

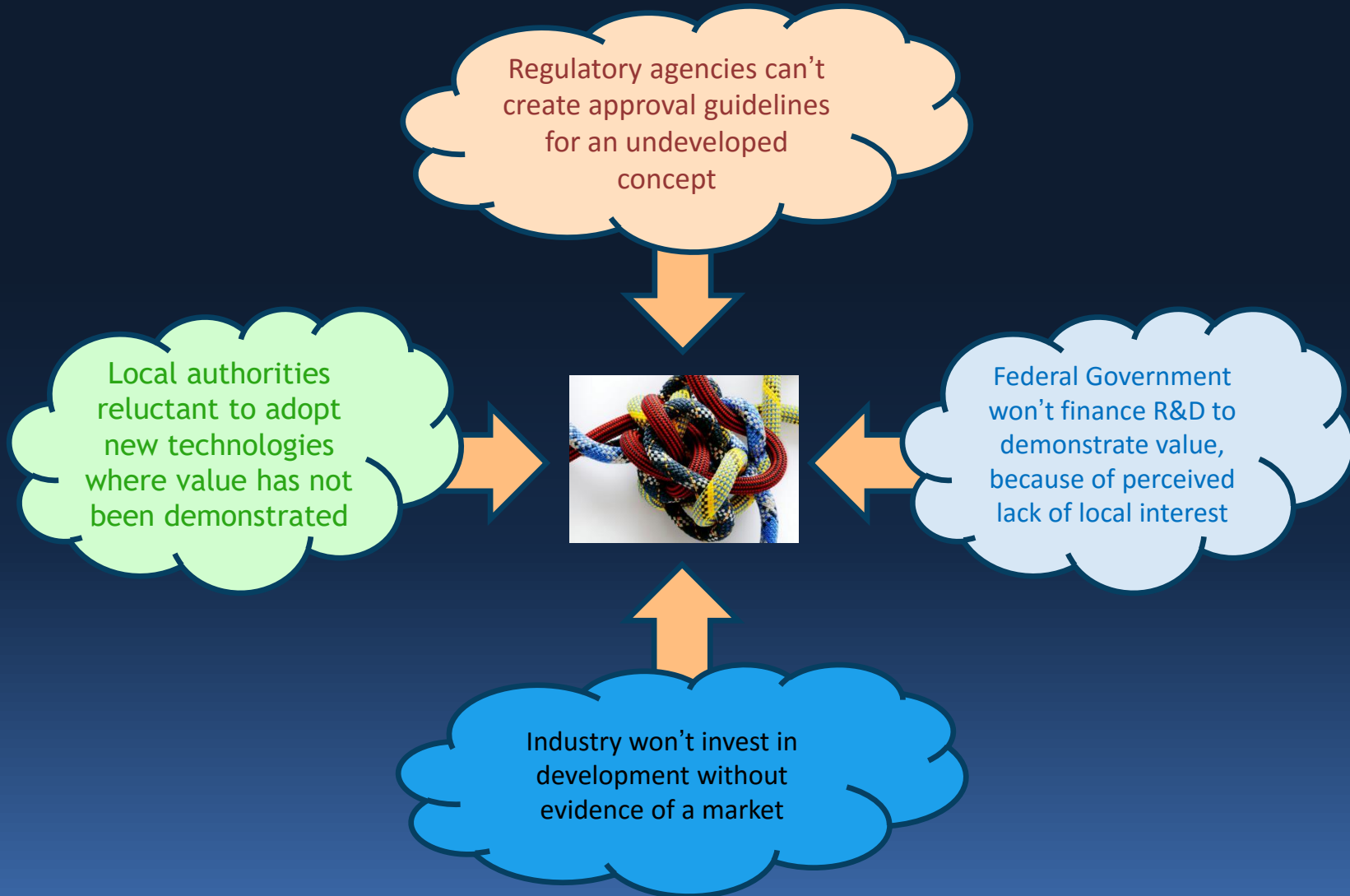
# Cracking the Gordian Knot: Advancing ATN Development and Deployment



# It's Been 40 Years!

- If ATNs are so great, why don't we see them everywhere in our cities and suburbs?
- Heathrow, Masdar City and Suncheon Bay have not yet led to widespread use.
- Perhaps we should ask . . .
  - What is blocking further development and deployments of ATNs?
  - What can we do about it?

# The Gordian Knot



# Cutting the Knot -- Two Parallel Paths

- Bring together local authorities to lead investigation
  - Demonstrate local interest and identify potential demonstration sites
  - Already interested: San Jose and Inglewood in CA. Greenville, SC; Ithaca, NY; Edina and other cities in Minnesota; Uppsala and Goteborg in Sweden
- Fund a proving ground for independent third party assessment and certification of ATN systems
  - Quantify the real potential of ATNs and reduce uncertainty and risk
  - Ensure proposed systems are ready and safe for “prime time”

# FRA Transportation Technology Center (TTC)



- 52 square miles
- 48 miles of track
- Specialized laboratories
- Infrastructure components
  - Signalling equipment
  - Safety devices
- Evaluation of vehicle stability, safety, endurance, reliability and ride comfort
- Freight and passenger vehicles



TTCI manages the Federal Railroad Administration's (FRA) Transportation Technology Center (TTC), located just 21 miles northeast of Pueblo, Colorado. TTC is operated under a care, custody, and control contract with the FRA. This 52-square mile, secure and remote site operates with a vast array of specialized laboratories and track. TTC enables isolated testing for all categories of freight and passenger rolling stock, vehicle and track components, and safety devices.

Test Tracks

Green Technologies at FAST

Laboratories

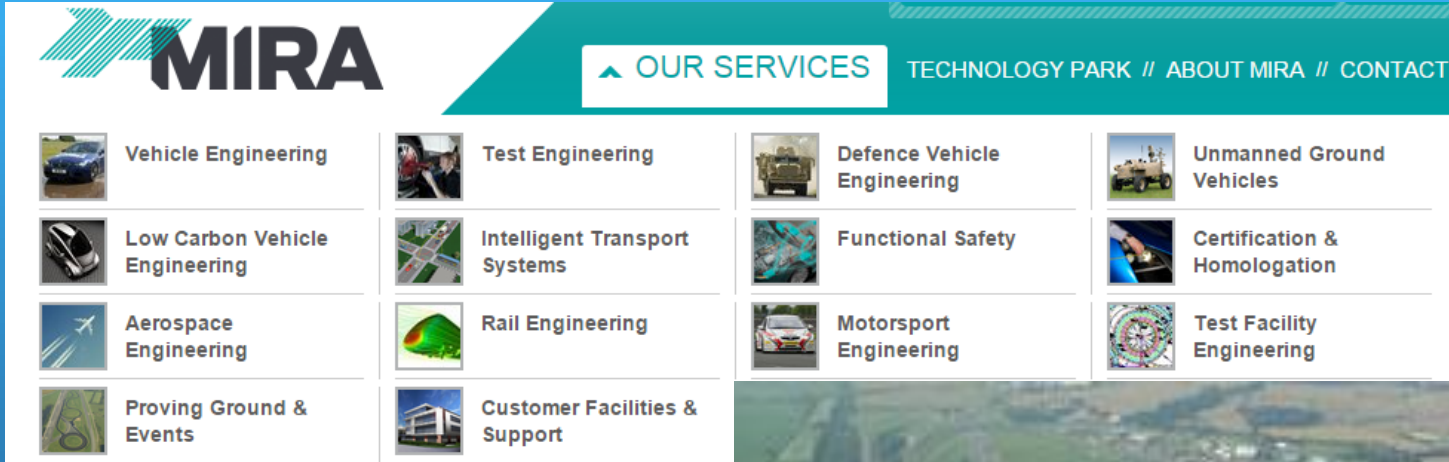
Transportation Security



[Go to Tracks](#)















There are 48 miles of railroad track available for testing locomotives, vehicles, track components, and signaling devices at the Transportation Technology Center (TTC), Pueblo, Colorado. Specialized tracks are used to evaluate vehicle stability, safety, endurance, reliability, and ride comfort. Using TTC's tracks eliminates the interferences, delays, and safety issues encountered on an operating rail system.

# Motor Industry Research Association (MIRA)



**MIRA**

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 Vehicle Engineering	 Test Engineering	 Defence Vehicle Engineering	 Unmanned Ground Vehicles
 Low Carbon Vehicle Engineering	 Intelligent Transport Systems	 Functional Safety	 Certification & Homologation
 Aerospace Engineering	 Rail Engineering	 Motorsport Engineering	 Test Facility Engineering
 Proving Ground & Events	 Customer Facilities & Support		

- Established in 1946
- Located in Warwickshire, UK
- Originally government funded, now an independent non-profit
- Vehicle engineering / testing facilities and consultation services



# Transportation Research Center (TRC)



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## About TRC



Transportation Research Center is an **independent automotive proving ground** providing research and development, and compliance and certification testing for vehicles and components, for **crash testing**, **emissions testing**, **dynamic testing** and **durability testing**.

- Established in 1962 by Ohio State University
- Facility located on 4,500 acres of land in East Liberty, Ohio
- Funded by state highway bond issue
- Utilized by automotive component and vehicle manufacturers, government agencies, and industry organizations worldwide
- Conducts programs designed to test for safety, energy, fuel economy, emissions, durability, noise, crash, crash simulation and performance
- Testing of trucks, buses, recreational vehicles, motorcycles, electric vehicles, passenger cars and components

# Purpose of Proving Ground

## Reduce Risk and Uncertainty

- Operational Testing by an independent neutral third party
- Reduce risks of technological, social, economic, environmental, political or physical failure.
- Give confidence to potential buyers of ATNs



# Purpose of Proving Ground

## Provide Technical Facilities

- Computer modeling, simulation and test
- Physical modeling laboratory
- System simulator allow members of public to experience a ride
- Component testing laboratory for sub-system research
- Earthquake, wind, climate test laboratories
- Guideways for vendors to test and validate their products
- Human factor design and test – comfort, safety
- Station design and alternatives
- Offices
- On-going test facilities to assure safety and acceptance as new systems and technologies are developed

# Purpose of Proving Ground

## Products

- Feasibility and cost studies
- Concept design, testing of new systems and technologies
- Develop standards of fit, form and function
- Construction design and installation methods
- Inform regulators about ATNs and how to regulate and certify their safety and quality of operations
- Performance Monitoring
- Ensure human factors are fully tested and acceptable
- Allow potential buyers to ride the systems and assess their impact in urban environment.
- Educate and train next generation of designers, network planners and operators

# To Summarize

- ATN development and deployment is stuck in the Gordian Knot
- Early ATNs are operating, but we need to take “next step” to make them scalable for urban use
- Innovative systems are not amenable to standard purchasing methods
- Local authorities cannot rely on the claims of vendors
- Proving Ground is relatively low cost and could support both ATNs and driverless cars on streets