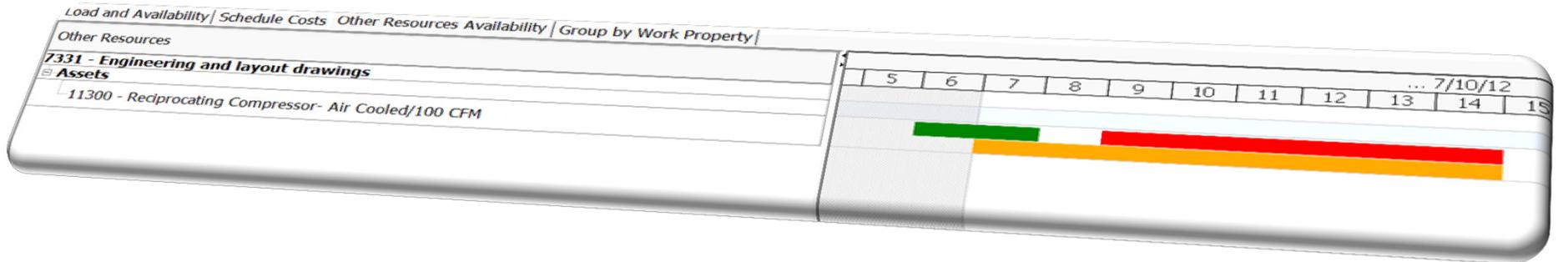


Asset and Location Availability



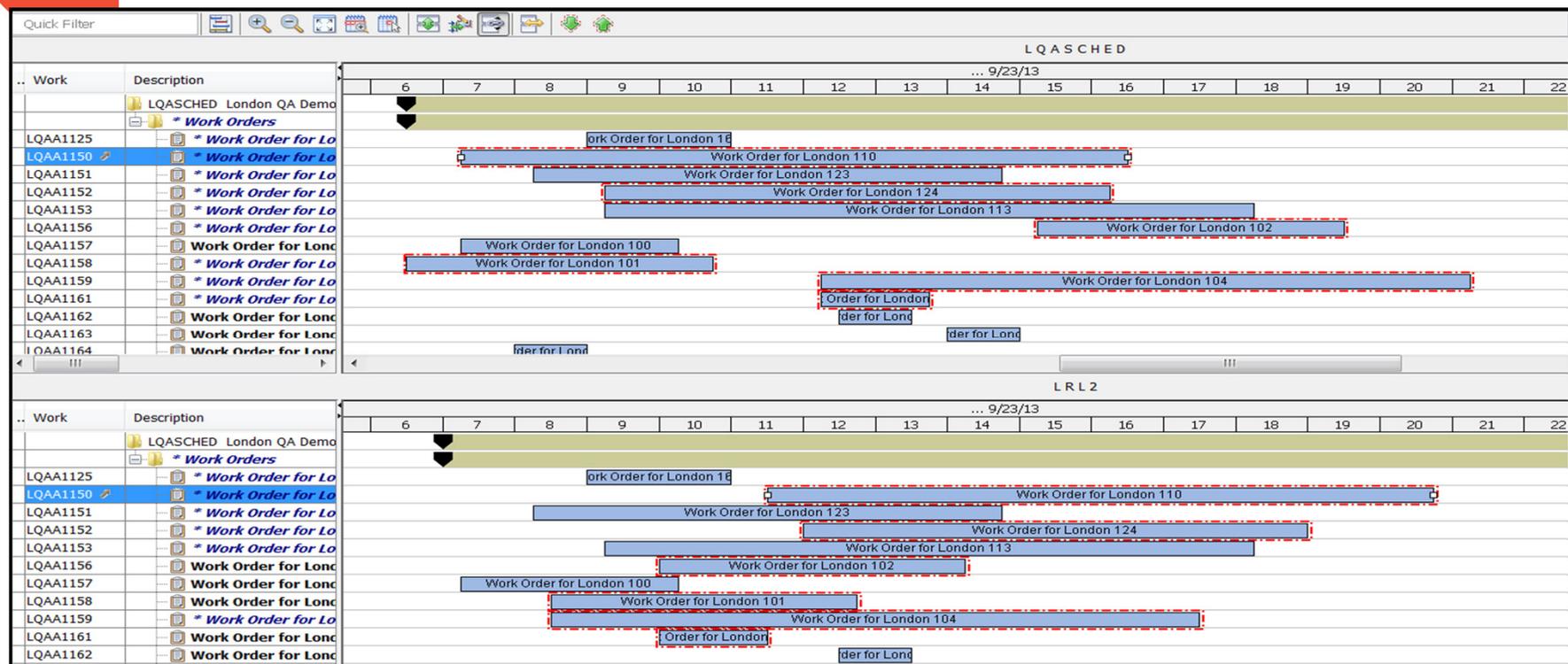
Maintenance and Operational schedules in Assets and Locations with visibility in Scheduler

This determines when work can be done on the Asset/Location

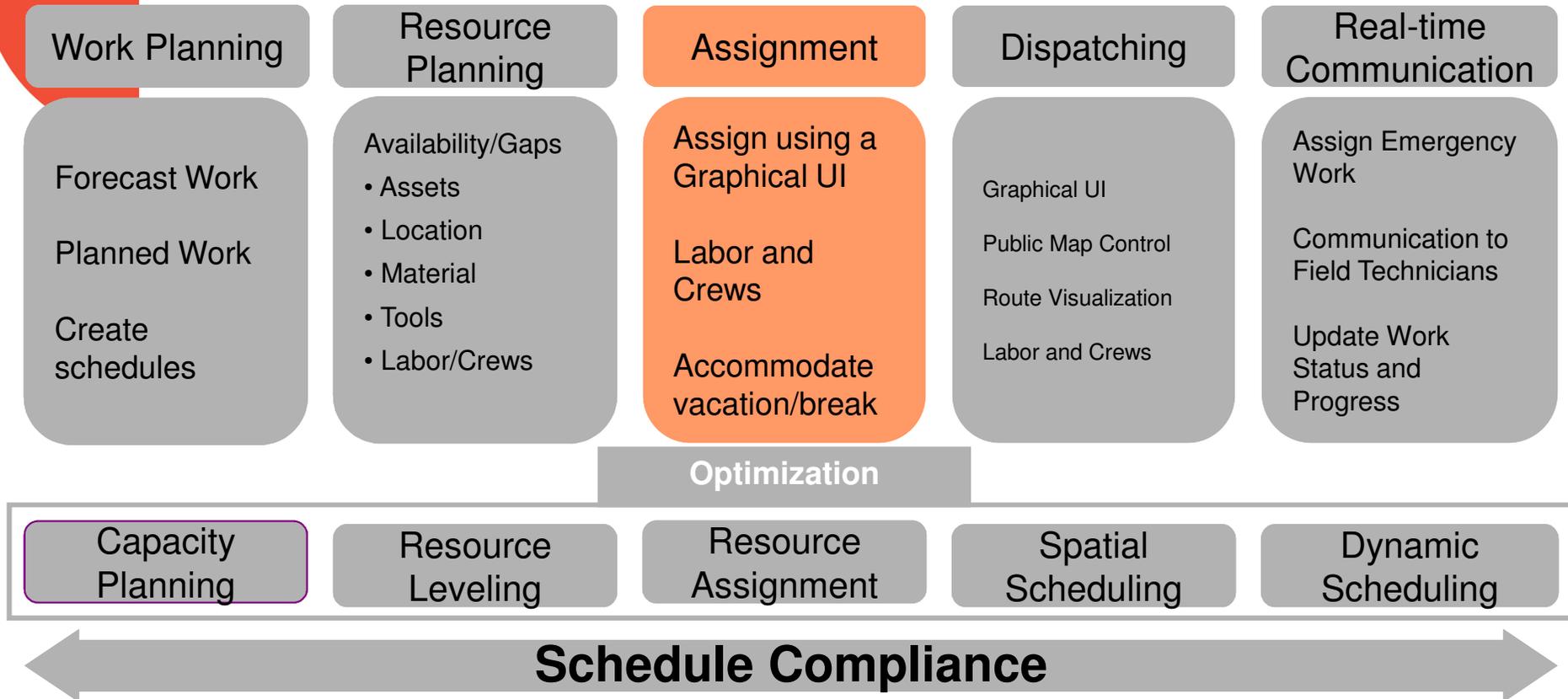


Snap Shots and Scenarios / Comparisons

- Ability to create multiple Snap Shots and Scenarios
- Ability to compare different scenarios before publishing the approved set of scheduled work orders



Assignment focus areas



Graphical Assignment

Aimed at the process of assigning work to people

- Similar UI to Scheduler Gantt view for consistency
- Helps the Planner & Scheduler see non work time for a resource, as well as assignments made by other Foremen beyond the bounds of their schedule...indicates duplicate labor assignments

The screenshot displays the 'Graphical Assignment' software interface. The top section features a 'Work List' table with columns for Work, Task, Description, Start Date, End Date, Priority, Status, Asset, Location, and Resources. Below this is a 'Resource Schedule' section with a table for resource availability and a corresponding Gantt chart. The Gantt chart shows assignments for various resources over time, with labels like 'for L' and 'for Lc' indicating specific assignments.

Work	Task	Descri...	Start Date	End Date	Priority	Status	Asset	Location	Interrupt...	Resources
LONB1159		...	29/05/12 ...	29/05/12 ...	9	APPR	LON104	LON104	N	
LONB1161		...	29/05/12 ...	29/05/12 ...	12	APPR	LON105	LON105	N	
LONB1162		...	29/05/12 ...	29/05/12 ...	6	APPR	LON106	LON106	N	
LONB1163		...	29/05/12 ...	29/05/12 ...	2	APPR	LON107	LON107	N	
LONB1164		...	29/05/12 ...	29/05/12 ...	8	APPR	LON122	LON122	N	
LONB1165		...	29/05/12 ...	29/05/12 ...	1	APPR	LON108	LON108	N	
LONB1167		...	29/05/12 ...	29/05/12 ...	2	APPR	LON117	LON117	N	
LONB1170		...	29/05/12 ...	29/05/12 ...	7	APPR	LON119	LON119	N	
LONB1172		...	29/05/12 ...	29/05/12 ...	3	APPR	LON109	LON109	N	
LONB1173		...	29/05/12 ...	29/05/12 ...	4	APPR	LON120	LON120	N	

Resource	Description	Default S...	Shift	Default vendor
Create London SLRs				
Crafts				
CARP	Carpenter			
LONLIBER	Diane Lit	FIRSTCLA...	DAY	
MECH	Mechanic			
LONHENRY	Earl He	FIRSTCLA...	DAY	
LONSTAN	Fred Stan	SECONDC...	DAY	
ELECT	Electrician			
LONFORD	Jerry Fi	FIRSTCLA...	DAY	

Assigning work

Yellow indicates time off

Orange unassigned work drag and drop on labor

Actions on task

- Split Work According to Shifts
- Split Work
- Split Work into Three Records
- Create Assignment
- Delete Assignment
- Lock
- Add/View Notes

The screenshot displays a resource schedule for a 'Mechanic' resource. The interface includes a 'Resources' table, a 'Resource Schedule' grid, and a task details pop-up.

Description	Default	6	7	8	9	10	11	12	13	14	15	16	17	18
Mechanic														
Eric Henry-Smit	FIRSTCLASS													
David Jelly	FIRSTCLASS													
Farley Stanson	SECONDCLASS													

Task Details Pop-up:

- PERS
- Duration: 1:00
- Start Date: 8/24/15 7:00 AM
- End Date: 8/24/15 8:00 AM
- Requirements:
- Assigned Skill:

Callouts:

- Yellow indicates time off:** Points to a yellow bar in the schedule for Eric Henry-Smit on 8/24/15.
- Orange unassigned work drag and drop on labor:** Points to orange bars labeled 'k Grappl' and 'own Drip' in the schedule.
- Skill level incorrect:** Points to a red bar labeled 'al Grapp' in the schedule.
- Split work according to shifts:** Points to a green bar labeled 'Pressure Inspection(MECH)' that is split across multiple days.

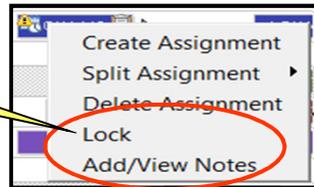
Fixed Appointments

- The ability to 'Lock' an appointment at a specific date/time so that it cannot be moved horizontally to another time.
 - For example: A homeowner needs to be available to let a Utility worker in to repair a meter at a certain date/time.
- The ability to create notes for the appointment - saved to Work Order Log as APPT.
 - For example: The Utility worker needs a key to go through a homeowner's gate to do work and must retrieve the key from the next door neighbor.

Appointment Required Icon



Lock and Add Notes



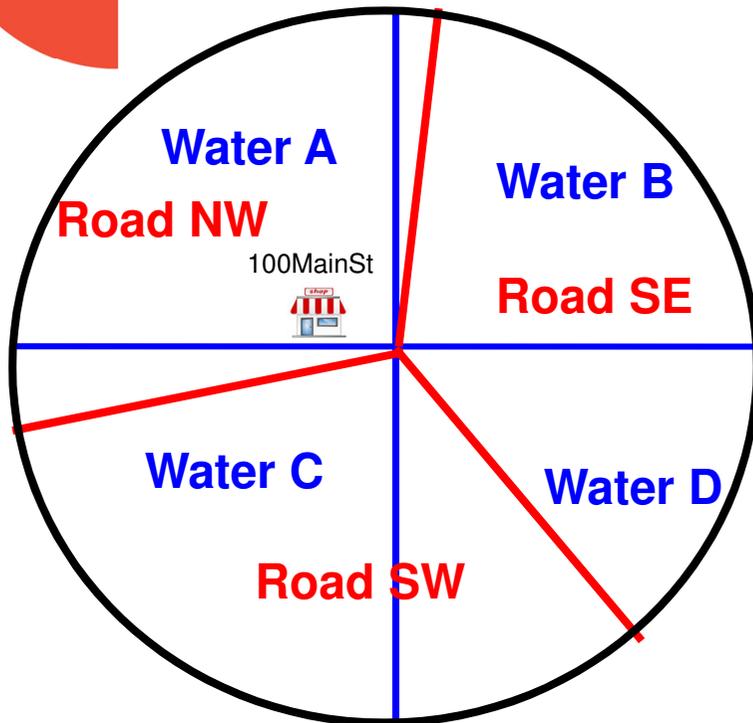
Appointment Locked Icon

Notes added to Work Log



Work Zone Application

- *What is a Work Zone?* - A dedicated area where a Labor or a Crew works.
- **New Work Zone Application @ Administration > Resources > Work Zones**



Location - 100MainSt

- **WZ – Water A**
- **WZ – Road NW**

Crew Type Water:

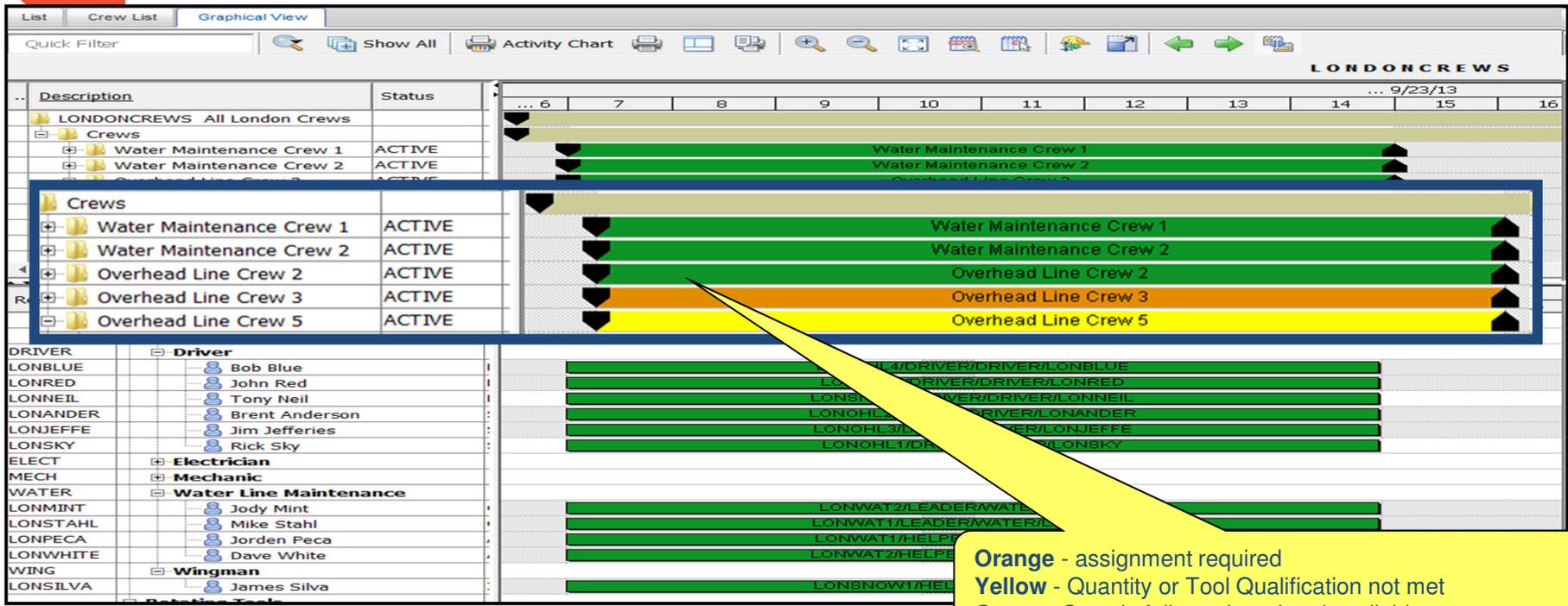
- **Crew2 – WZ - Water B**
- **Crew5 – WZ – Water D**

Crew Type Road:

- **Crew4 – WZ – Road SE**
- **Crew7 – WZ – Road SW**

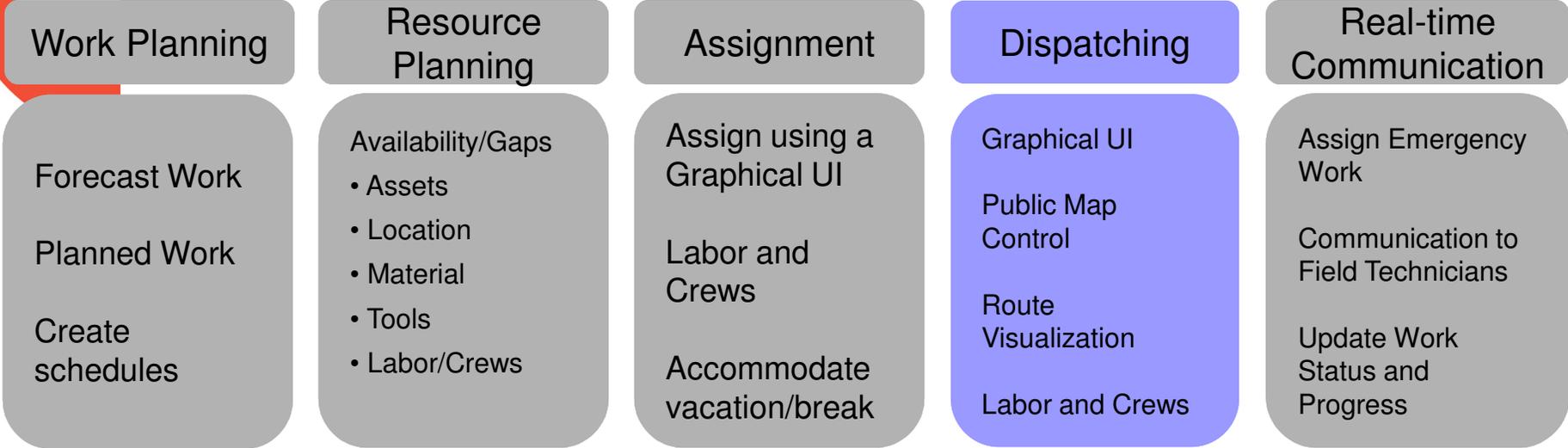
Graphical Crew Management

- **New Crew application to help with the Daily Morning shuffle of Crew Assignments**
 - Drag and drop labor and tools to make up a qualified crew

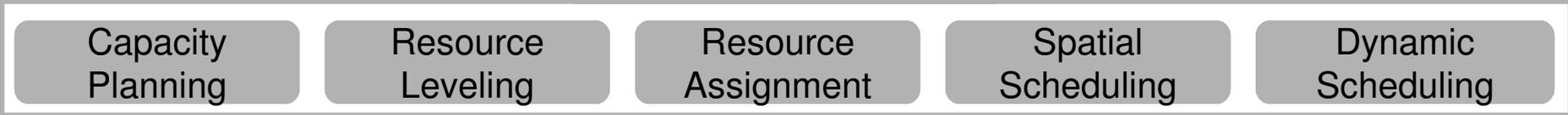


Orange - assignment required
Yellow - Quantity or Tool Qualification not met
Green - Crew is fully assigned and available

Dispatch focus areas



Optimization

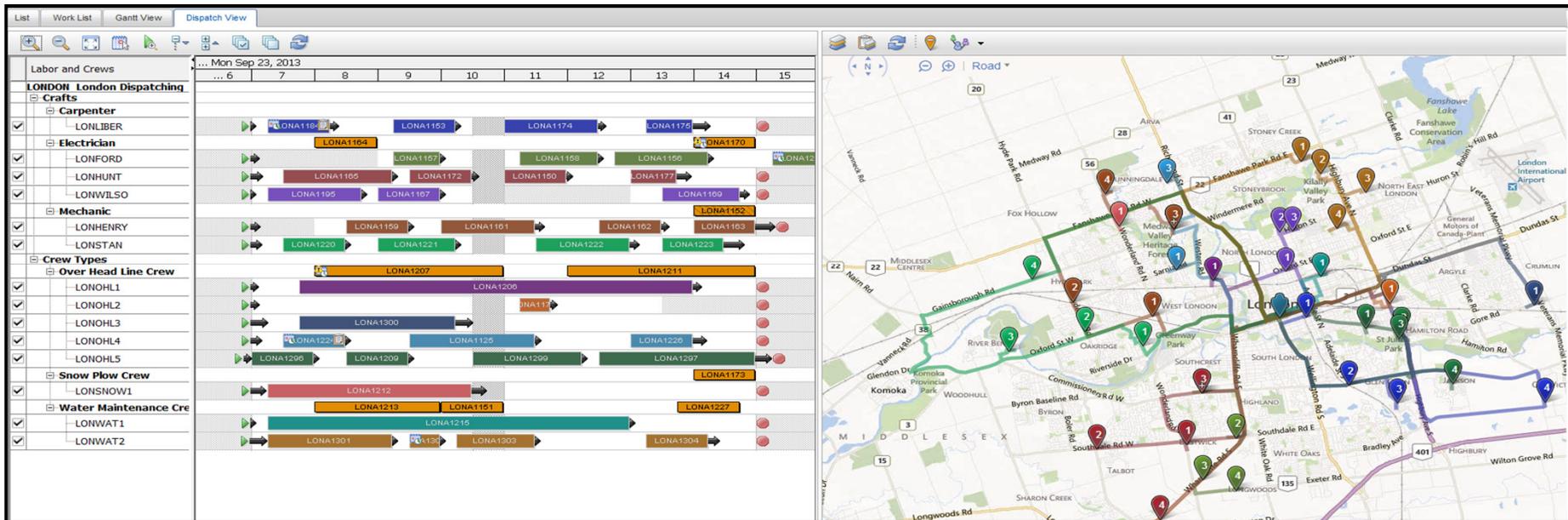


Schedule Compliance

Dispatching

Dispatcher monitors and responds to on-going work out in the field :

- View Work Order assignments in a calendar and map view to spatially understand the dynamic work day
- View geo-location data from mobile devices and locate resources on a map to determine current location
- Ability to view spatially which resource can be rescheduled based on location and travel time when new unassigned work orders come in throughout the day



Unassigned WOs in Dispatch

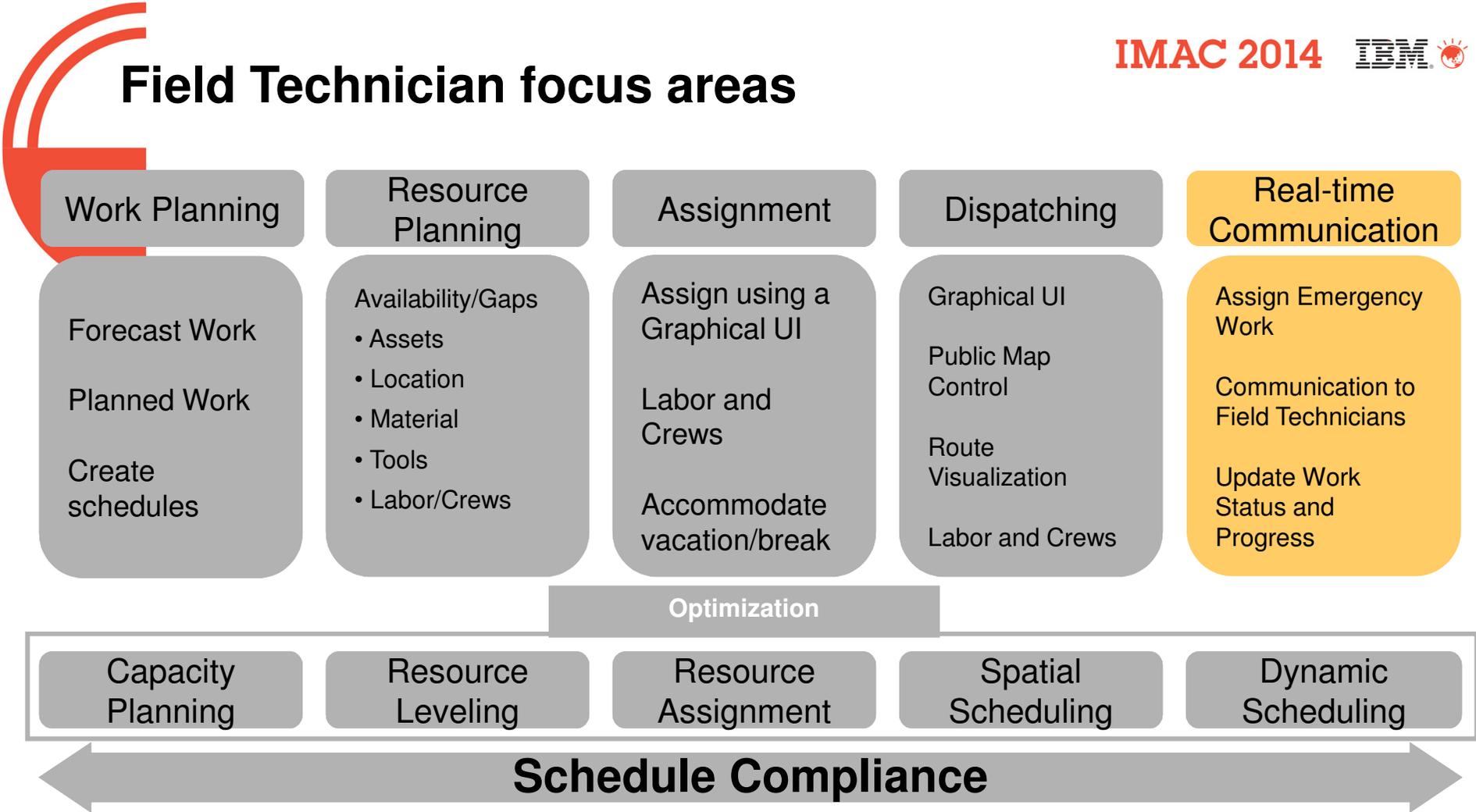
- Unassigned WOs that are part of the work list query that have a craft/crew type defined will be displayed in both the calendar view and map view.

The screenshot shows a dispatch software interface with two main views: a calendar view and a map view. The calendar view is for Monday, September 23, 2013, and shows a grid of work orders (WOs) for different crafts. The crafts listed are Carpenter, Electrician, and Mechanic. The Electrician craft has several unassigned WOs, including LONA1164, LONA1165, LONA1172, LONA1150, LONA1177, and LONA1169. The map view shows the geographic locations of these WOs, with a red circle highlighting a location pin. A yellow callout points to this pin with the text 'Corresponding Unassigned WOs when Unassigned WO query is enabled.' Another yellow callout points to the LONA1164 WO in the calendar view with the text 'Unassigned WO requiring an Electrician'.

Unassigned WO requiring an Electrician

Corresponding Unassigned WOs when Unassigned WO query is enabled.

Field Technician focus areas



Field Technician - Everyplace

Everyplace Technician (Tablet) - Mozilla Firefox: IBM Edition

9.32.229.192/maximo/ui/?event=loadapp&value=techttablet

Most Visited IBM My Yahoo! Comcast RTC: Maximo Plans Mobile Dev Wiki Facebook

Everyplace Technician (Tablet)

Required Materials 1 - 4 of 4

Item	Description	Storeroom	Quantity
11241	Contact, Renewal Kit	CENTRAL	3.00
11453	Seal, Mechanical, Self Aligning- 1 In ID	CENTRAL	3.00
XMP-9500	Gasket- AR46	CENTRAL	3.00
Z-RAGS	Rags, Cloth	CENTRAL	2.00

1 - 4 of 4

Required Tools 1 - 1 of 1

Tool	Description	Storeroom	Quantity
TORQUE	TORQUE WRENCH-20 FT-LB CAPACITY		3.00

1 - 1 of 1

Field Technician's Street Level Route

Field Technician's Material Requirements

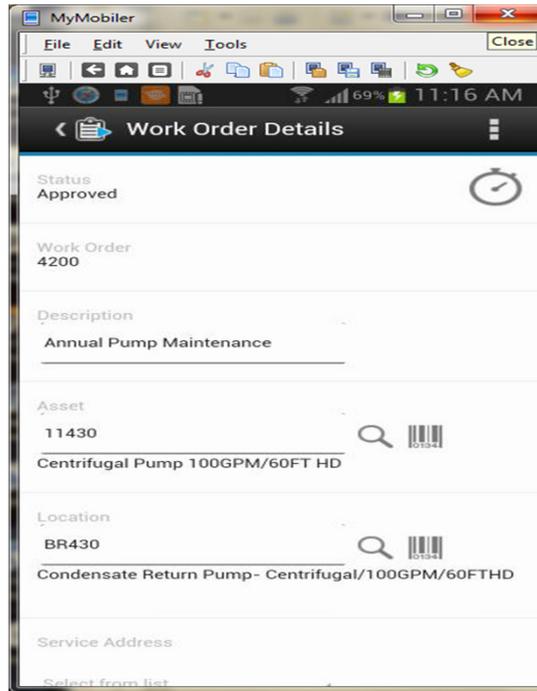
Field Technician's Tool Requirements

Field Technician - AnyWhere

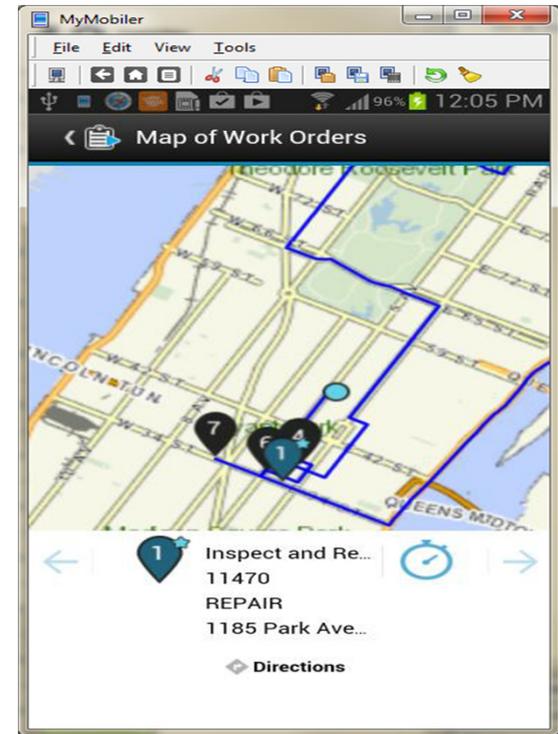
Work List



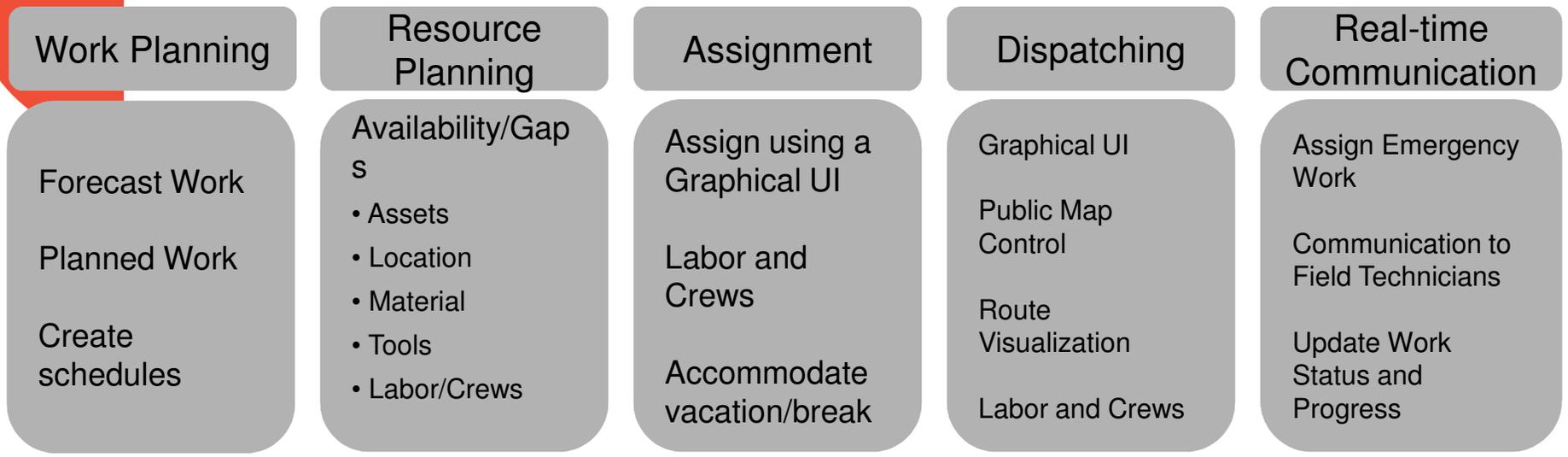
Work Details



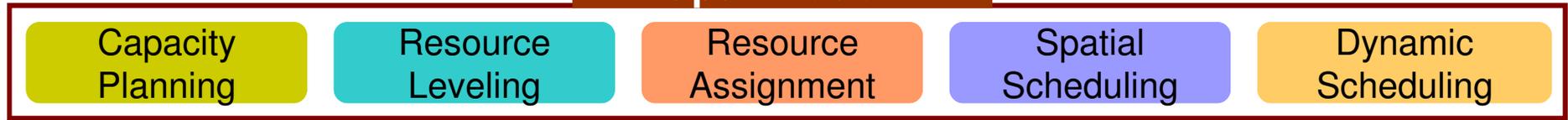
Offline Maps & Directions



Optimization



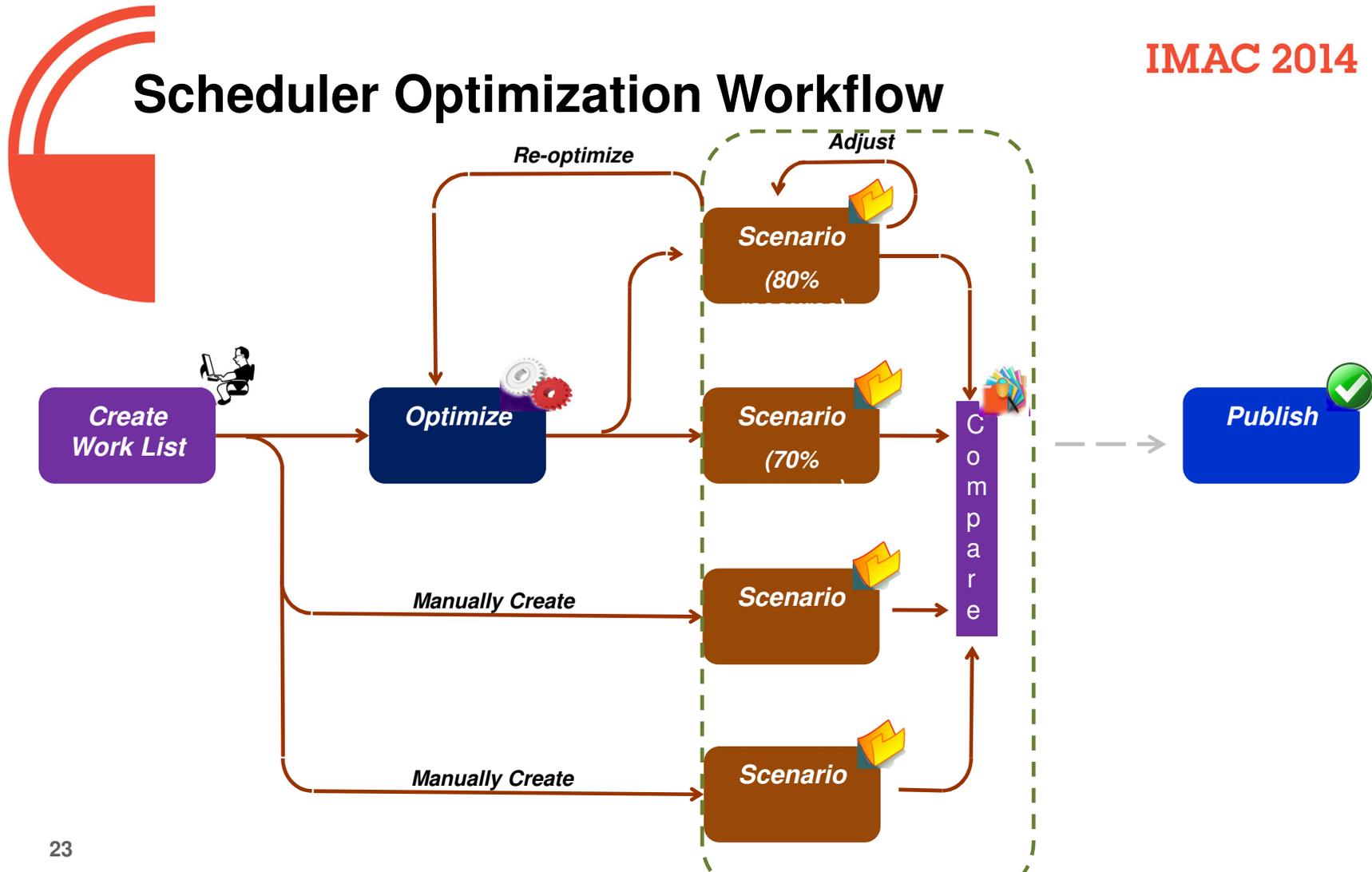
Optimization



Schedule Compliance



Scheduler Optimization Workflow



Scheduler Optimization Models

Capacity Planning and Resource Leveling

Capacity Planning Optimization

Scenario: CAPPLAN Overhead Line Crew Schedule - Optimization

Schedule

Immediate Run in Background Mode?

At this Time Refresh Project Data?

Recurring

E-Mail Address Notification:

* Name: 1022

Constraints **Variables**

Match Skills? Include External Labor and Crew?

Include Priority? Schedule Window?

Last Run

Save Submit Close

Capacity Planning only

Constraints **Variables**

* Enforce Asset Maintenance Schedule: IGNORE

* Enforce Asset Operating Schedule: IGNORE

* Priority Direction: ASCENDING

* Enforce Location Maintenance Schedule: IGNORE

* Enforce Location Operating Schedule: IGNORE

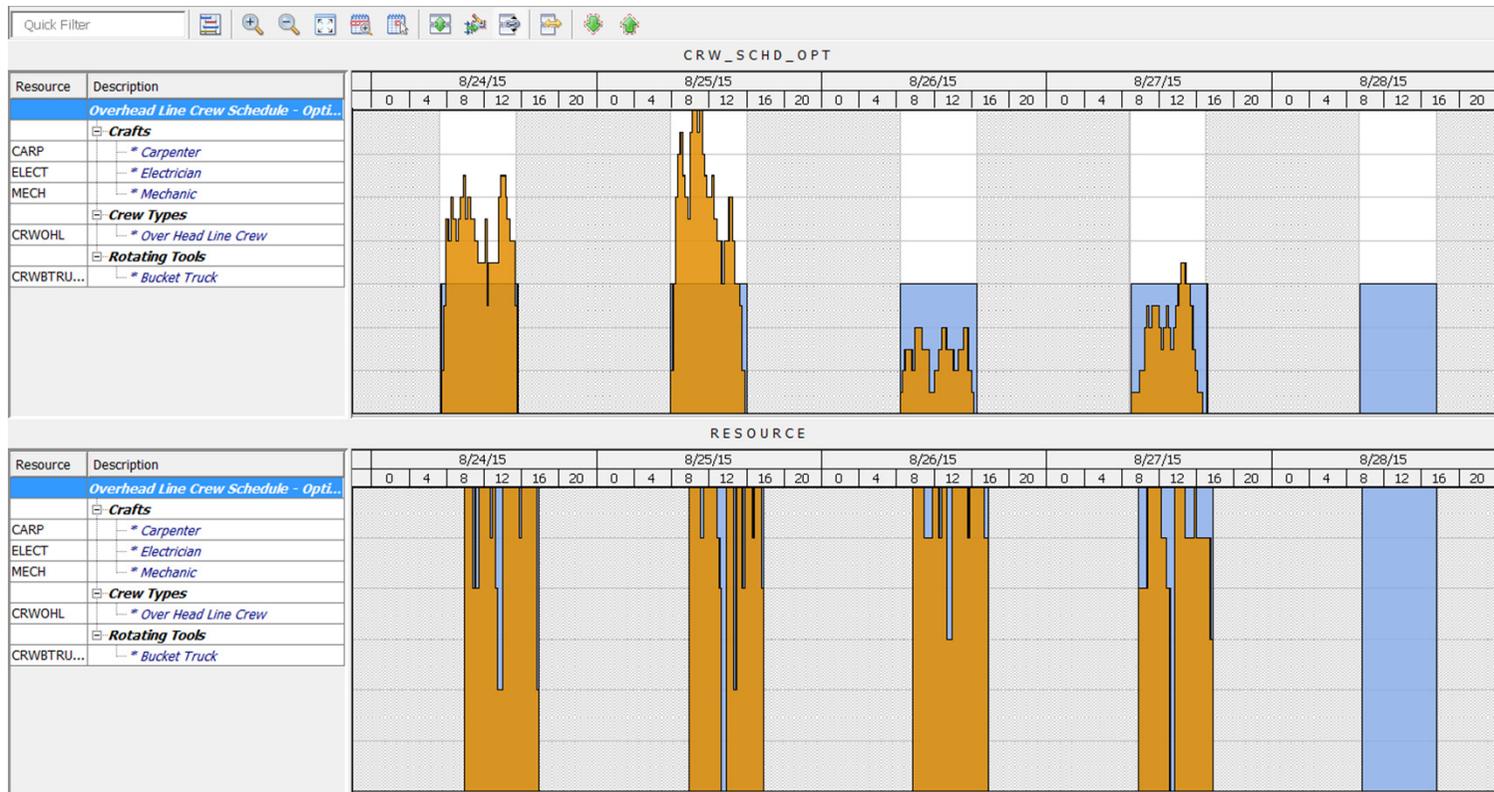
* Resolution Minutes: 60

* End Date:

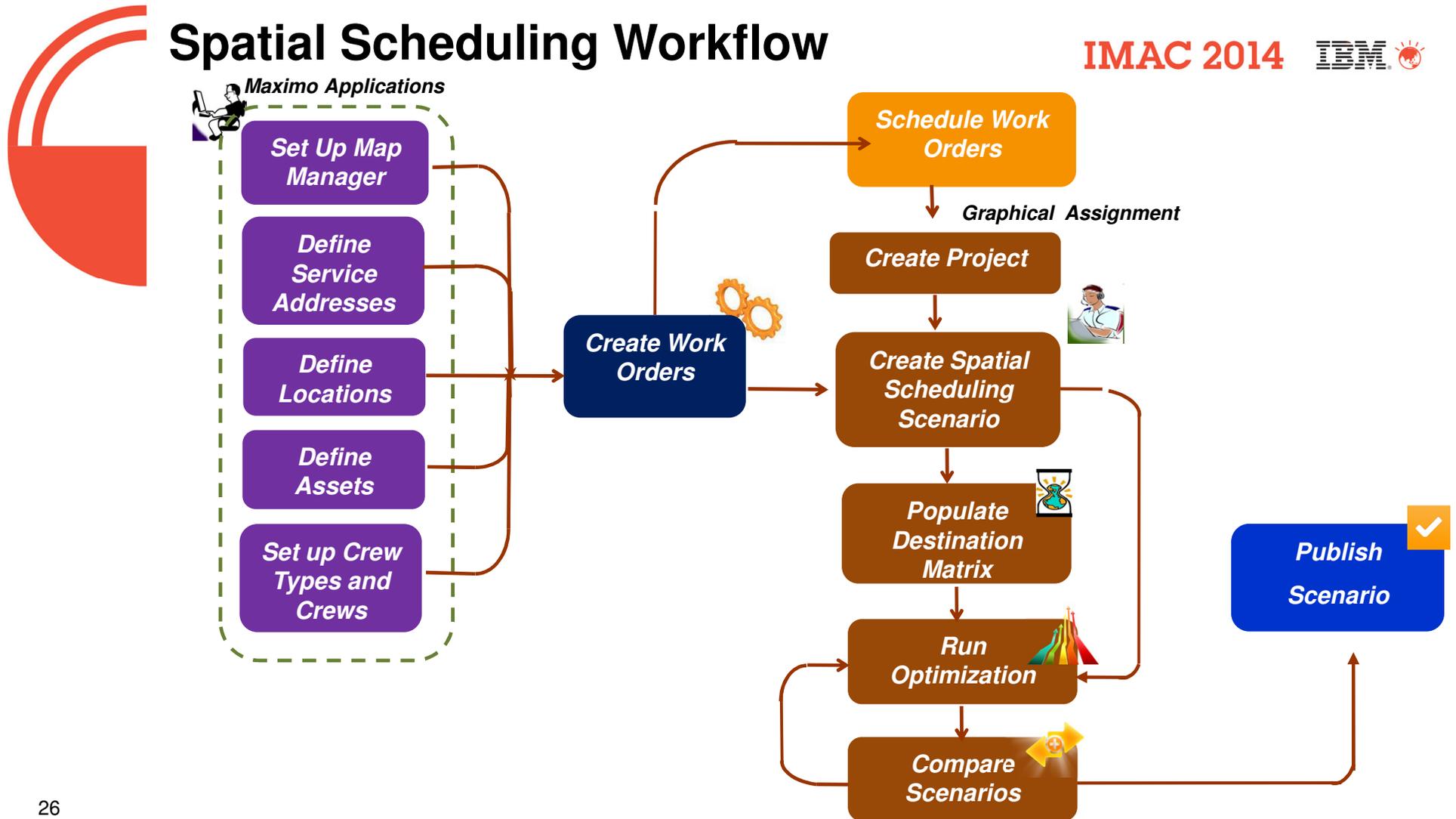


Compare Scheduler Scenarios

Before and after Resource Leveling



Spatial Scheduling Workflow



Assignment Optimization Models

Resource Assignment and Spatial Assignment

Objectives Constraints Variables

Minimize Task Interruptions? Maximize the Sum-product of Prioritized Work Orders? Minimize Travel Time?

Maximize the Number of Assigned Work Orders? Minimize Task Completion Time? Complete High Priority Work First?

Objectives Constraints Variables

Match Skills? Schedule Window? Include Travel Time in Total Time?

* Travel Time Buffer %:

Objectives Constraints Variables

* Enforce Asset Maintenance Schedule: IGNORE * Enforce Location Maintenance Schedule: IGNORE

* Enforce Asset Operating Schedule: IGNORE * Enforce Location Operating Schedule: IGNORE

* Priority Direction: ASCENDING * Resolution Minutes: 60

Spatial Assignment only

Compare Assignment Scenarios



Dynamic Scheduling

- System can automatically assign Emergency work orders to a labor/crew OR users can manually decide who gets the emergency work order

Define Emergency Work Orders

Enter a where clause defining emergency work that should be added to the schedule. Use the scheduling criteria to choose when the query is run and the work assigned.

Scenario: LONDON London Dispatching

Where Condition: (wopriority = 99 and worktype like '%EM%')

Automatically assign?

Auto Assign Resources.

Emergency Work Resource Availability

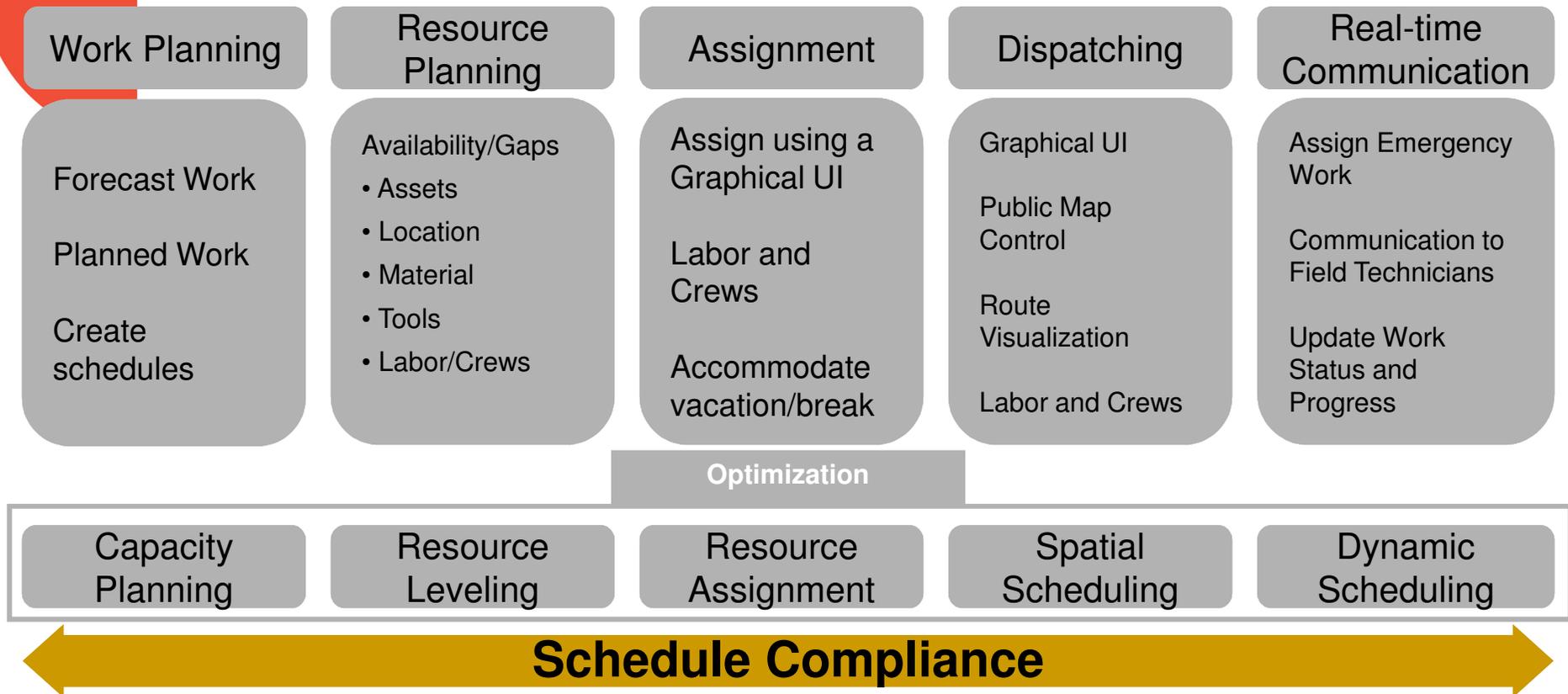
Available Resources Filter 1 - 4 of 4 Download

<input type="checkbox"/>	Work Order	Craft	Skill Level	Labor	Crew Type	Crew	Currently Assigned Work Order	Travel Time
<input type="checkbox"/>	EM1999	CARP	FIRSTCLASS	LONLIBER				0:08
<input type="checkbox"/>	EM1998				LONOHL	LONOHL5		0:09
<input type="checkbox"/>	EM1998				LONOHL	LONOHL3		0:09
<input type="checkbox"/>	EM1998				LONOHL	LONOHL2		0:09

Assign Close

Manually Select the Labor/Crew for the assignment

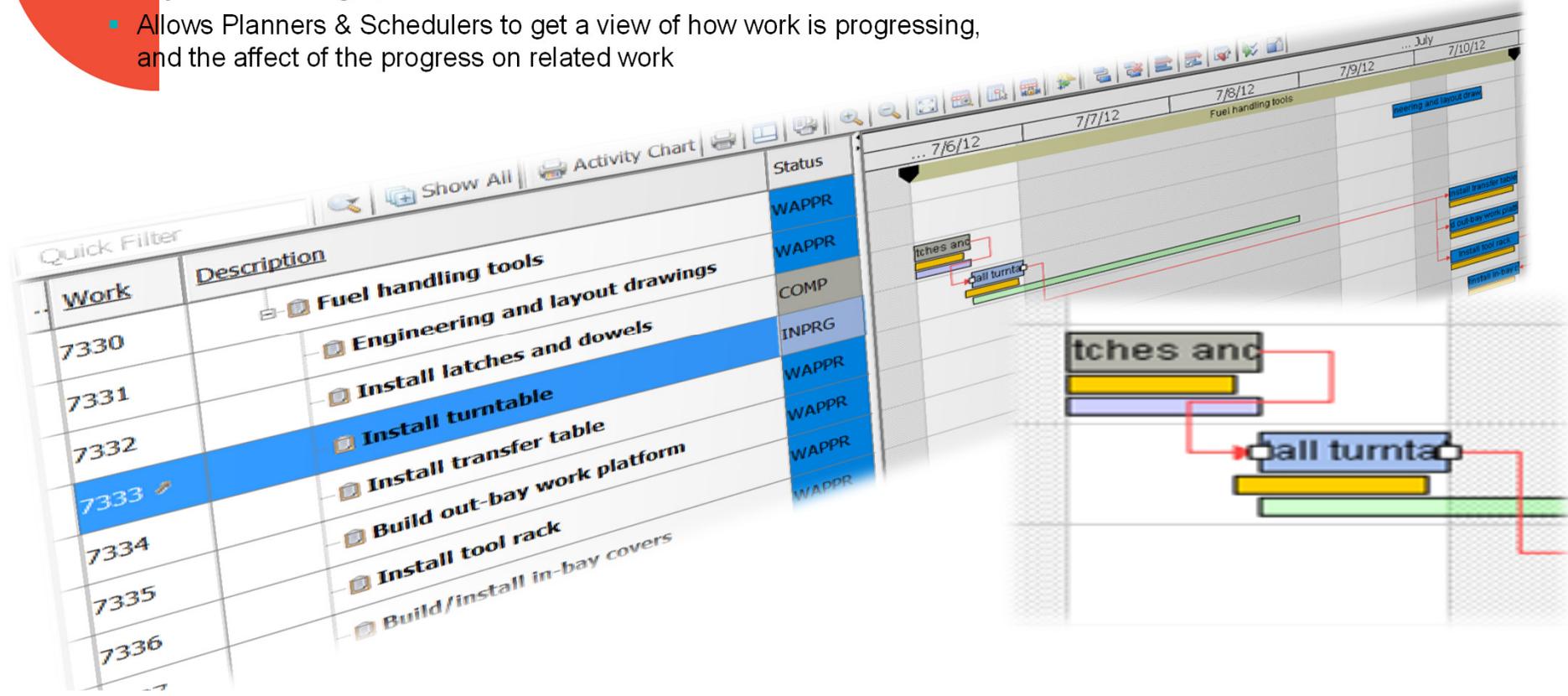
Compliance focus areas



Schedule Progress

The ability to show Target, Scheduled and Actual Dates on the Gantt chart

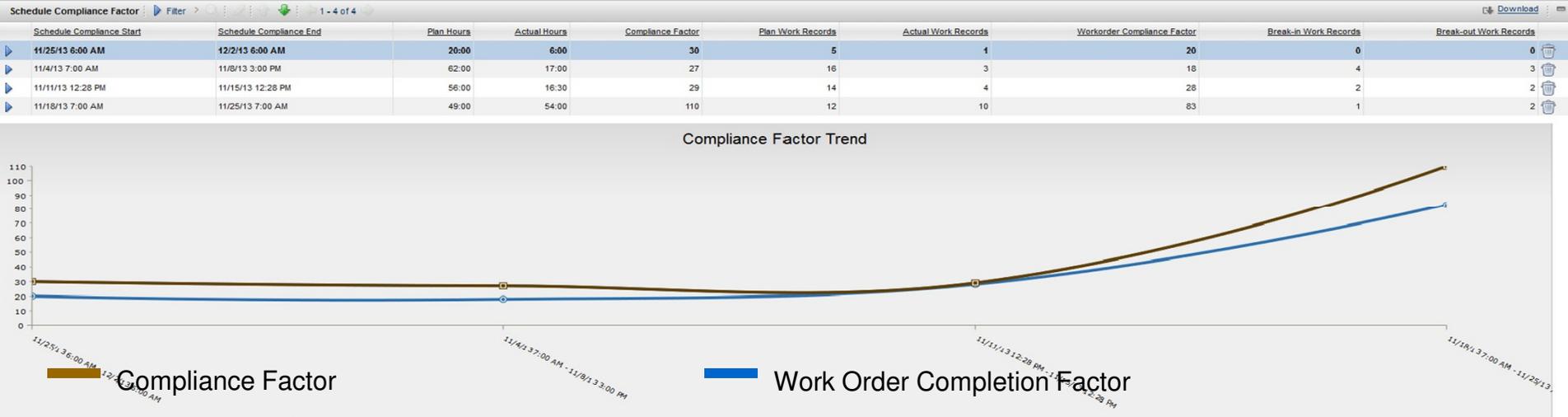
- Allows Planners & Schedulers to get a view of how work is progressing, and the affect of the progress on related work



Compliance Dashboards

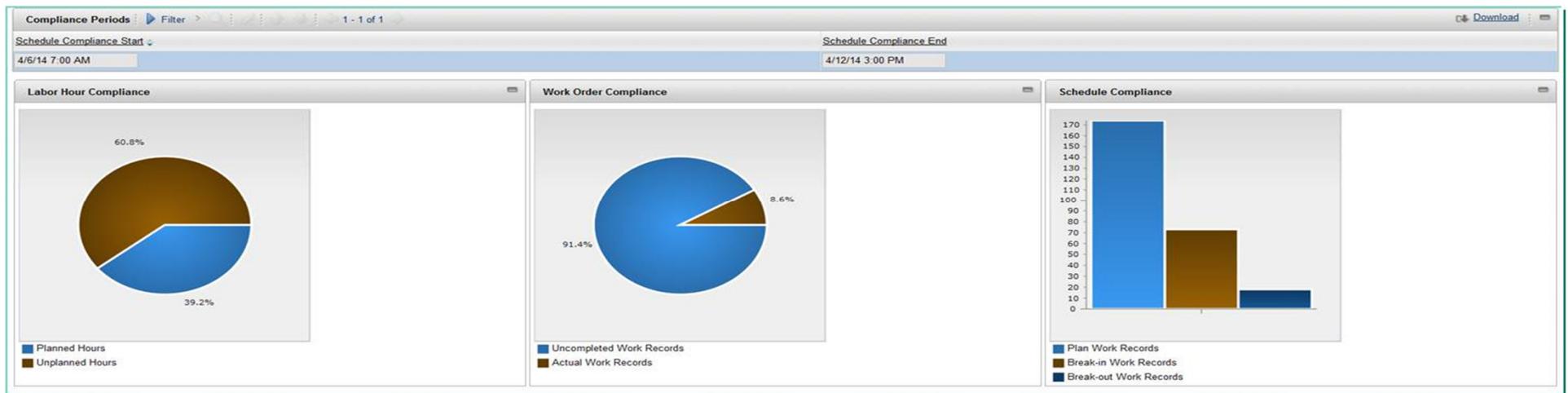
- Measure labor, work order and schedule compliance for any user defined work period

Compliance Factor and Work Order Completion Factor



Compliance Dashboards

- Compare planned vs unplanned hours
- Visibility into completed Work Orders against total Work Orders planned
- Calculate break-in and break-out Work Orders



Maximo Scheduler Pedigree

7.1.X
 Work Orders in a Gantt
 PM Forecasts
 View Labor Load/Avail.

7.5.1
 Work Orders in a Gantt
 PM Forecasts
 View Labor Load/Avail.

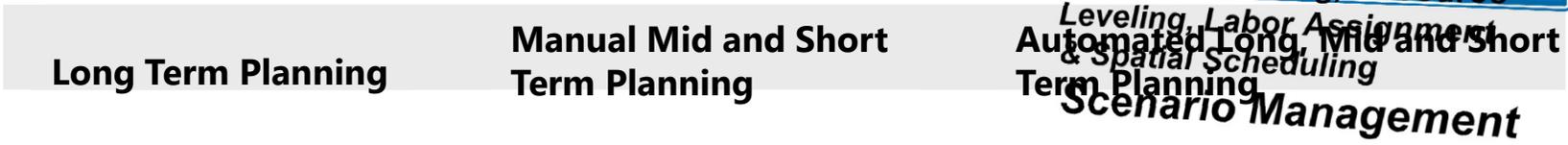
Asset, Location, Tools & Item Avail.
Graphical Assignment
Dispatching
Schedule Compliance

7.5.2
 Work Orders in a Gantt
 PM Forecasts
 View Labor Load/Avail.

Asset, Location, Tools & Item Avail.
Graphical Assignment
Dispatching
Schedule Compliance

Crew Assignment Optimization
Capacity Planning, Resource

Focus Areas:

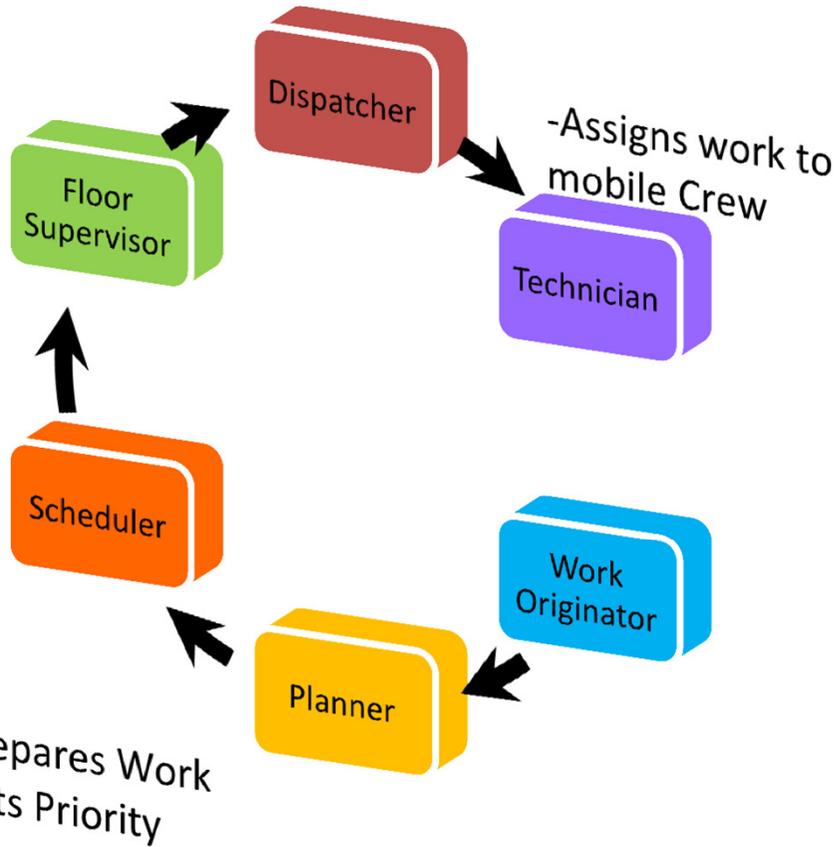


Roles We Accommodate



-Assigns work to Labor

- Identifies Skill
-Prepares weekly/
monthly schedule



-Assigns work to mobile Crew



-Completes Work



- Work Request
- PM Schedules

- Prepares Work
- Sets Priority

Scheduler is part of Maximo Asset Management

**Maximo Asset Mgmt
7.5.0.5**

**Maximo Scheduler
7.5.2**



— *Required for Optimization*

IMAC 2014 IBM

Maximo

- 7.5.0.5 fix pack level

Scheduler 7.5.2

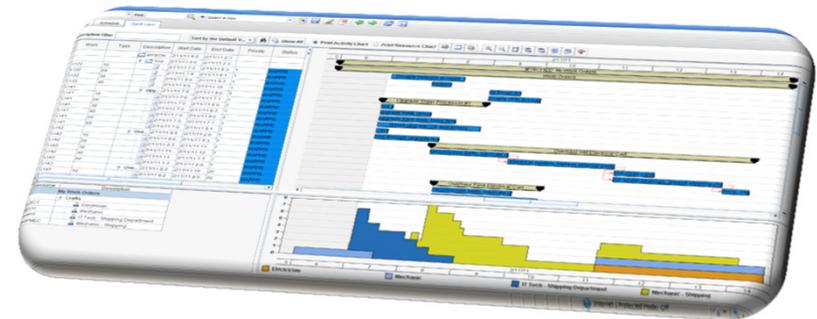
- Add-on product to Maximo EAM, installed when 7.5.0.5 is installed
- Scheduler 7.5.2 license required
- Includes integration adapter and optimization models

ODME Server

- Optional: clients may choose not to use the optimization capability and can skip the ODME installation during the install process

Why Maximo Scheduler?

- **Lower maintenance costs by gaining operational efficiencies**
 - Optimization models transform laborious, manual and time consuming work management tasks into faster, automated processes with meaningful results
 - Quick, easy to perform, and reliable labor assignments help save valuable time
 - Send/receive updates and constantly monitor work progress
 - Respond quickly to emergency situations
- **Improve resource utilization**
 - Know when Assets and/or Locations are unavailable for work to be performed before finalizing a schedule and dispatching resources
 - Dispatchers' awareness of resource location and field conditions translates to greater resource efficiencies when handling unplanned work
- **Embedded in Maximo**
 - Manage all your asset classes, schedule, and resources through leveraging an industry leading EAM system
 - No third party product integrations required





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Location History for Labor/Crews

- When audit table is enabled for LBSLocation then location history for the labor and crews can be displayed on the Map tab in the Labor and Crews applications.

Query Location History

Location History From: 9/23/13 4:00 PM

Minus Hours: 48:00

Find Cancel

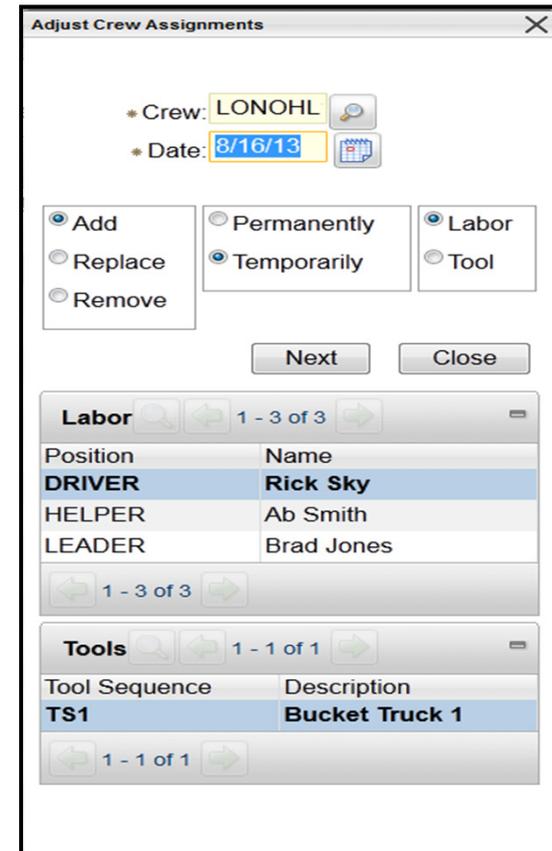
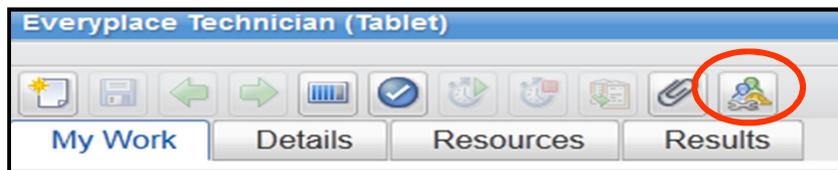
LONHENRY Earl Henry
 Phone: (617) 555-3657
 Shift: DAY
 Supervisor:
 Craft: MECH
 Skill level: FIRSTCLASS
 Last Update: 9/22/13 8:30 AM

Dialog to enter in a Location History Date plus Minus Hours of 0 to 48.

Displays Last Update field from a lbslocation and work order number is configured.

Blue icons are closer to Location History time. Red icons are the furthest in time.

Adjust Crew Assignments



- New icon in the Everyplace Template
 - Also available in Graphical Crew Management
- Quick way to change assignments on a crew and have all conflicts resolved in the background.
- Builds on the New Unrestricted Row functionality available in Crews
- Replace and Remove added