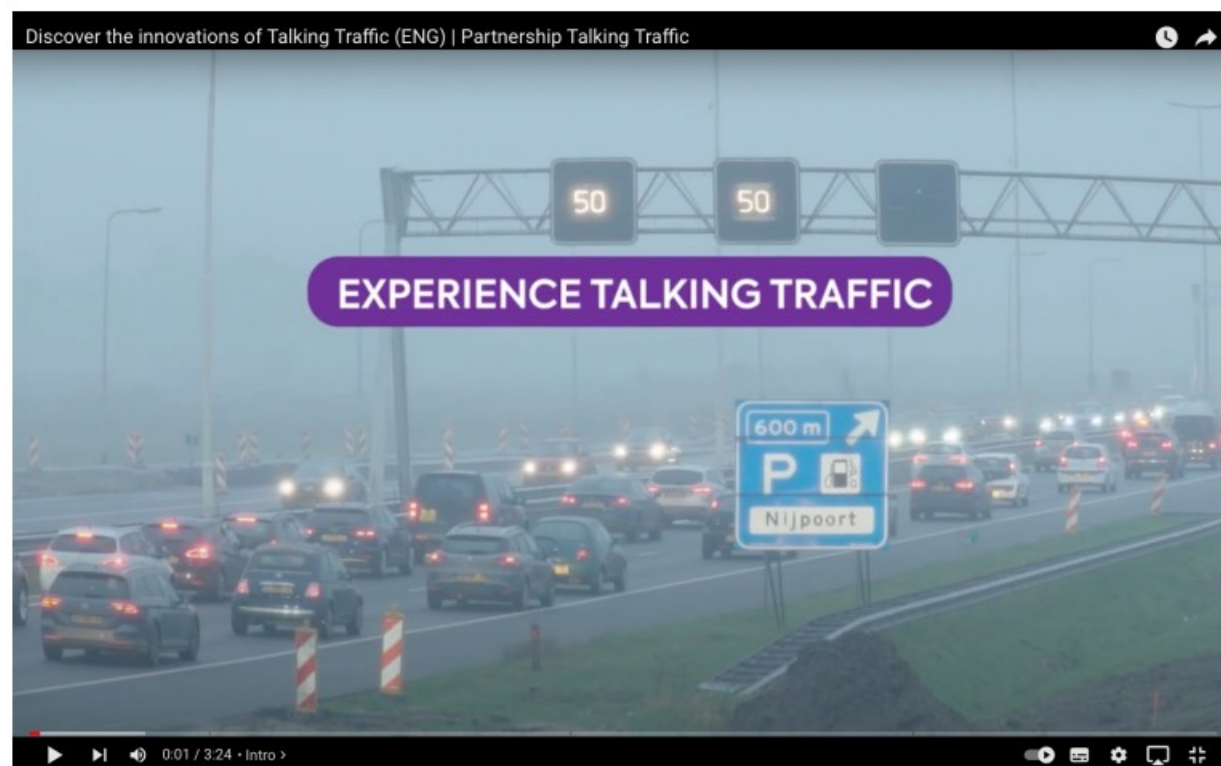**ITS Washington Annual Meeting 2024**

Session 2B: Bridging Local Networks and the Cloud - Enhancing ITS Connectivity

Lessons Learned: The Role of Stakeholder Data-Sharing to Enable Large-Scale ITS Deployment

Talking Traffic

https://youtu.be/KbFQQ2TGkq8?t=1

Breaking the cycle
of ITS Solution
Silos

Use Cases

Demonstrated:

- Parking availability
- Efficient routing, crash/backup aware
- Local Speed
- Emergency vehicle safety notice
- GLOSA, , TTGreen, TTRed
- Prioritization
  - Emergency preemption
  - Transit prioritization
  - Freight   "
  - Cyclist   "

Not Mentioned

- Adaptive Signal/Corridor Management
- Urban Access Control

In Evaluation

- School zone warnings
- VRU warnings
- Self-driving shuttles

Talking Traffic

Deployment 2016 - present

Talking Traffic program

- Originated by Dutch Ministry of Infrastructure and Waterworks
- 60 regional and local road agencies
- National and international private companies:
  - vendors roadside equipment
  - app providers
  - mobile network operators
  - consultancy
  - system integrators
  - etc.
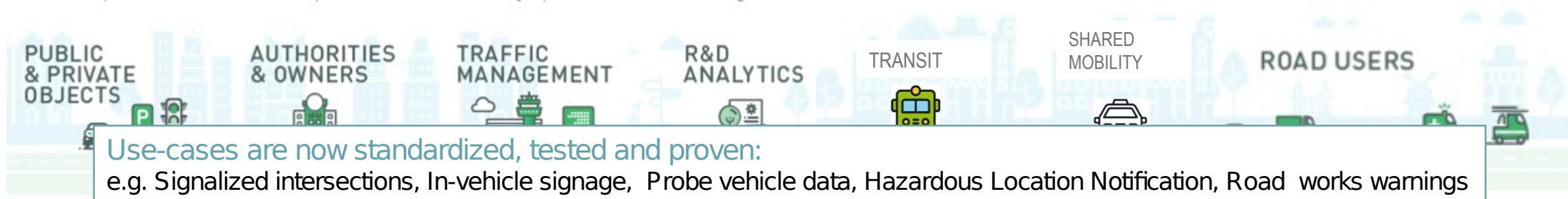- Budget € 70 m
- 09/2016 – 12/2020

The Vision

Multi stakeholder eco-system:
Agencies, industry, traffic ops, OEMs, planners, transit, mobility providers, etc.

Many data providers and consumers:
e.g. roadside systems, road users and fleets (PT/EV/Logistics), traffic management centers

PUBLIC & PRIVATE OBJECTS

AUTHORITIES & OWNERS

TRAFFIC MANAGEMENT

R&D ANALYTICS

TRANSIT

SHARED MOBILITY

ROAD USERS

Use-cases are now standardized, tested and proven:
e.g. Signalized intersections, In-vehicle signage, Probe vehicle data, Hazardous Location Notification, Road works warnings

GOVERNANCE

Technical obstacles:
e.g. identification, security, data quality, latency

C-ITS APP

Organizational obstacles:
e.g. governance, privacy, standardization

TLEX

**These challenges require a platform capable of handling real-time data
in a multi-stakeholder eco-system**

Talking Traffic principles

Use international standards / interfacing where possible

Create new open standards / interfacing where needed

Use existing telecommunication network

Security and privacy by design

No end-to-end solutions, ITS needs an eco-system

Talking Traffic Use-Cases

Live at large scale

- Time To Green = reduce emissions
- Improve traffic flow = efficiency and reduce emissions
- Prioritize designated traffic = less disruption
- Emergency vehicle alerts = shorten roundtrip and reduce accidents
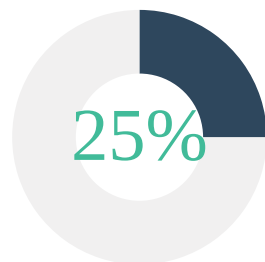
Ongoing growth of use-cases

- Urban Vehicle Access Regulations
- EV access to private sites
- Hazardous locations (based on a variety of sensors)
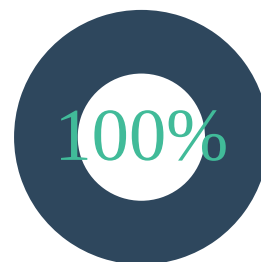- And more traffic lights, emergency vehicles, and fleets/road users

Eco-system today

25%
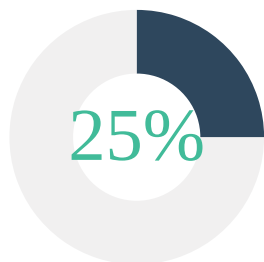
Traffic light controllers, controlling 10,400 'lightsets'

25%

Cars (approx. 2.5 mln)

100%

Dutch ambulances (approx. 850)

1.5 bln C-ITS messages exchanged per day (SPAT, MAP, CAM, DENM, SRM, SSM)

Pilot connections

✓ Barriers   ✓ Smart Cameras   ✓ Radars   ✓ Sensors

Continuous growth of objects and 'special vehicles'

Integrate Once, Use-Many

Agency/IOO
(road use policy
& infrastructure)

Service
Provider
(back
office)

Auto OEMs
(road user)

Data
Exchange
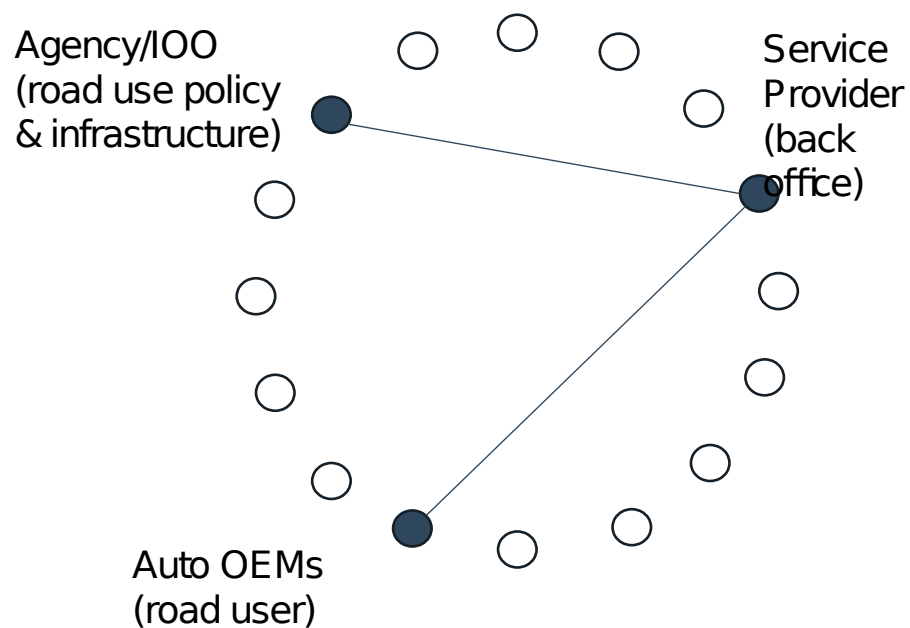
One agency, one service, one fleet
- Approaching Emergency Vehicle
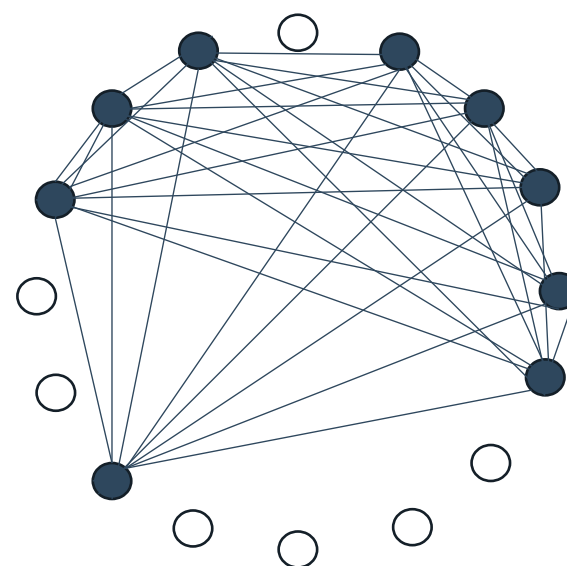
Three agencies, five services
- Approaching emergency
- Work zone warning
- Accessible pedestrian
- Wrong way driving
- Emergency vehicle preemption

READ MORE
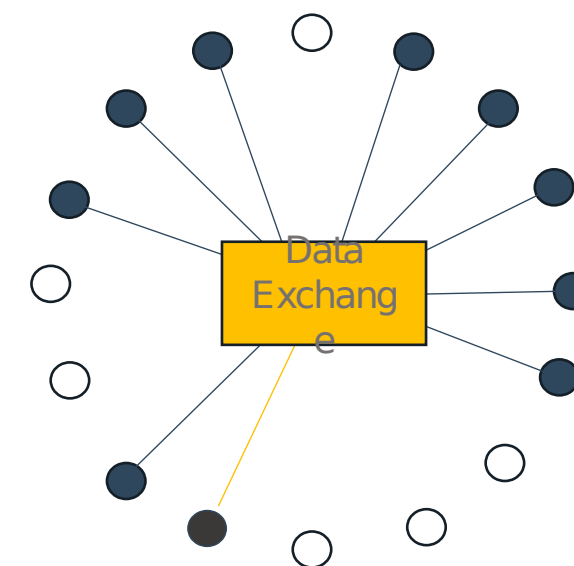
HAAS Alert and Monotch announce digital infrastructure partnership

Dutch roads will become safer and more connected thanks to a new partnership between smart infrastructure specialist Monotch and collision mitigation service HAAS Alert, which will deliver in-car safety messages to warn drivers of hazards.

TTI May 23, 2024 issue

Federate Regions into a larger whole
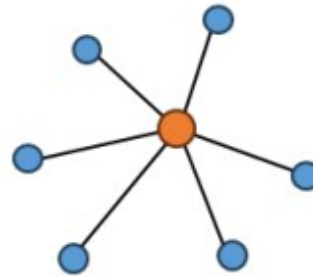
(a) Full mesh   (b) Centralized   (c) Mesh federation

Federation builds toward a national system
Live Today on TLEX:

Initiative	Areas Federated
Nordic Way	Sweden, Finland, Norway, Denmark
Mobilidata	Belgium, Netherlands
Talking Traffic	Netherlands regions

See: "Road traffic operation in a digital age. A holistic cross-stakeholder approach" 5GAA 2024
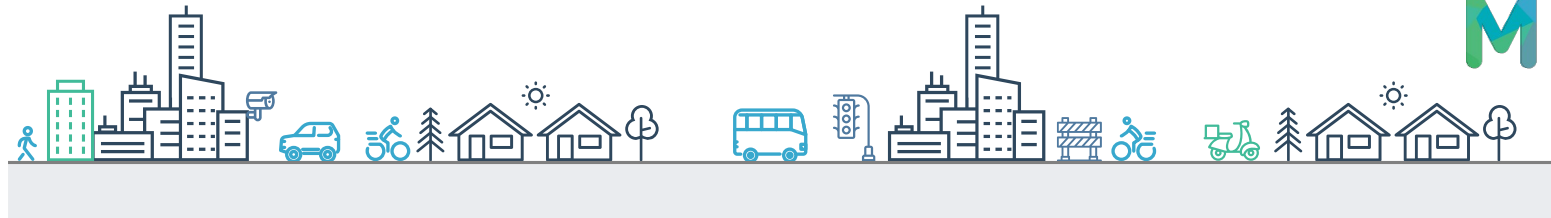
Conceptual Architecture

USE-CASE DOCK

- TMC
- Digital twin
- Micro mobility
- Mobility hub
- Etc.

Governance (Policy Enforcement)

Use-case shared services
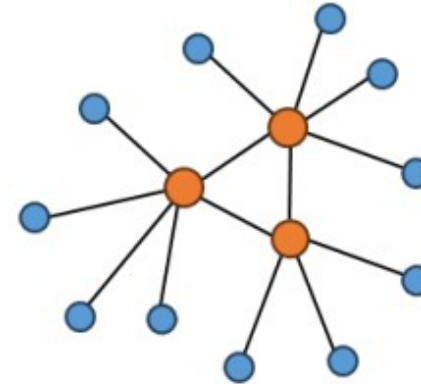*(Authentication. SSO, Dashboarding, Monitoring, Alerting)*

Policies
(Governance / Quality / Security / Privacy)

Connection, data and use-case verification

Field equipment engine | **Data exchange engine**

Transformation engine

FIELD EQUIPMENT DOCK

- (v) Sensors
- TLCs
- RSUs
- AI Camera´s
- Etc.

CONNECTED MOBILITY DOCK

- Apps
- Public Transport
- EV Vehicles
- Logistics
- OEMs

FEDERATION DOCK

- C-Roads II
- Data Space Protocol
- X-Road trust

Connecting parties [NL]

Roadside equipment

Data Sharing Platform

Service Provider / Road user interface

How:
Enabling large-scale deployment

Put the public mobile network to use

Targeting safety-enhancing and mobility use cases

Maximum latency budget 1500 ms

| Road side infrastructure | | Data Sharing Platform | | Service provider | Cellular connection | User Interfaces Road user / Public fleets |

Max 100 ms

Max 100 ms

Avg < 5 ms

Average latency between 100 and 200 ms
(TNO research Intercor project)
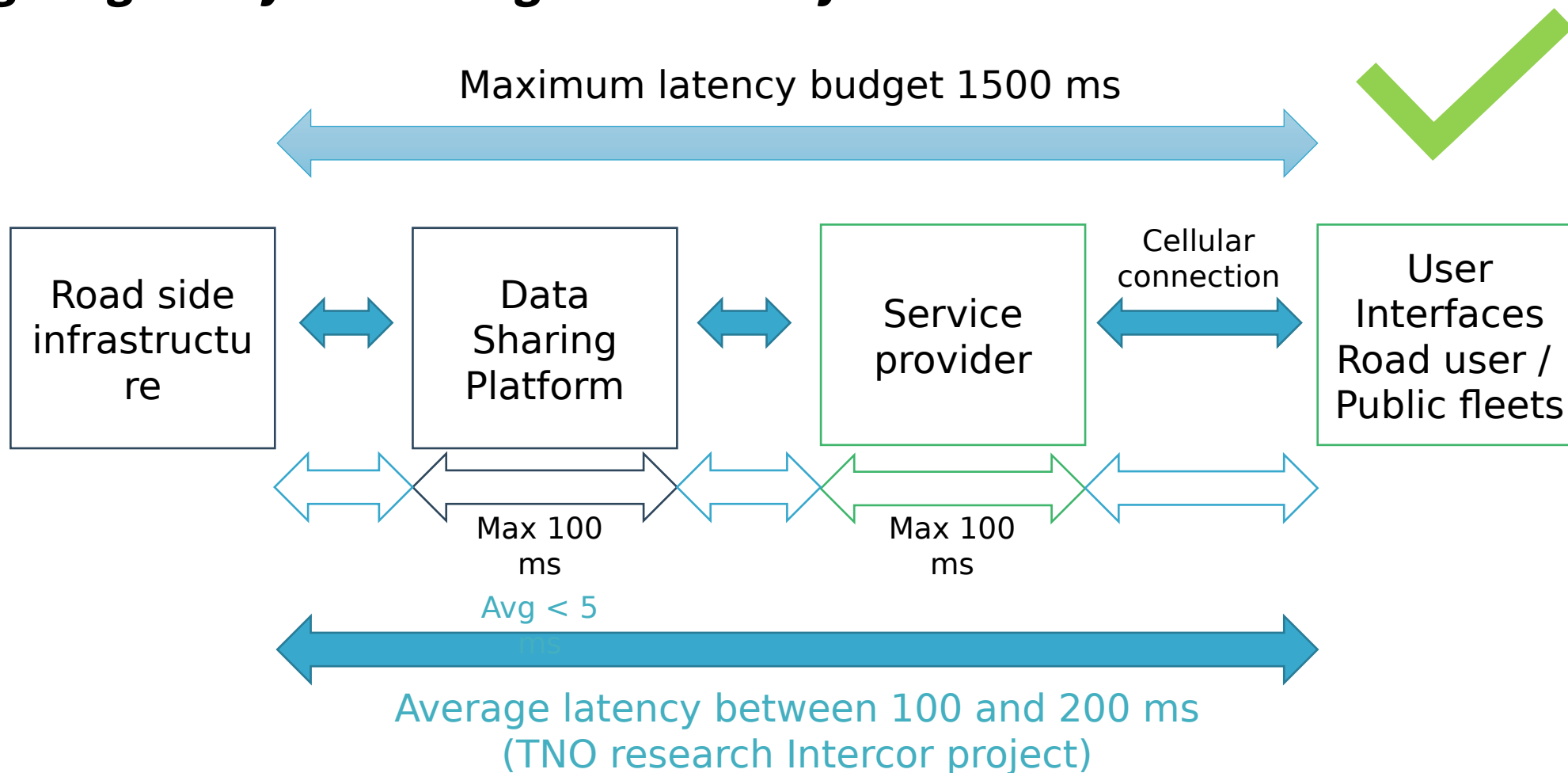
Enabled a System of Systems Approach
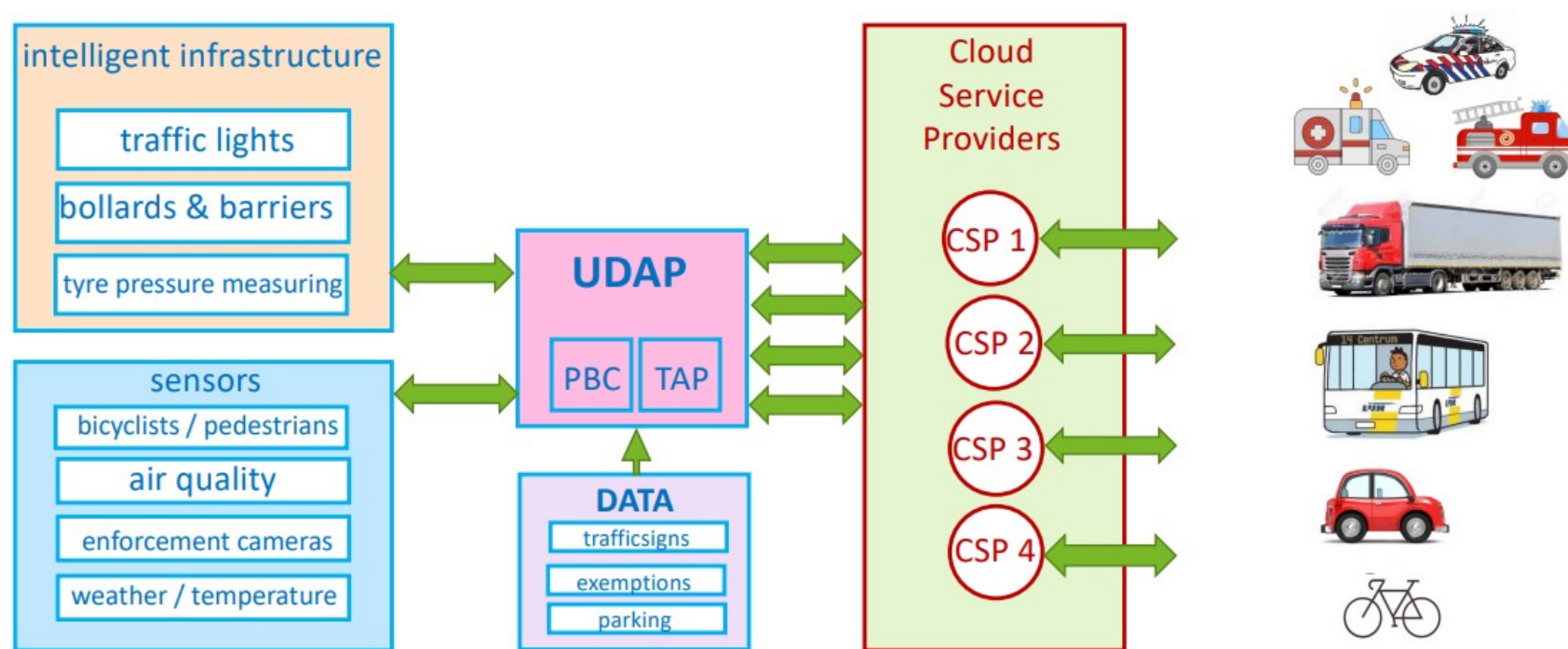
Source: Talking Traffic

www.monotch.com

Continously monitored data quality

- Dashboards, reports and alerts for all stakeholders:
  - Connection quality
  - Message quality
  - Use-case quality

- Governance options for authorities:
  - Data quality policies
  - Administrative policies
  - Alert | Report | Drop | Ban

Aantal VRIs met een KPI melding (All)

	3		1		1
Percentage toegekend prioriteitsverzoek hulp...		Percentage beantwoorde prioriteitsverzoek		Percentage toegekend prioriteitsverzoek over...	

KPI meldingen (All)

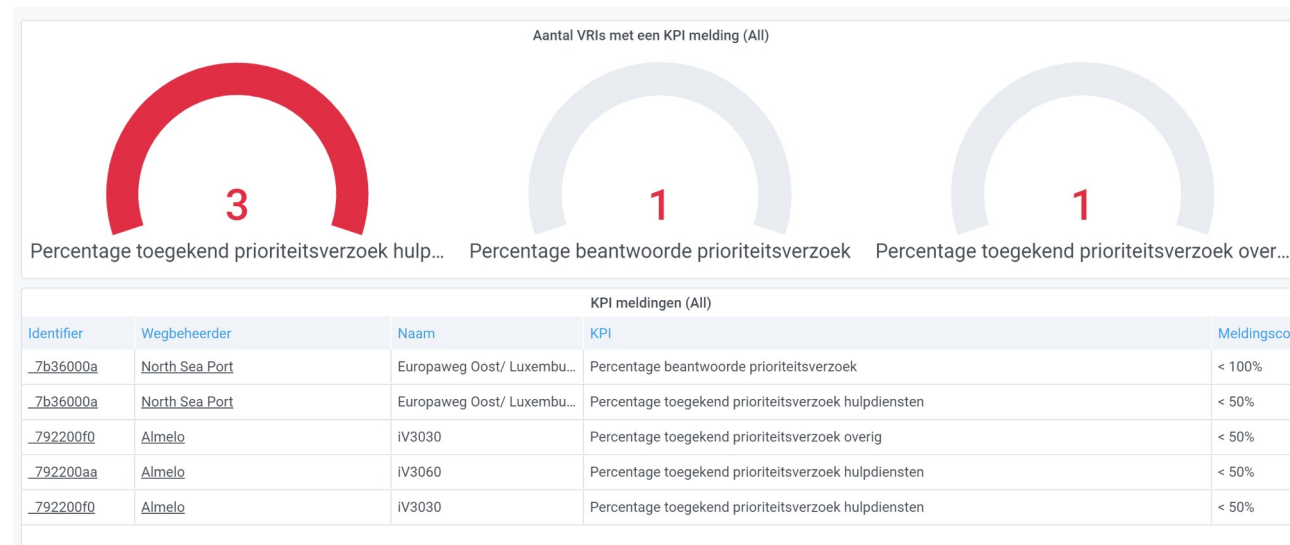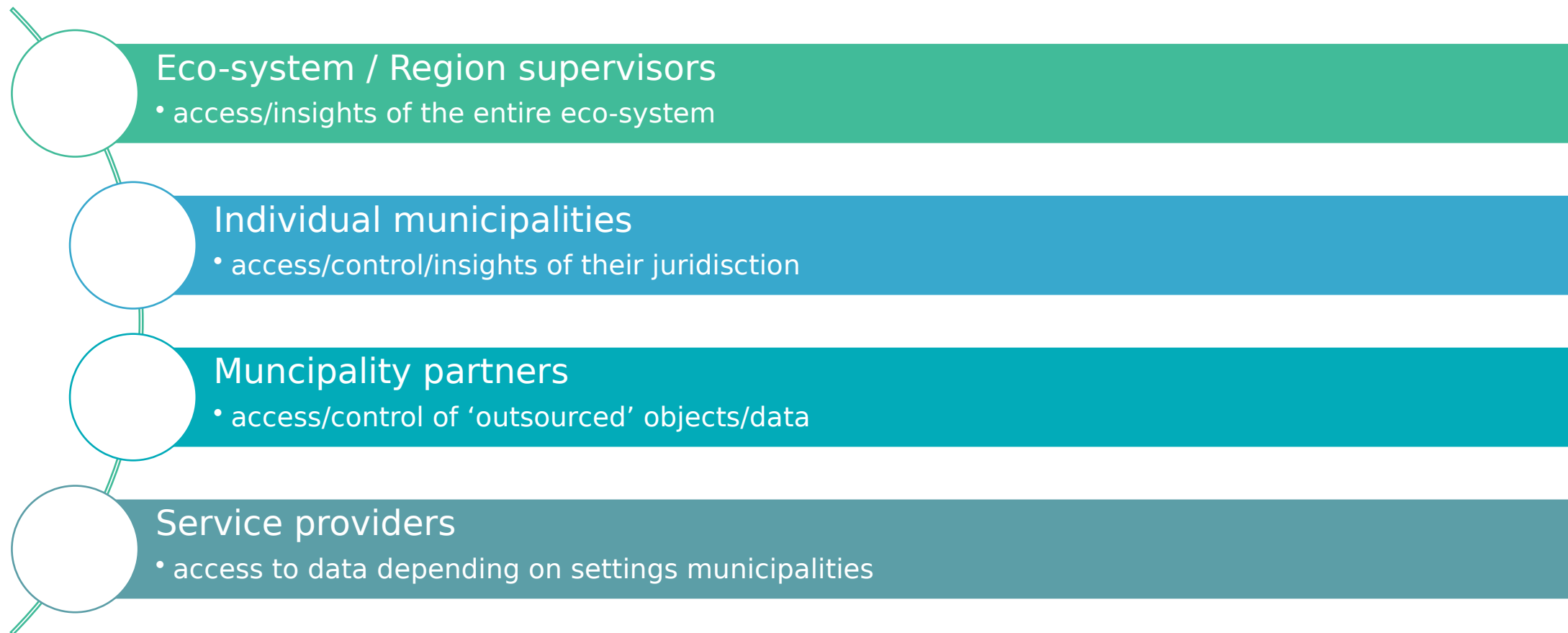| Identifier	Wegbeheerder	Naam	KPI	Meldingscon...
7b36000a	North Sea Port	Europaweg Oost/ Luxembu...	Percentage beantwoorde prioriteitsverzoek	< 100%
7b36000a	North Sea Port	Europaweg Oost/ Luxembu...	Percentage toegekend prioriteitsverzoek hulpdiensten	< 50%
792200f0	Almelo	iV3030	Percentage toegekend prioriteitsverzoek overig	< 50%
792200aa	Almelo	iV3060	Percentage toegekend prioriteitsverzoek hulpdiensten	< 50%
792200f0	Almelo	iV3030	Percentage toegekend prioriteitsverzoek hulpdiensten	< 50%

Geregistreerde VRIs (Productie)

TLC-Identifier	Naam	Status
7a320118	73020	Verbonden
7a3201c2	75020	Geblokkeerd
7a3201cc	75030	Geblokkeerd
7a3201d6	75050	Verbonden

Governance: provided control to local agencies

Eco-system / Region supervisors
- access/insights of the entire eco-system

Individual municipalities
- access/control/insights of their juridisction

Muncipality partners
- access/control of 'outsourced' objects/data

Service providers
- access to data depending on settings municipalities

Future-proofed the as-yet known

Connect RSUs to hybridize <u>safety-enhancing</u> and <u>safety-critical</u> systems

Maximize Impact
- Bring actionable data from out of RSU range
- Convey in-range data to road users via apps
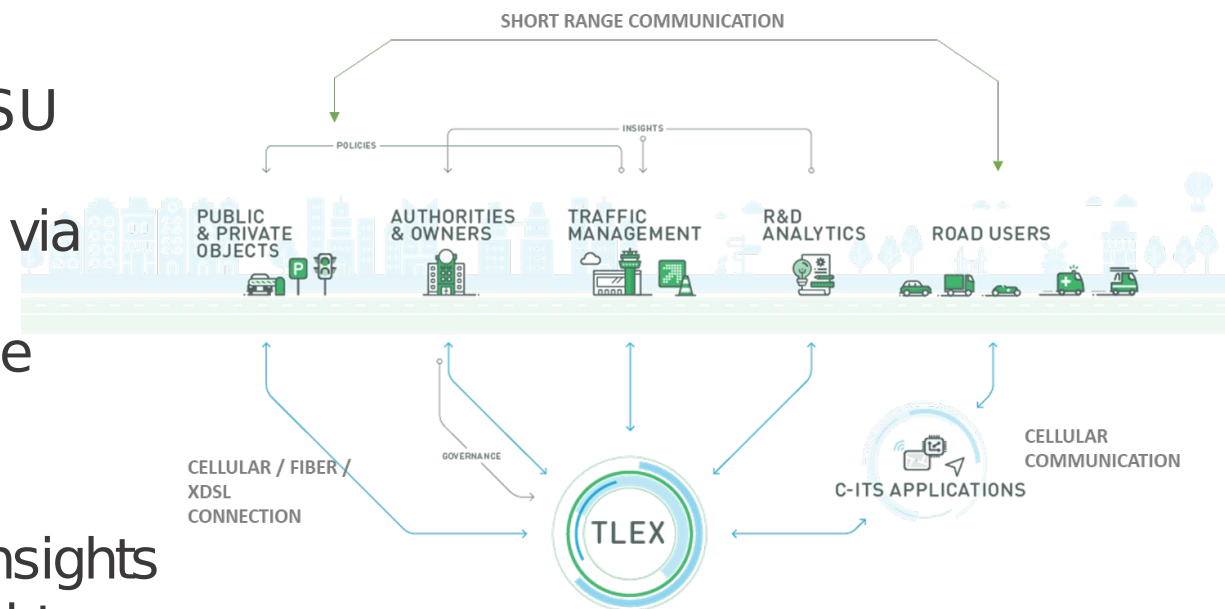- Raise number of connected roadside objects

Gather data
- Collect roadside data for real time insights
- Collect traffic data for real time insights

Monitor Use-Case Performance
- Compare roadside and traffic data w/ planned outcome on select use cases

SHORT RANGE COMMUNICATION

POLICIES   INSIGHTS

PUBLIC & PRIVATE OBJECTS   AUTHORITIES & OWNERS   TRAFFIC MANAGEMENT   R&D ANALYTICS   ROAD USERS

CELLULAR / FIBER / XDSL CONNECTION

GOVERNANCE

TLEX

C-ITS APPLICATIONS

CELLULAR COMMUNICATION

Benefits

Breaking Data Silos for Emergency Vehicles

Talking Traffic benefits for Stakeholders

- **Agencies** are unburdened, yet control their own jurisdiction in an affordable and scalable setup
- **Roadside equipment suppliers** can sell advanced standardized services
- **Service providers and Car OEMs** joined because of the harmonized data, quality and scalable approach
- **Traffic management** benefits from real-time insight and policy deployment
- **Public fleets (PT, Emergency service)** benefit from improved response times
- **Road users** benefit from improved safety and traffic flow

What it suggests for to us…

Bridging Local Networks and the Cloud - Enhancing ITS Connectivity

It starts with an intention

- Make your next connection a share-able one
- Make your next solution a non-silo
- Each increment is progress
- Start small, start anywhere (no silos!)

NO SILOS

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Thank You