



Yard Management Overview

13 December 2019

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Agenda

- The Value of Yard Management
- Trapeze YardMaster Solution
- Product Roadmap / Screen Shots

A typical day in the life of a bus maintenance garage



The Yard
Walk



Planning
with the
Wrong Data

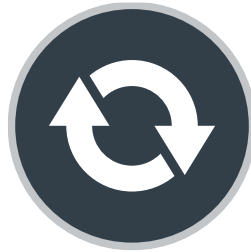


Lost Buses

What does yard management do?



Automates



Integrates



Optimizes

Yard Management Value

Increased Productivity

Optimized Dispatch
Operations

Optimized Maintenance
Operations

Reporting / Analytics

Increased Safety

Yard Management Value

Increased Productivity

Optimized Dispatch
Operations

Optimized Maintenance
Operations

Reporting / Analytics

Increased Safety

- No need for a Yard Walker to manually record parking locations
- Reduces the time Mechanics, Drivers and Fuelers look for vehicles ('lost' vehicles)
- Reduces time spent communicating between Maintenance and Dispatch regarding vehicle location and status
- Reduces the need to manually assign parking
- Reduces manual parking errors and re-parking after pull in
- Reduces the amount of paper used (Green Initiative)

Yard Management Value

Increased Productivity

Optimized Dispatch
Operations

Optimized Maintenance
Operations

Reporting / Analytics

Increased Safety

- Supports On-time Pull Out Compliance
 - Reduces delays in on-time pull outs
 - Avoids dispatching the wrong bus
 - Ability to locate alternate buses quickly when currently assigned bus is not available
 - Reduces blocked vehicles
- Supports Dispatch's ability to assign vehicle parking for the next pull out
- Automatically loads vehicle locations into Trapeze OPS Yard Management scheduling module
- Ability to support remote dispatching

Yard Management Value

Increased Productivity

Optimized Dispatch
Operations

Optimized Maintenance
Operations

Reporting / Analytics

Increased Safety

- Supports fleet maintenance management by mileage
 - Balance vehicle mileage with daily maintenance schedule
 - Balance vehicle mileage with Preventive Maintenance (PM) compliance
 - Optimized maintenance capacity planning
- Prevents vehicles from being dispatched with open work orders
- Ability to manage the balance of spare vehicles
- Ability to integrate to Electric Vehicle charging stations

Yard Management Value

Increased Productivity

Optimized Dispatch
Operations

Optimized Maintenance
Operations

Reporting / Analytics

Increased Safety

- Ability to create and customize reports using Trapeze Viewpoint
 - Powered by Microsoft Power BI
- Realtime report of available vehicles and status
- Time-based maintenance activity reporting
- Supports dynamic playback
- Supports accident reporting
- Provides vehicle parking history when fluid leaks are detected

Yard Management Value

Increased Productivity

Optimized Dispatch
Operations

Optimized Maintenance
Operations

Reporting / Analytics

Increased Safety

- Less time spent looking for vehicles decreases the chance of a pedestrian strike in the yard
- Less time spent re-parking buses reduces the chance for vehicle collisions



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Why Trapeze YardMaster RTLS technology?



ACCURACY

- Real-Time Location Service (RTLS) based on Ultra-Wideband Technology (UWB)
- Provides X/Y position information for each tag
- High accuracy, <1m
- Improved error recovery



EASE OF SETUP

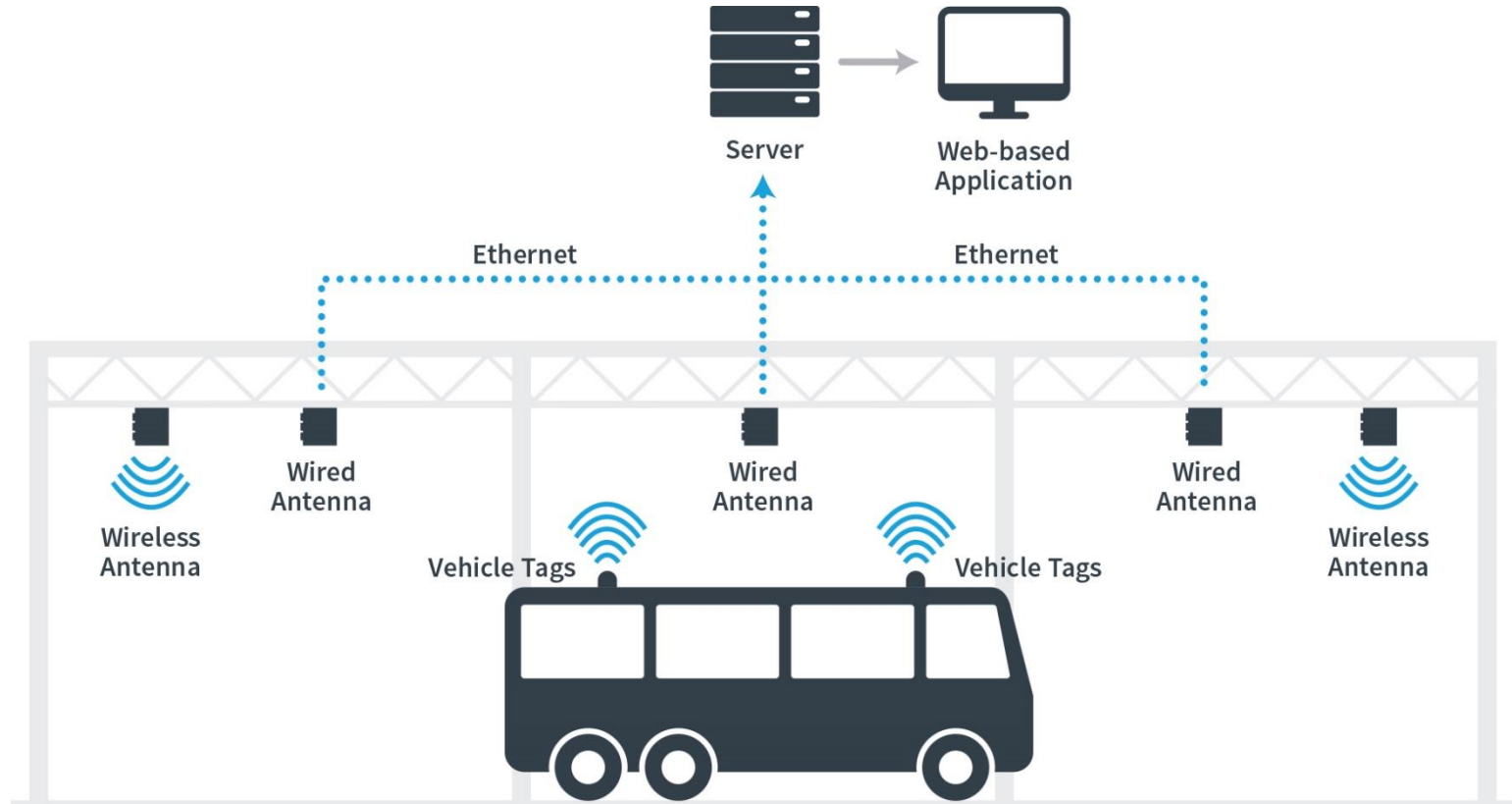
- Self-calibration features
- Suitable for indoor and outdoor use
- Mesh networking capability



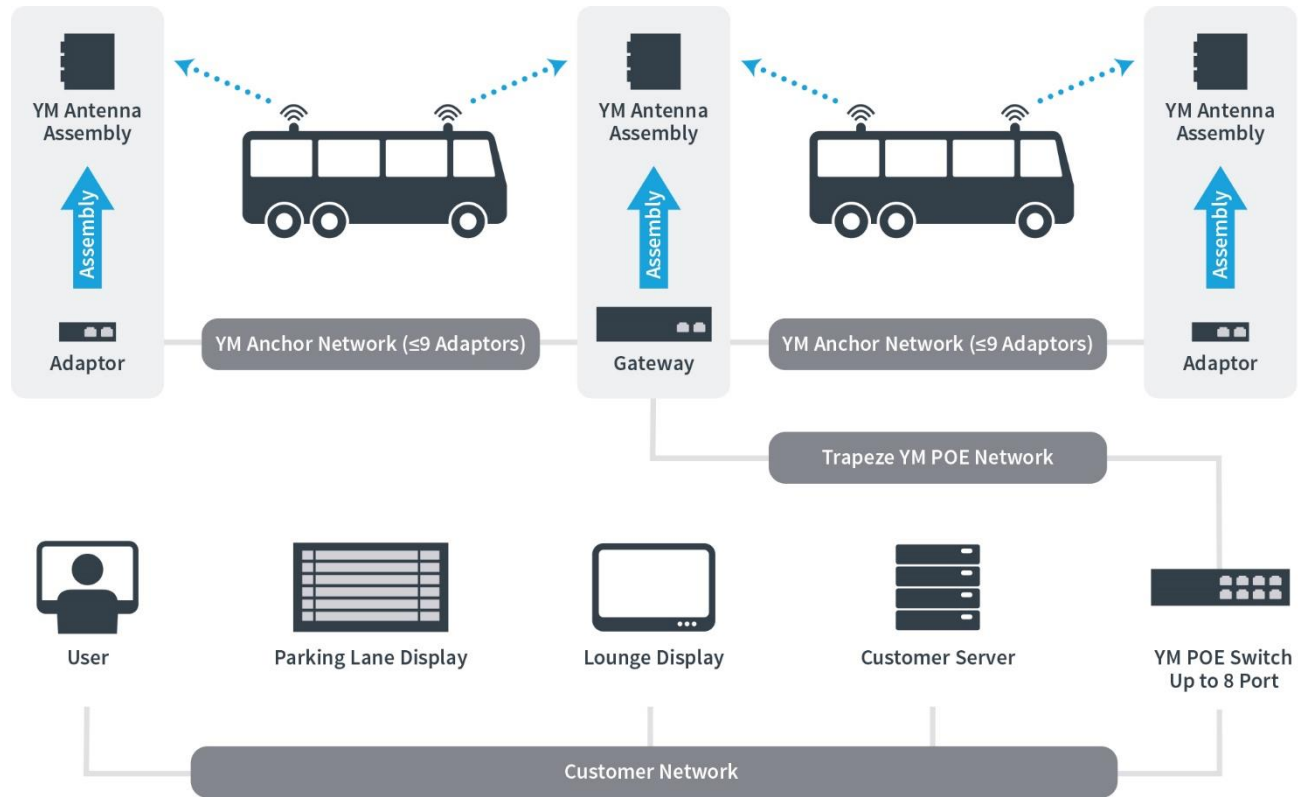
FLEXIBILITY

- Flexibility for changing business rules
- Low power consumption – viability of battery powered tags
- Can be used to track objects other than buses

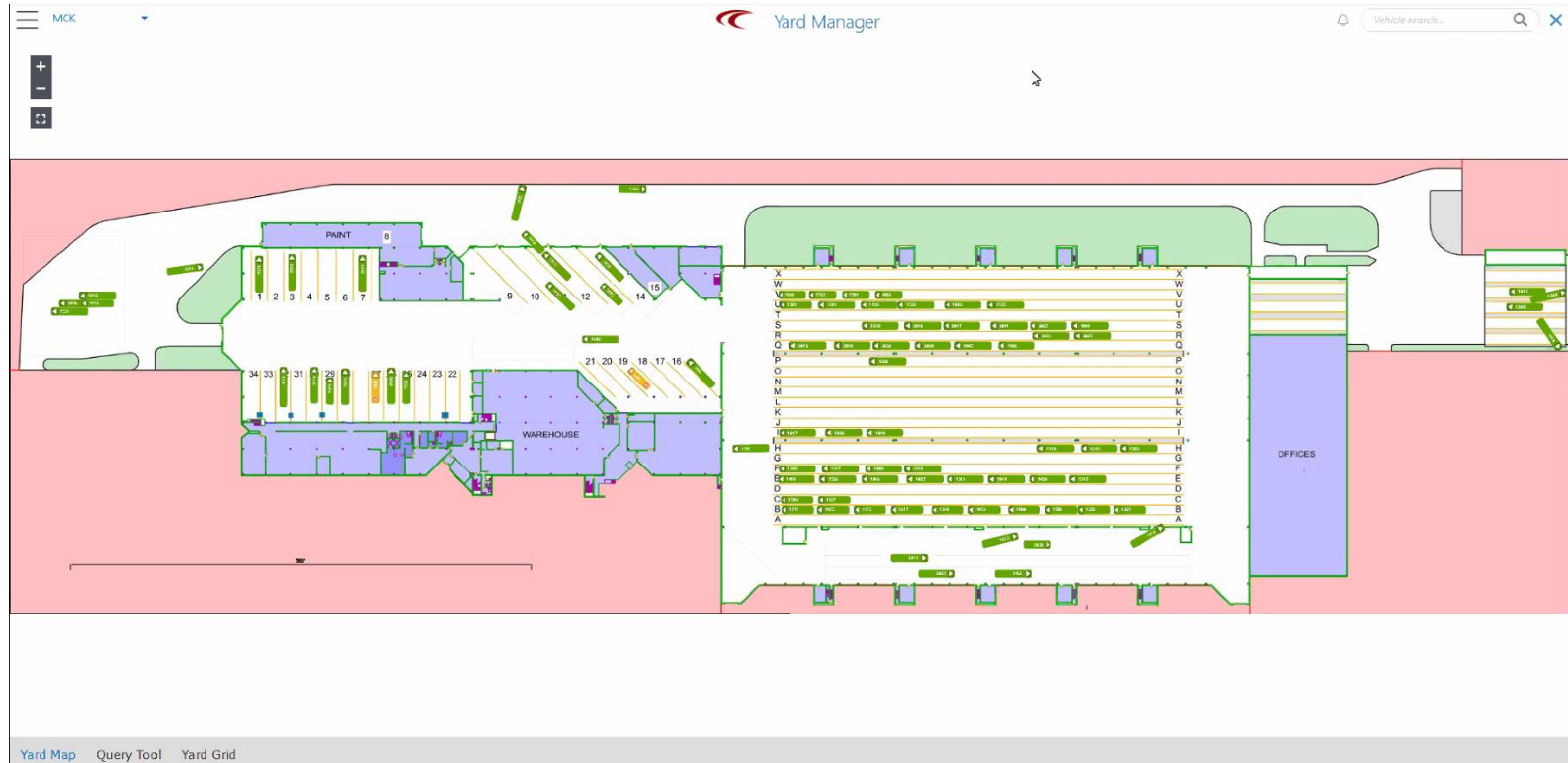
Yard management general overview



Yard management system overview



Yard management facility map example

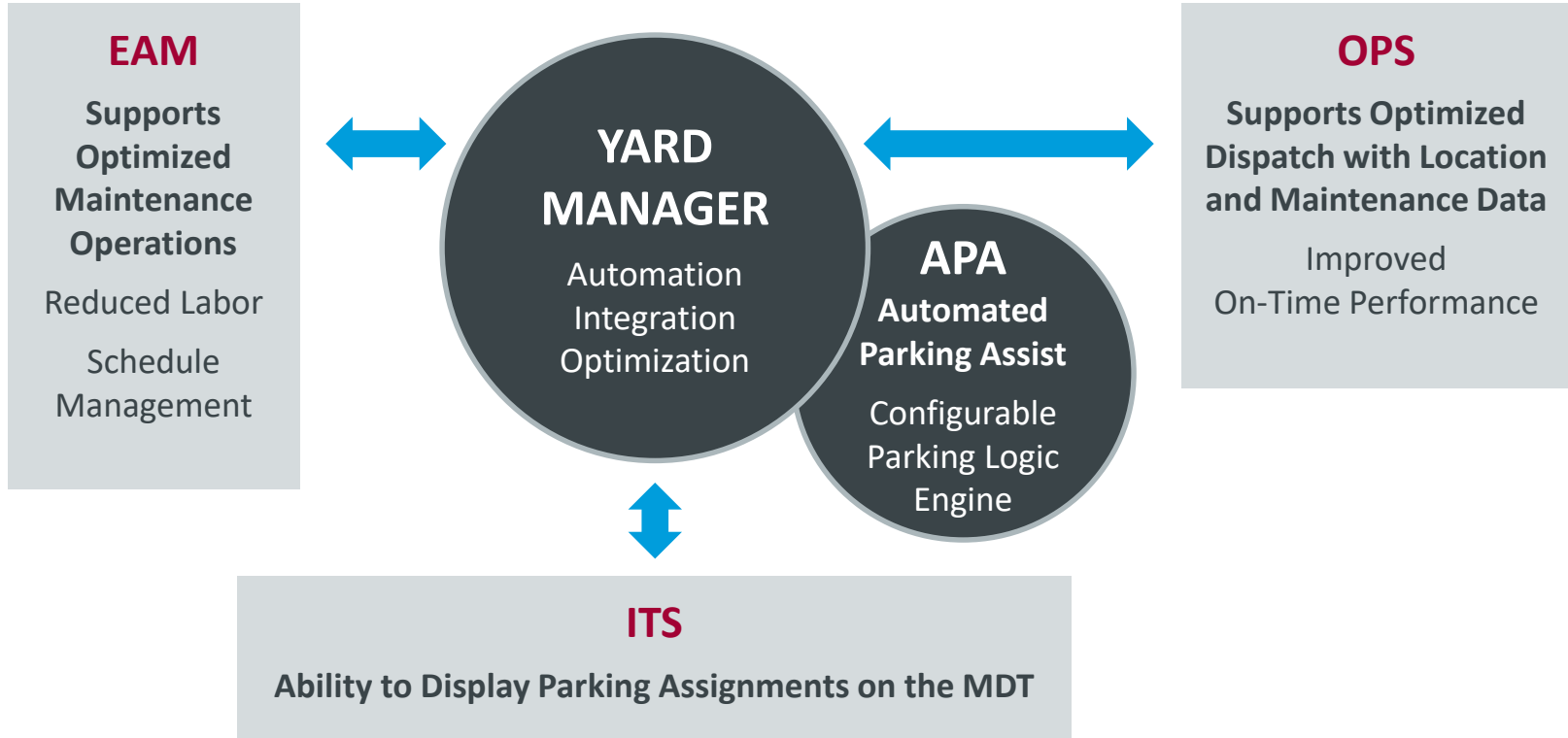


YM Gen2 Sensors



Yard management software

Real-time Situational Awareness Bridges EAM and OPS





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Yard Manager Application – Yard Map

The screenshot displays the Yard Manager application interface. On the left, a schematic map of a facility is shown with various areas labeled: SIT Desks, MAINT, FUEL, AFC, WASH, Tables, and a STAIRWELL. A vehicle with ID 1030 is highlighted on the map. On the right, a sidebar provides detailed information for the selected vehicle 1030, including its status (Not Ready For Service), location (L4 | ALL HANDS), and maintenance history. The sidebar also includes buttons for Fuel, Vault, and Wash, and sections for MAINTENANCE, ACCIDENT, WORK BLOCKS, and VEHICLE DETAILS. A search bar at the top right allows for searching across all facilities.

Facility selection dropdown

Status indicators match selected vehicle

Search across all facilities

Side-bar displaying details for the selected vehicle

Schematic (map) view of the selected facility

ALL HANDS

Yard Manager

Vehicle search...

1030

96 2010 GILLIG

L4 | ALL HANDS

Not Ready For Service

Fuel

Vault

Wash

MAINTENANCE

ACCIDENT

zCoach pulled because of damage

Start 09:00

Finish 09:00

WORK BLOCKS

VEHICLE DETAILS

Yard Map

Yard Grid

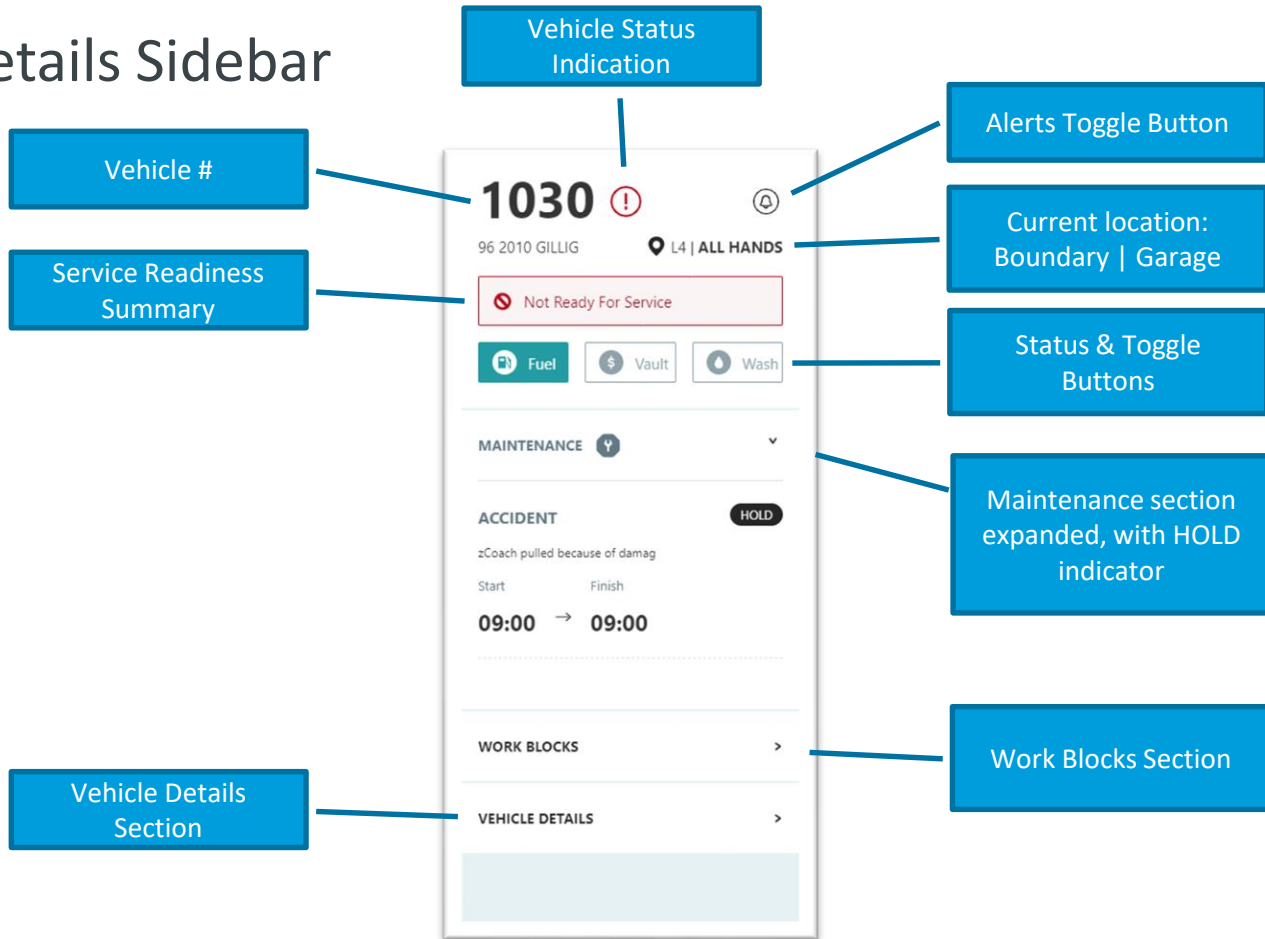
Maintenance

Parking Plans

Report Designer

APA Setup

Vehicle Details Sidebar



Yard Manager Application – Yard Grid

The screenshot displays the Yard Manager application interface. At the top, there is a navigation bar with a menu icon, the text "ALL HANDS", and the "Yard Grid" logo. A search bar on the right contains the text "Vehicle search...".

The main area is a grid with columns labeled "1" through "6" and rows labeled "BUS LANE" with vehicle types: AFC, FB, L1, L2, L3, L4, MB, and WB. Each cell in the grid contains a dashed rectangular box. The L4 row in column 1 is highlighted in blue and contains a black box with the number "1030" and a red warning icon. The L1 row in column 2 contains a black box with the number "1010" and a yellow warning icon. The L2 row in column 1 contains a teal box with the number "1020" and a left-pointing arrow. The L3 row in column 1 contains a teal box with the number "1000" and a left-pointing arrow.

On the right side, a detailed panel for vehicle "1030" is shown. It includes the vehicle ID "1030", the text "96 2010 GILLIG", and a location tag "L4 | ALL HANDS". A red box with a warning icon and the text "Not Ready For Service" is present. Below this, there are sections for "MAINTENANCE" (with a wrench icon), "ACCIDENT" (with a "HOLD" button), and "WORK BLOCKS". The "ACCIDENT" section notes "zCoach pulled because of damag" and shows a time range from "09:00" to "09:00". The "VEHICLE DETAILS" section is also visible.

At the bottom of the application, a navigation bar contains the following items: "Yard Map", "Yard Grid" (highlighted), "Maintenance", "Parking Plans", "Report Designer", and "APA Setup".

Grid Map – Dark View

The screenshot shows a web browser window with the title "YardMGR 19.0.x-20191003-175". The address bar shows the URL "10.219.69.246:5000". The application interface is titled "Yard Grid" and features a dark theme. On the left, a sidebar lists "ALL HANDS" and "BUS LANE". The main area is a grid with 10 columns labeled 1 through 10 and 9 rows labeled AFC, FB, L1, L2, L3, L4, MB, ODZ, and WB. The AFC, FB, MB, and WB rows have green status bars with values 1030, 1020, 1010, and 1000 respectively. The L3 row in column 2 is highlighted with a grey selection box. At the bottom, a navigation bar includes links for "Parking Plans", "APA Setup", "Yard Grid", "Monitor", "Yard Map", "Themes", and "Query Tool".

BUS LANE	1	2	3	4	5	6	7	8	9	10
AFC	1030									
FB	1020									
L1										
L2										
L3										
L4										
MB	1010									
ODZ										
WB	1000									

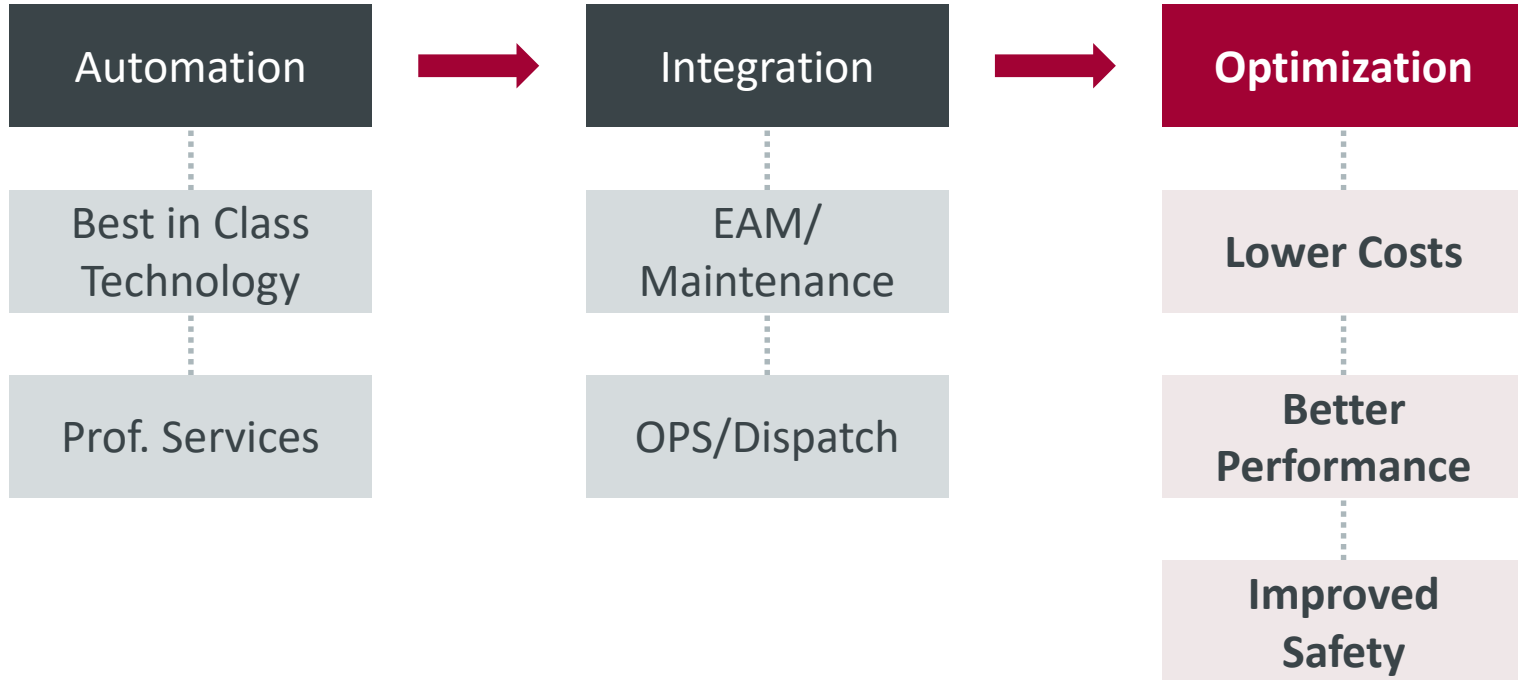
Driver Lounge Display

Colored indicators for late pullout, next 10 minutes

Pages through long lists

9h00				COTA				1/4	
Pullout	Operator	Vehicle	Location	Pullout	Operator	Vehicle	Location		
08:58	BADGE1	Scott, C	4169	09:20	BADGE24	Black, B	4192		
09:00	BADGE2	Slate, B	4170	09:20	BADGE25	Dover, N	4193		
09:01	BADGE3	Bale, D	4171	09:20	BADGE26	Wickliffe, L	4194		
09:01	BADGE4	Bloggs, F	4172	09:21	BADGE27	Loredo, R	4195		
09:01	BADGE5	Jane, M	4173	09:23	BADGE28	Bunyard, R	4196		
09:01	BADGE6	Driver, J	4174	09:25	BADGE29	Borquez, J	4197		
09:02	BADGE7	Flintstone, J	4175	09:25	BADGE30	Stair, C	4198		
09:04	BADGE8	Marrigold, F	4176	09:27	BADGE1	Scott, C	4199		
09:04	BADGE9	Flowers, J	4177	09:27	BADGE2	Slate, B	4200		
09:04	BADGE10	Latch, J	4178	09:27	BADGE3	Bale, D	4201		
09:04	BADGE11	Mire, F	4179	09:27	BADGE4	Bloggs, F	4203		
09:05	BADGE12	Bee, K	4180	ABL17	09:28	BADGE5	Jane, M	4204	ABL24
09:07	BADGE13	May, B	4181	ABL17	09:28	BADGE6	Driver, J	4205	
09:11	BADGE14	Sanders, D	4182	ABL17	09:33	BADGE7	Flintstone, J	4206	
09:11	BADGE15	McGee, D	4183	ABL17	09:36	BADGE8	Marrigold, F	4207	
09:11	BADGE16	Daniels, P	4184	ABL17	09:37	BADGE9	Flowers, J	4208	
09:12	BADGE17	Spencer, F	4185	ABL14	09:38	BADGE10	Latch, J	4209	
09:12	BADGE18	Wood, C	4186	09:41	BADGE11	Mire, F	4210		
09:12	BADGE19	Spencer, T	4187	09:43	BADGE12	Bee, K	4211	ABL23	
09:15	BADGE20	Horton, G	4188	09:43	BADGE13	May, B	4212		
09:15	BADGE21	Reynolds, D	4189	09:43	BADGE14	Sanders, D	4213		
09:18	BADGE22	Wrobel, K	4190	09:46	BADGE15	McGee, D	4214		
09:18	BADGE23	Crafton, C	4191	09:46	BADGE16	Daniels, P	4215		

Summary: Why trapeze yard management?





Questions?

Thank You | Discussion

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