MAKING AN IMPACT ON U.S. MANUFACTURING

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

Buy America Transit Supply Chain Connectivity Forum

APTA Rail Conference
Phoenix, AZ
June 22, 2016

U.S. Department of Transportation
Federal Transit Administration

RevAZ Manufacturing a Revolution

Agenda

8:00am	Registration/Continental Breakfast
8:30am	Welcome Remarks and Forum Introduction
8:45am	U.S. DOT Keynote and Buy America Overview
9:25am	Q&A
9:40am	Break
9:50am	Arizona Public Transportation
10:00am	OEM Panel: Supply Chain Opportunities and Needs
11:15am	Q&A
11:30am	Supplier Panel: The View from Prospective Suppliers
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12:25pm	Lunch (One-on-One Signups)
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1:45pm	Open Discussion: Transit Supply Issues and Opportunities
2:05pm	Intro to One-on-One Meetings among OEMs and Suppliers
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2:15pm	Networking Reception Concurrent with One-on-One Meetings
5:00pm	ADJOURN

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WELCOME TO PHOENIX

David Garafano
Executive Director

RevAZ Manufacturing a Revolution

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U.S. Department of Transportation

Lucy Garliauskas, Associate Administrator for Planning and Environment

U.S. Department of Transportation

Highway & Motor Vehicle Safety

Railroads

Public Transportation

Truck & Bus Safety

Hazardous Materials

Roads & Bridges

5 YEARS

$3 BILLION

More Info?

U.S. Department of Transportation

Federal Transit Administration

Buy America 101

Richard Wong
Federal Transit Administration
Washington, DC

Who Should be Aware of Buy America?

- Transit Agencies
- Government Officials
- Vehicle Manufacturers
- System Vendors/Aggregators
- Component Suppliers
- Architects and Designers

What Does Buy America Cover?

- Steel & Iron Products
- Manufactured Products
- Rolling Stock & Their Related Systems (train control, traction power, communications)

What Kind of Steel & Iron Products?

- Construction Materials
- Beams, Girders, Running Rail, Power Rail
- Excludes steel or iron components of rolling stock or manufactured products
- 100% U.S.-manufactured

What are “Manufactured Products?”

- The “catch-all”
- Includes “systems”
- 100% U.S. manufacturing
- 100% U.S.-made components
- Does not extend down to subcomponents

What is required for “Rolling Stock?”

- Buses, Railcars, Vans
- Final Assembly in the U.S.
- 60% U.S.-made components
- 60% U.S. subcomponents
- 65% in FY18 & FY19
- 70% in FY20
- Train control, traction power, & communication equipment

What was changed in the FAST Act?

- 60% U.S.-made components & subcomponents in FY16 & FY17
- Rises to 65% in FY18 & FY19, and 70% in FY20 & beyond
- U.S.-made Steel & Iron used in frames and car shells count towards U.S. content ($300K floor)
- FTA must certify waiver denials

What Kind of Waivers Are Available?

- Non-availability
- Cost-differential
- Public Interest

How Do I Obtain a Waiver?

- Apply – 49 CFR 661.9
- Federal Register Publication Notice and Comment
- NIST/MEP Scouting Search
- FAST Act certification process

Three Standing Public Interest Waivers

- Products on the FAR's Non-Availability Schedule (48 CFR 25.104)
- Microprocessors, Microcomputers, & Software
- Small purchases (fixed at $150K by FAST Act)

How Is Buy America Enforced?

- FTA Buy America Audits & Reviews
- FTA Triennial & State Management Reviews
- Petitions from third parties
- Investigations 49 CFR 661.15
- FTA's right to inspect records and documents

What could result from enforcement?

- FTA's right to terminate or recover funding
- Re-procurement
- Debarment and Suspension
- Criminal Penalties

What's in FTA's BA pipeline?

- Guidance on FAST Act amendments (April 6, 2016 Federal Register Notice & Waiver)
- Updated Pre-award/Post-delivery Handbook
- Guidance on Security and Surveillance Systems
- Proposed Minivan Waiver

Where can I go for further assistance?

- www.fta.dot.gov/buyamerica
  - Regulations
  - Waivers & Decisions
  - Audit Handbooks & Guidance
  - NIST/MEP Program
  - Policy Statements

Buy America Recap

- FTA's Buy America requirements apply to the following items:
  - *Steel and Iron*
  - *Manufactured Products*
  - *Rolling Stock*
- Domestic content is increasing
- Help is available

Questions?

- Richard.Wong@dot.gov
- https://www.transit.dot.gov/regulations-and-guidance/buy-america/buy-america
- http://www.fta.dot.gov/buyamerica
- https://www.transportation.gov/highlights/buyamerica

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Q&A

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BREAK

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Scott Smith, Interim CEO
Valley Metro

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Transit Original Equipment Manufacturer and Tier 1 Supplier Panel

- ALSTOM Transportation
- Bombardier (MORNING OEM PANEL ONLY)
- Fuji Electric
- Kawasaki Motor Manufacturing
- Siemens (ONE-IN-ONE MEETINGS ONLY)
- Stadler Rail

Federal Transit Administration (FTA) / National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership (MEP)

Buy America Transit Supply Chain Connectivity Forum

June 22, 2016

ALSTOM
Designing fluidity

ALSTOM Products and Services

TRAINS

- Streetcar, LRT, metro, commuter, high speed, very high speed, locomotive
- Components: traction, bogie, motor
- NAM HQ: Hornell, NY

45%

SERVICES

- Maintenance
- Modernisation
- Spare parts, repairs and overhaul
- Support services
- NAM HQ: Naperville, IL

23%

SIGNALING

- Signaling solutions portfolio for:
  - Main lines and urban systems
  - Train control, security, and communications
  - CBTC and PTC
- Sold as products or solutions
- NAM HQ: Rochester, NY

20%

SYSTEMS

- Integrated solutions (turnkey)
- Infrastructure, including power supply and distribution, electro-mechanical, and track
- Systems Integration
- NAM HQ: New York, NY

12%

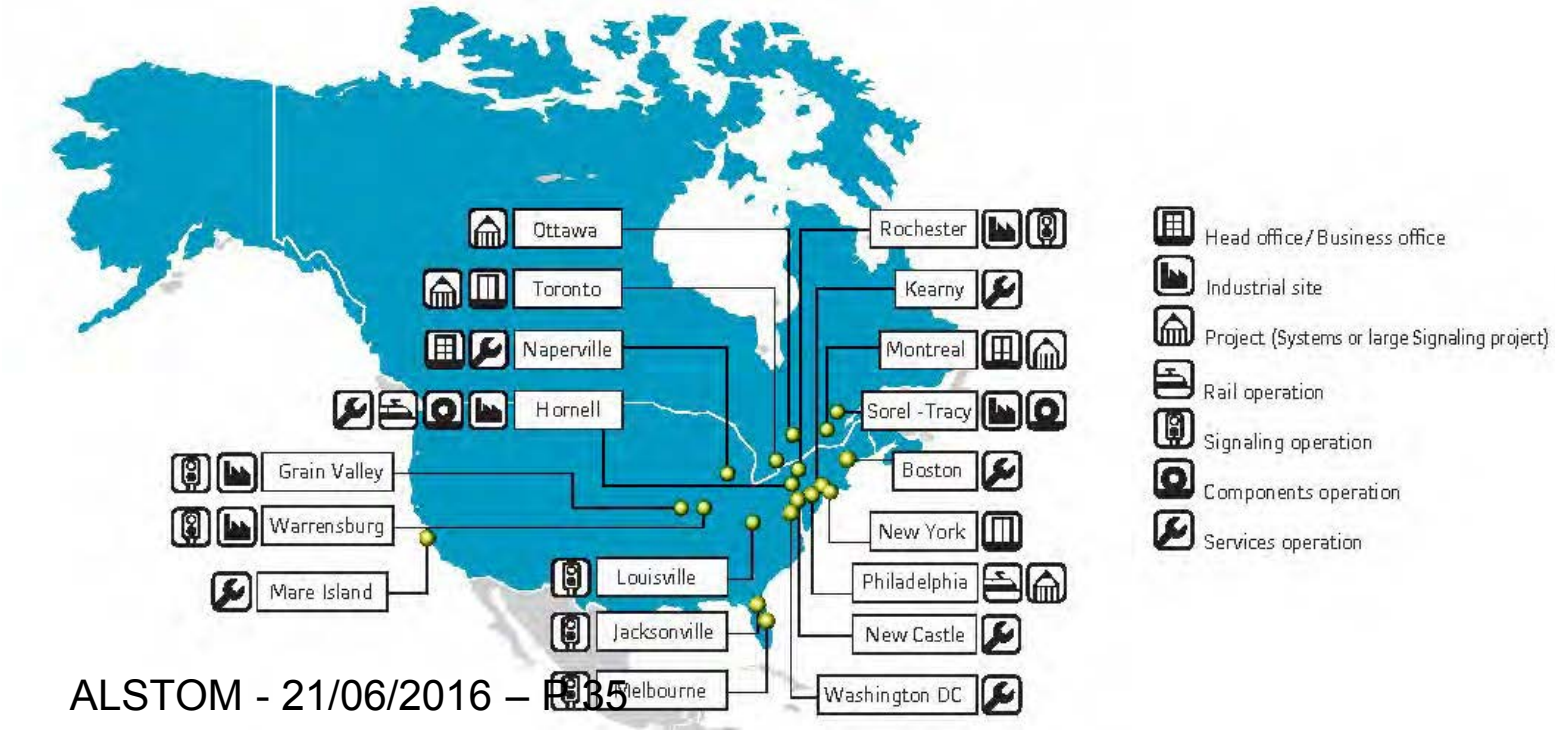
A company with annual sales of $7+ billion

Note: all figures include the signaling activity recently acquired from General Electric

ALSTOM

North America Presence

- 2,000 employees
- 19 locations



ALSTOM

Alstom Sourcing Contacts

Trains

- Metallic – Michael Bauman: michael.bauman@transport.alstom.com
- Electric – Janet Phillips: janet.phillips@transport.alstom.com
- A-Systems – Genoveva Bonora: genoveva.bonora@transport.alstom.com
- Interiors – Philip Stewart: philip.stewart@transport.alstom.com

Services

- Monica Sampleton: monica.sampleton@transport.alstom.com

Signaling

- Please visit Alstom booth at Railway Systems Suppliers Exhibition
  - June 28-30, Grapevine, TX

Systems

- Barbara Schroeder: barbara.schroeder@transport.alstom.com

DBE / SBE

- Talmech Williams: talmech.williams@transport.alstom.com
- Michelle Studer: michelle.studer@transport.alstom.com
- Bart Spangler: bart.spangler@transport.alstom.com

ALSTOM

www.alstom.com

ALSTOM
Designing fluidity

BOMBARDIER

BOMBARDIER
the evolution of mobility

BUILT ON INGENUITY

1942-73

- Company start-up
- Development of passenger and personal snowmobiles
- Vertical integration
- Energy crisis provoked market collapse

1974-85

- Diversification into mass transit market
- Learning of new industry
- 1982 New York metro contract secured strong position in American market

1986-93

- Entry into aerospace through Canadair acquisition
- Consolidation of North American mass transit position and reinforcement of presence in Europe

BUILT ON INGENUITY

Strategic acquisitions

- Aerospace: Short Brothers (U.K.), Learjet (U.S.), de Havilland (Canada)
- Transportation: BN (Belgium), ANF (France), Deutsche Waggonbau (Germany), Concarril (Mexico), Talbot (Germany), Adtranz (Germany)

1993-2003

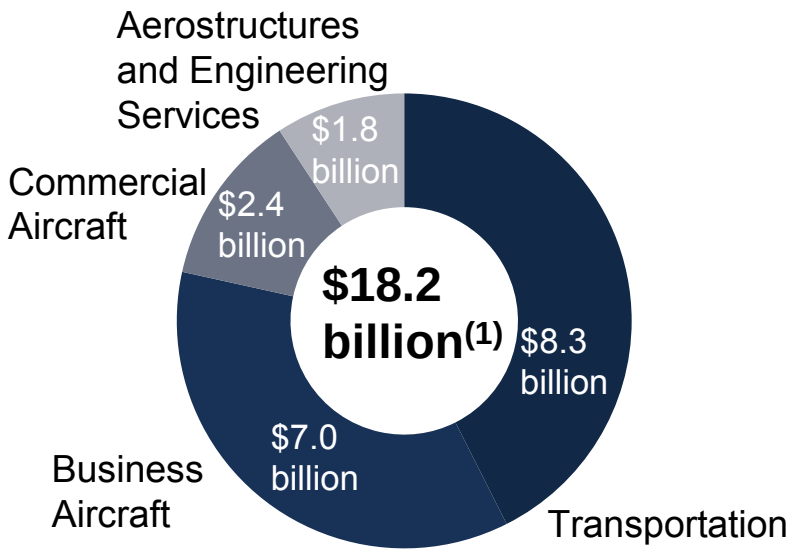
- *CRJ* Series, *Global Express, Challenger 300*
- Tilting train, AGC (Autorail Grande Capacité)
- Sale of Recreational products business unit

2003-2012

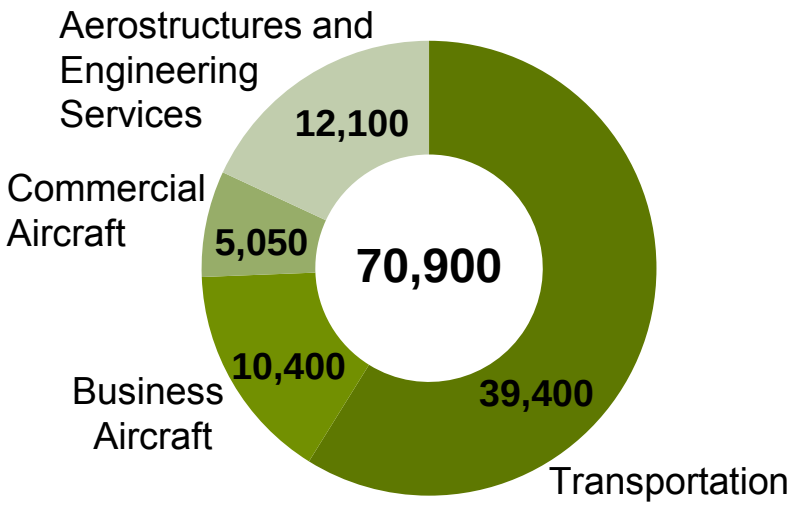
- *CRJ1000*, *CRJ NextGen* family, *Learjet 85*, *Q400 NextGen, CSeries, Global 7000, Global 8000*
- Historical *EBrakes* first flight
- New aerospace manufacturing centre in Mexico
- Hybrid AGC, *ZEFIRO*, *ECO4*
- Transportation's expansion into emerging markets

BOMBARDIER
A diversified company

Breakdown by revenues[1]



Breakdown by workforce[2] [3]



(1) For fiscal year ended December 31, 2015. Consolidated revenues $ 18,2 billion.
(2) As at December 31, 2015, including contractual and inactive employees. Subsequent to the end of the fiscal year, we decided to take steps to optimize our workforce with a combination of manpower reduction and strategic hiring. These figures do not reflect the planned changes.
(3) 3,950 product development engineering, Corporate office and other employees are not allocated to a reportable segment.

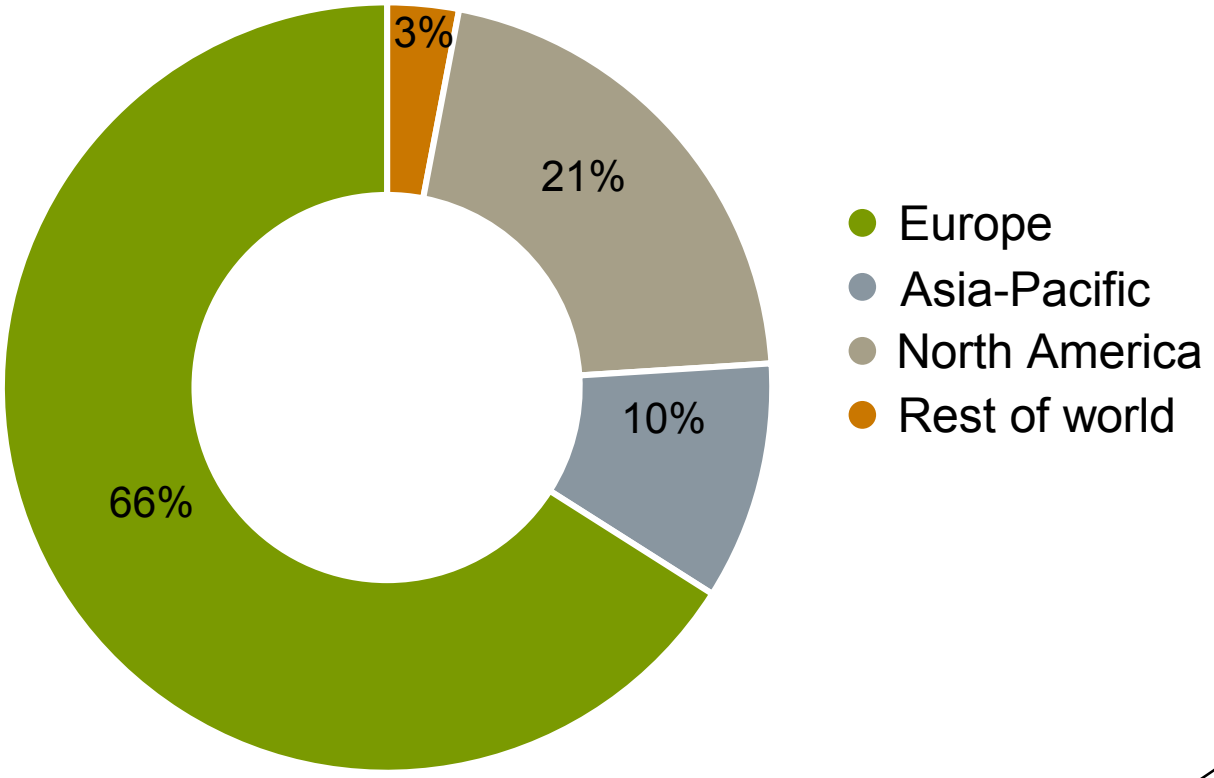
BOMBARDIER
the evolution of mobility

BOMBARDIER TRANSPORTATION

BOMBARDIER
the evolution of mobility

BOMBARDIER TRANSPORTATION
Employees by geographic region

Total workforce: 39,400[(1)]



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BOMBARDIER
the evolution of mobility

BOMBARDIER TRANSPORTATION
A global player with a European base

Revenues 2015[1]: $8.3 billion **Employees[2]: 39,400**

Global Headquarters

Production Sites

- (1) As at December 31, 2015

(2) As at December 31, 2015, including contractual and inactive employees. Subsequent to the end of the fiscal year, we decided to take steps to optimize our workforce with a combination of manpower reduction and strategic hiring. These figures do not reflect the planned changes.

BOMBARDIER
the evolution of mobility

BOMBARDIER TRANSPORTATION

BOMBARDIER
the evolution of mobility

Bombardier Transportation Americas

Manufacturing Capacity and Centres of Competence

Thunder Bay
Ontario, Canada

La Pocatière
Québec, Canada

St-Bruno
Québec, Canada

Mississauga
Ontario, Canada

Plattsburgh
New York, United States

Pittsburgh
Pennsylvania, United States

Kingston
Ontario, Canada

Sahagun and Huehuetoca
Mexico

OUR PRODUCTS AND SERVICES

THE BROADEST PORTFOLIO IN THE RAIL INDUSTRY

Rail Vehicles

- Light rail vehicles
- Metros
- Commuter trains
- Regional trains
- Intercity trains
- High speed trains
- Locomotives

Transportation Systems

- Monorail systems
- APM systems
- Light rail systems
- ART systems
- Metro systems
- Intercity systems
- Transit Security

Services

- Fleet management
- Operations & maintenance
- Material solutions
- Vehicle refurbishment
- Component reengineering

Rail Control Solutions

- Integrated control systems
- Automatic train protection and operation
- Interlocking systems
- Wayside equipment
- Services

Propulsion & Controls

- Traction converters
- Auxiliary converters
- Traction drives
- Control and communication

Bogies

- Portfolio to match entire range of rail vehicles
- Full scope of service over the lifetime of a bogie

BOMBARDIER TRANSPORTATION

LEADER IN RAILWAY PRODUCTS AND SERVICES IN THE AMERICAS

Operations & Maintenance
Toronto (Canada)

Metros
Montréal (Canada)

Double Deck Trains
BiLevel Coaches (Canada, USA)

Commuter Trains
EMU M-7 (New York, USA)

Low Floor Trains
FLEXITY Outlook (Toronto, Canada)

Dual-Powered Locomotive
New Jersey and Montréal

APM Systems
INNOVIA - Dallas/Fort Worth Airport (USA)

ART Systems
SkyTrain Vancouver (Canada)

Monorail Systems
Las Vegas (USA)

MultiLevel commuter cars
Montreal (Canada)

High Speed Trains
Acela Express (USA)

Rubber-tyred metros
Mexico, Canada

VERY STRONG BACKLOG OF PROJECTS TO DELIVER

- Montréal AZUR metro, 468 cars
- NYCT R-179 metro, 300 cars
- San Francisco BART metro, 775 cars
- Toronto Rocket metro, 480 cars

- CEM Bilevel, 204 cars (+125 options)

- Chicago APM
- São Paulo Monorail

- Toronto Streetcar, 204 cars
- Metrolinx LRV, 182 vehicles
- Region of Waterloo LRV, 14 vehicles
- Edmonton LRV
- Guadalajara LRV, 14 vehicles

- Progress Rail Locomotive assembly and parts manufacturing

BOMBARDIER
the evolution of mobility

BOMBARDIER

BOMBARDIER
the evolution of mobility

Barbara Houston
Sales & Engineering Manager
bhouston@fujuelectric.com

Kawasaki

Kawasaki Motors Manufacturing Corp., U.S.A.

Rail Car Division

Kawasaki Motors Manufacturing Corp., U.S.A.
Rail Car Division

Kawasaki Motors Manufacturing Corp., U.S.A. (KMM)

Location:
6600 NW 27th Street
Lincoln NE 68516 U.S.A.

Established:
1981
(Operation started on 1974 as Kawasaki Motors Company facility)
Rail Car: 2001

Products:
Rail Cars, Jet Ski Water Craft, ATVs, Utility Vehicles, RUVs, ATV & RUV Rims

Land Area:
Total: 335 acres
(Rail Car: 57 acres)

Factory Floor Space:
Total: 2,007,000 ft^2
(Rail Car: 733,000ft^2)

Quality and Environmental System

- ISO 9001 Quality Management System
  Registered, December 2005
- ISO 14001 Environmental Management System
- Registered, May 2005

Manpower

- Highly Skilled Workforce

Kawasaki
Kawasaki Motors Manufacturing Corp., U.S.A.

History

Aug 2000 - Announced plan to build Rail Car Facility
Nov 2000 - Began construction of Rail Car Facility
Nov 2001- Began Production of Rail Cars (NYCT R142A)
Jan 2002 - First Rail Car shipped from KMM
Nov 2002 - Completed last R142A for NYCT (120 Cars)
Dec 2002 - Completed last R143 for NYCT (8 cars)
Nov 2004 - Completed last R142S for NYCT (80 Cars)
May 2006 - Completed last double-deck coach for MBTA (29 Cars)
Feb 2008 - Shipped 500th Car (NYCT R160B)
Feb 2010 - Shipped 1,000th Car (PATH PA5)
Mar 2010 - Completed last NYCT R160B (650 Cars)
Mar 2011- Function Test Facility Operational
May 2011- Completed PATH PA5 Base Order (332 Cars)
Jan 2012 - Completed PATH PA5 Option Order (10 Cars)
Mar 2013 - Completed 1,500th Car (MNR M8)
Mar 2014 - Completed 126 R188 cars for NYCT
Present - Building 366 M8 cars for Metro North Railroad
- Building 528 WMATA 7000 Cars
Future - M9 Cars for Long Island Railroad

Supply Chain

Supplied by KHI

Truck Frame & End U/F

KHI

KSC

From Japan

Japanese Vendors

Supplied by KRC

Major Vendors

Contract Parts

KMM
Made in America

Supplied by KMM

Parts

USA Vendors

Painting, Sheet Metal

In house Manufacturing

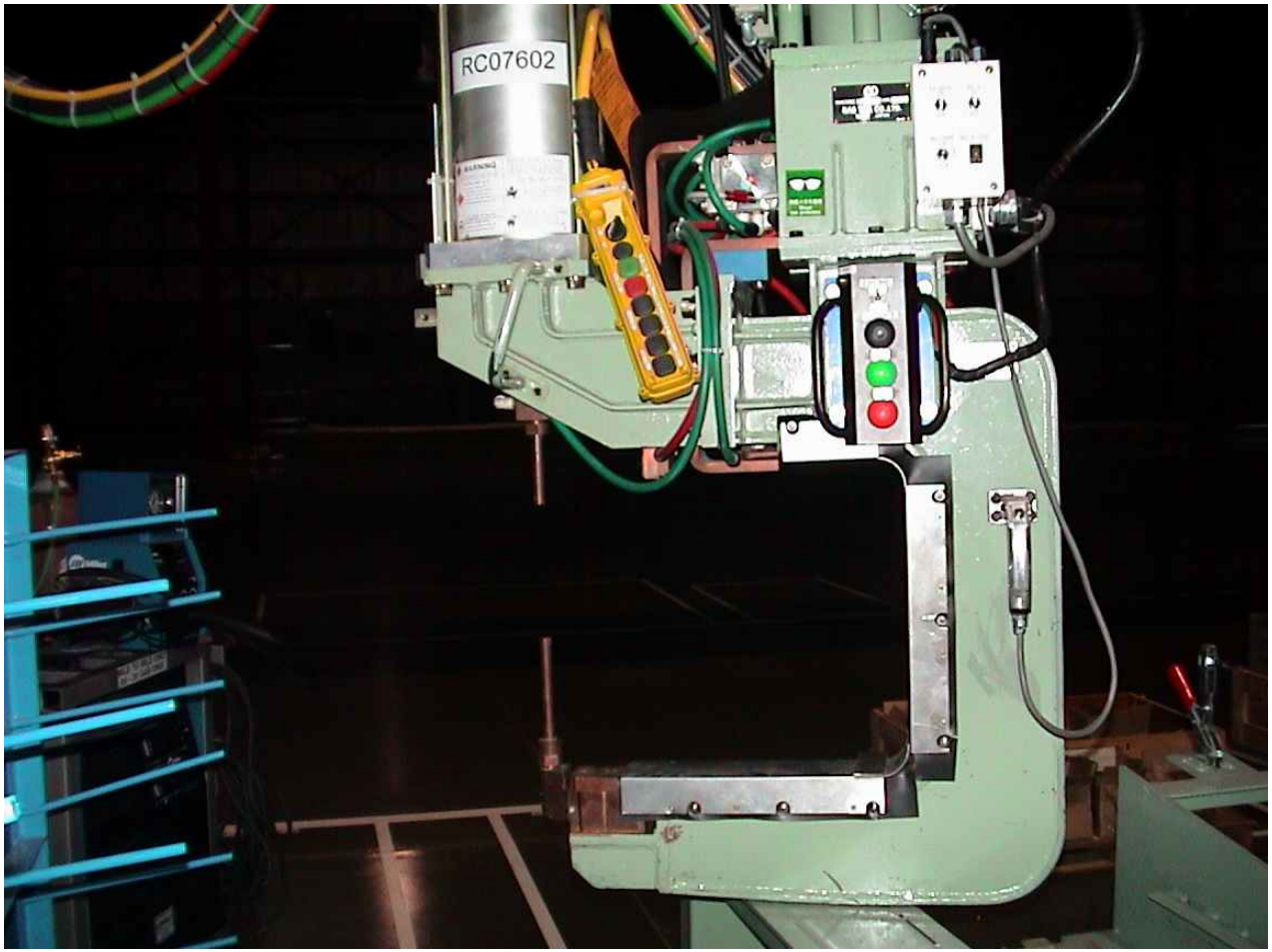
KHI-KMM Technology Transfer

Production Flow

Fabrication （A/B/F/G Lines）

U10 Robot(Plasma Cutting and Spot Welding)

Spot Welding Machine

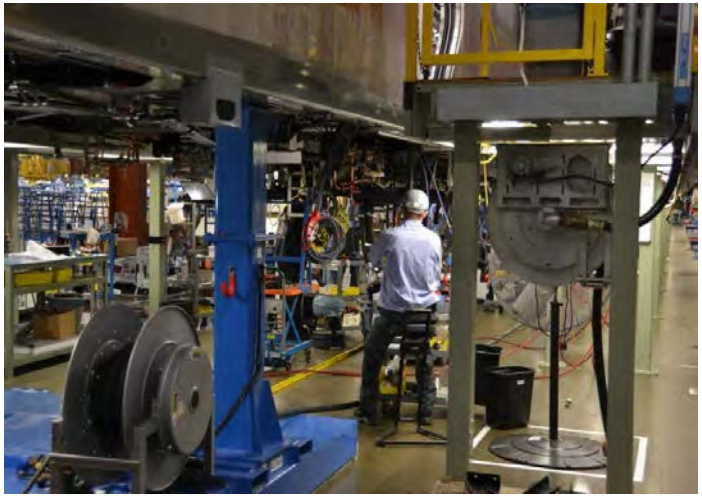


Automatic Spot Welding Machine for Side Panel

Automatic Roof Welding Machine

Interior Fitting （C/D/H/J Lines）

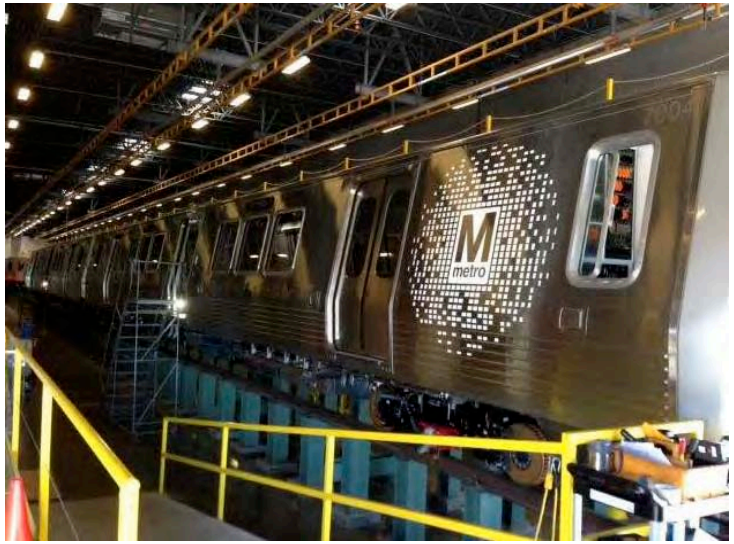
Kawasaki
Kawasaki Motors Manufacturing Corp., U.S.A.



Truck Assembly and Testing

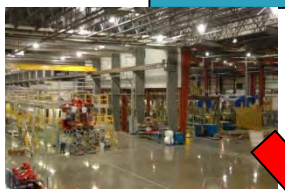
Water Tightness Test Facility

Function Test Facility



Ship out from KMM

Manufactured at KMM



Completed

Customer

Semi-completed

Completed by KRC, Yonkers, NY

Ship Out Crane

Ship Out by Truck to KRC

Ship Out by Roll-on Roll-off Trailer to Customer

Ship Out by Rail to Commissioning Site

MTA New York City Transit R142A/R142S (200 Cars)

MTA New York City Transit R143 (8 Cars)

First Cars Completely Fabricated at KMM (2002)

Massachusetts Bay Transit Authority Boston Double Deck Commuter Car (29 Cars)

First Car Transported to Customer by Rail from KMM (2004)

MTA New York City Transit R160B (650 Cars)

Port Authority Trans-Hudson PA5 (342 Cars)

MTA New York City Transit R188 (126 Cars)

MTA Metro-North Railroad M-8 (366 Cars)

Complete Static and Dynamic Function Testing at KMM

Washington D.C. Metro Area Transit Authority
WMATA 7000 (528 Cars)

Future – Long Island Railroad M-9

Kawasaki

Kawasaki Motors Manufacturing Corp., U.S.A.

Thank you very much

ありがとうございました。

SIEMENS

WILL BE AVAILABLE AT THIS AFTERNOON'S ONE-ON-ONE MEETINGS

Nicolas Alezeau
nicolas.alezeau@siemens.com

Angel Viera-Di Scioscia
angel.viera@siemens.com

THE STADLER RAIL GROUP
BUY AMERICA TRANSIT SUPPLY CHAIN CONNECTIVITY FORUM

Fabio Mueller, Phoenix, 22 June 2016

STADLER

VISION

Stadler – building your train is our passion

AGENDA

DIVISIONS

Switzerland

Stadler Bussnang
1700 employees

Stadler Altenrhein
950 employees

Stadler USA*

Stadler Australia*

* Ramp-up phase.

Germany

Stadler Pankow
Berlin / 1000 empl.

Stadler Pankow
Velten / 40 employees

Stadler Reinickendorf
60 employees

Central Europe

Stadler Polska
800 employees

Stadler Praha
50 employees

Stadler Minsk
300 employees

Spain

Stadler Rail Valencia
900 employees

Components

Stadler Winterthur
220 employees

Stadler Stahlguss
120 employees

Stadler Szolnok
362 employees

Services

Stadler Algeria
100 employees

Stadler Netherlands
80 employees

Stadler Linz
20 employees

Stadler Meran
10 employees

Stadler
Pusztaszabolcs
72 employees

Stadler Service
70 employees

Stadler Sweden
20 employees

Stadler Poland
30 employees

AN OVERVIEW

Facts and figures

Production and maintenance sites

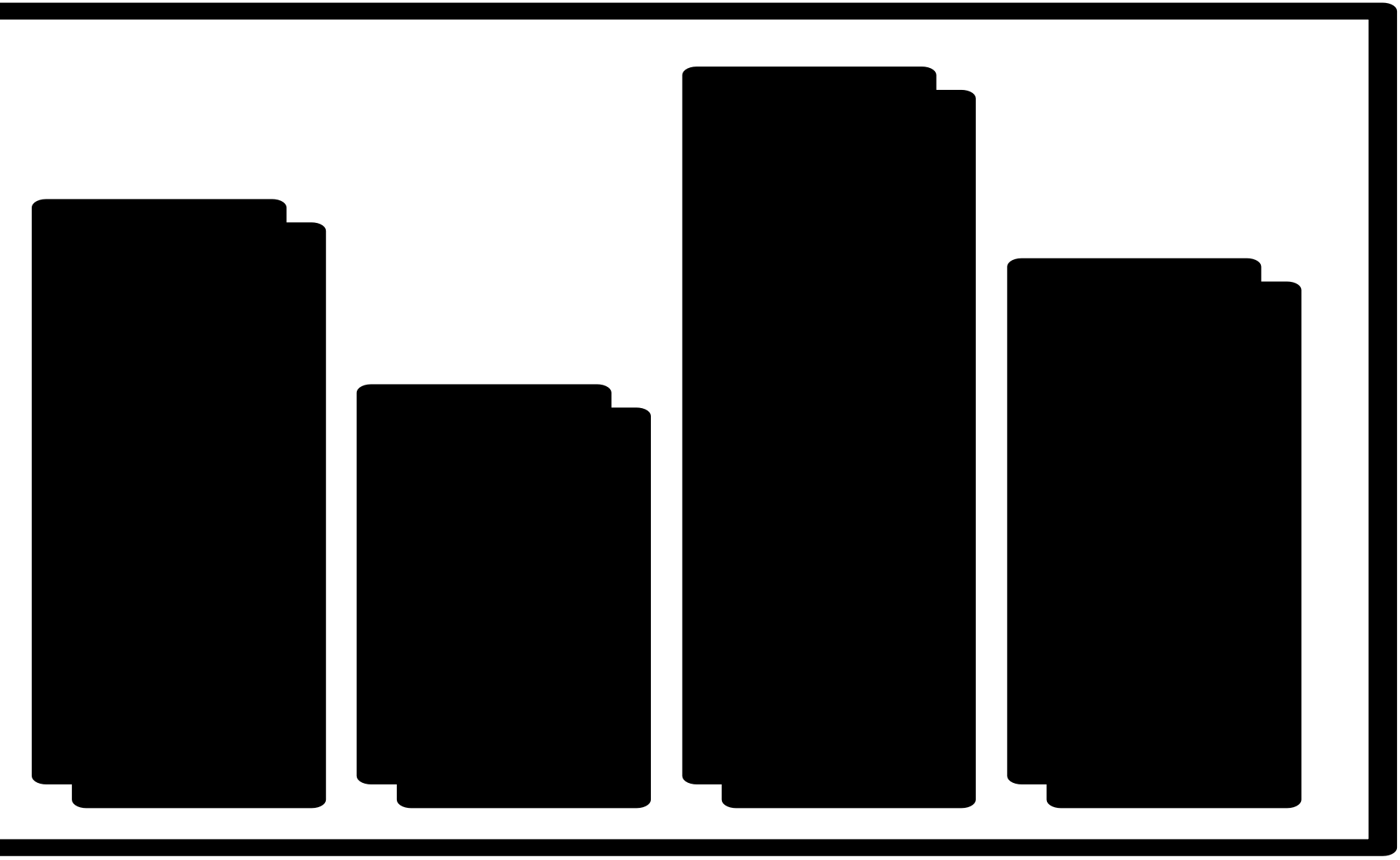
Bussnang	Switzerland	EMU, DMU, Tailor Made
Altenrhein	Switzerland	EMU, Double-Decker EMU, LRV
Winterthur	Switzerland	Bogie Manufacturing
Biel	Switzerland	Steel Casting
Pankow	Germany	EMU, Double-Decker EMU, DMU, LRV, Metro
Valencia	Spain	D-Locs, Dual Locs, LRV, Metro
Siedlce	Poland	EMU, DMU
Minsk	Belarus	EMU, Double-Decker EMU, DMU, LRV, Metro
Szolnok	Hungary	Car Body Production
Salt Lake City*	United States	DMU
New South Wales*	Australia	EMU
Maintenance sites in: Switzerland, Germany, the Netherlands, Hungary, Italy, Algeria, Poland, Austria, Norway, Sweden, Denmark*		

* Ramp-up phase.

Since the takeover by Peter Spuhler in 1989, Stadler Rail has achieved strong growth

Some 7000 employees work in Stadler Rail's international production and maintenance network

EMPLOYEE DEVELOPMENT



AGENDA

PRODUCT PORTFOLIO

Segmentation				Modular concepts Adhesion engines	Tailor-made concepts Adhesion and rack engines
Urban	LRV	Tram	≤80 km/h	 	 
		Tram train	≤100 km/h		
	Metro	Metro km/h	≤100	 	 
Railway vehicles	DMU	Commuter / regional	≤140 km/h	 	 
	EMU	Commuter / regional	≤160 km/h		
		Intercity	≤200 km/h	 	Out of scope
		High speed	≤250 km/h		Out of scope
		Very high speed	>250 km/h	Out of scope	
	Loc.	Mainline loc. diesel / dual / electric		 	
		Shunting loc. / special purpose vehicle		 	
	Coaches	Passenger and sleeping coaches			 
		Freight wagons		Out of scope	Out of scope

STADLER RAIL'S REFERENCES – UNITS SOLD

EC250 29

FLIRT 1235

KISS 246

GTW/RS 1103

Metro + LRV 968

Locomotive 2252

Tailor Made 317

Coaches 384

AGENDA

US MARKET DELIVERIES

NJT, New Jersey

Capital Metro, Austin

STADLER US INC.- UTA WARM SPRINGS FACILITY

AGENDA

TEXRAIL – BUY AMERICA COMPLIANT

FLIRT³ DMU

Commercial & Technical

BECOMING A STADLER SUPPLIER

Requirements

- Ability to handle EN Norms and Material
- On-time delivery
- High quality
- Small quantities
- Certifications (NFPA 130)

Process

- Questionnaire
- Audit
- RFQ
- Analysis of Quote
- Order
- Delivery Inspection

Needs

- Metal fabrication (Aluminum, Stainless)
- Plastic parts (Side wall panels, Thermoformed parts, Plastic bearings)

THANK YOU FOR YOUR ATTENTION

purchasing.us@stadlerrail.com

Agenda

8:00am	Registration/Continental Breakfast
8:30am	Welcome Remarks and Forum Introduction
8:45am	U.S. DOT Keynote and Buy America Overview
9:25am	Q&A
9:40am	Break
9:50am	Arizona Public Transportation
10:00am	OEM Panel: Supply Chain Opportunities and Needs
11:15am	Q&A
11:30am	Supplier Panel: The View from Prospective Suppliers
12:10pm	Q&A
12:25pm	Lunch (One-on-One Signups)
1:15pm	MEP Assistance and Resources
1:45pm	Open Discussion: Transit Supply Issues and Opportunities
2:05pm	Intro to One-on-One Meetings among OEMs and Suppliers
2:15pm	Transition to One-on-One Meetings among OEMs and Potential Suppliers
2:15pm	Networking Reception Concurrent with One-on-One Meetings
5:00pm	ADJOURN


Q&A

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Supplier Panel - The View from Prospective Transit Suppliers

- Cleveland Electric Labs
- Pilgrim Screw Corporation
- Ridgetop Group
- St. Clair Technologies

CLEVELAND ELECTRIC LABORATORIES
Thermocouples & Sensing Solutions Since 1920

Pilgrim Screw CORPORATION

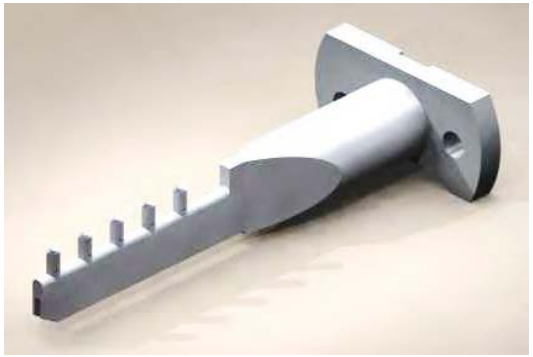
Ridgetop Group Inc

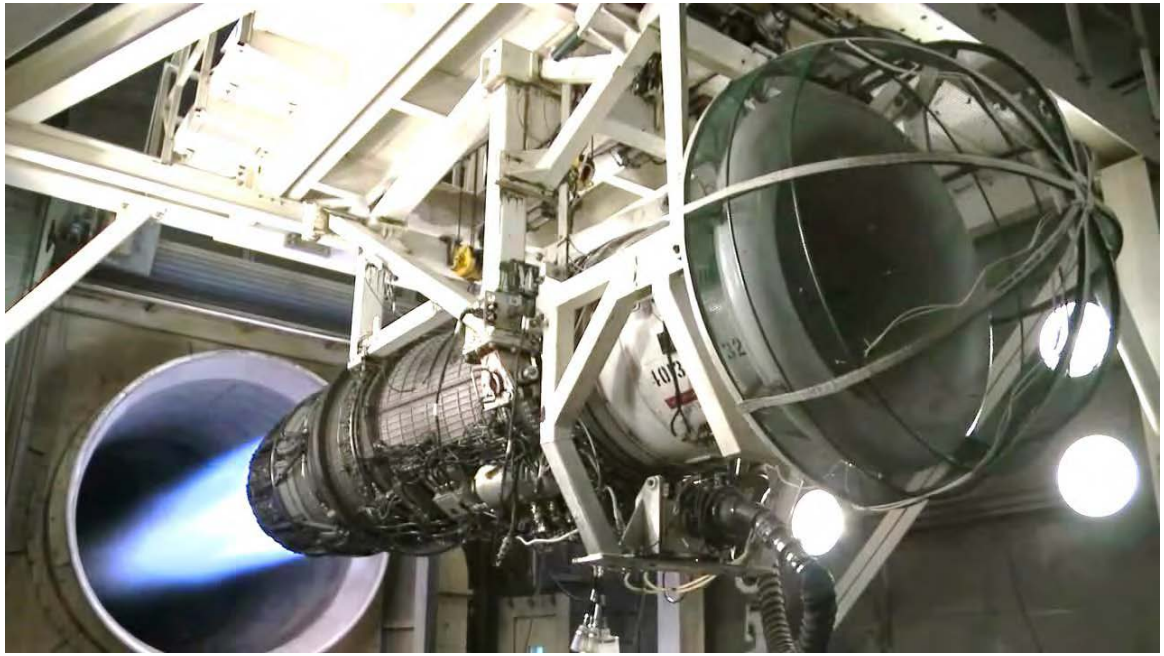
ST. CLAIR Technologies Inc.
Innovative Solutions For Electrical Systems


FiberStrike®
by Cleveland Electric Labs
LIGHT CAPTURING MOTION

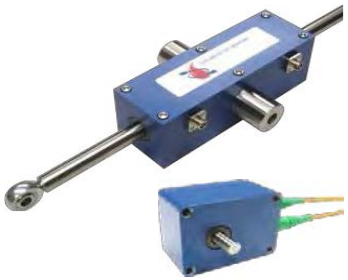
FiberStrike
by Cleveland Electric Labs
LIGHT CAPTURING MOTION

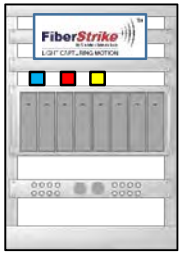
Temperature measurements, turbine engine instrumentation





FiberStrike
by Cleveland Electric Labs
LIGHT CAPTURING MOTION



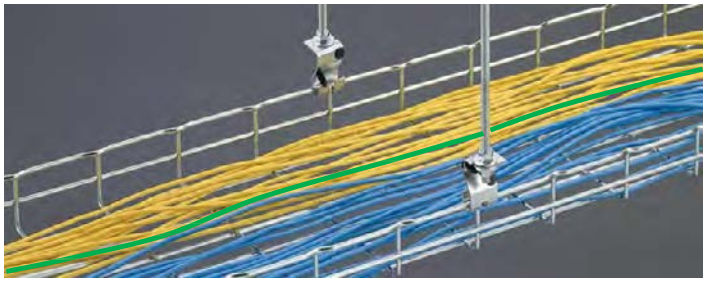


FiberStrike
by Cleveland Electric Labs
LIGHT CAPTURING MOTION

Bridge structural monitoring

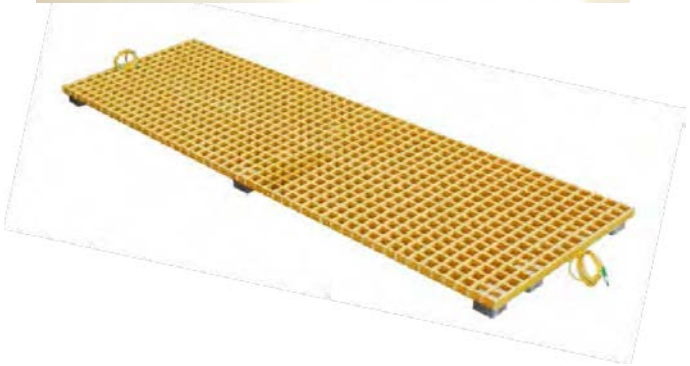
FiberStrike
by Cleveland Electric Labs
LIGHT CAPTURING MOTION

Perimeter and communications pathway protection



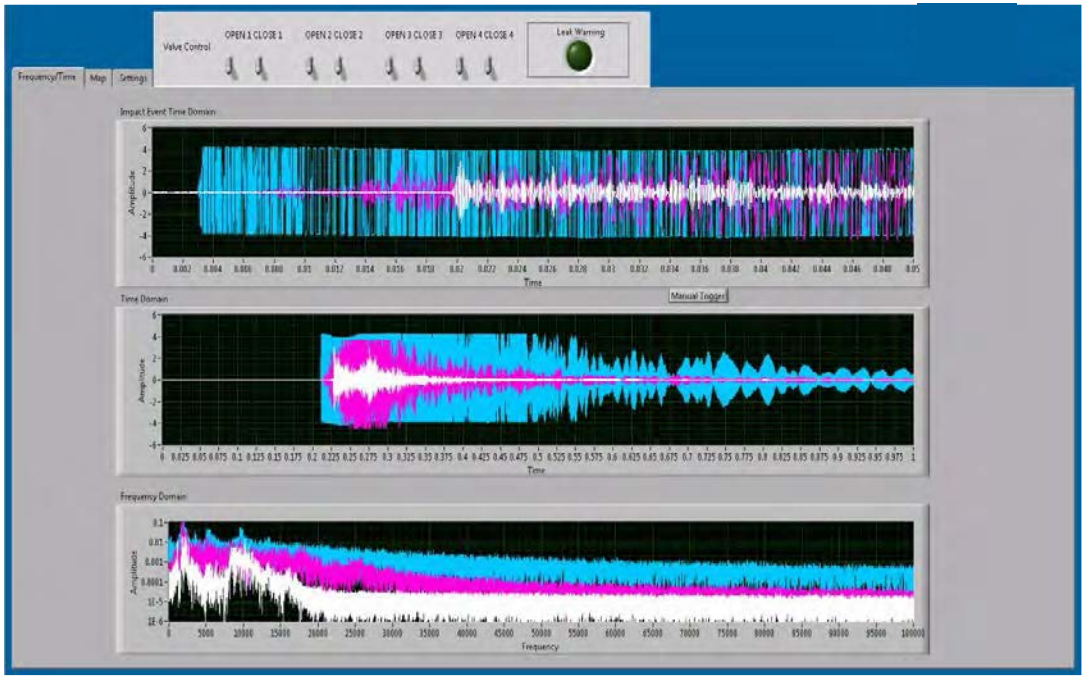
FiberStrike
by Cleveland Electric Labs
LIGHT CAPTURING MOTION

Manhole covers, platforms, enclosures monitoring



FiberStrike
by Cleveland Electric Labs
LIGHT CAPTURING MOTION

Pipeline leak and impact events - detection and location



Rodger Shephard
Vice President
(480) 967-2501
rshepherd@cel-atg.com
www.clevelandelectriclabs.com

Pilgrim Screw CORPORATION

www.PilgrimScrew.com

History

- 1932 Founded by Fred Sahakian
- 1941 Jewelry to screws
- 1961 Gary Grove joins the firm
- 1970 Stainless steel focus
- 1987 Aerospace & Defense focus

PRODUCTS

- Fasteners
  - Screws, Bolts, Pins, Rivets, Panel Fasteners
- Size Capabilities
  - • 0.060 to 1.25 inch diameter
    • Length: up to 36 inches
    • Metric: M1.6 through M25 diameter
- Consensus standards
  - AN, MS, NAS, NA, DIN, BS, ISO
  - OEM standards and specials
- Pilgrim Engineered Fasteners
  - Pi-Lok panel fastener
  - PIL290 test bolts
  - US Army Guide pins
  - R&D for AA and Airbus

QUALITY

- AS 9100
- ISO9001
- DFARS
- AMERICAN MADE

Approvals

Airbus	Hawker Beechcraft
Aernnova	Honeywell
BAE Systems	Israel Aircraft Industries
B/E Aerospace	Learjet
Bell Helicopter	Lockheed Martin
Boeing	NASA/JPL
Bombardier	Northrop Grumman
Cessna Aircraft	Raytheon
Embraer	Rockwell Collins
General Dynamics	Rolls Royce
General Electric	Sikorsky
Goodrich	Spirit Aero Systems
Gulfstream	Textron
Hamilton- Sundstrand	Triumph/Vought

Customer Service

- On Time Delivery is our top priority
- NPS 72
- Dedicated inside sales representative
- Our goal is to exceed your expectations

Thank You

- Get registered on our web site
  - www.pilgrimscrew.com and save to your favorites
- Follow us on LinkedIn and Facebook
- Put us in your Outlook Contacts
- Thank you for making us part of your supply chain!

Remember

RailSafe™

Track and Wheel Health Analysis System

Doug.Goodman@RIdgetopGroup.com

June 2016

Ridgetop Group, Inc.

- **Incorporated in 2000, and headquartered in Tucson, AZ. Ridgetop Europe is established in Belgium.**
- **Advanced Diagnostic and Prognostic solutions:**
  - **RailSafe™ Rail Transit Integrity Tool**
  - **Sentinel Suite™ Prognostic Analysis Platform**
  - **State of Health (SoH) and Remaining Useful Life (RUL) on complex electromechanical systems.**
  - **Design and Integration Services**
- **Strong market position with commercial and government customers in USA, Canada, Europe, and Asia**

Ridgetop Group Facilities in Tucson, AZ

Ridgetop Europe Facilities in Brugge, Belgium

Partners and Customers

Helitune
Engineering Rotortuner Solutions

UTC Aerospace Systems

AkerSolutions

BOEING

ROLLS ROYCE
Rolls-Royce®

LOCKHEED MARTIN

Raytheon

Honeywell

ASTRONICS
CORPORATION

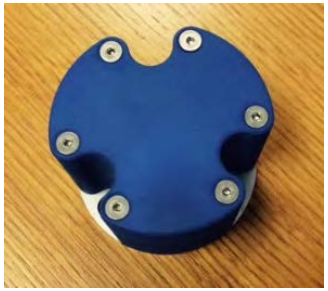
BAE SYSTEMS

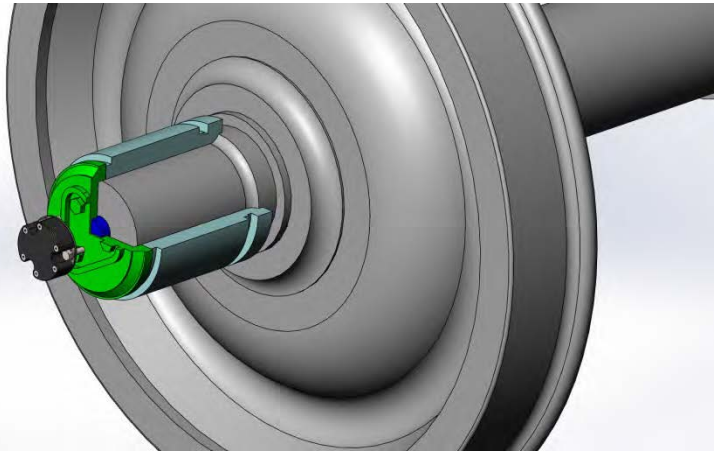
Transit Problem Statement

- Decaying Railroad Infrastructure; track, rolling stock, bridges
- Wheel cracks, flat spots, defective bearings and connections to axles
- Transportation of Dangerous materials such as flammable liquids and gases
- Lack of mechanism to prioritize maintenance actions.

Safety Solution

RotoSense™ Wireless Rotational Vibration Sensor





Mount two wireless RotoSense™ sensors, one on each side of the axle end caps. All wheels have sensors mounted.

NASA Spinoff – RotoSense™

Office of the Chief Technologist

Value for NASA, Benefits for the Nation

NASA Spinoff

Home | About Spinoff | Request a Spinoff | Be In Spinoff | Spinoff Database | Spinoff FAQ | Contact Us

Connect with NASA Spinoff

Spinoff 2012

Wireless Sensors Pinpoint Rotorcraft Troubles

Transportation

NASA Technology

Helicopters present many advantages over fixed-wing aircraft: they can take off from and land in tight spots, they can move in any direction with relative ease, and they can hover in one area for extended periods of time. But that maneuverability comes with costs.

For example, one persistent issue in helicopter maintenance and operation is that their components are subject to high amounts of wear compared to fixed-wing aircraft. In particular, the rotor drive system that makes flight possible undergoes heavy vibration during routine performance, slowly degrading components in a way that can cause failures if left unmonitored. The level of attention required to ensure flight safety makes helicopters very expensive to maintain.

Ridgetop's wireless MEMS accelerometer can gather quality data from spots inaccessible to the sensors typically employed today.

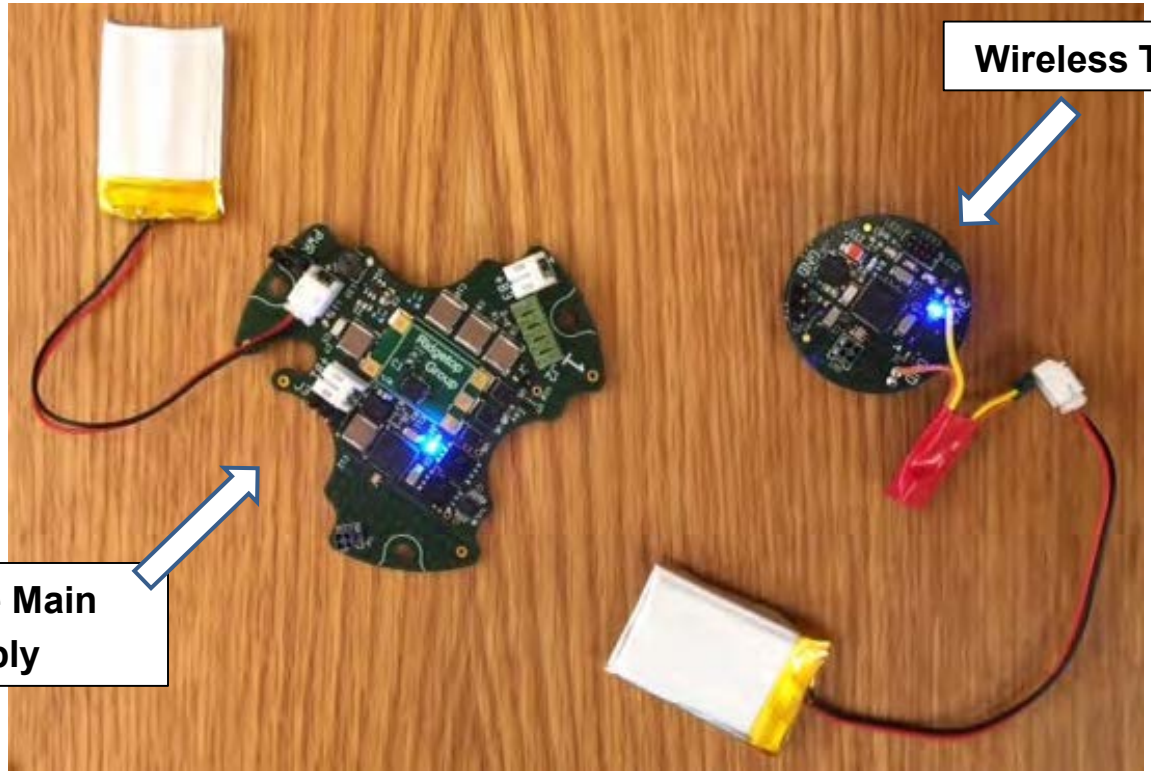
As a part of NASA's Fundamental Aeronautics Program, the Subsonic Rotary Wing Project seeks to advance knowledge about and improve prediction capabilities for rotorcraft, with the aim of developing technology that will meet future civilian requirements like higher efficiency and lower noise flights. One of the program's goals is to improve technology to detect and assess the health of critical components in rotorcraft drive systems.

Full article here: http://spinoff.nasa.gov/Spinoff2012/t_6.html

RailSafe™ Wireless Testing Conducted at Pueblo Test Facility

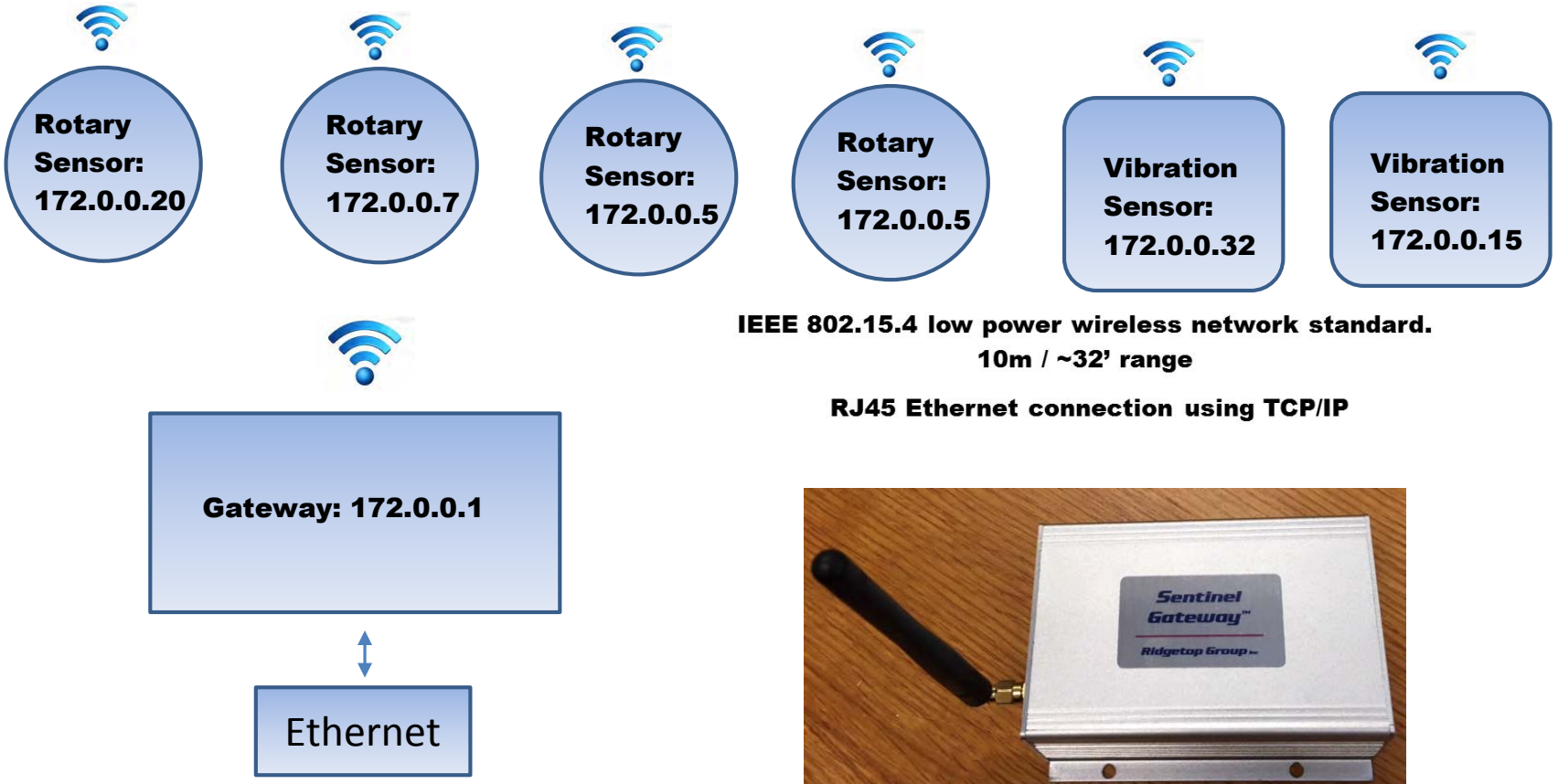
RotoSense Hardware Components

IEEE 802.15.4 low power wireless network standard



Standard TCP/IP Implementation

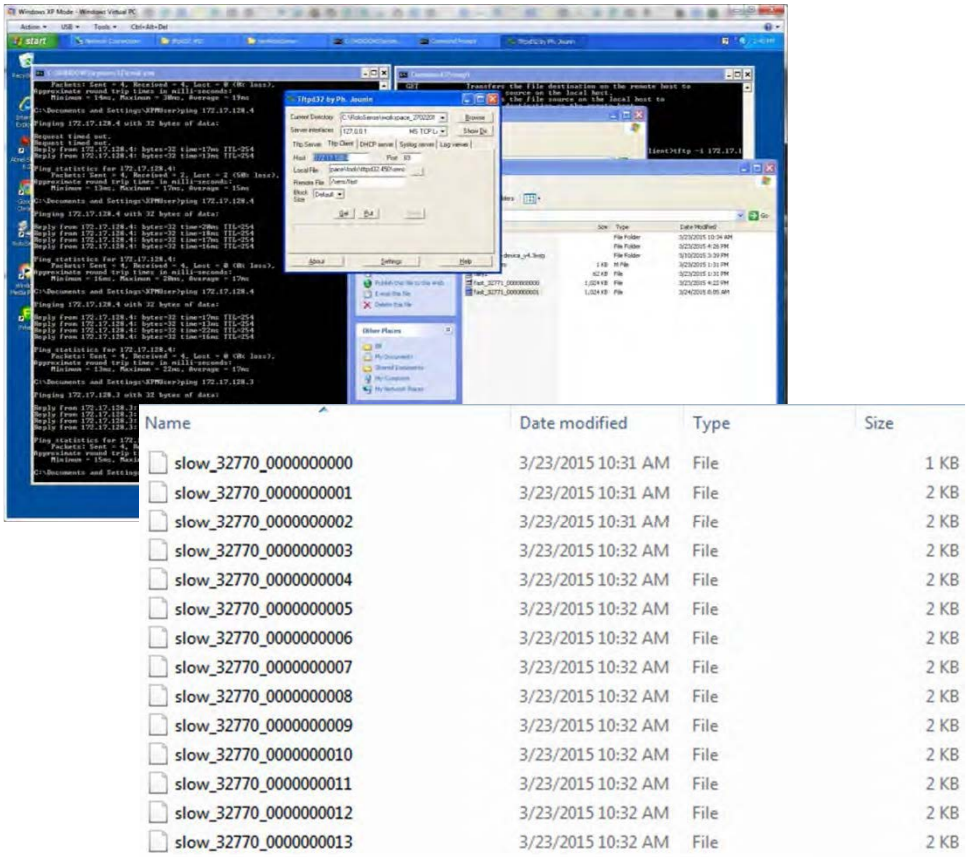
Each Gateway along with each sensor node has discoverable IP addresses



IEEE 802.15.4 low power wireless network standard.
10m / ~32' range

RJ45 Ethernet connection using TCP/IP

RailSafe Wireless Real Time Data Transfer



Name	Date modified	Type	Size
slow_32770_0000000000	3/23/2015 10:31 AM	File	1 KB
slow_32770_0000000001	3/23/2015 10:31 AM	File	2 KB
slow_32770_0000000002	3/23/2015 10:31 AM	File	2 KB
slow_32770_0000000003	3/23/2015 10:32 AM	File	2 KB
slow_32770_0000000004	3/23/2015 10:32 AM	File	2 KB
slow_32770_0000000005	3/23/2015 10:32 AM	File	2 KB
slow_32770_0000000006	3/23/2015 10:32 AM	File	2 KB
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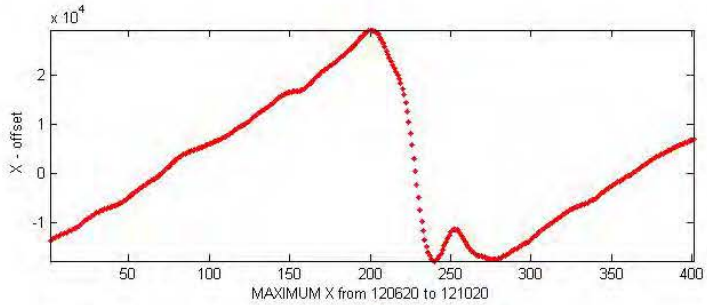
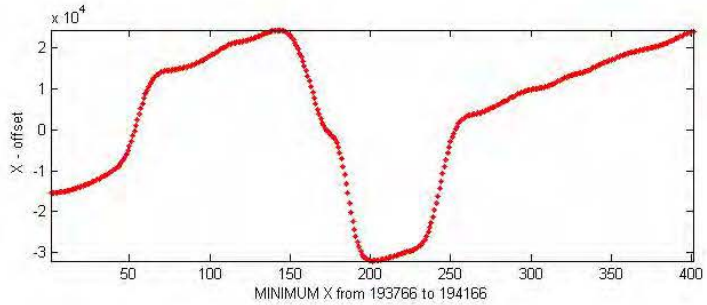
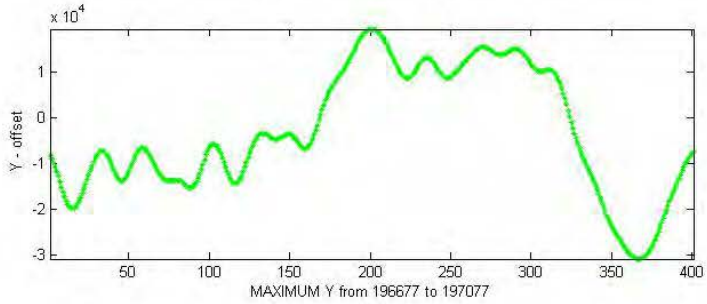
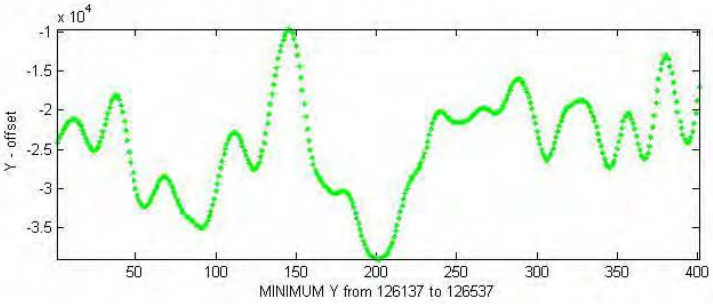
slow_32770_0000000009	3/23/2015 10:32 AM	File	2 KB
slow_32770_0000000010	3/23/2015 10:32 AM	File	2 KB
slow_32770_0000000011	3/23/2015 10:32 AM	File	2 KB
slow_32770_0000000012	3/23/2015 10:32 AM	File	2 KB
slow_32770_0000000013	3/23/2015 10:32 AM	File	2 KB

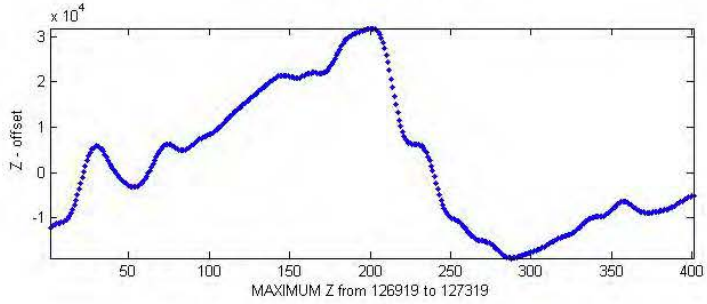
RailSafe Raw Data Plots

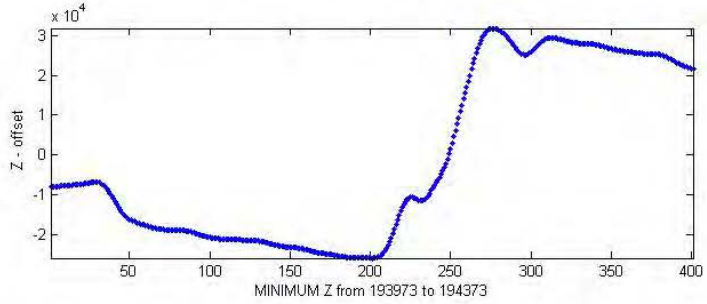








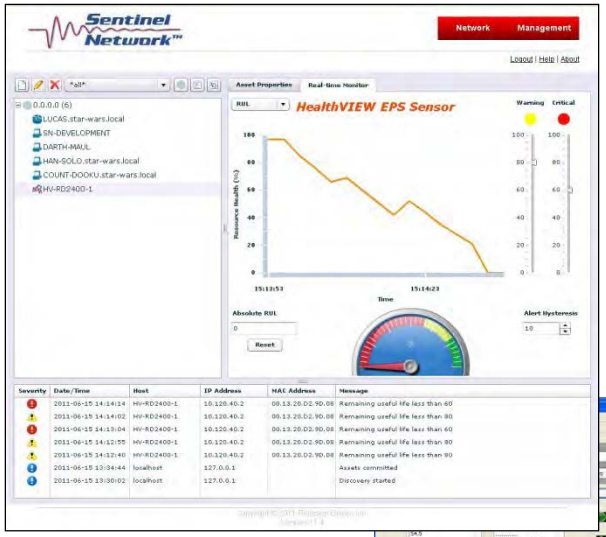


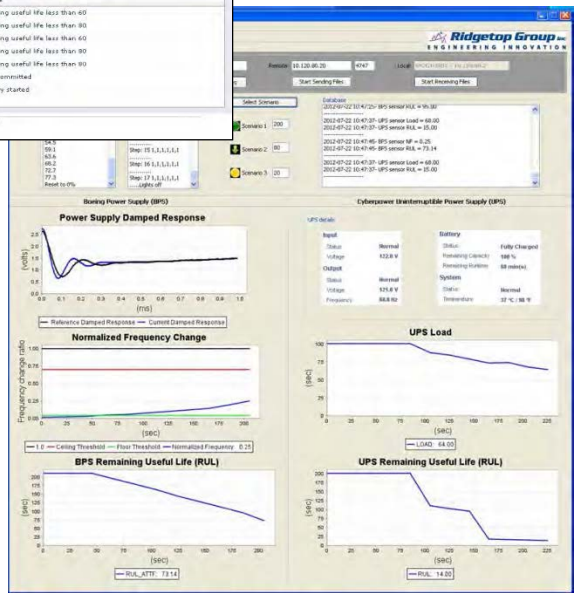


Red = X = Horizontal motion
Green = Y = Vertical motion
Blue = Z = Lateral motion

RailSafe™ Complete Solution

- **Continuous RotoSense™ sensor monitoring with analysis using proven Ridgetop algorithms**
- **Provides system-level State of Health (SoH) indication with accurate Remaining Useful Life (RUL) estimates**
- **Results can be integrated with existing CBM systems**





Contact Information

Ridgetop Group Inc.

Advanced Diagnostics and Prognostics
Ridgetop Group, Inc.
Doug.Goodman@RidgetopGroup.com

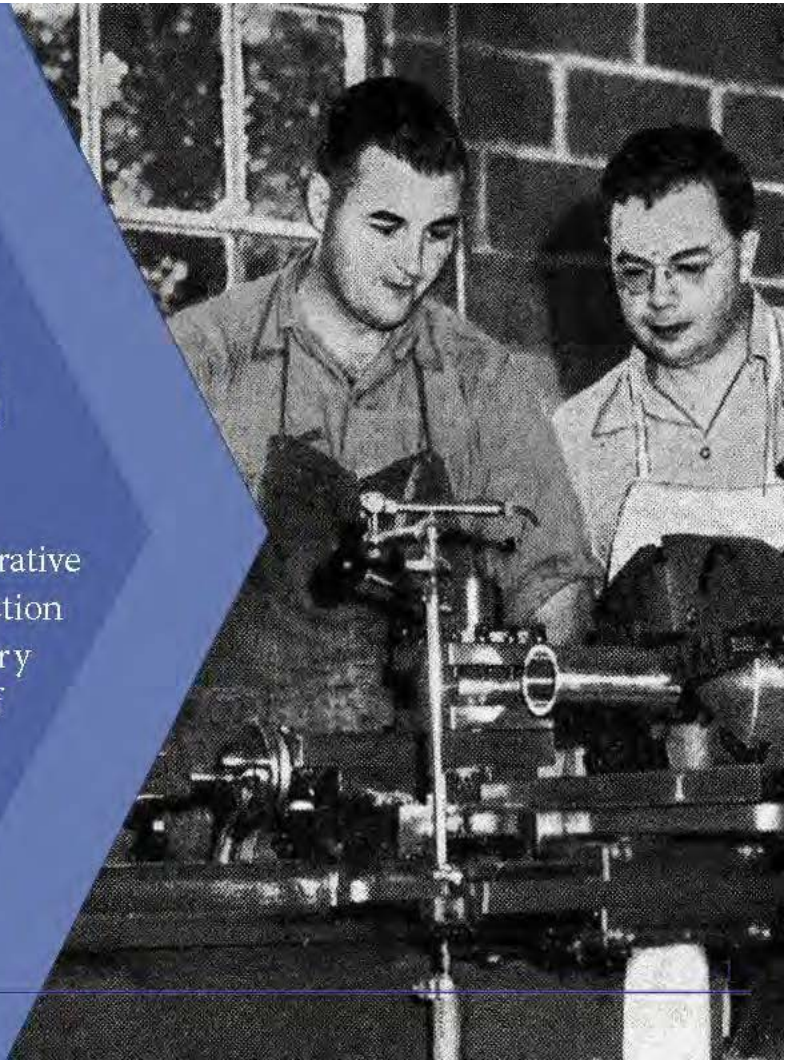
ST. CLAIR TECHNOLOGIES

Innovative Solutions for Electrical Systems


ST. CLAIR TECHNOLOGIES
has 65 years of industry experience
specializing in electrical system design
and production.
Your needs are our opportunities.

St. Clair Technologies provides cost-effective, innovative solutions, tailored to our customers' specific needs. St. Clair is recognized in the industry for our ability to manage customer programs regardless of volume, complexity or product mix as evidenced by our diverse customer base and the various market segments we support.

St. Clair is a full service supplier offering collaborative solutions from the development phase to production launch, utilizing innovative and proprietary systems. Our expertise spans an array of industries including automotive, military, bus, RV, truck, marine, alternative energy and aerospace.



CERTIFICATIONS

ISO/TS16949

ISO 9001 & ISO 14001

AS9100C

U.S. Government certified—Military (DOD CCR)

IMDS Compliant

CTPAT & FAST

ITAR Registrant Code: M23465

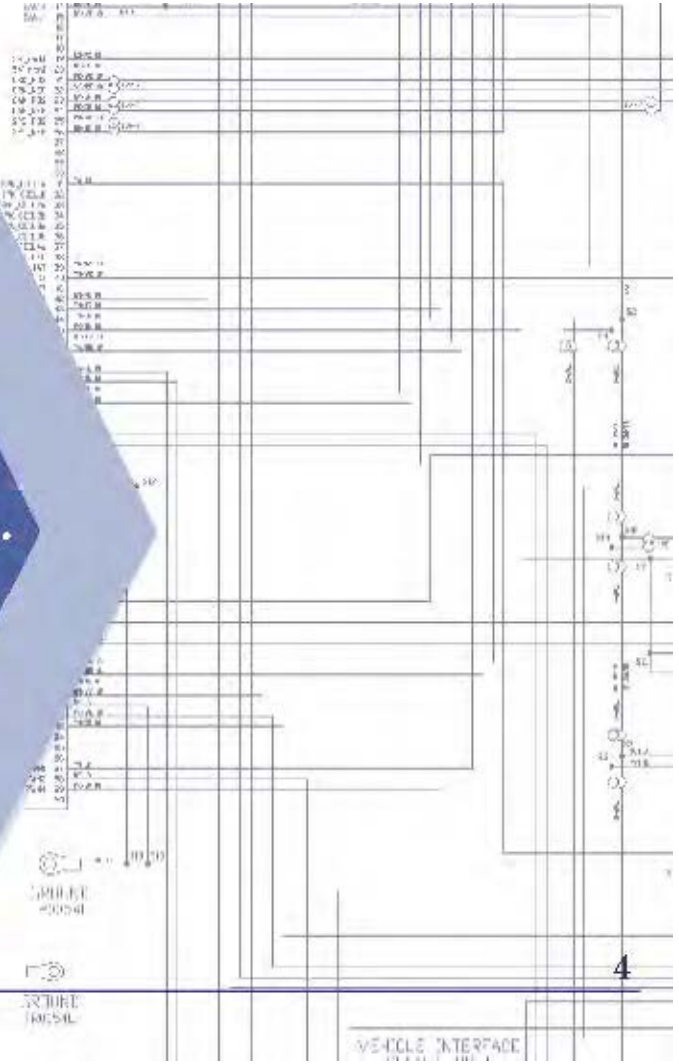
UL Registrant Code: E6123

Women Owned Business Status (WBENC) via MATH Solutions, LLC. (see pages 32-33)

LOCATIONS

St. Clair Technologies has two manufacturing facilities in Guaymas, Sonora, Mexico, which is located 250 miles from Nogales, Arizona.

MORE THAN JUST BUILD TO PRINT...



At St. Clair Technologies, we pride ourselves on responsive and adaptive support. Our knowledgeable and experienced engineering team has the ability to anticipate our customers' needs, which leads to innovative and proactive solutions.

Our support teams are bilingual and able to quickly communicate with our workforce in Guaymas, Mexico. We have been established as a national company in Mexico for decades and offer a stable and retentive workforce of skilled operators.

St. Clair has managed a tremendously diverse range of products and has experience in many different industries. We promote a Value Analysis/Value Engineering (VAVE) approach to product development that focuses on material and labor cost reduction, quality improvement and design for manufacturability.

TRUCK AND BUS

Unlimited Option Driven Content...

...makes every bus unique,
just like every child it carries.

St. Clair Technologies is a leader in bus and heavy truck harness manufacturing. We can produce and deliver large and highly complex harnesses in four weeks. Our VIN specific harnesses allow for unlimited option variations. We also offer a focused kitting system and manufacturing cells for small batch processing: we create solutions to match your needs.

AUTOMOTIVE


Innovative Engineering...
We excel in creating automotive solutions to fulfill our customers' needs, providing proactive development of custom component solutions, even in high volume scenarios. Our lean manufacturing approach enables our products to be cost competitive. Our precision quality systems exceed industry standards and ensure the performance you expect.

St. Clair offers industry-standard exterior lamp sockets with nearly 10 years of field applications and excellent warranty performance. In the interior, we integrate circuit boards for LED ambient lighting.

We use sophisticated manufacturing systems for Insulation Displacement Connections (IDCs) that ensure highly reliable performance.

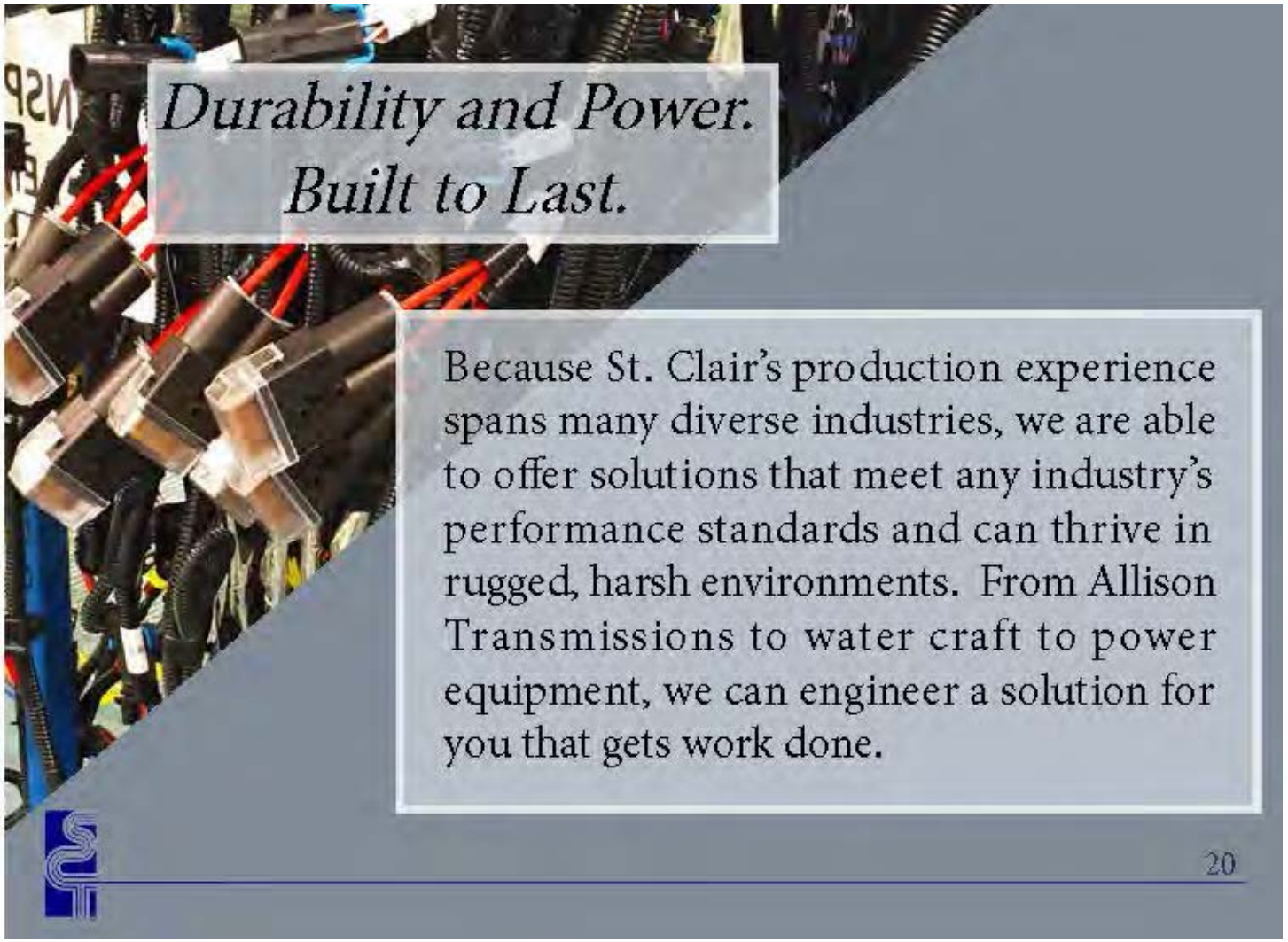
MILITARY

Robust performance...

...proven in the field.

St. Clair Technologies has a long history of producing harnesses for tactical wheeled vehicles. Every harness we produce is manufactured and tested to comply with strict military standards. Our rapid, proven logistics systems and ITAR compliance ensure that we will be able to provide the best solutions to fit our customers' needs.

COMMERCIAL

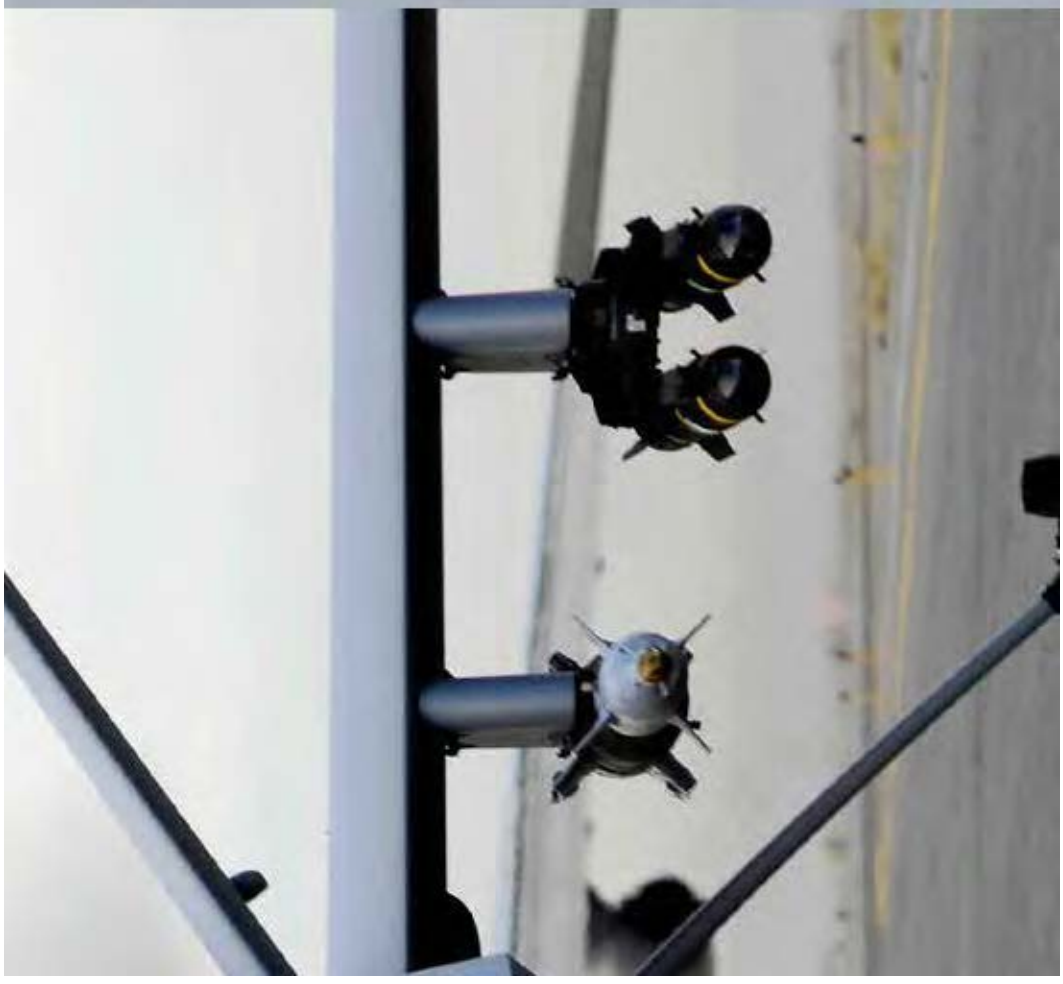


Durability and Power. Built to Last.

Because St. Clair's production experience spans many diverse industries, we are able to offer solutions that meet any industry's performance standards and can thrive in rugged, harsh environments. From Allison Transmissions to water craft to power equipment, we can engineer a solution for you that gets work done.

St. Clair is a preferred supplier of Allison World Transmission production and service harnesses along with component kits for fixes in the shop or field. For more information and purchasing options, visit www.stclairtech.com/products/allison.

AEROSPACE




Technology that soars above the rest...

St. Clair Technologies is an AS9100 certified supplier, ensuring that everything we produce is safe and reliable while also meeting the strict requirements of the aerospace industry. Our focus is in commercial aviation and unmanned aerial vehicles (UAVs), though we invite you to challenge our innovative capabilities.

ALTERNATIVE ENERGY


Innovation in an industry that is defining the future...

St. Clair Technologies has experience spanning many aspects of the alternative energy industry, including solar, wind, alternative fuels and hybrid powertrains. We have the capability to support programs born from ideas in a technology incubator through the full production life span. We support multiple programs that provide alternative fuel sources for conventional engines such as compressed natural gas, propane and bi-fuels.

component solutions

St. Clair Technologies designs, validates and manufactures custom component solutions to fit your unique needs.

Industry Standard Lamp Sockets

Custom Pass-Through Designs

Custom Connection Systems


MATH Solutions
Technical Consulting & Sales
Making Valuable Connections
Between Suppliers and
Customers...

Does your company have a Supplier Diversity Program? Like others, your company could benefit by partnering with a certified Women's Business Enterprise National Council (WBENC) Representative.

If your company has an interest in attaining government credit or customer appreciation for sourcing utilizing a Women Owned Business, please visit www.mathsolutionsllc.com. Previously the Sales and Engineering Director at St. Clair Technologies, Melissa Femia Hess is now the President and Owner of MATH Solutions, LLC., a Technical Consulting and Sales Company aimed at satisfying customer initiatives and matching customers with solutions.

MATH Solutions represents and supports St. Clair Technologies as a customer, and also works independently of St. Clair to help companies meet their minority sourcing initiatives.

For more information, please contact:

Melissa Hess
President, MATH Solutions, LLC.
[1] 248-798-3018
melissa.hess@mathsolutionsllc.com

Certified WBENC Women's Business Enterprise

ST.CLAIR TECHNOLOGIES Innovative Solutions for Electrical Systems

CONTACT INFORMATION

For more information, please contact:

St. Clair Technologies, Inc.
460 S. Benson Lane, Suite 7
Chandler, AZ 85224
Office Telephone: [1] 602-842-7297
Email: SCTSales@stclairtech.com

www.stclairtech.com

Agenda

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5:00pm	ADJOURN


Q&A

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LUNCH

We plan to reconvene promptly at 1:15pm

DON'T FORGET TO SIGN UP FOR YOUR ONE-ON-ONE MEETINGS AT THE REGISTRATION DESK

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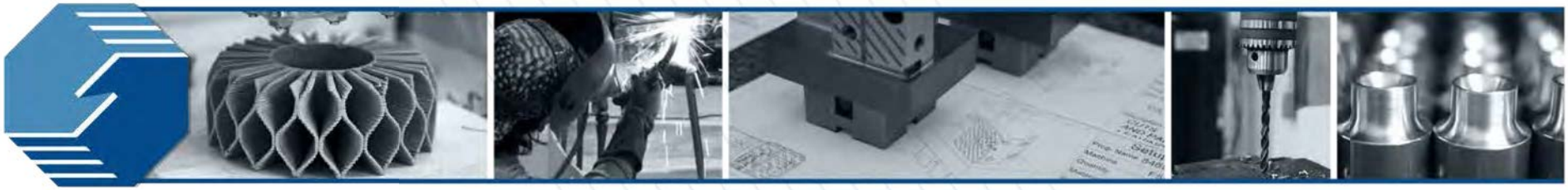


MAKING AN IMPACT ON U.S. MANUFACTURING

MEP Assistance Opportunities and Available Resources

Buy America Transit Supply Chain Connectivity Forum
Phoenix, AZ
June 22, 2016

David Stieren
Technical Manager, Program Development
NIST MEP
david.stieren@nist.gov

Samm Bowman
Business Specialist, Program Development
NIST MEP
samm.bowman@nist.gov

www.nist.gov/mep

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

NIST Overview

- Serve as the National Metrology Institute for the U.S.
- Responsible for Nation's measurement infrastructure – focused on measurements, standards, technology
- ~ 3,000 employees
- ~ 2,700 associates, facilities users
- ~ 1,200 field staff in partner organizations

Main programs:

-- NIST Labs

-- Hollings Manufacturing Extension Partnership (MEP)

-- Baldrige Performance Excellence Program

Gaithersburg, MD

©HDR Architecture

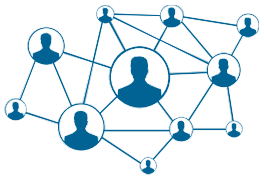
Boulder, CO

©Christina Kiffney Photography

JILA

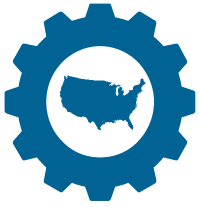
Collaborations:
JILA, JQI, HML, IBBR, ChiMaD, NCCoE

MEP Summary



National Network

MEP Center in all 50 U.S. states plus Puerto Rico. System-wide non-Federal staff of over 1,200 individuals in ~400 service locations assisting U.S. manufacturers. Contracting with ~2,500 3rd party service providers



Local ⇒ National Connection

System of Centers providing localized service to manufacturers in each State – with National reach and resources

Partnership Model

Federal, State and Industry

MEP Strategy: Global Competitiveness and Growth

Mission to provide direct, hands-on tech & business assistance to domestic manufacturers to help them compete and grow

MEP Budget & Business Model

$130M FY16 Federal Budget with Cost Share Requirements for Centers

Rail Relevance for Small Mfrs

Annually serve thousands of small U.S. manufacturers; partnering with U.S. DOT – ***MEP facilitating rail / transportation connections to small U.S. manufacturers***

MEP National Network

MANUFACTURING EXTENSION PARTNERSHIP
National Network

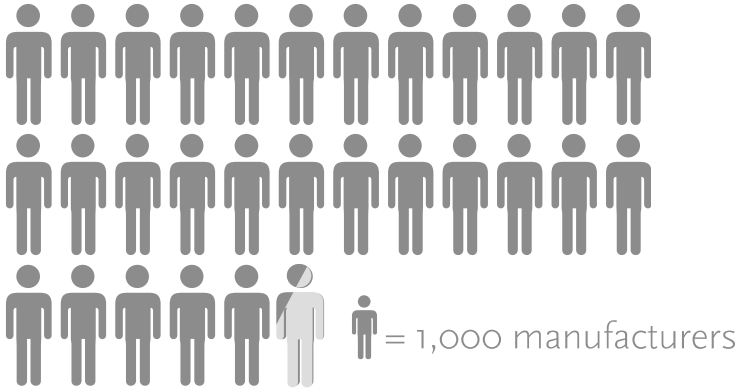
www.nist.gov/mep
301-975-5020
… and …
manufacturing.gov

What MEP Does

- Work with small and medium size manufacturers to help them create and retain jobs, increase profits and save time and money
- Focus on meeting manufacturer's short term needs, but in context of overall company strategy.
- Reach over **29,000 manufacturing firms** and complete ~**10,000 projects** per year.
- Provide companies with trusted assistance and a consistent set of services

MEP Client Impacts

29,101
Manufacturers served in FY15



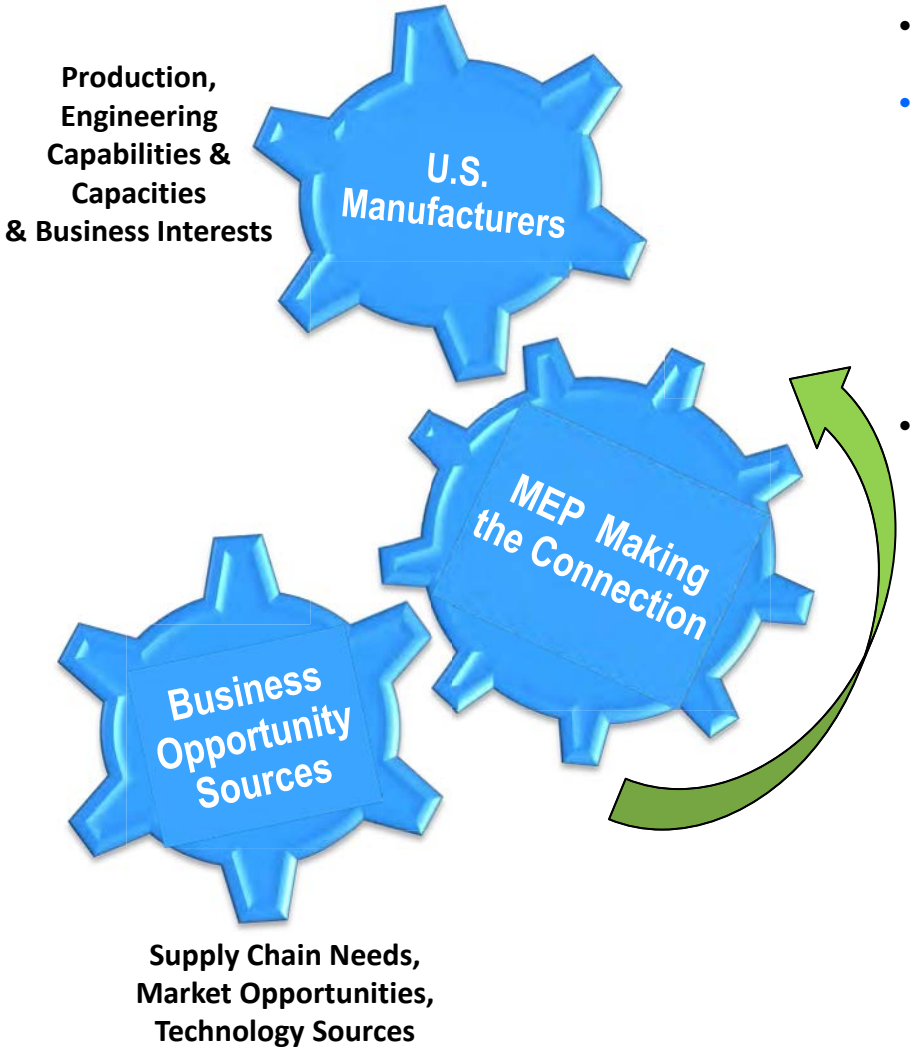
JOBS RETAINED	JOBS CREATED	NEW CLIENT INVESTMENTS	COST SAVINGS	RETAINED SALES	NEW SALES
49,011	19,466	$3.2 Billion	$1.2 Billion	$5.7 Billion	$2.3 Billion

MEP Program Initiatives

MEP's Program Initiatives

are aimed to help manufacturers identify opportunities that will accelerate and strengthen their growth and competitiveness in the global marketplace

MEP: Connecting and Assisting U.S. Manufacturers



- Enhance business opportunities for U.S. manufacturers
- *Connect* products, capabilities, capacities of U.S. (small) manufacturers with:
  - ✓ *Resources available from Nation's technology sources, including NIST Labs, other Federal Labs, NNMI Institutes*
  - ✓ *New market opportunities*
  - ✓ *Supply chain needs of OEMs, Tier 1s, gov agencies*
- Provide *assistance* to manufacturers, including:
  - ✓ *Technical manufacturing services for products, processes*
    - *Manufacturing Strategy, Scale-up*
    - *Production Optimization, (Re)tooling (Lean/Quality/Automation)*
    - *Engineering and Design Practices*
    - *Innovation and Product/Process Development*
  - ✓ *Supply Chain Development and Optimization*
  - ✓ *Market Diversification, Marketing*
  - ✓ *IP Management and Financing/Access to Capital*
  - ✓ *Workforce Development*
  - ✓ *Environmental Sustainability*
  - ✓ *Exporting*

MEP Supplier Scouting

- Leverages nationwide network of Supplier Scouts in MEP Centers to connect capabilities, capacities, business interests of small U.S. mfrs w/needs, business opportunities of manufacturing supply chains.

- Includes connecting small U.S. manufacturers w/procurement opportunities tied to gov. agency Buy America(n) requirements for domestic content.

- Identifies and connects domestic manufacturers with business opportunities for supply chains in the following industry sectors**:
  - ✓ ***passenger and freight rail cars and rail locomotives***
  - ✓ ***railroad track and physical infrastructure***
  - ✓ highway and waterborne transportation systems
  - ✓ defense weapon systems and defense support equipment
  - ✓ energy-related products
  - ✓ laboratory instruments
  - ✓ various consumer products
  - ✓ power utilities

**has included identifying small domestic manufacturers w/particular demographic attributes – such as DBE, MOSB, VOSB, WOSB, etc.

MAKE IT IN AMERICA
MANUFACTURING EXTENSION PARTNERSHIP

15
Participating Organizations

~200
Items Scouted

70+ Identified Suppliers

>$160M New Business Opportunities

MEP Supplier Scouting and Buy America Transit Supply Chain Connectivity and Development

The nationwide MEP Network is actively assisting in the development of more robust domestic supply base for transit equipment in the U.S

- ✓ Interagency Agreement between DOT FTA and NIST MEP
- ✓ NIST MEP coordinate national, system-wide MEP efforts
- ✓ MEP Supplier Scouting conducted by Centers to ID manufacturers both capable of and interested in supplying needed manufactured goods
  - Include manufacturers currently serving transit industries + manufacturers from other sectors (auto, defense, aero, industrial controls / electronics, others ?)
- ✓ MEP available to assist domestic manufacturers with needs and requirements to enter transit supply chains and become suppliers

Buy America Transit Supply Chain Connectivity
Next Steps

- **Today's Supply Chain Connectivity Forum**
  - ✓ NIST MEP to post slides for access by participants, interested entities at www.nist.gov/mep
- **MEP Assistance to Manufacturers**
  - ✓ Local MEP Centers available to work with manufacturers at the local level to provide assistance in response to needs – resulting from today's Forum and other needs
    - In AZ, contact Rev AZ: www.azcommerce.com/programs/rev-az
  - ✓ NIST MEP available to coordinate national level MEP assistance resulting from today's Forum, such as supplier scouting, supplier development and improvement, other, …
    - NIST MEP: www.nist.gov/mep

BLUEGREEN ALLIANCE

Resources for Passenger and Transit Rail & Components Manufacturers

Summary

Buy America Transit Supply Chain Connectivity Forum

Phoenix, AZ

June 22, 2016

Resources: Rail Supply Chain & Market Analysis

Reports from BlueGreen Alliance, Duke CGGC, AAM, ELPC provide picture of the transit & passenger rail industries

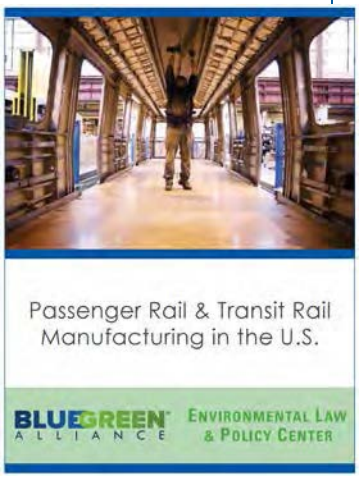
- Market history and outlook
- Opportunities and gaps in the value chain
- Practical and Policy recommendations to help grow the transit manufacturing sector

APTA, Jobs to Move America

- Visibility of upcoming transit procurements
- Procurement tools to encourage greater domestic sourcing

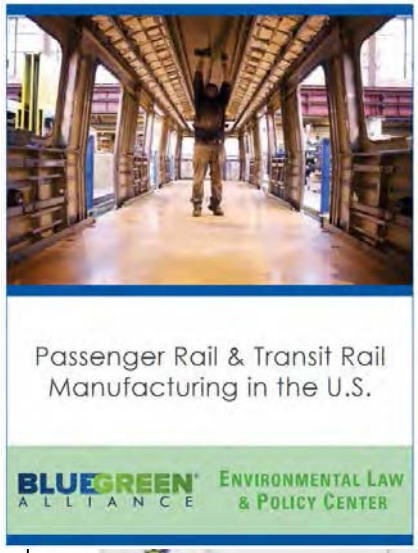
2015 BGA/ELPC

- Overview of transit rail manufacturing today PLUS
- Detailed listing of rail and component manufacturers



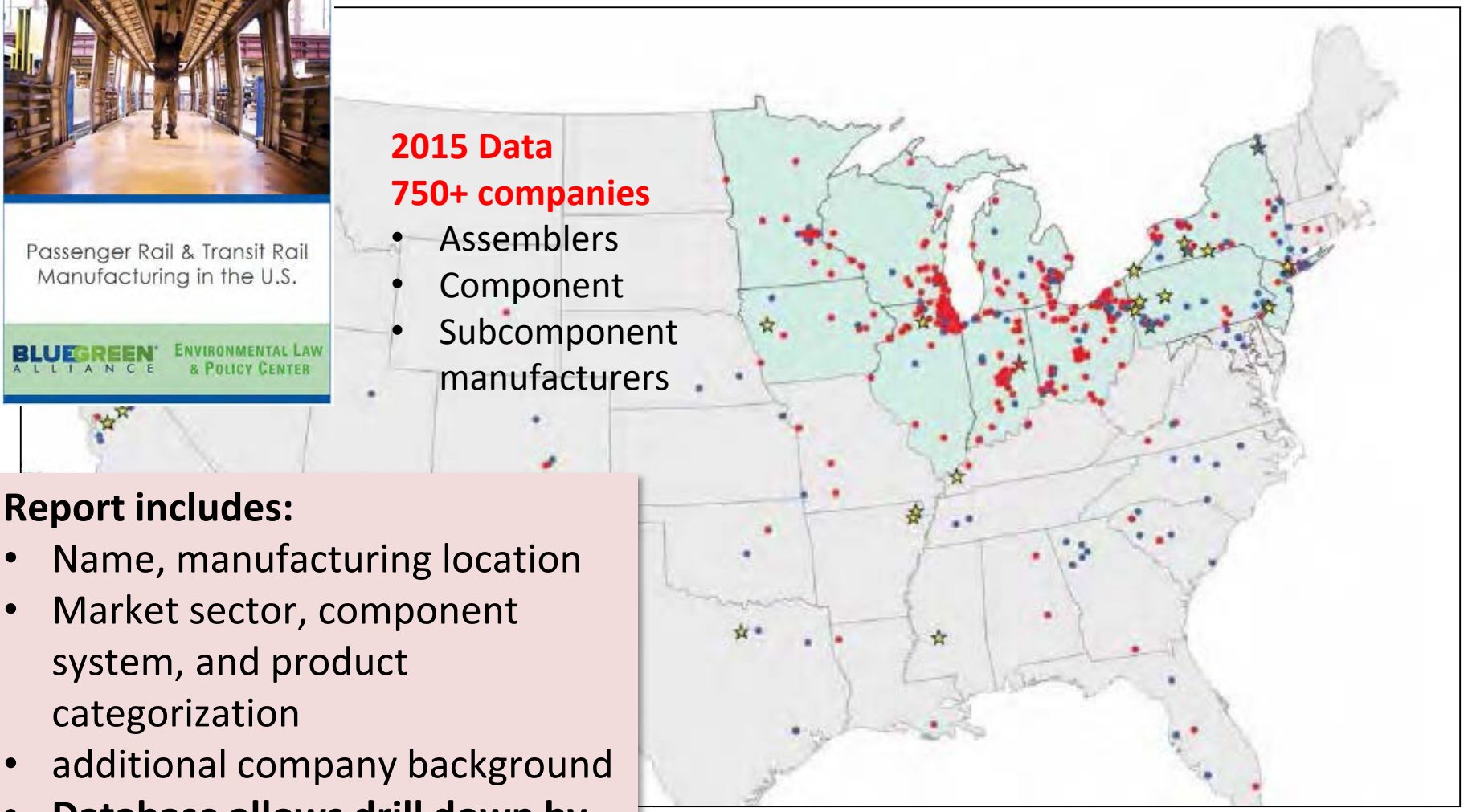
2015

Building on 2015 analysis



2015 Data
750+ companies

- Assemblers
- Component
- Subcomponent manufacturers

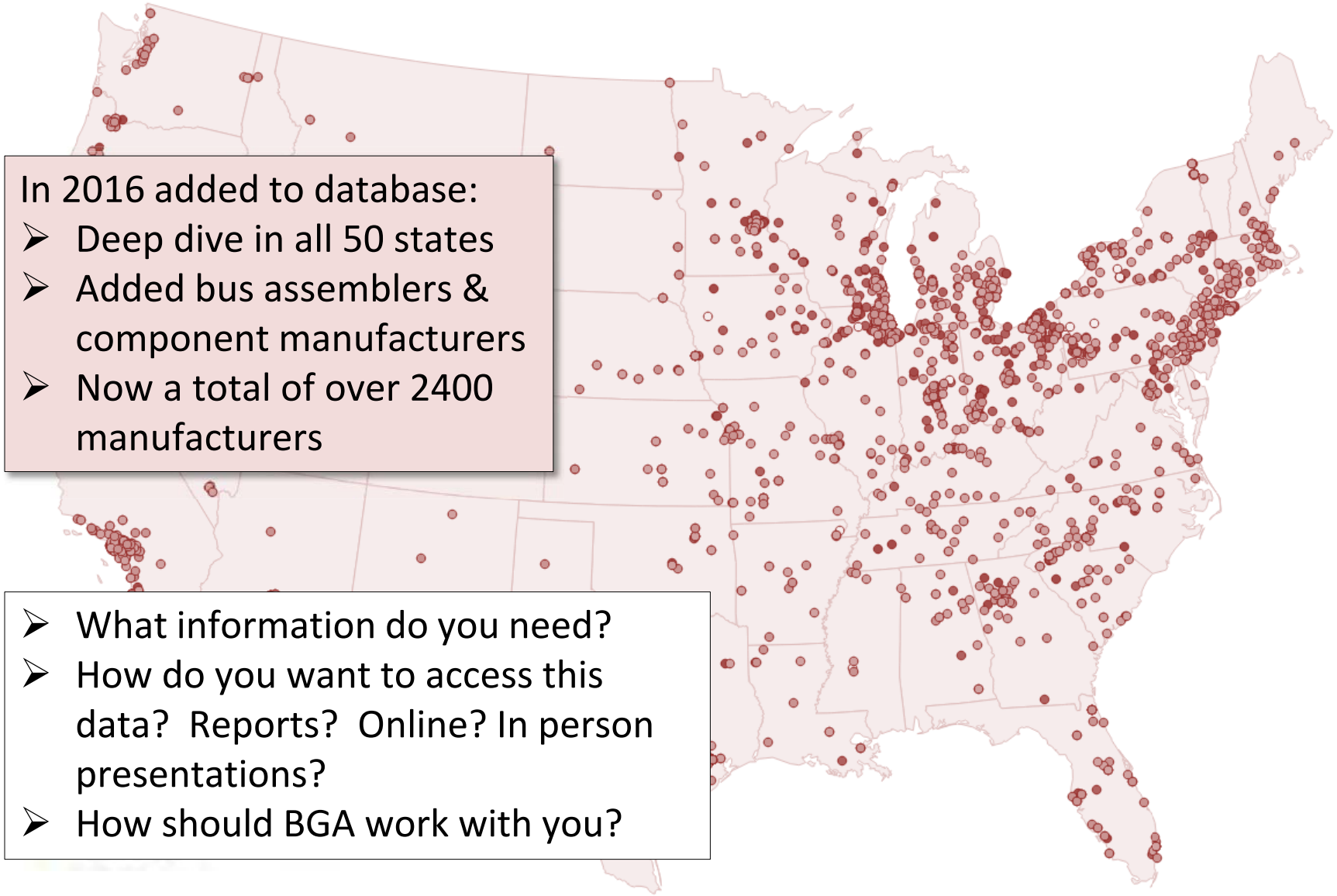


Report includes:

- Name, manufacturing location
- Market sector, component system, and product categorization
- additional company background
- **Database allows drill down by geography or sub-sector**

Find it at: www.bluegreenalliance.org

What tools and data would you like to see?



In 2016 added to database:

- Deep dive in all 50 states
- Added bus assemblers & component manufacturers
- Now a total of over 2400 manufacturers

- What information do you need?
- How do you want to access this data? Reports? Online? In person presentations?
- How should BGA work with you?

How to Contact BGA

Roxanne Johnson
Research Analyst
roxannej@bluegreenalliance.org
612-466-4508

Zoe Lipman
Senior Policy Advisor
zoel@bluegreenalliance.org
202-706-6902

BlueGreen Alliance – 15 of the nation's largest labor and environmental groups committed to building a cleaner, fairer and more competitive America


Rev
AZ
A NIST/MEP Affiliate

RevAZ Mission

To make every Arizona manufacturer the most successful business it can be.

Service Offerings – Operational Excellence

- Continuous Improvement
- ISO Certifications
- Supply Chain
- Sourcing
- Supplier Development
- Inventory Optimization
- MRP/ERP
- Technology Planning & Roadmaps
- Technology Implementation
- Work Force

Service Offerings – Business Excellence

- Strategy Development
- Business Planning
- P&L/Cash Flow
- Financial Modeling
- ExporTech

- OD Workshops and Training
- Sales Training
- CRM Processes & Tools
- Marketing
- Diversification

RevAZ Service Delivery

- RevAZ Staff
- Network of Approved Business Partners
- Experts across the MEP Network

Business can be challenging…

RevAZ can help!

Dave Garafano **DavidG@AZCommerce.com** **602-845-1246**

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OPEN DISCUSSION

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Thank You

Stay Connected

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http://nistmep.blogs.govdelivery.com

Get the latest NISTMEP news at:
www.nist.gov/mep

RevAZ Manufacturing a Revolution

FTA Federal Transit Administration