TIC CONNECTS Systems - Vehicles - Travelers

The Case for Improving Work Zone Management and Communications in a Highly Automated Driving World

Introduction Eli Sherer

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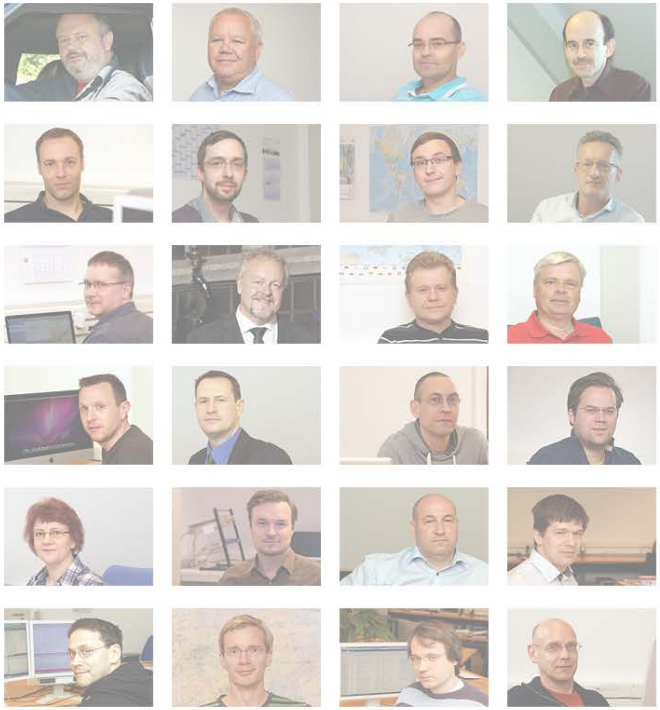


Founded in 1992.

Corporations in Germany, and USA.

Headquarters in Bernburg (Germany).

Additional offices in Germany (Leipzig), UK, and USA.

Public and private sector customers worldwide.

10 Solutions including Work Zone.

What makes a Work Zone Smart?

Any technology which helps:

To increase drivers and workers safety.

To reduce impact on traffic.

During the entire life cycle:

From planning until completion.

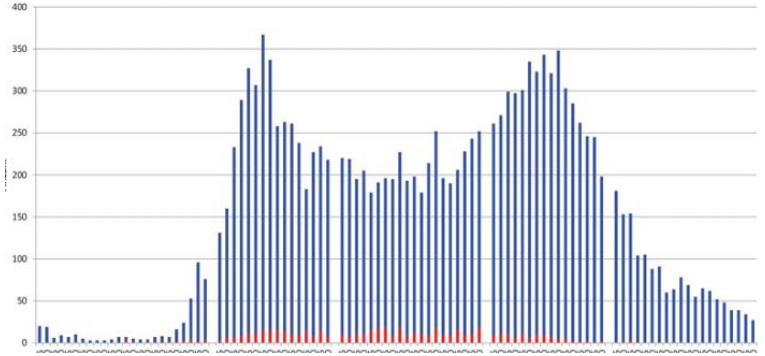
Work zone planning
Reduce traffic impact

Problem:

Work zones cause congestion.

Option for solution:

Find the best time by using historical traffic patterns.



Problem:

Work zones on diversion route cause congestion.

Option for solution:

Identify conflicts:

By location (nearby).

By location and diversion routes:

Pre-defined routes.

Navigation routes.

By location and other road restrictions.

Problem:

Not all conflicts are detected.

Option for solution:

Coded work zone locations.

All work zones in one system:

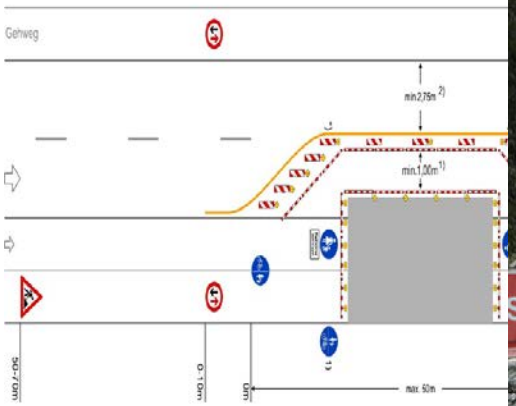
Work zone information system which can be used all agencies (state, county, city, …).

Planned Work Zones:

Do not always follow the plan.

Also lacking in data to meet the **demands and requirements for CAV**.

The Plan



The Reality

Option for solution:

Send coded information about traffic control to vehicles (CAV)

Automatically update the information:

- Traffic flow (speed):
  - Service providers (HERE, Inrix, TomTom, Google, …).
- Sensors (iCone, …).

In Germany, since the 1990's, the State Police are responsible for making notifications, changes and cancellations about traffic incidents.

Information is created, stored, and distributed to websites and traffic information providers, including broadcasters and in-vehicle navigation systems.

Each of the 16 Federal States use their own TIC system, to create and exchange data.

AWSA: Moving work zone warning system in Saxony Anhalt.

Uses existing business processes and systems.

First European project to increase traffic safety using Smart Work Zones.

Saxony-Anhalt

Area:

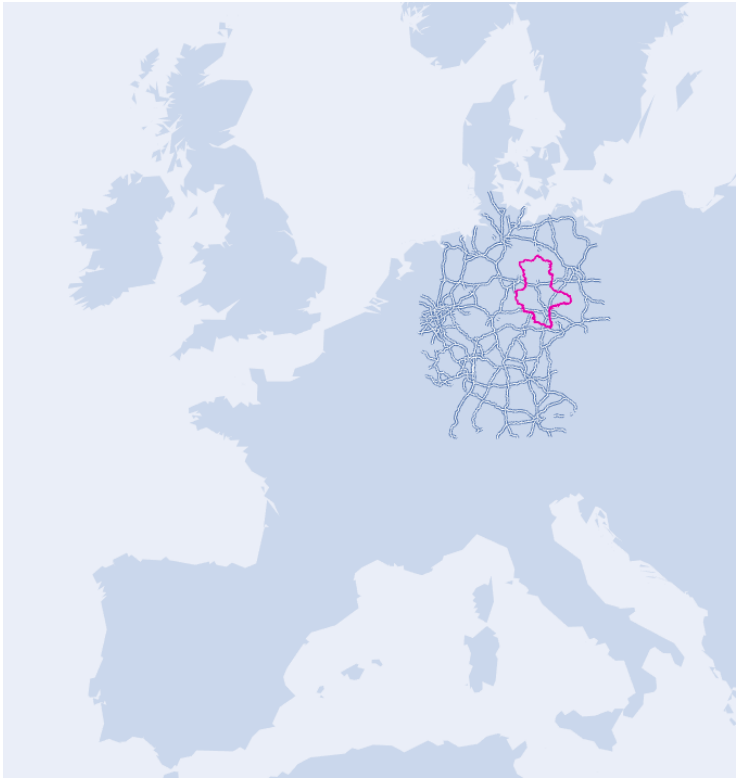
8th largest federal state

~7,900 square miles

Population (2015):

10th largest population

2.245 Million



Autobahn (Interstate roads):

290 miles.

7 road maintenance departments.

Federal, State, County roads:

4,340 miles.

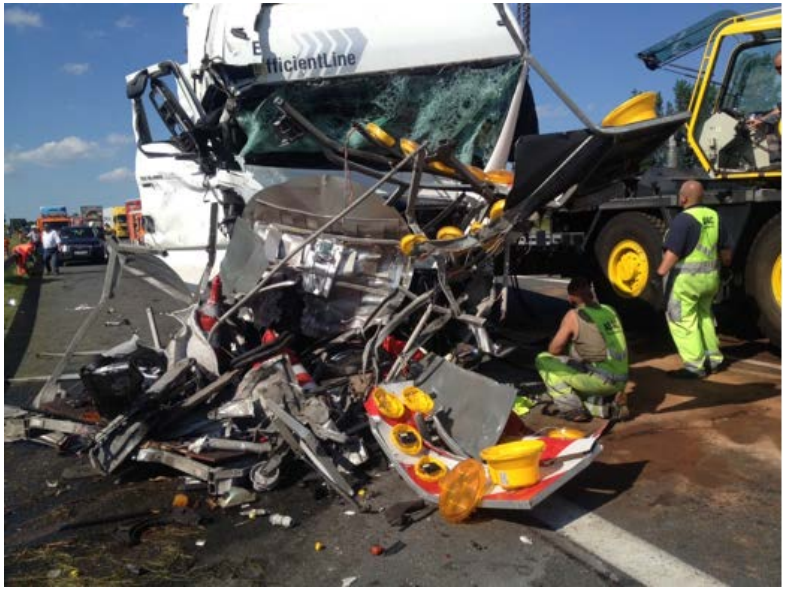
21 road maintenance departments for Federal, State, County roads.

Accidents on autobahns in 2017:

- 4,800 total.
- 2,000 caused by trucks.
- 27 people killed.

Road agency employee killed during truck accident in 2014 and 2017.

7-10 warning trailers lost by accidents per year.



Source: LSBB

Increase:

Safety of workers (construction and otherwise).

Drivers safety.

Minimize:

The risk of accidents.

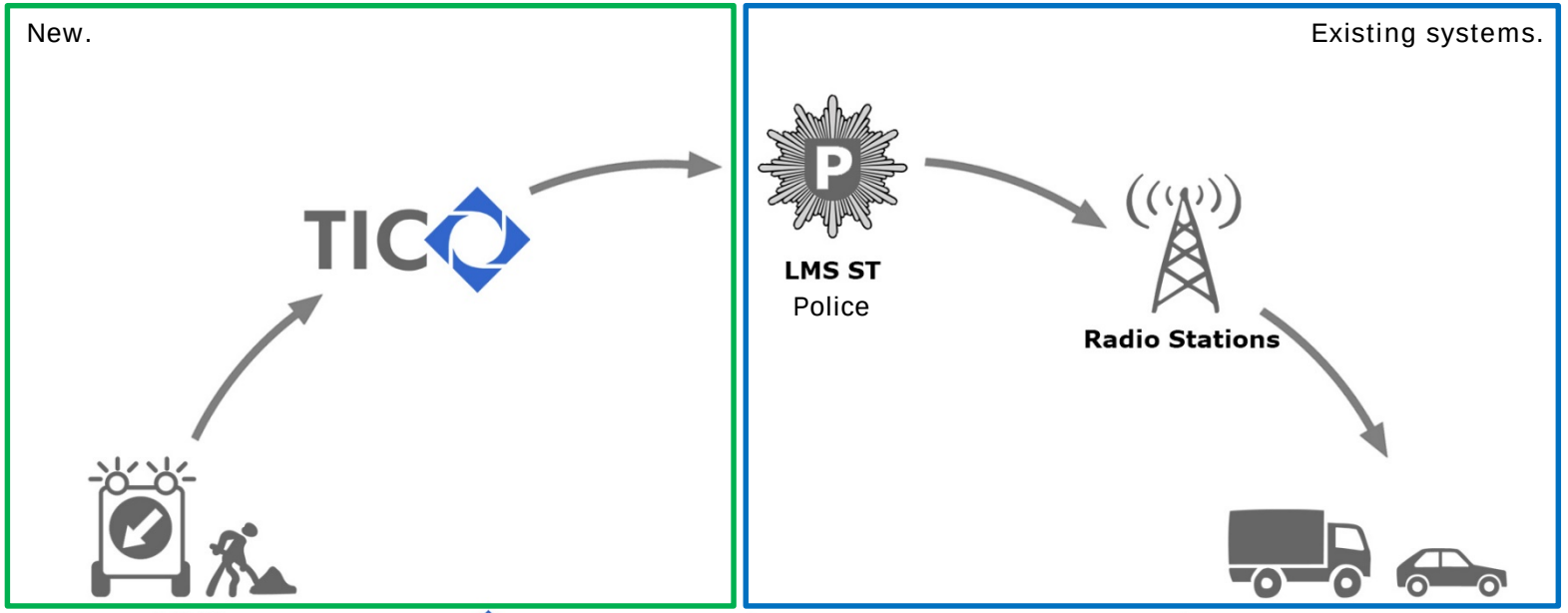
Traffic disruption at work zones.

Technology can be used by old and new vehicles.

Use existing information systems and existing business processes.

Source: LSBB

The project


New.
Existing systems.
LMS ST
Police
Radio Stations
LSBB
Moving and planned work zones
TICCONNECTS
Road Agencies & Vehicles

Location and Work Zone data reported automatically

TIC Id	Name	Description	Identifier	Activity	Planned duration	Non-codeable information	Location
RD/119_75		A9 Berlin Richtung	75	green care			A9 Berlin to Ha
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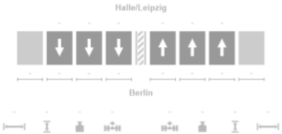
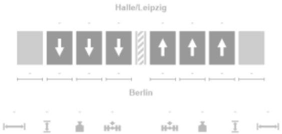
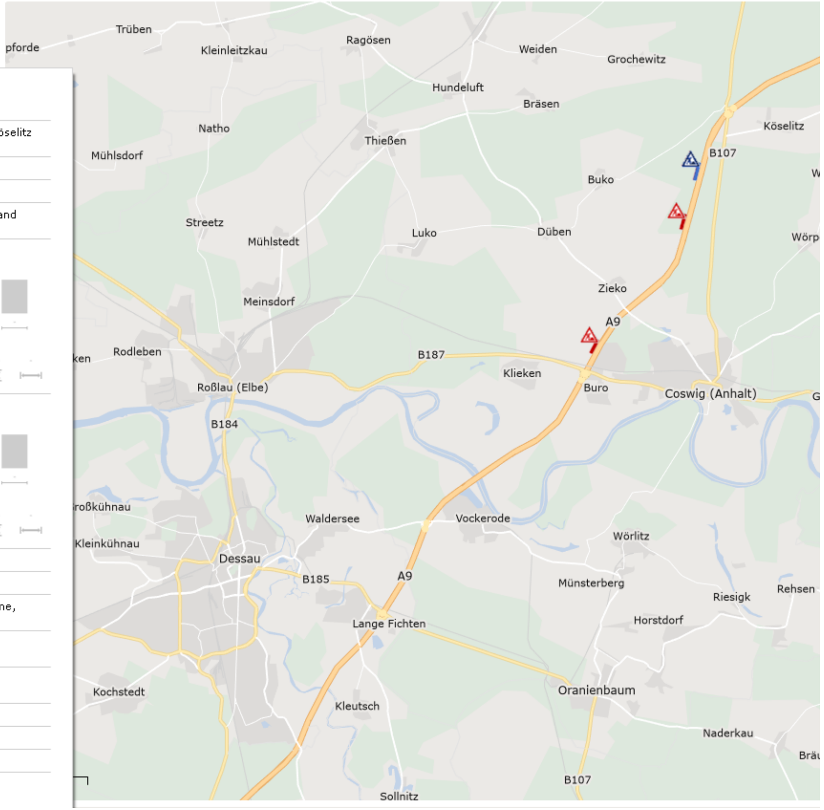
Work Zone

TIC Id:	RD/119_75
Description:	A9 Berlin Richtung Halle/Leipzig zwischen Köselitz und Coswig Grünpflege
Identifier:	75
Activity:	green care
Location:	A9 Berlin to Halle/Leipzig between Köselitz and Coswig
Work zone traffic control:	
Normal traffic control:	
Data producer:	AWSA
Moving:	Yes
Time zone:	(UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
Object version create time:	10/1/2018 2:30:33 PM
Object version end time:	10/1/2018 2:30:33 PM
Object version type:	Deleted
Store time:	10/1/2018 2:30:33 PM
Data create time:	10/1/2018 2:30:33 PM
Created by TIC Server component:	NOVASIB MBDE (Collect)



Data is automatically updated

Moving work zones are now available:

- Common navigation systems via RDS/TMC.
- Apple and Google traffic data.
- In traffic announcements and web sites.

Short and long term work zones are available.

All work zones are available at Mobility Data Marketplace.

TIC Implementation cost 150k € ($175K)

- Add $1~2k per warning trailer unit.

Source: LSBB

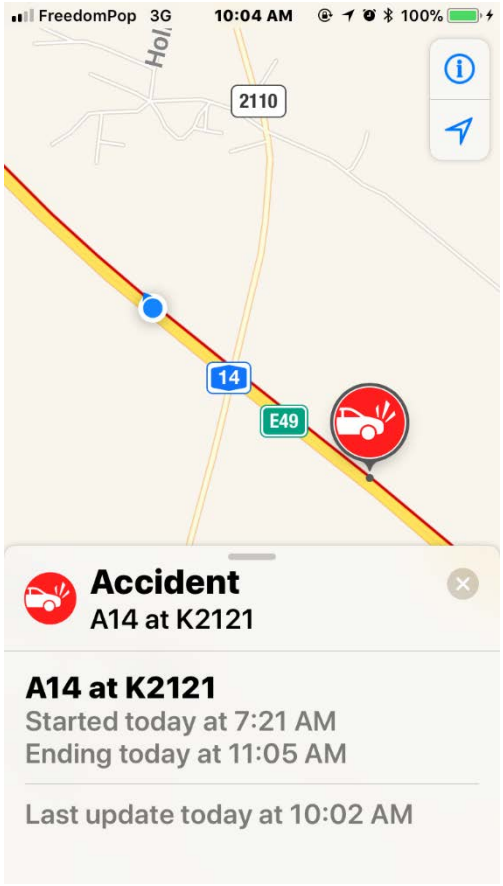
A Personal Experience

A crash on the A14

Crash reported

State Police create a Traffic Event and dispatch emergency responders.

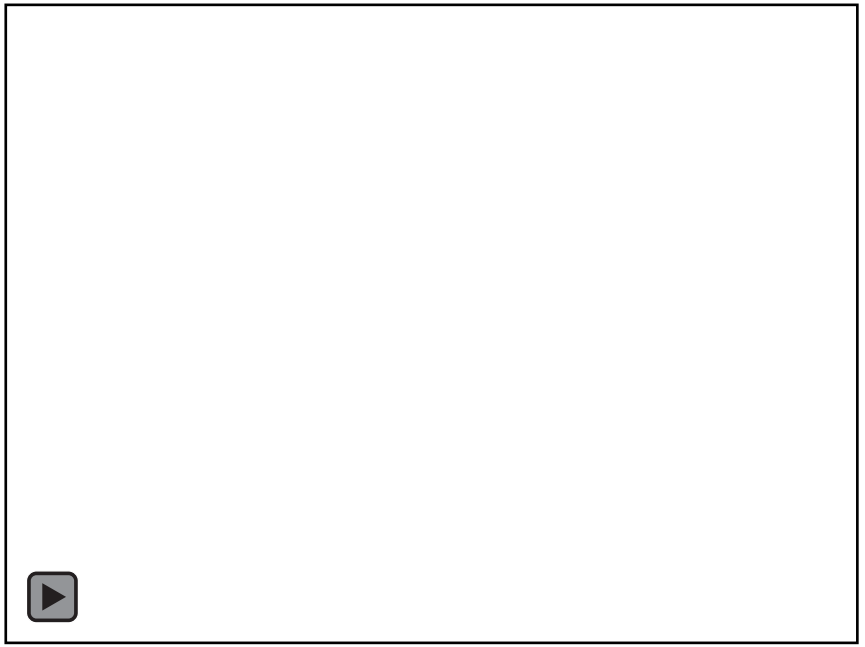
- Information is distributed to navigation systems via RDS/TMC.
- Apple and Google traffic.
- Broadcasters, web sites, ...



Drivers move to the sides of the road

Trucks to the right, cars to the left, leaving a center lane opening for emergency vehicles to pass.

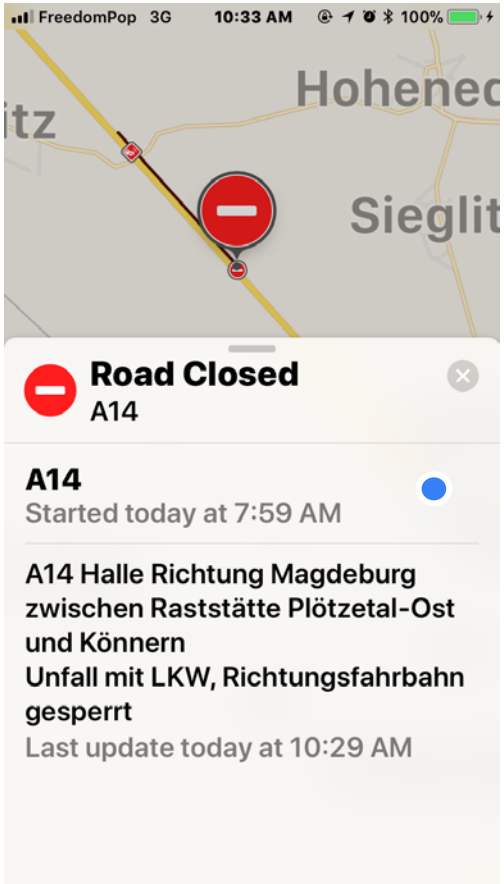
Backup eventually reached ~10km (more than 6 miles).



Warning trailer brought to the site

Emergency responders, and a Mobile Warning Trailer arrive.

- Warning trailer provided more accurate location.
- Message entered on warning tralier, including arrow board direction.
- Closure information automatically updated based on actual sign location AND actual message delivered on the sign!



Can be added to any warning trailer

Warning trailer can be “old” equipment.

On-Board tranmitter unit with GPS and Internet connection, powered by the same battery as the sign.

Can be placed at any location.

Data is sent to drivers via RTTI, RDS-TMC, …, and received using in-vehicle navigation device or other means.

2018:

Operations started in Mar 2018.

At least one warning trailer per road maintenance agency.

2019:

60 warning trailers will be in use.

Solution can be used worldwide.

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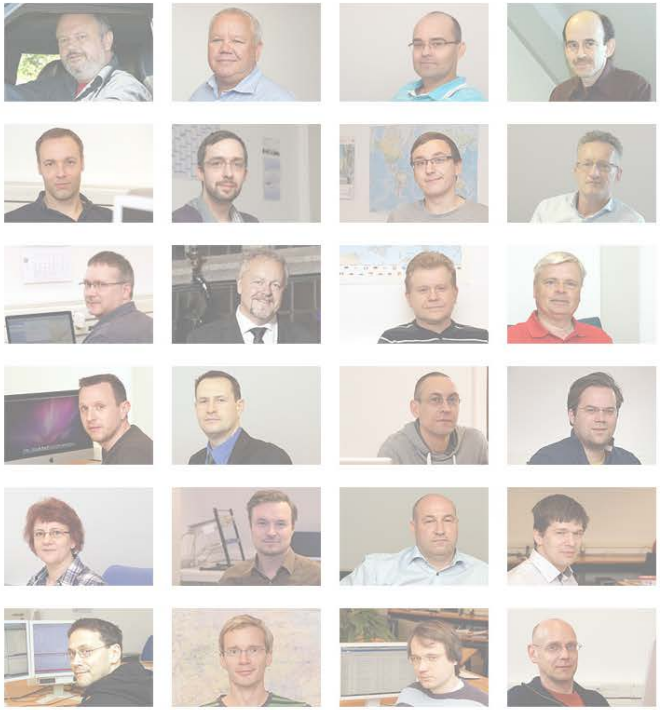

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