Partnering with
Marine Terminal Operators
to Provide Ocean Cargo Visibility

...and Supporting Cargo Security

Lance Ludman July 2006





### Savi Networks Overview

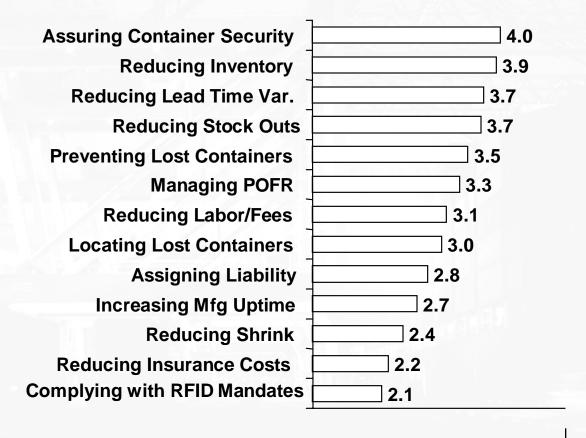
- The challenge -- improved, automated visibility in commercial supply chain -- has been one of the chicken and the egg.
  - Many different entities have to collaborate on network deployment
  - No one entity can make the network investment decision
- Hutchison Port Holdings / Savi Technology (Lockheed Martin) formed a joint venture to address the container tracking market

# **Savi Networks**

- Provides container and cargo location, identity, and status information services
- Partners with terminal operators, carriers, shippers, and their service providers
- Solution based on existing and emerging technical and industry standards
- The platform is open and extensible
  - Think the internet the original backbone has provided a platform that others have built on top of, extended to private networks, and leveraged to provide better services to their customers

## **Market Drivers: Overview**

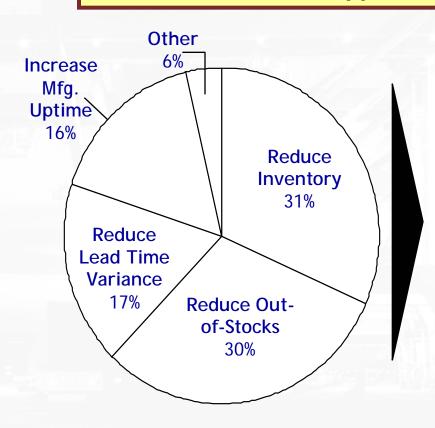
# Reducing Inventory and Assuring Container Security are the most important issues supply chain executives are managing



Source: A.T. Kearney interviews

# **Market Drivers: Supply Chain Efficiency**

Supply chain executives estimated the total average benefit per container from an end-to-end RFID tracking solution will be approximately \$1,150<sup>(1)</sup>



# **Key Findings**

- Approximately 94% of the total benefit derived from the offering savings are driven by four factors
  - Reduced inventory carrying costs
  - —Reduced out-of-stocks
  - Reduced lead time variance
  - Increased manufacturing uptime
- Reducing labor and fees (3%), increasing security (2%), preventing lost containers (1%), combined for 6% of the total benefit

Note: (1) Reducing insurance costs showed zero benefits or the benefits could not be provided, according to the interviewees Source: A.T. Kearney Interviews; A.T. Kearney analysis

e: A.T. Kearney interviews; A.T. Kearney analysis 7/26/2006 Sav<sup>†</sup>Networks

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# **Market Drivers: Beneficial Cargo Owner POV**

Opportunity	Labor Cost Reduction	Inventory/PP&E Cost Reduction	Customer Service / Retention	Revenue Driver
Dynamic inventory allocation		✓	✓	
Distribution-center bypass		<b>✓</b>	✓	
Re-routing of spoiled/damaged goods		✓	✓	<b>√</b>
PP&E reduction via the "floating warehouse"		<b>✓</b>		
Reductions in lead-time variability		<b>✓</b>	✓	
Re-routing of missed sailings			✓	<b>√</b>
Improved manufacturing line up-time	✓			
Inventory reconciliation – labor and derivative costs	✓			
Seasonal/promotional freight automation	✓		✓	<b>√</b>

### Savi Networks Business Model



- Installs and operates a shared network infrastructure
- Operates the service to collect data, monitor the network and provide information to customers
- Savi Networks provides hardware, services, and tags necessary for users to connect
  - Manufacturing and consolidation facilities that originate cargo
  - Distribution centers receiving cargo
- Savi Networks provides data to carriers, shippers and/or other customers
  - Hosted view of the information
  - Integration to backend systems
  - Per transaction or subscription basis



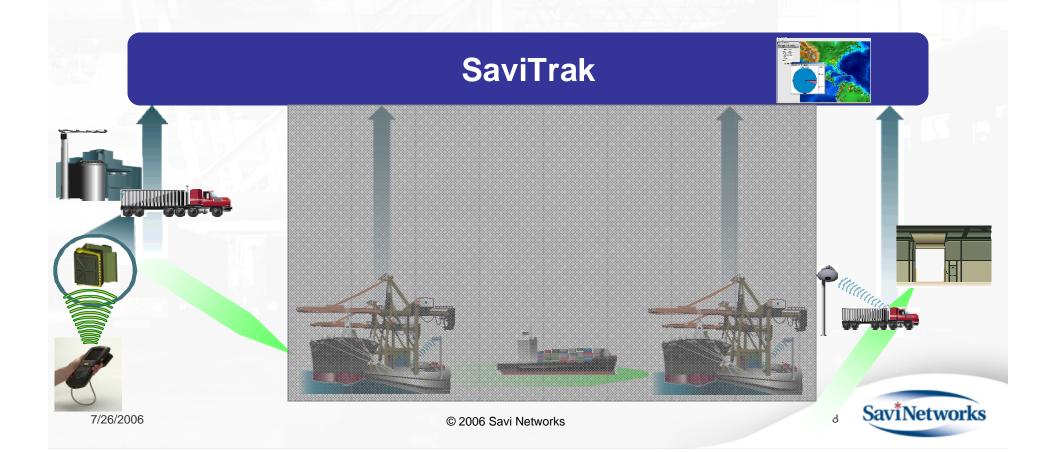
# **Savi Networks - Solution**

Savi Networks deploying an RFID network in major ports including a hosted application to provide global visibility and manage the security of ocean cargo containers

# SaviTrak

# **Savi Networks - Solution**

Shippers pay for RFID tags and RFID infrastructure at supply chain end points, connecting to Savi Networks hosted software extending the network across the global supply chain

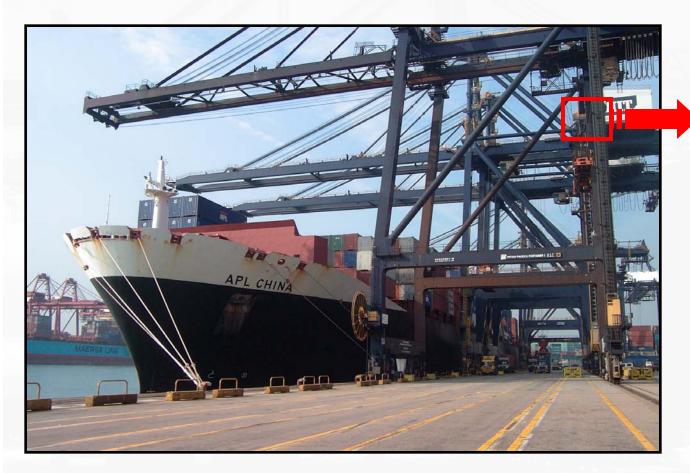


# Network Deployment: In & Out Gates





# Network Deployment: Quay Cranes





# **Terminal Operator Benefits**

# Labor Reduction & Cost Savings from:

- 1) Audit trail and change of custody
  - Insurance Savings
- 2) Automated Track & Trace
  - Shippers
  - Carriers
- 3) Automated Seal Validation Quay side & Gate In / Out
- 4) Automated recording of sealing and unsealing events
- 5) Complements other technology projects (Asset management, chassis tracking, OCR, etc.)

# SaviTrak Data for Efficiency and Security

# **AUTOMATED DATA CAPTURE**





Transport



Center



**Transport** 























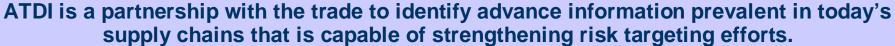
# **Commercial Benefits**

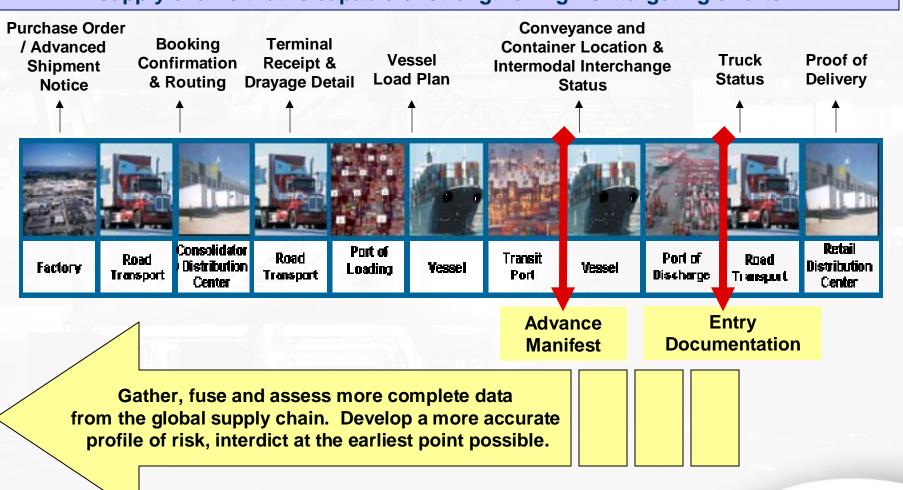
- Reduced inventory carrying costs
- Reduced inventory out-of-stocks
- Reduced lead time variance
- Increased manufacturing uptime
- Preventing theft
- Preventing lost containers
- Reducing administrative costs and fees

# **Enhanced supply chain security**

- Supply Chain Data for Risk Targeting
  - **Immediate**
  - **Direct**
  - Dynamic
  - Unique
- Secure State Engine
- **Seal Verification** 3.

# Supply Chain Data for Risk Targeting Example: ATDI





# **SaviTrak Data Elements**

CONSOLIDATION	PORT OF DEPARTURE		POPT OF	ARRIVAL	DE-CONSOLIDATION
CONSCIDATION	CONTAINER GATE IN	CONTAINER LOADING/DISCHARGE	CONTAINER QUAY IN	CONTAINER GATE OUT	DE-CONSOLIDATION  DE-CONSOLIDATION
ASN#	SOM MALICON IL IIV	STORING BIOGRAPHOL	00117111211 00711 111		ASN#
Supplier Part #					Supplier Part #
Customer Part #					Customer Part #
Product Name					Product Name
Quantity					Quantity
PO#		850/860			PO#
Invoice #		000,000			Invoice #
Manufacturing Lot #					Manufacturing Lot #
Shipping Lot #					Shipping Lot #
Supplier Name or ID					Supplier Name or ID
Customer Name or ID					Customer Name or ID
Source Location		and the second s		Table to the same of the same of	Source Location
Final Destination Location					Final Destination Location
Bill of Lading #					Bill of Lading #
BoL Date					BoL Date
Booking #				/ h / h	Booking #
_					_
Booking Date					Booking Date
Reference Numbers (Shipment, Manifest)			37		Reference Numbers (Shipment, Manifest)
Shipping Line/Container Operator					Shipping Line/Container Operator
Shipper Name					Shipper Name
Shipper Address					Shipper Address
Consignee Name					Consignee Name
Consignee Address					Consignee Address
Container Stuffing Location		TO MAY A 18 THE MANAGEMENT OF THE PARTY OF T			
Consolidator Name			A TABLE OF AN AND A PARTY OF THE STREET		
Consolidator Address					
ETA Final Destination (Consignee)		040/050			ETA Final Destination (Consignee)
ETD Shipment Origin		310/856			ETD Shipment Origin
Port of Loading					Port of Loading
ETD Port of Loading					ETD Port of Loading
Port of Discharge		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			Port of Discharge
ETA Port of Discharge					ETA Port of Discharge
	10 10 10 10 10 10 10 10 10 10 10 10 10 1				
Port of Destination					Port of Destination
ETA Port of Destination					ETA Port of Destination
Vessel Code					Vessel Code
Vessel Name					Vessel Name
Voyage Number					Voyage Number
Commodity Description/Classification					Commodity Description/Classification
HTC (6 digits)			ma my state of the		HTC (6 digits)
Pieces and UOM (low est ext. packaging level)		Voltage of			Pieces and UOM (low est ext. packaging level)
Weight and UOM					Weight and UOM
Marks & Numbers					Marks & Numbers
Container Size		Separate Property Comments			Container Size
Container Type			4		Container Type
Container ID	Container ID		Container ID	Container ID	Container ID
	Contained ID		CONTRAINED ID	CONTRAINED ID	
Seal Commission Notice					Seal Decommission Notice
Seal Commission User ID					Seal Decommission User ID
Seal Commission Date & Time					Seal Decommission Date & Time
Seal Commission Location					Seal Decommission Location
Seal Number	Seal Number	Seal Number	Seal Number	Seal Number	Seal Number
Seal Key (for electronic seals)		Seal Key	Seal Key	Seal Key	
	Seal Status	Seal Status	Seal Status	Seal Status	Seal Status
	Seal Event Log	Seal Event Log	Seal Event Log	Seal Event Log	Seal Event Log
Out-gate Time & Date	Gate In/Out Time (Also 315)	Loading/Discharge Date & Time	Discharge Date & Time (Also 315)	Discharge Date & Time (Also 315)	Arrival Date & Time
	Container Security Status	Container Security Status	Container Security Status	Container Security Status	Container Security Status
Light, Temperature, Humidity, Shock	Light, Temperature, Humidity, Shock	Light, Temperature, Humidity, Shock	Light, Temperature, Humidity, Shock		Light, Temperature, Humidity, Shock
Eight, Fornporatal c, Harrianty, Orlock	- Eight, Femperature, Flamany, Shock	- Eight, Fortiperature, Flamatty, Silock	- Eight, Femperature, Flamiliary, Shock	Eight, Pemperature, Hamlany, Shock	Eight, Formperatore, Hamilatty, Ondek

# **Secure State Engine**



A "Security State Engine" is complex software that automatically manages the security status of a container in context to the actual physical transaction and the expected physical transaction.

Able to sift through the millions of data elements and segment containers into

- ✓ Secure
- ? Suspect
- **X** Tamper
- Security status is maintained via checks-and-balances between the device (e.g. e-seal) and network software system.
- Even if a device (e.g. eSeal) is damaged or removed

#### **Seal Verification**

# **Anticipating SVR**

- COAC Recommendations to DHS
  - All in-bound containers
  - To be verified by Carriers
  - Last inspected at Port of Departure prior to U.S. arrival
- World Customs Organization Framework of Standards (SAFE)
  - Seal Integrity Program

# Many shippers will turn to electronic seal verification

- Standards-based: ISO 18185
  - Preparing for SVR, carriers and terminal operators have pushed ISO electronic seal standard to draft form
- No disruption to existing supply chain processes
  - Reduced labor for verification
  - Reduced/eliminates transmission & reconciliation errors
- Opportunity for far-ranging efficiency benefits

# Thank you!