Triplesign Variable Message Signs (VMS)

International Case Studies

triplesign.com
Innovation and ECO Technology

RTL

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A Triplesign VMS is the sustainable alternative

- When only a limited number of messages is required
- When there are no cables (yet) for power or communication
- When there is a small budget to take measures
- When the same problems occur repeatedly
- When a varying message must be displayed for a longer period (such as different speed limits, temporary roadblocks, weather warnings, etc.)

Key Features of Triplesign Solution

- Extremely low power consumption
- Solar energy operation or battery only
- Wireless functionality
- Turnkey and IoT readiness
- Easy cable-free installation
- Low investment
- Web-interface or back-end platform control

Autonomous slippery road warning

Key Features of Triplesign Solution

- Exceptionally long service life (>20 years)*
- Minimal yearly maintenance
- Low and easy maintenance
- Easy to integrate with existing Intelligent Traffic Management systems
- Reliability – Always displaying a message
- Uniformity to static signs

- Replacement of active components gives a new sign when the 20 years lifetime is lapsed

Some real-life examples

- Variable speed zones in Belgium
- Autonomous flood warning system in the UK
- Narrow road passes in Norway
- Flexible use of road sections in Italy

School zones
or
Variable speed zones

Excessive and unadopted speed is still the main cause of accidents on Belgian roads. Not only the drivers of the vehicle are affected. Most victims are the passengers of the vehicle, occupants of a hit vehicle or cyclists and pedestrians.

- **A local government chose to create temporary speed limitations during rush hours in specific areas, to reduce the risk for traffic incidents.**

Preconditions:

- The solution needed to be sustainable
- No power was available on site
- The signs needed to work on solar energy
- The signs needed to be autonomous and maintenance free

The KRYCER solution:

- Krycer installed the Triplesign solution that is operated with a pre-programmed yearly calendar. Possible adjustments are made via a web-interface or by local reprogramming of the PLC.

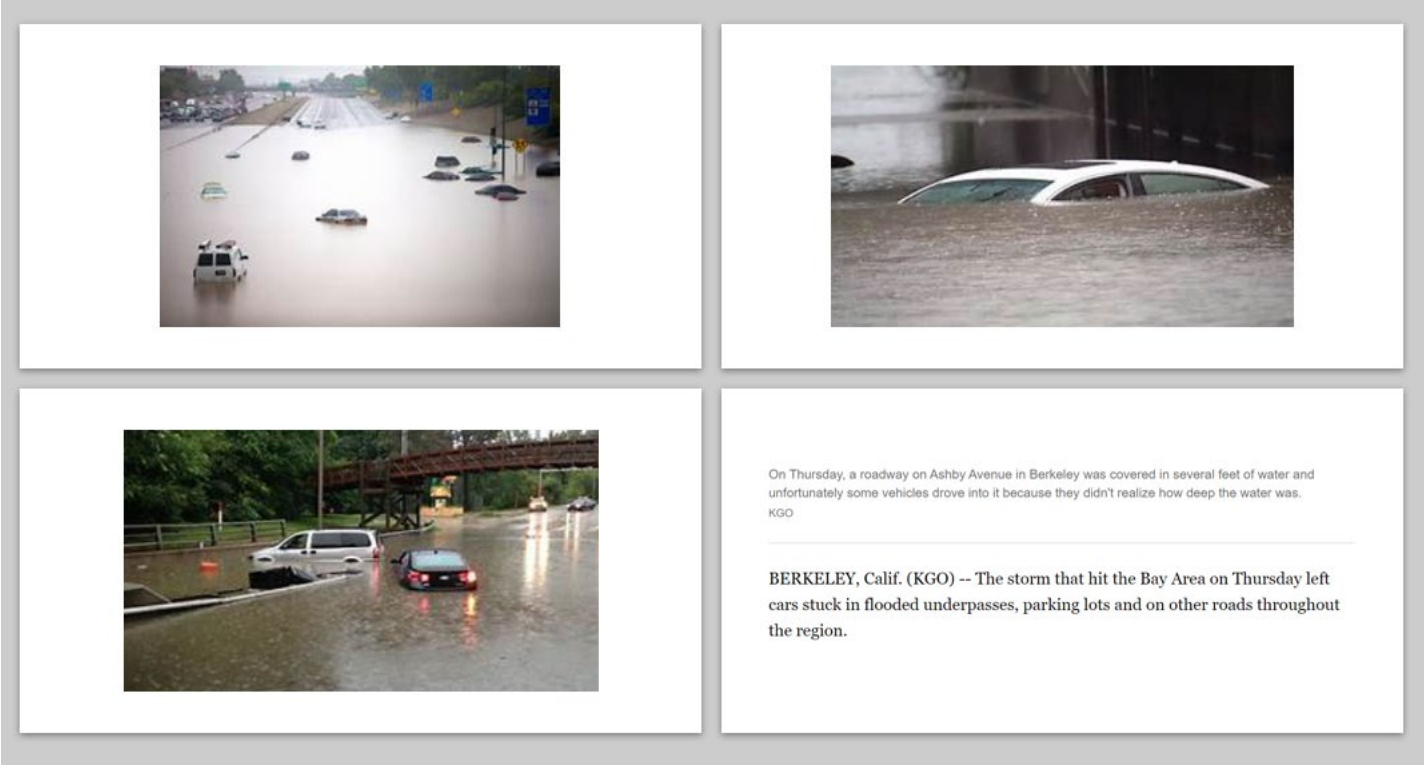

30
30

Some challenges and lessons learned from this project:

- The power consumption of the signs is 1W/hour
- This is too much when the sign is placed in the shadow and there is little possibility to recharge the battery
- The signs need to be reprogrammed every now and then and this needs to be done for each sign separately
- The signs are not connected to each other and need to rotate all at the same time
- This is complicated when the signs are not “grouped” to work together

New Triplesign system (Portal Multi):

- Grouping and Control of several signs in 1 portal
- Secure communication (MQTT communication, TLS protocol)
- Power consumption – down to 0,14 W/hour
- Sign status and battery level available 24/7
- Log files available 24/7
- Customer controlled portal
- Add and remove users
- Access control
- Calendar functionality (Hourly/Daily/Monthly/Yearly etc..)



On Thursday, a roadway on Ashby Avenue in Berkeley was covered in several feet of water and unfortunately some vehicles drove into it because they didn't realize how deep the water was.
KGO

BERKELEY, Calif. (KGO) -- The storm that hit the Bay Area on Thursday left cars stuck in flooded underpasses, parking lots and on other roads throughout the region.

Flood warning

News › County News › Traffic and Travel

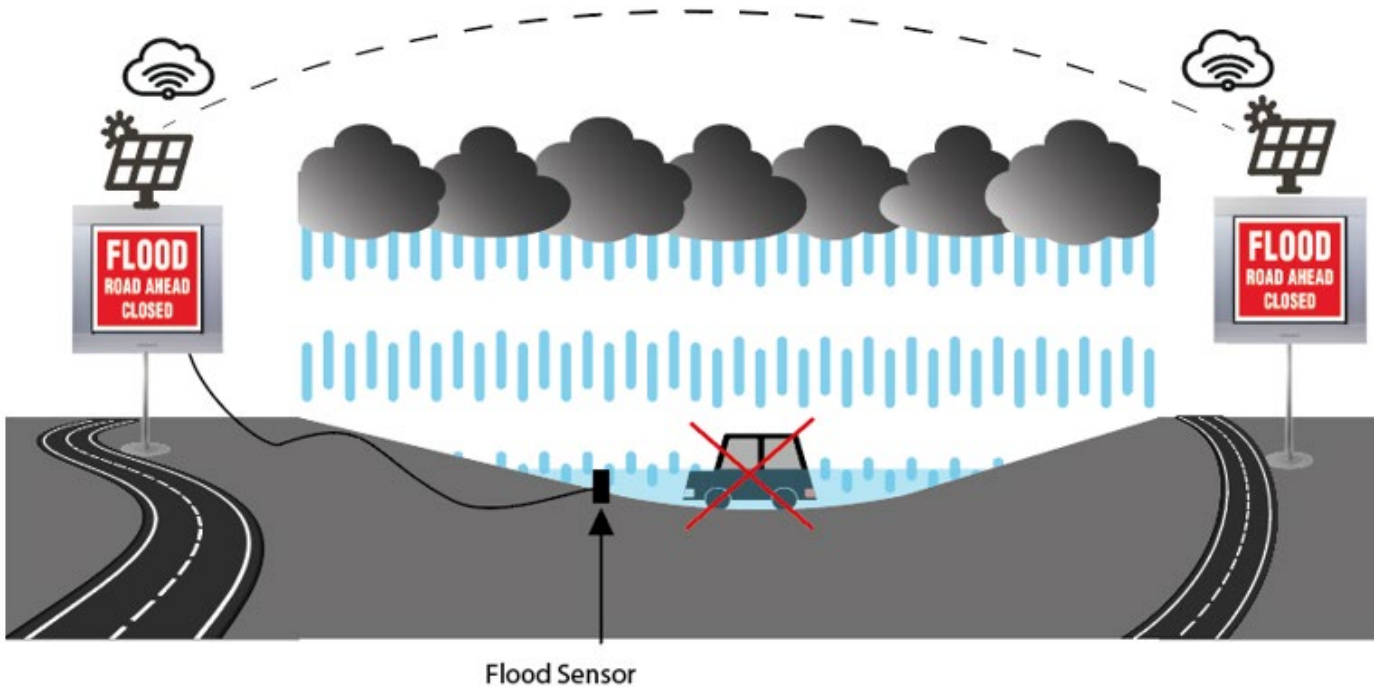
Action to tackle bridge notorious for flooding finally set to happen after years of problems

Cars have been regularly seen trapped in the rising waters

The bridge has gained a reputation for its flooding (Image: John Corley/Leicestershire and Rutland 4x4 Response)

Safety measures aimed at preventing cars from getting trapped under a notorious **Leicestershire** bridge prone to flooding are set to be put in place. The Church Hill Road bridge in Thurmaston has been the centre of flooding problems for decades, with residents voicing concerns for years about the issue.

Despite **calls for action**, no preventative measures had been put in place to keep drivers safe. But that will now change after council bosses confirmed measures will be installed in the coming weeks.



Ingredients:

- 2 Triplesign VMS
- 1 flood sensor

Communication:

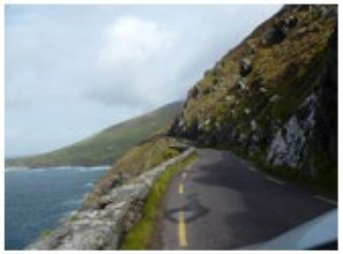
- Mobile network (IoT SIM-card)
- Triplesign portal

The customer can log in to the portal and see alerts, logs and status of the sign

Narrow road passes







Narrow road situation in Norway

- 10 – 12% of country roads are too narrow for two (big) vehicles to meet
- No budget to solve this with traditional methods
- Traditional methods often lead to major interventions in nature
- Looking for innovative and sustainable solutions

Problem:

- When two (large) vehicles meet they cannot pass each other
- The vehicles cannot see each other in time

Solution:

- Give priority to one vehicle and let the other vehicle wait
- System based on logic for strike in/strike out

This sounds simple, but…….

Preconditions:

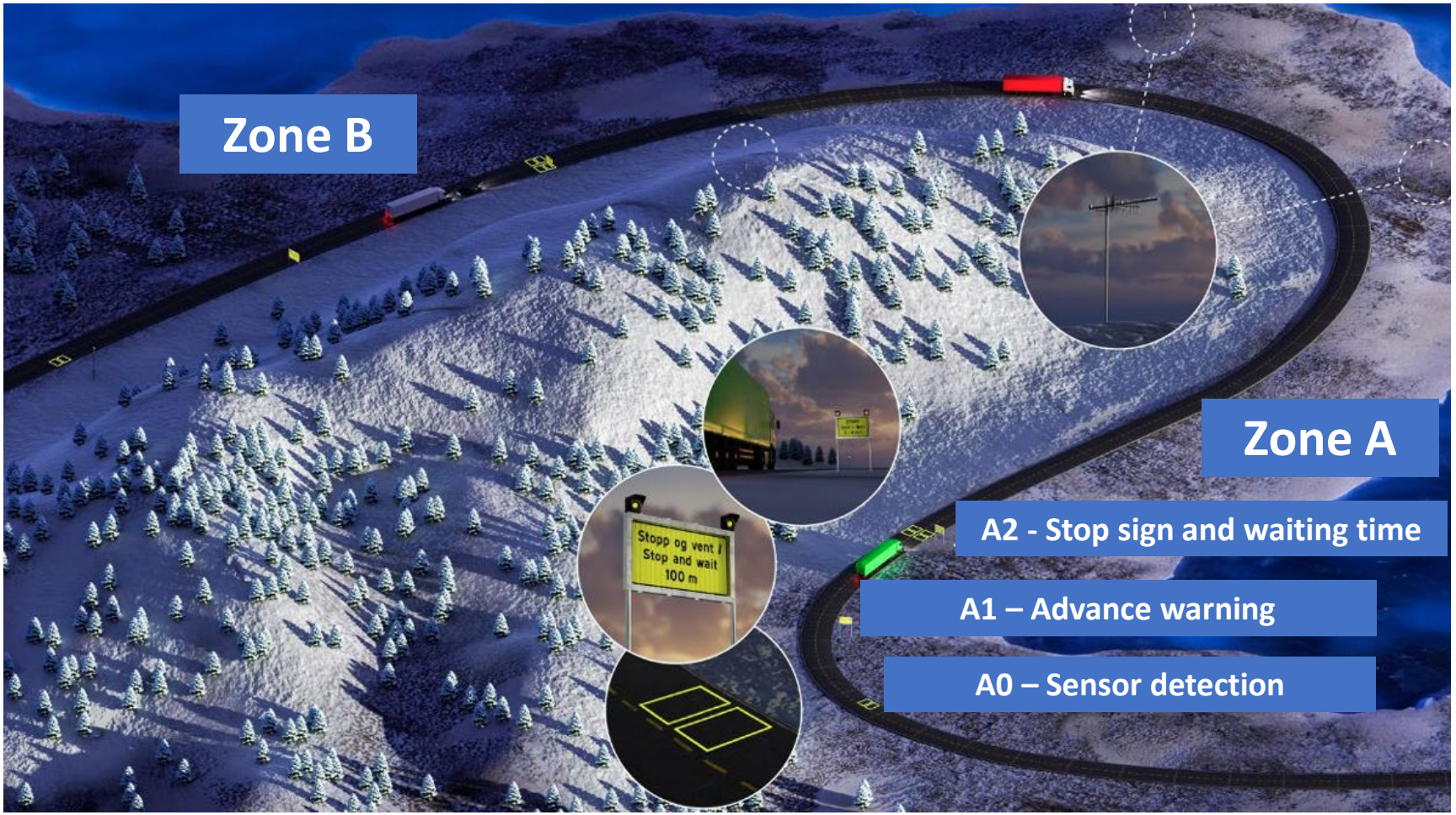
- Drivers cannot be expected to speak/understand Norwegian
- No electricity can be expected – self sufficient solution is needed
- No landline or mobile communication can be expected – system must be able to communicate internally between the devices regardless of GSM coverage
- Solution must be adaptable and solve local conditions and challenges
- Solution must be reliable
- At least 85% of all issues need to be solved with this solution

The AMPARO solution:

- A universal, local ITS system, consisting of two or more "ITS stations"
- Each ITS station is "self-propelled", self-supplied with electricity
- The ITS station communicates wirelessly with other ITS stations, and
- The ITS stations are controlled/interact according to specified local/specific "driving rules"
- The ITS stations must be based on existing technology and products to the greatest extent possible

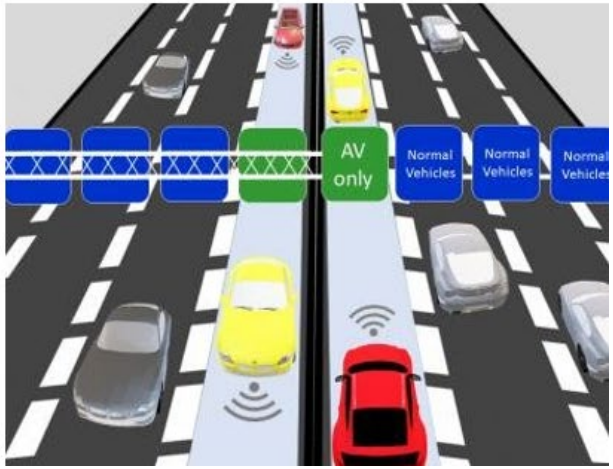
Main components of the solution:

- Use and interaction of existing products/technology
- Possibilities for local adaptation
- Scenario analyses and "traffic rules" (general/per location)
- Amparo, adapted communication solution (radio)
- Triplesign VMS, effective presentation/dissemination of messages in “real time“
- Development of energy-efficient and autonomous solution, independent of the grid


Zone B
Zone A
A2 - Stop sign and waiting time
A1 – Advance warning
A0 – Sensor detection
Stopp og vent /
Stop and wait
100 m


Stopp og vent /
Stop and wait
100 m
STOPP
Vent / Wait
2 - 4 min
STOPP
Vent / Wait
5 - 10 min


Flexible use of road sections


AV only
Normal Vehicles
Normal Vehicles

Congestion situation in Italy

- The most congested arterial motorway in Milan is the A4 from Turin to Trieste
- An average of 70.000 vehicles is passing daily
- With peaks exceeding 200.000 vehicles per day

Autostrade per l'Italia was looking for a sustainable solution to speed up travel times for vehicles and above all reduce the environmental impact:

Every hour of congestion = 1.5 tons of CO2 emission!

Problem:

- During peak hours, the traffic was not able to flow
- Travel times were extremely long
- Environmental impact of the congested areas was huge
- There was no space to widen the motorway as it is in an urban area

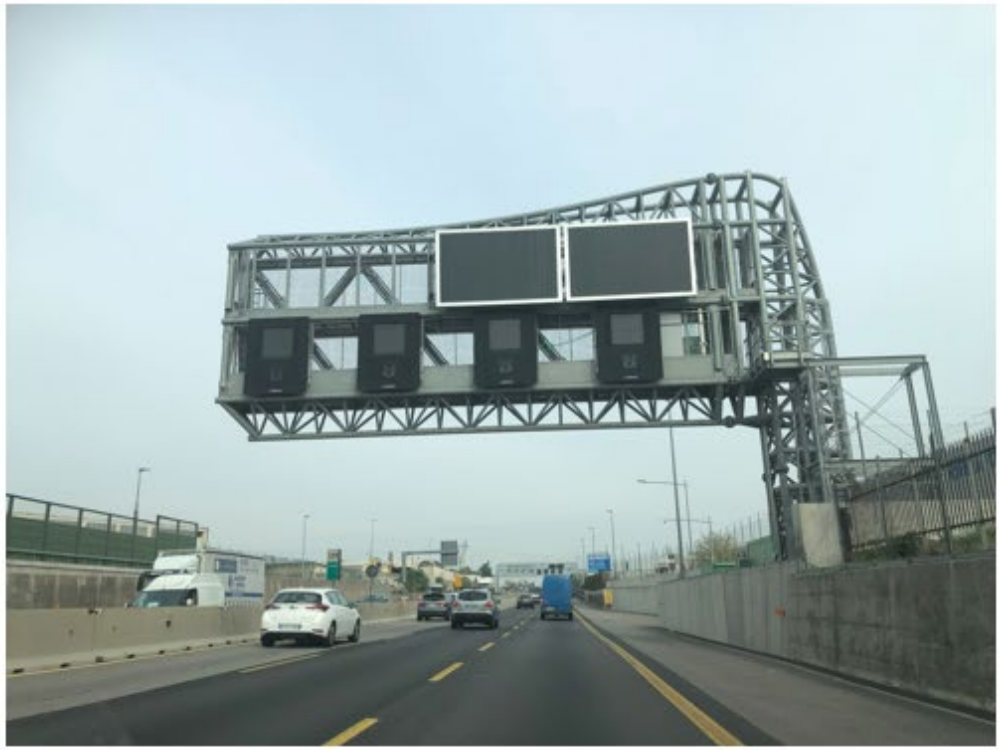
Solution:

- Give the traffic more room to keep it flowing; create a " Dynamic fourth lane"
- During rush hours the emergency lane is converted to a fourth lane

The GESTED Solution:

- Using a mix of innovative technologies a new dynamic lane that covers a distance of 3.5 kilometers is created
- An electronic control system that constantly monitors traffic and detects all potential dangers
- Making it possible to open the emergency lane for traffic during rush hours
- And making it possible to close it in times of need
- Motorists are notified in real time of changes in the use of the lanes
- The communication system makes use of a combination of LED VMS above the lanes, and Triplesign VMS, above and on the side of motorway


E 66 VENEZIA
VENEZIA
CORMANO



Other applications

- High winds on bridges
- Warnings for slippery conditions
- Traffic jam warnings
- Mandatory snow chains

High winds on bridges

Forth Road Bridge closed after high winds blow lorry over
Telegraph Video, VIDEO SOURCE ITN11 January 2017 • 2:53pm

Transport truck crashes on Cape Breton's Seal Island Bridge
Police are blaming high winds for the crash and one lane will remain closed overnight
David Burke · CBC News · Posted: Nov 27, 2016 12:43 PM EST | Last Updated: November 28, 2016

Real time information

High winds at highway bridges

Uddevalla bridge - Sweden

Warnings for slippery conditions

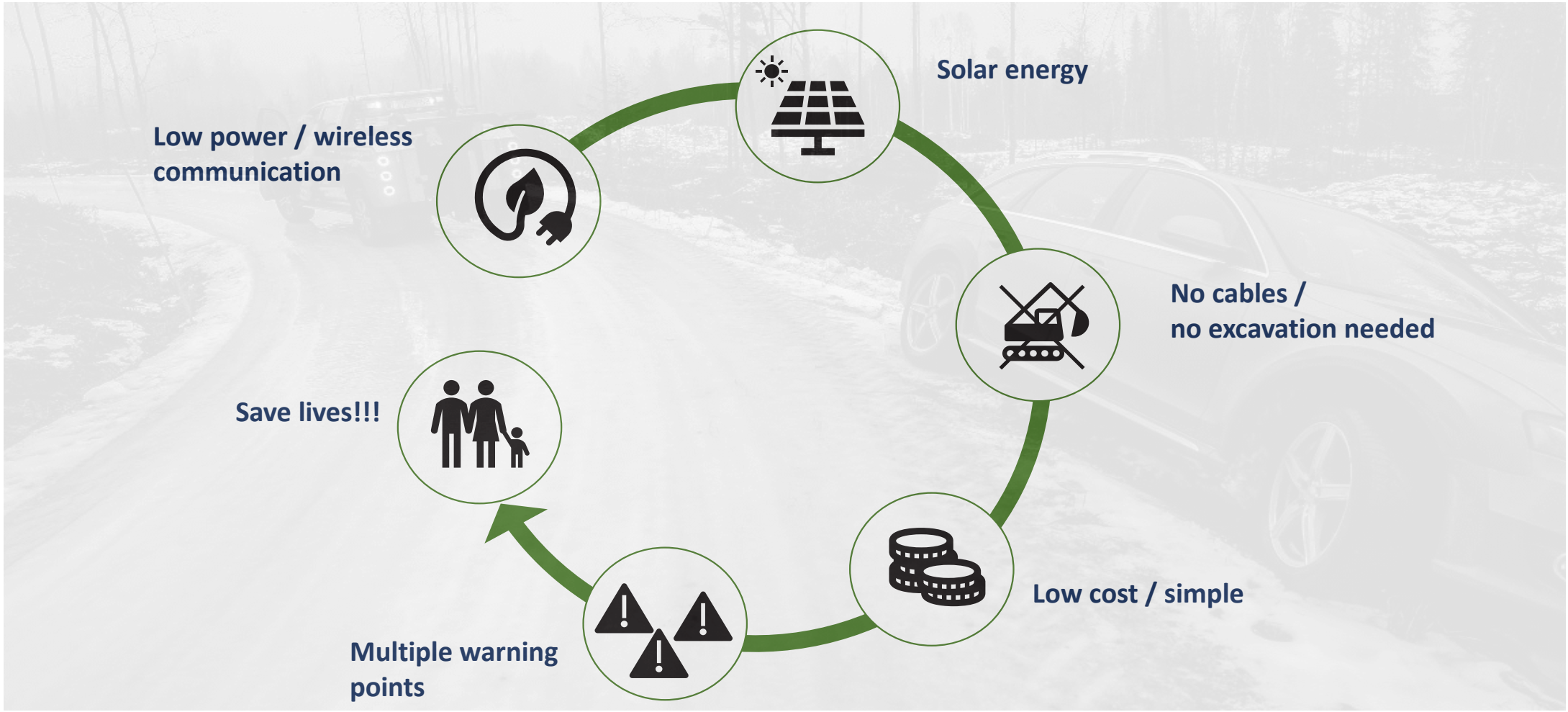
Traffic jam warnings

Snow chain obligation

Conclusions

Triplesign System is a very sustainable and affordable solution for traffic safety

- **The new secured communication system makes it possible for smaller communities to install and operate their own traffic management systems**
- **Systems can be autonomous and warn drivers for specific dangers using sensor technology and AI**
- **The system can be integrated – wirelessly – with existing intelligent traffic management systems**


Solar energy
No cables /
no excavation needed
Low cost / simple
Multiple warning
points
Save lives!!!
Low power / wireless
communication