



Zebra Enterprise Solutions



Automated Container Tracking and Equipment Monitoring

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The world has changed

Then



Now

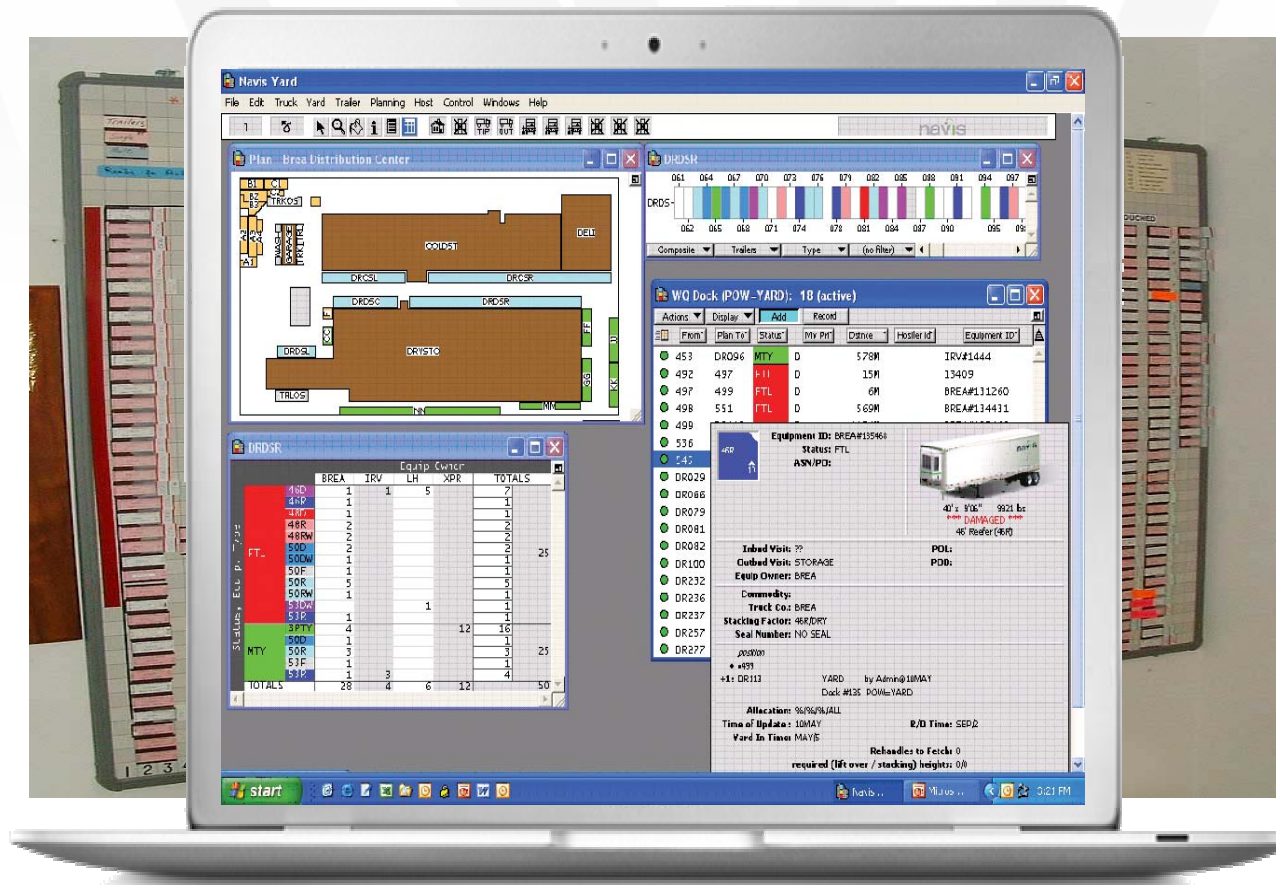


Ships

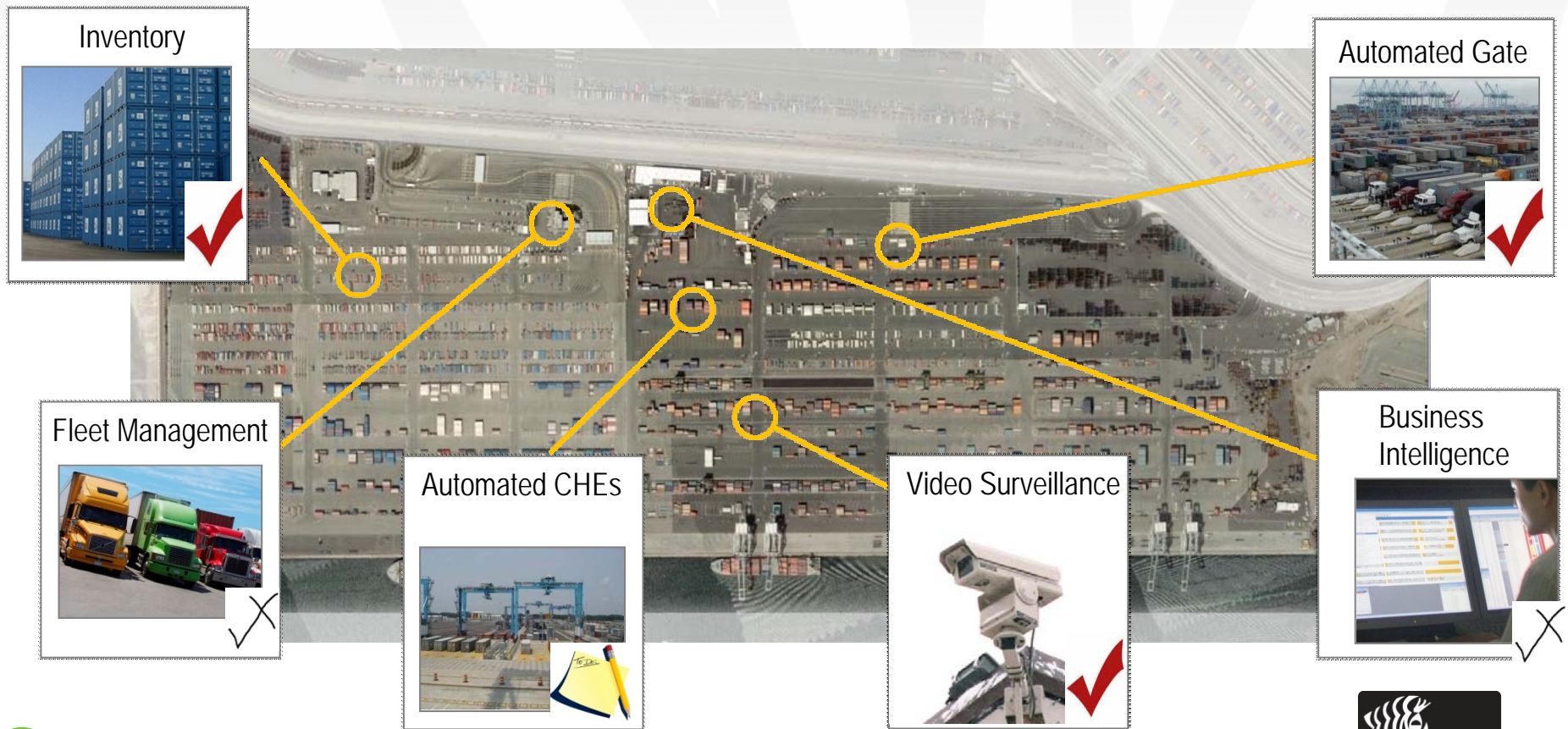


Technology

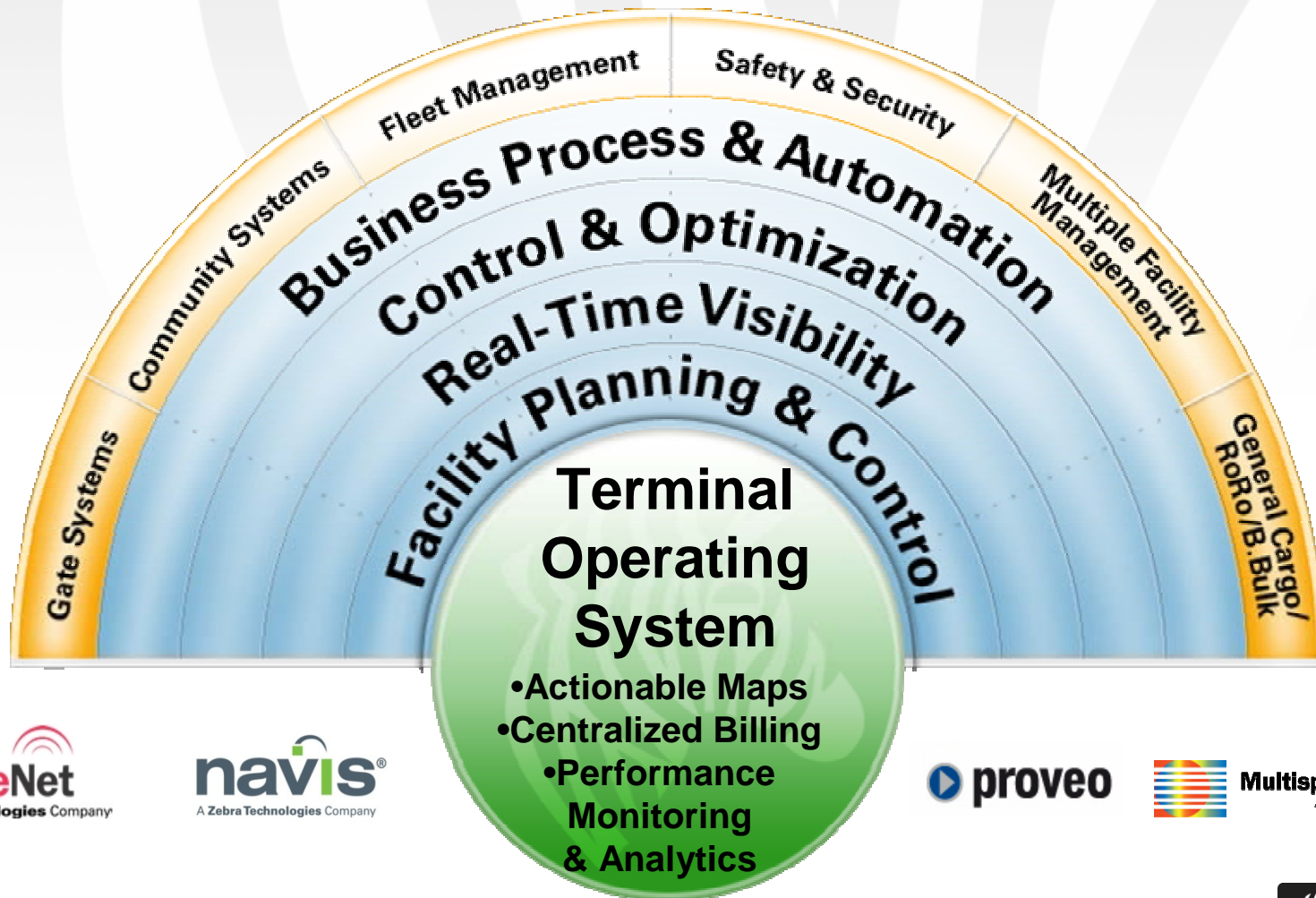
NOW
Then



Bringing it all together

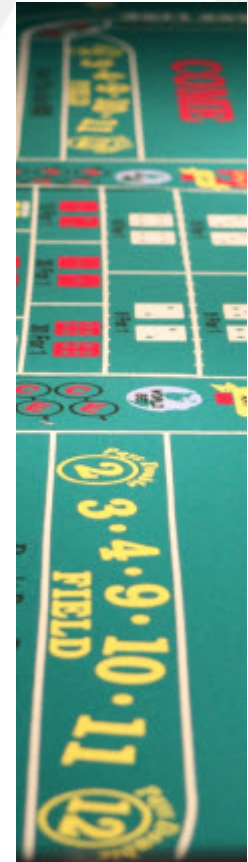


An Integrated Approach to Terminal Management



Stack the Odds in Your Favor

- **Operations - involve early in the project**
 - » The business process will change
 - » Exception cases must be part of the process
- **Deliverables - break the project into phases**
 - » Big bang leads to big chaos
 - » Early wins build confidence
- **Deadlines - must be realistic & achievable**
 - » Business process re-engineering takes time
 - » You can't blow the dependencies and hit the end date
- **Synergy – requires a coordinated effort**
 - » Multiple departments must work together to win
 - » Multiple vendors must exchange data and synchronize deliverables



Container Management

Automated Container Tracking

- **Gate – Street Truck – Handling Equipment - Stack**
- Quay - Yard Truck – Handling Equipment - Stack

LA/LB Gate Access and Truck Tracking



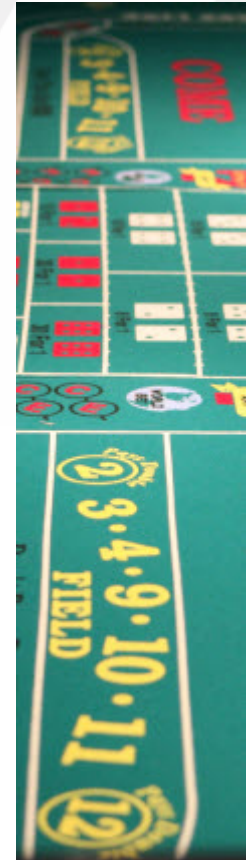
Positive ID on Entry/Exit

- RFID automates validation of trucker data for registered truckers
- Facilitates administration of the Clean Truck Program



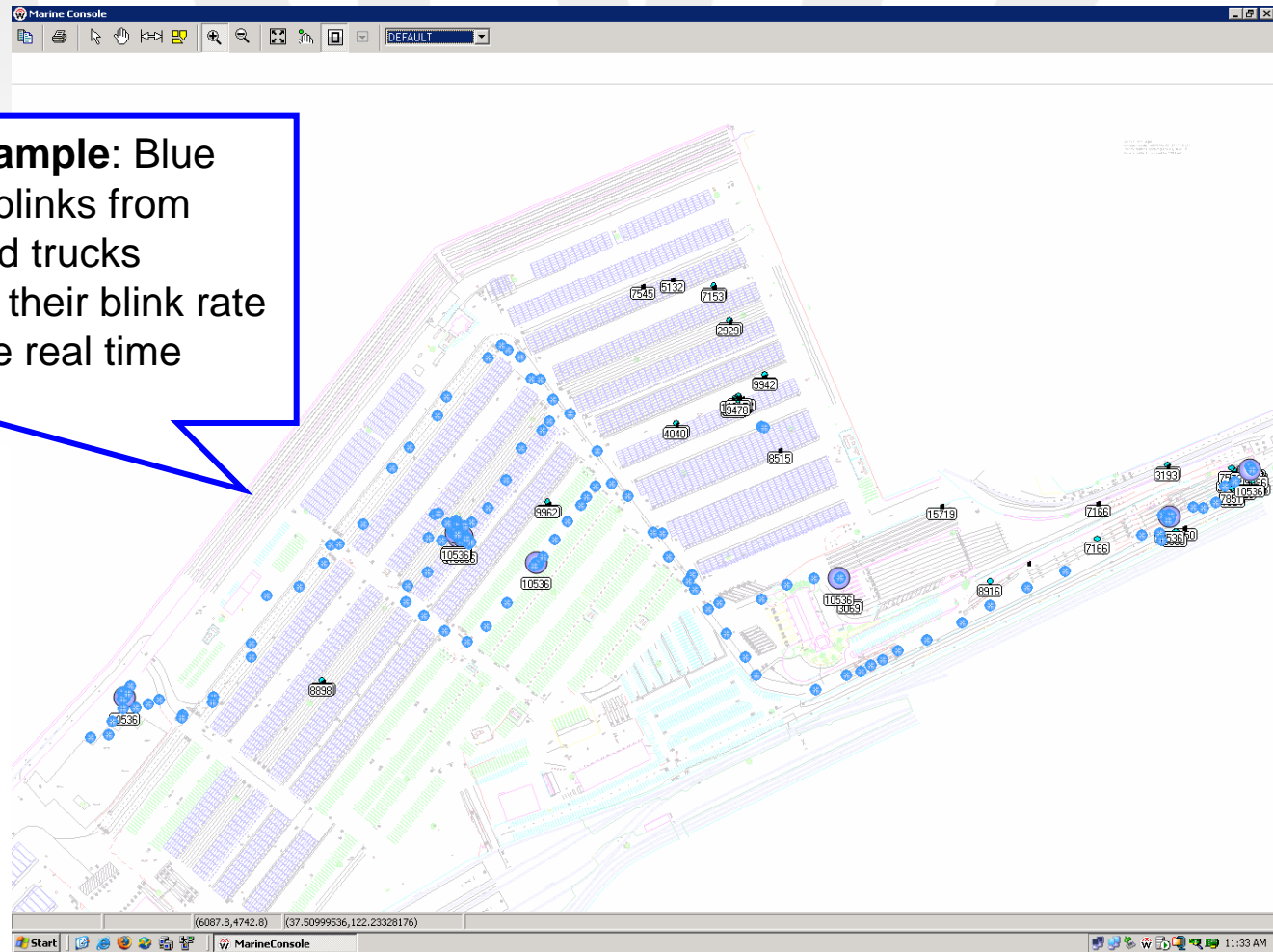
At Least Seven Players

1. Pier Pass /Port Check
 - » Administrator and fee collection
2. Emodal
 - » Port Community System
3. Port Authorities
 - » Trucker Concessions
4. Natomas
 - » Truck emissions database
5. Zebra
 - » RFID tags, infrastructure and tracking software
6. Truckers
 - » Register, data entry, apply tags
7. Terminals
 - » IT & Operations



Monitor Street Truck Location in The Yard

Locate Accuracy Example: Blue dots indicate “locate” blinks from tagged Over The Road trucks (OTR). Tags increase their blink rate when onsite to provide real time location tracking.



Confirm OTR/CHE Container Transition

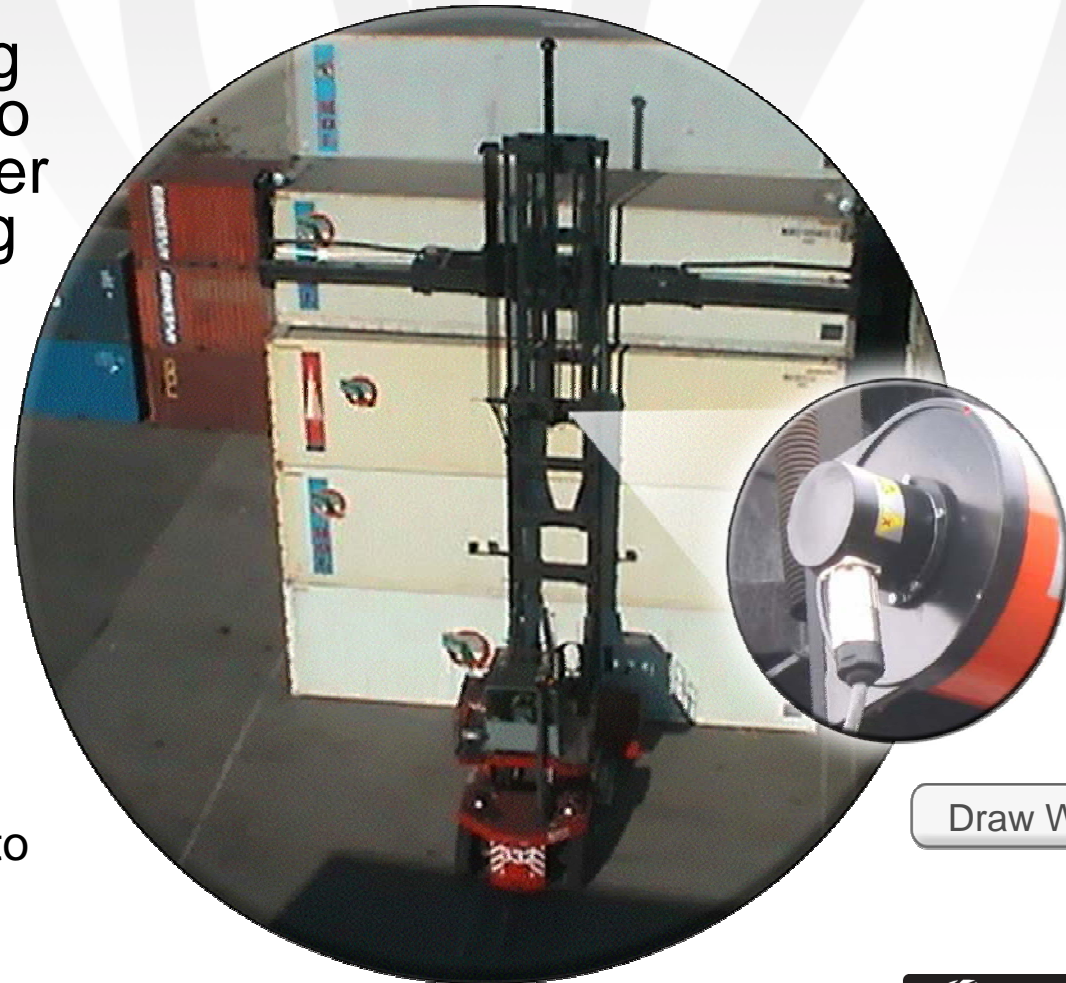
- Tag “Exciter” on leg of RTG
- Identifies the truck to be serviced and assists in matching the correct container



Final Container Position in the Stack

The Container Handling Equipment is outfitted to enable Precise container tracking without tagging the container.

1. PLC data provides lock/unlock
2. Draw wire provides height (z) for the lock/unlock
3. Position Detection System (PDS) integrates location and sensor data
4. Software provides a container position update to the Terminal Operating System (TOS)



Draw Wire

Equipment Efficiency Manager

Equipment Monitoring

- **Collect key sensor and status data from machines**
- **Automate key yard processes**



Fleet Management



- **Machine Telemetry**
 - » Collect key usage & status data from machines
 - » Identify faults or alerts before damage results
- **Equipment Tracking**
 - » Where is the equipment now?
 - » Where has the equipment been?
- **Maintenance Management**
 - » Manage maintenance alerts
 - » Manage maintenance based upon usage
- **Access Control Management**
 - » Limit use to authorized operators
 - » Link operators to equipment (type, size, application)

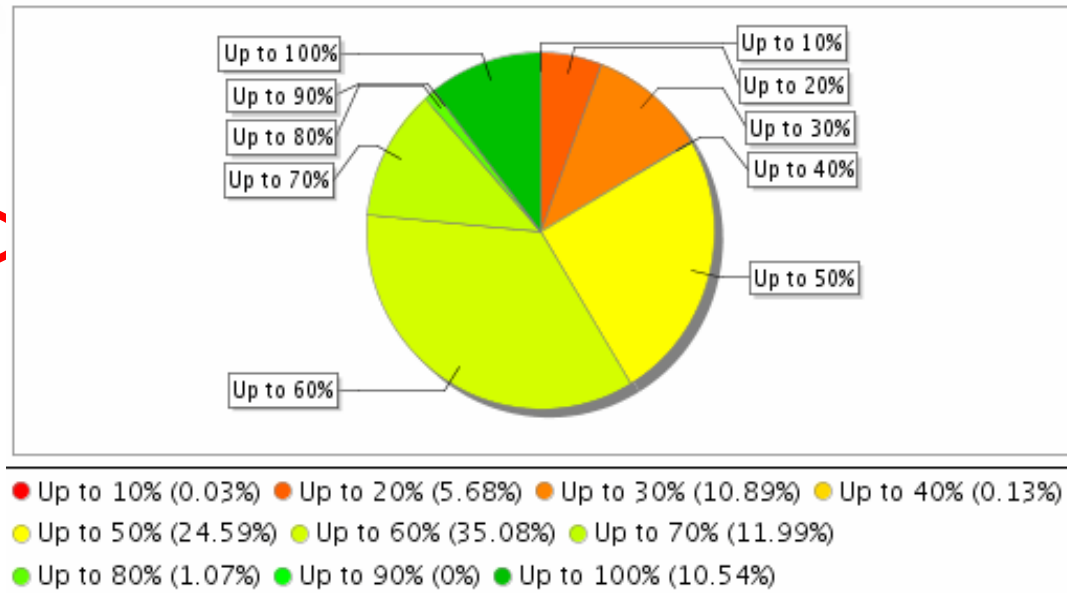


Optimized fuel process

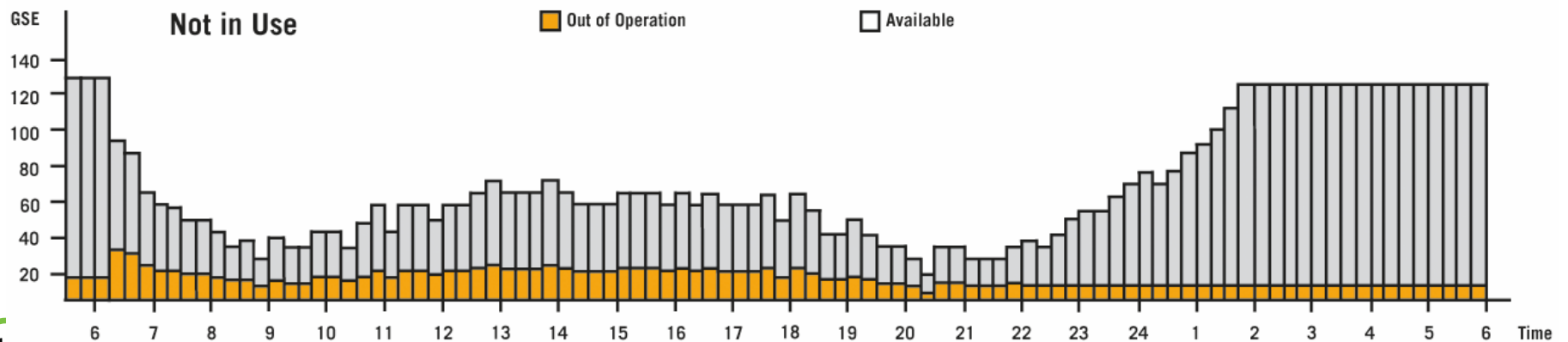
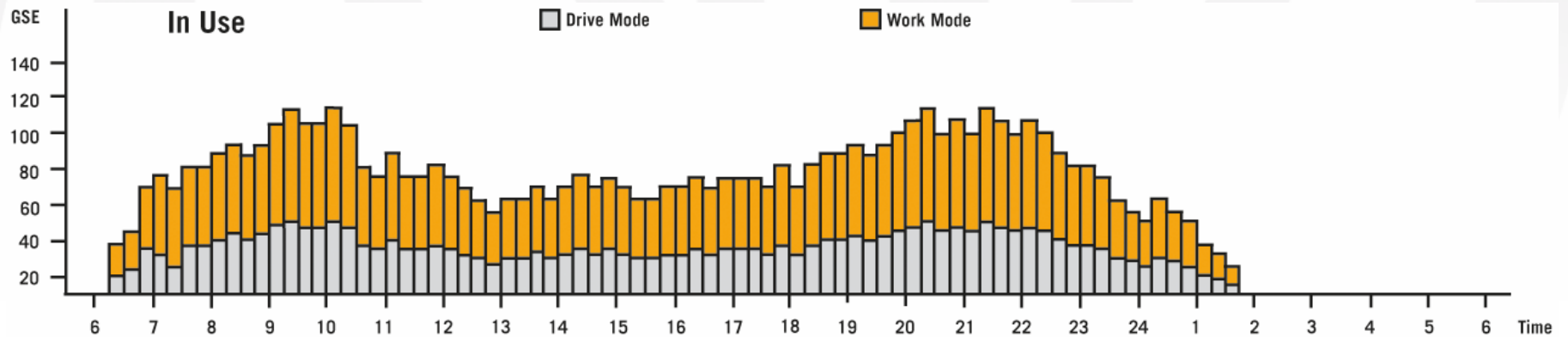
Name	LM06-07	Group	Aircraft Tractor
Area	25 (25)	Since	22 Oct 08 12:22:12 0 00:10:07
GPS	47° 58.3139' E, 29° 14.2713' N		
Speed	1	km/h	
Moving Direction	24	degree (North/East)	
Online Status	online	Since	22 Oct 08 12:20:49 0 00:11:30
Operation Stat...	work mode	Since	22 Oct 08 12:22:12 0 00:10:07
Engine Status	runs necessarily	Since	22 Oct 08 11:59:56 0 00:32:23
Fuel Status	below 90%	Since	21 Oct 08 18:45:54 0 17:46:25
Service Status	in operation	Since	07 Oct 08 15:35:24 14 20:56:55
Assigned Status	assigned	Since	18 Oct 08 08:15:58 4 04:16:21
Push/Tow	push	Since	22 Oct 08 10:21:37 0 02:10:42

- » Identify and reduce equipment idle time
- » Increase fleet availability
- » Avoid re-fueling all equipment at shift start/stop
- » Avoid un-expected outages

Fuel Status



Equipment Utilization Charts



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Driver Accountability

- » Savings on repairs due to vandalism or accidents
- » Accountability of the driver linked to a CHE
- » Role assignment
- » XY impact with shock sensor

Name	GSE Operator	Start Area	Start Time	End Time	End Area	Duration
T32	Lewis R.	B23	21.02.08 07:03:09	21.02.08 07:04:35	B23	00:01:26
T32	Lewis R.	B23	21.02.08 07:13:54	21.02.08 07:22:14	A15	00:08:19
T32	Lewis R.	A15	21.02.08 07:24:37	21.02.08 07:27:37	B30	00:03:00
T32	Lewis R.	B30	21.02.08 07:47:25	21.02.08 07:49:00	B30	00:01:35
T16	Lewis R.	A13	21.02.08 21:08:56	21.02.08 21:30:07	A13	00:21:10

Name	GSE Operator	Start Area	Start Time	End Time	End Area	Duration
T16	Wood M.	A13	21.02.08 07:27:51	21.02.08 07:31:01	A11	00:03:10
T16	Thomson O.	A11	21.02.08 07:44:24	21.02.08 07:51:06	A13	00:06:42
T16	Meath U.	A13	21.02.08 16:28:02	21.02.08 16:28:04	A13	00:00:01
T16	Roberts I.	A13	21.02.08 16:28:13	21.02.08 16:33:48	E	00:05:34
T16	Roberts I.	E	21.02.08 16:37:41	21.02.08 16:39:27	E	00:01:45
T16	Roberts I.	E	21.02.08 16:51:53	21.02.08 16:54:00	B21	00:02:07
T16	Kinlan K.	B21	21.02.08 17:12:27	21.02.08 17:13:56	A13	00:01:28
T16	Lewis R.	A13	21.02.08 21:08:56	21.02.08 21:30:07	A13	00:21:10



Safety & Compliance Check list

Asset Viewer

Logged in as proveoadmin | Preferences | Log out

Operations GSE Facts Maintenance Administration

SCL Inspection Overview | Now | All GSE Units

Concerns >0 SCL Status --- Usable ---

Name	GSE Type	Body No	SCL Status	# Concerns	Usable	Operation Status	Op Status Date	Duration	Icon
355	Forklift	10097	Red	2	No	In Service	10/11/08 9:14 AM	1732:04:07	+
398	Forklift	74532	Yellow	1	Yes	Out of Service	10/10/08 3:10 PM	1905:32:13	+
502	Forklift	95858	Yellow	3	Yes	Out of Service	9/1/08 9:30 PM	2510:02:01	+
719	Forklift	13129	Green	1	Yes	In Service	9/13/08 7:45 PM	2344:59:01	+

Create/Edit Safety Question

Name: Check Tires

Description: Check tire condition and pressure

Question: Tires OK?

Random Order:

Response 1: Yes Not Usable Driver Message:

Response 2: Low Air Not Usable Driver Message:

Response 3: Flat Not Usable Driver Message: See Maintenance

Back Save

Manage Safety Checklist

Checklist Name: Forklift Electric SCL

Description: Electric HiLo Safety Checklist

Equipment Type: Forklift Electric

Completion Time: Once Start of Operating Period

Alt Driver Must Perform Inspection:

Operating Period Duration (HH:MM): 8 30

Grace Period (MM:SS): 3 30

Random Order:

Available Safety Questions (15):
 Safety Question 4
 Safety Question 5
 Safety Question 7
 Safety Question 10
 Safety Question 11
 Safety Question 12
 Safety Question 13
 Safety Question 15
 Safety Question 16

Selected Safety Questions (7):
 Safety Question 1
 Safety Question 2
 Safety Question 3
 Safety Question 6
 Safety Question 8
 Safety Question 9
 Safety Question 14

Up Dw

Back Save



Performance

Operation Status

14.04.08



LM06-01 - Pushback



Status	Begin Date↑	End Date	Duration	Remark
Available	14.04.08 00:00:00	14.04.08 01:45:04	01:45:04	
Drive Mode	14.04.08 01:45:04	14.04.08 01:50:32	00:05:28	
Available	14.04.08 01:50:32	14.04.08 01:52:16	00:01:43	
Drive Mode	14.04.08 01:52:16	14.04.08 01:58:36	00:06:20	
Standby	14.04.08 01:58:36	14.04.08 02:23:28	00:24:51	
Work Mode	14.04.08 02:23:28	14.04.08 02:27:24	00:03:55	
Drive Mode	14.04.08 02:27:24	14.04.08 02:31:14	00:03:50	
Available	14.04.08 02:31:14	14.04.08 02:31:39	00:00:24	
Drive Mode	14.04.08 02:31:39	14.04.08 02:40:26	00:08:47	
Available	14.04.08 02:40:26	14.04.08 04:32:22	01:51:56	

Engine Status

14.04.08



LM06-01 - Pushback



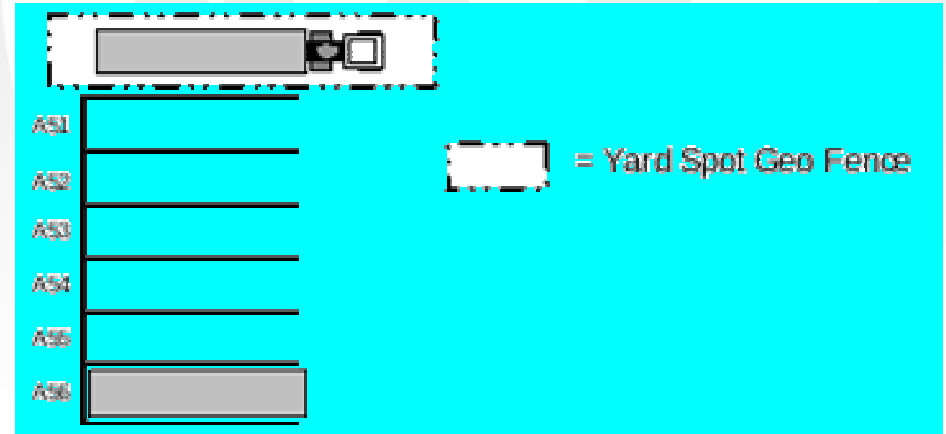
Status	Begin Date↑	End Date	Duration
Engine Off	14.04.08 00:00:00	14.04.08 01:45:04	01:45:04
Runs Necessarily	14.04.08 01:45:04	14.04.08 02:40:26	00:55:22
Engine Off	14.04.08 02:40:26	14.04.08 04:32:22	01:51:56



Contship Italia

Value

- ✓ Equipment Efficiency
- ✓ Take F1 away from driver
- ✓ Consistent data for Prime Route
- ✓ Reduce idle time when combining with RTG position information



At Least Six Players

1. Operations

- » Business process changes for equipment maintenance, re-fueling,

2. IT

- » Server setup and wireless connectivity

3. LXE

- » Wireless provider

4. Zebra

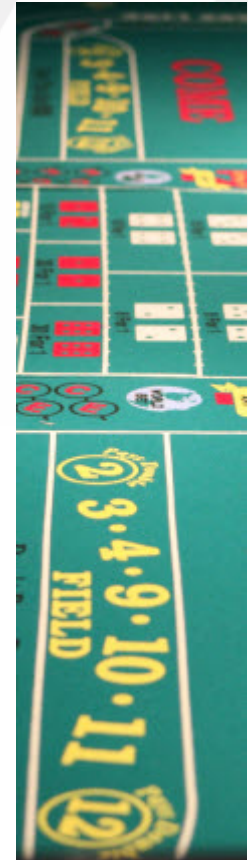
- » Location and Telematics hardware/software

5. Mechanics

- » Hardware install

6. Customs

- » Hardware approvals for Tangiers



Set Yourself Up to Win

- **Operations** - involve early in the project
- **Deliverables** - break the project into phases
- **Deadlines** - must be realistic & achievable
- **Synergy** - requires a coordinated effort

