

South Carolina State Ports Authority

Wireless in the CY

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Goal

Create a system to increase productivity and communicate events in realtime... 24x7.

How?

Install a wireless infrastructure and a mobile application utilizing a “store and forward” architecture.



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'01 YMS at Columbus Street

- **Technology**

- Intermec OpenAir wireless
 <1Mbps vs. typical desktop ~10Mbps
- Pole height: 25'
- Windows 95 clients, 24MB RAM

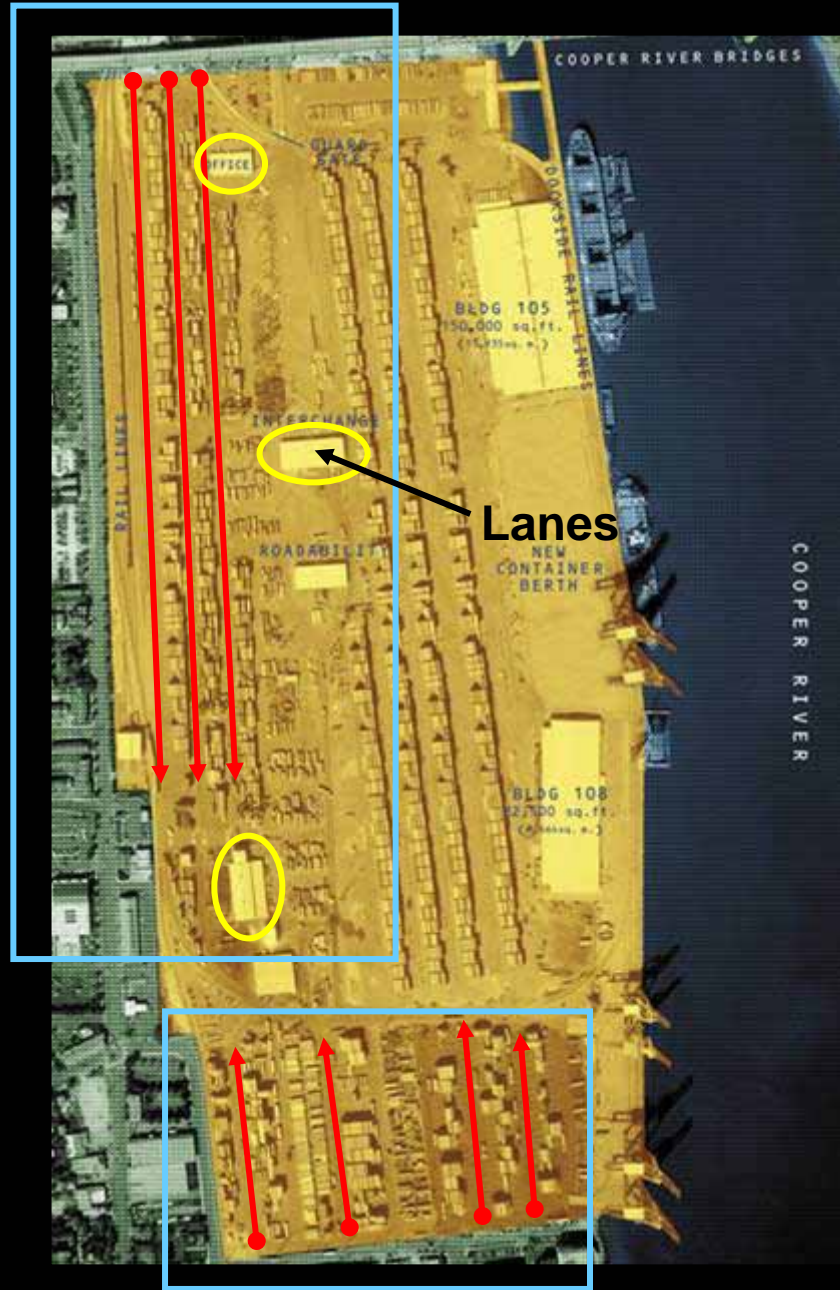
'01 Columbus Street Terminal



Directional



Omni-directional



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'01 RF Issues at Columbus St

- Slow
- Unpredictable
- Metal (the train has left the station...)
- “Snowball” outages
- Query tuning
- Data overload
- Equipment handlers differences

'01 Lessons Learned

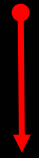
- Antennae on RTGs performed best under the cab
- Application performance is paramount for success
- Reports from users in the field have to be investigated

'03 YMS at North Charleston

Technology

- Cisco access points 802.11b
- Pole height: 25'
- Windows XP, 256MB RAM or more, fast processors

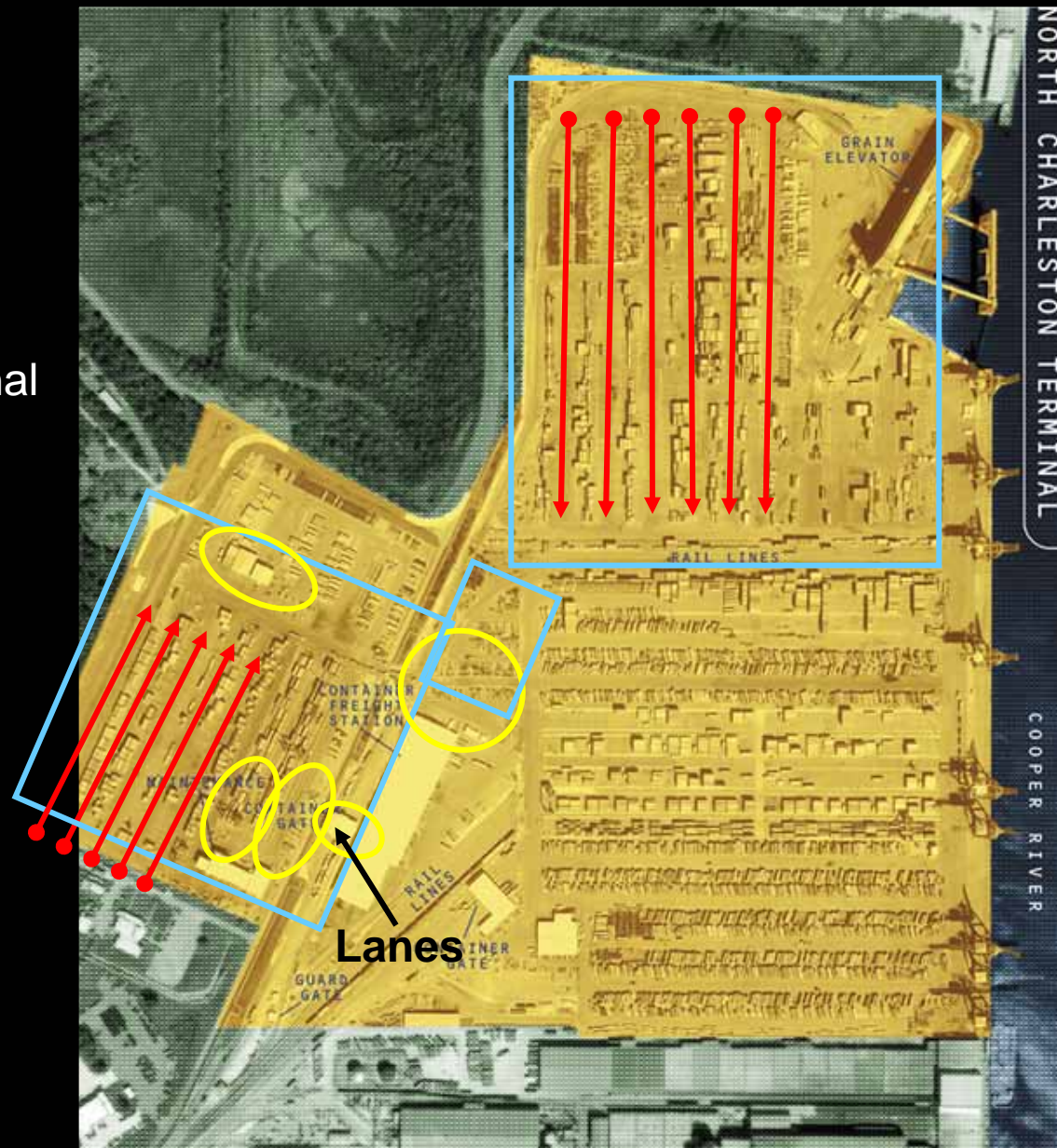
'03 North Charleston Terminal



Directional



Omni-directional



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'03 RF Issues at North Charleston

- Larger footprint
- Overlapping coverage
- Continued metal issues
- Windows XP wireless features

'03 Lessons Learned

- Greater success determining connectivity independently
- Dedicated IP addresses
- Software distribution is costly
- User behavior
- Hold on tightly (to that connection)...
- Less data, more quickly
- Survey!

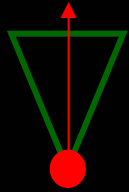
'05 YMS at Wando Terminal

- **Technology**
 - 7 Vivato panels
 - Pole height: vary from 100' to 135'
 - Traditional access points in the lanes
 - Same advanced handheld clients

'05 Other Infrastructure Changes

- Employed a Metropolitan Area Network
- Centralized on Sun V1280

'05 Wando Welch Terminal



Vivato



Omni-directional



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Vivato Panels



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Vivato Panels



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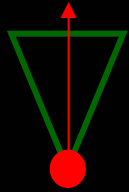
Vivato Panels



'05 Issues at Wando Terminal

- Terminal shape
- Impossible for traditional access points
- 135ft poles
- Panel pitch and direction
- User interaction
- “Black hole”

'05 Wando Welch Terminal



Vivato



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'05 Lessons Learned

- “Shining down” = good stack coverage
- Software distribution costs can be mitigated
- Panels weren’t effective for chassis fields
- Connect only as needed
- Manufacturer viability

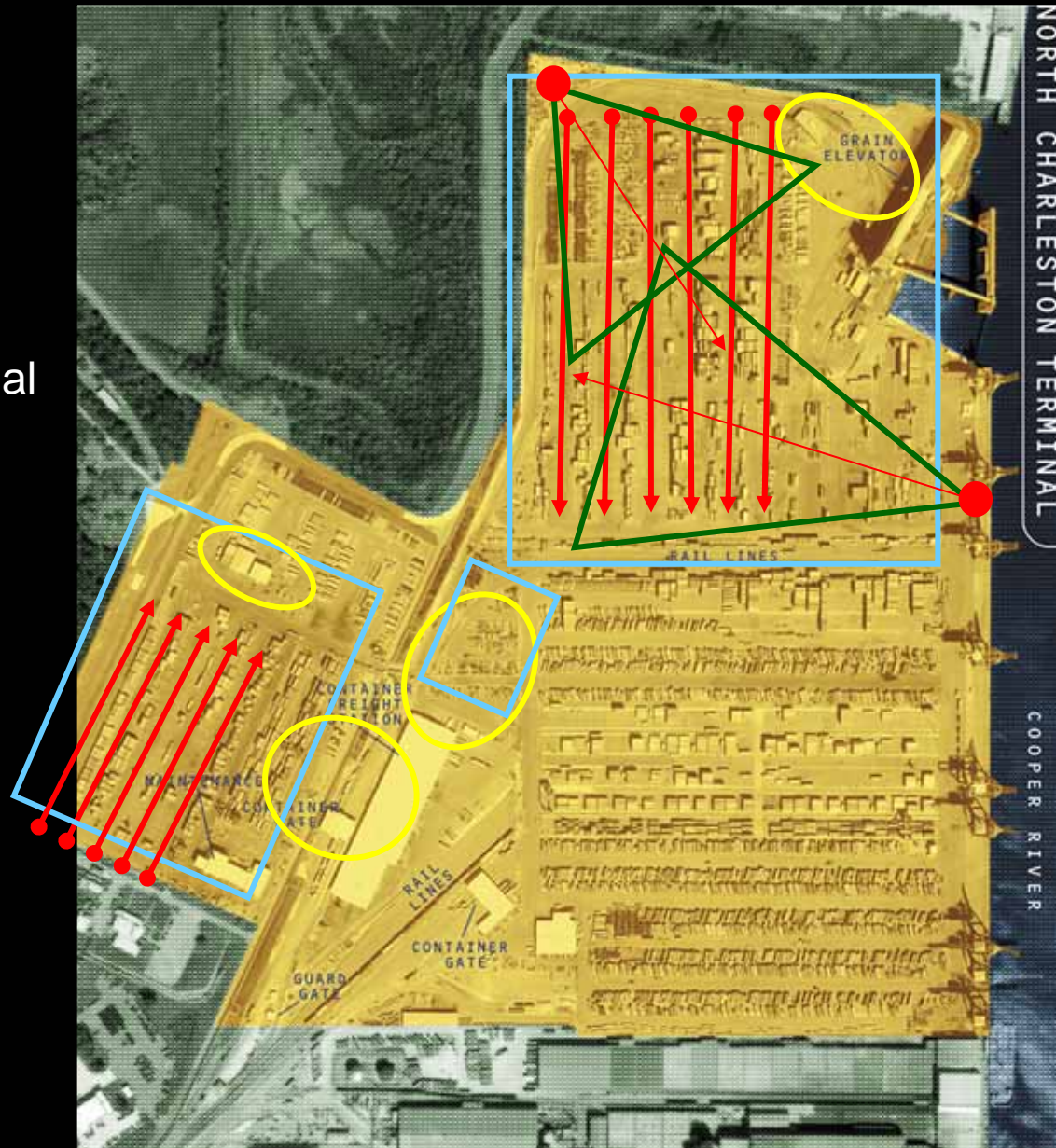
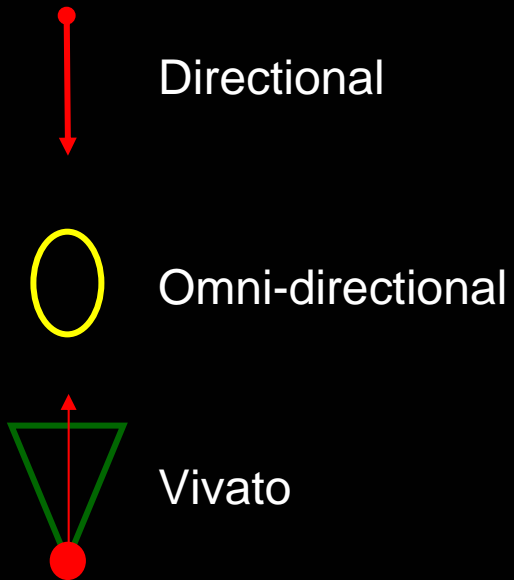
Gains!

- Increased gate throughput by 40%.
- Decreased turn times by 70%.
- Open architecture allows for better operations with our customers.
- More accurate/timely billing.
- Increased vessel productivity by 15-20%.
- All of this was done while increasing volumes by 40% and maintaining current staffing levels.

And then...

- Retrofitted North Charleston terminal with Vivato panel
- Later replaced Vivato panel with Comtech

'06 North Charleston Terminal - Panel



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Consider this...

- Understand your application and user behavior
- Provide the Best You Can at the Edge
- Survey
- Footprint
- Find Stable Vendors
- Interoperability (security, for example)
- Develop internal expertise

Thank You.



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