TISGRADE Talk #1

Pre deployment validations (PDVs)

23 June 2026

REC

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Co-funded by the European Union

1. Practical points of attention

- The meeting will be recorded
- Presentation will be available on TISGRADE website
- Recording will be available on YouTube
- Questions?
  - Use chat
  - Raise hand during Q&A slides
- After each presentation block, there will be time for max. two questions
- At the end of the session, opportunity for a broader discussion

Agenda

1. Introduction TISGRADE
2. Introduction PDVs
3. Traffic Circulation Plans & Traffic Management Measures
4. Static data validation
5. Dynamic data validation
6. General questions and discussion

Be involved!

1. Who joins us today?

1. Are you involved or new to TISGRADE?
   - Involved as partner
   - Active follower (e.g. via LinkedIn-group)
   - First-timer for TISGRADE
2. What kind of organisation do you work for?
   - National public authority
   - Regional or local public authority
   - Service provider
   - Network organisation
   - Other

1. Introduction TISGRADE

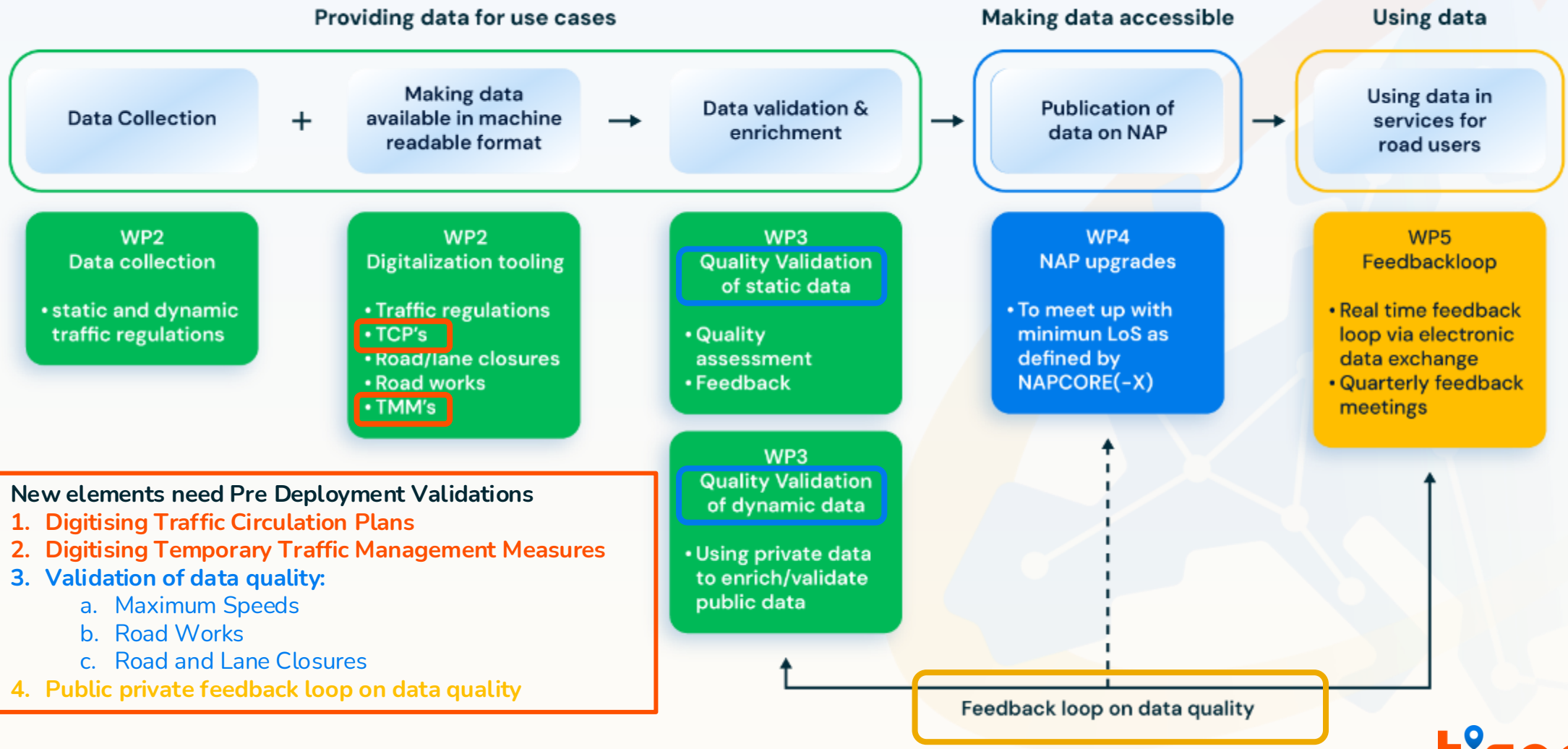
EU-wide upgrade of **Traffic Information Services**:

- Providing road users with **accurate information** in order to make well-informed decisions
- Route advices taking **societal impact** into account

How?

- Increasing RTTI data availability
- Increasing the data quality
- Increasing the accessability of data
- Making data usable for service providers
- Creating a public private feedback loop
- Increasing public-private collaboration

Project structure



New elements need Pre Deployment Validations

1. Digitising Traffic Circulation Plans
2. Digitising Temporary Traffic Management Measures
3. Validation of data quality:
    a. Maximum Speeds
    b. Road Works
    c. Road and Lane Closures
4. Public private feedback loop on data quality

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2. Introduction PDVs

- PDVs will take place in **different locations**, with different starting points and on different road types (national, regional, local)
- Locations of the pre deployment validations are selected in such a way that the **effectiveness of the proposed solutions can be tested** in different environments.
- The pre deployment locations consist of **urban areas and regions** with high traffic volumes, as well as **corridors**.
- All the relevant **stakeholders** (road authorities, NAPs and service providers) will be included in the set-up of the PVDs.

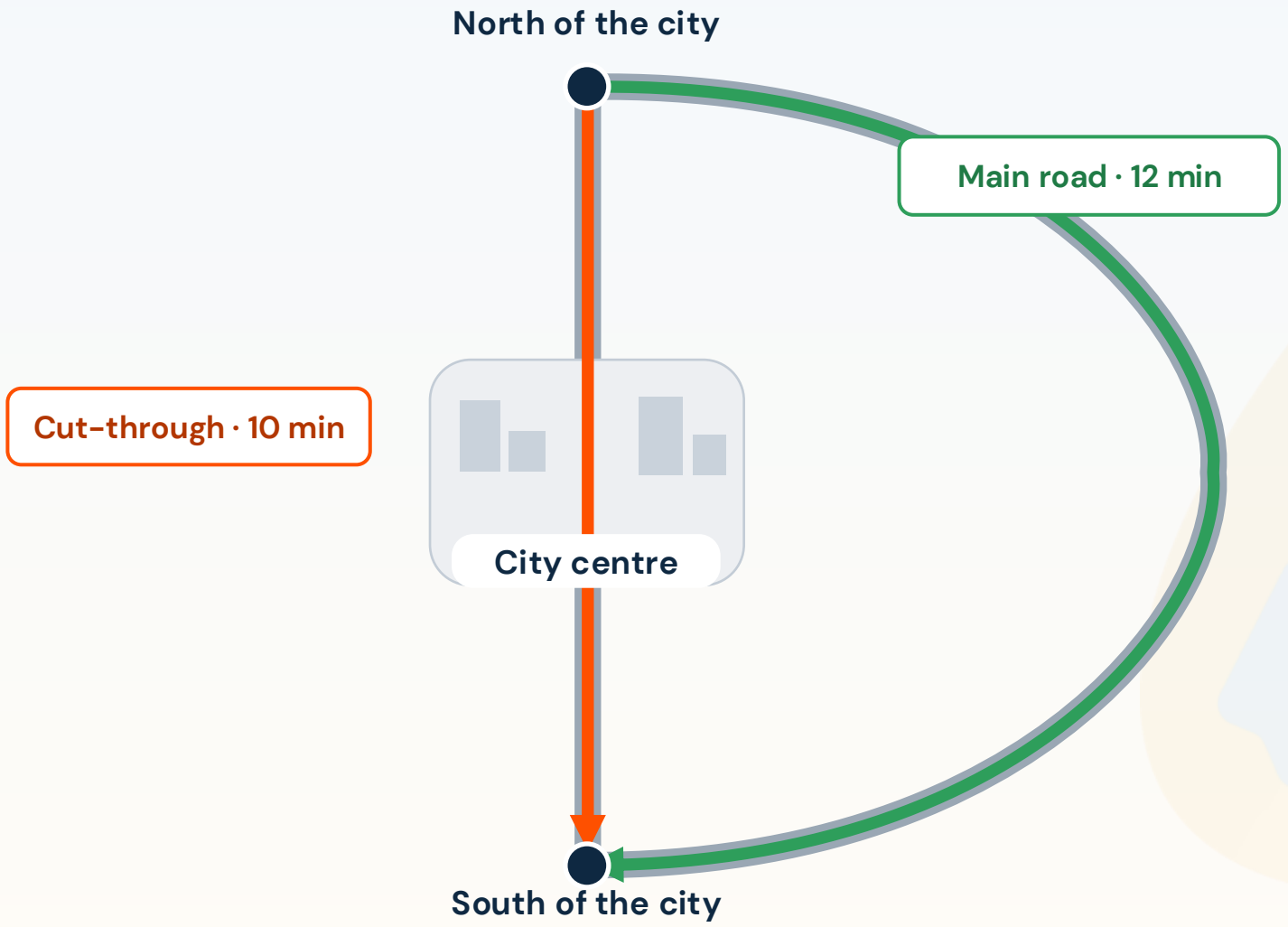
2. Introduction PDVs

Questions

3. Traffic Circulation Plans & Traffic Management Measures

Isaak Yperman (Movias, BE)
Martijn de Kievit (NDW/Goudappel, NL)

Why integrate TCPs into navigation services?



What happens today

Route via the main road — where the TCP wants through-traffic to stay.

Shortcut through the center is a few minutes faster, so some nav apps route traffic here (cut-through).

Integrating the Traffic Circulation Plan into navigation services keeps through-traffic on the main road.

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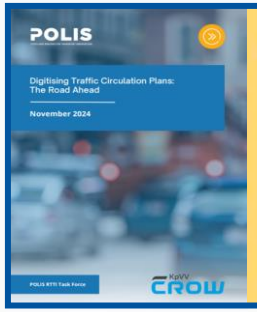
TCPs and TMMs

Definitions

Definition TCP



Our proposal for a harmonised definition for TCPs in Europe:
A Traffic Circulation Plan (TCP) is a set of permanent traffic management measures designed by traffic managers to control and guide traffic flows in response to permanent or recurring traffic disturbances. This plan must guide traffic flows based on policy objectives, provide a framework for optimizing the transportation network, and align with existing regulations and infrastructure. Additionally, it should be communicated in a standardized language, define the functionality of roads based on a Functional Road Classification, and support navigation services in promoting sustainable and efficient routes.

napcore

Traffic Circulation Plans (TCP): the minimum information required for disseminating and describing the content of plans that are developed by local authorities to control and guide traffic flows in response to known and recurring traffic conditions as well as in consideration of seasonality effects and existing limitation and constraints (e.g., existence of school zones).

Definition TMM

napcore

Temporary traffic Management Measures (TMM): dynamic information disseminating temporary traffic management measures in response to the current state of or conditions on particular segments, links, or parts of the road network, which can change over time due to several factors (e.g., road works, weather conditions, special events).

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Digitized TCP/TMM

- Private motorized traffic only
- no public transport;
- no multimodal traffic.

Public-Private Agreement

https://www.polisnetwork.eu/document/polis-rtti-task-force-digitising-traffic-circulation-plans-the-road-ahead/
https://github.com/NAPCORE/its-data-dictionary/blob/main/release/DR_EU_2022-670.md

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TCPs: A 3-Layer Concept

TCP — Traffic Circulation Plan

▲ layers build on the base — each layer adds detail and enables richer integration

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How FRCs are used today

Road Authorities

Road Authority X
- Classification system
- # Road categories
- Technical format

Road Authority Y

...

Road Authority Z
- Classification system
- # Road categories
- Technical format

Service Providers

Platform	Classification System
Open Street Map 	highway=* tags
TomTom tomtom	Functional Road Class (FRC 0–7)
HERE here	Functional Class 1–5
Google Maps 	Functional Roads Class, represented as road priorities

https://tisa.org

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Integration of FRCs in navigation services

Road Authority X
- Classification system
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Road Authority Y

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NAP as middleman between RA and SP

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Standardized layer: Digitized TCP incl. FRCs

NAP

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Simulation tools
Proposed routes
Generic KPIs

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TMMs: A 3-Layer Concept

TMM — Traffic Mgmt. Measure

Layer 2: Requests by Road Authority
Because of a (or multiple) incident(s) the Road Authority requests from service providers to avoid, promote or reroute traffic over different sections of the network

Layer 1: TM wish from Road Authority
Because of a (or multiple) incident(s) certain sections of the network function differently (along the lines of a TCP – e.g. a temporary TCP or additional zones, business rules)

Layer 0: Basic information available
Trigger & location as context for the measure
Traffic management objectives
TM means digitally available

▲ layers build on the base — each layer adds detail and enables richer integration

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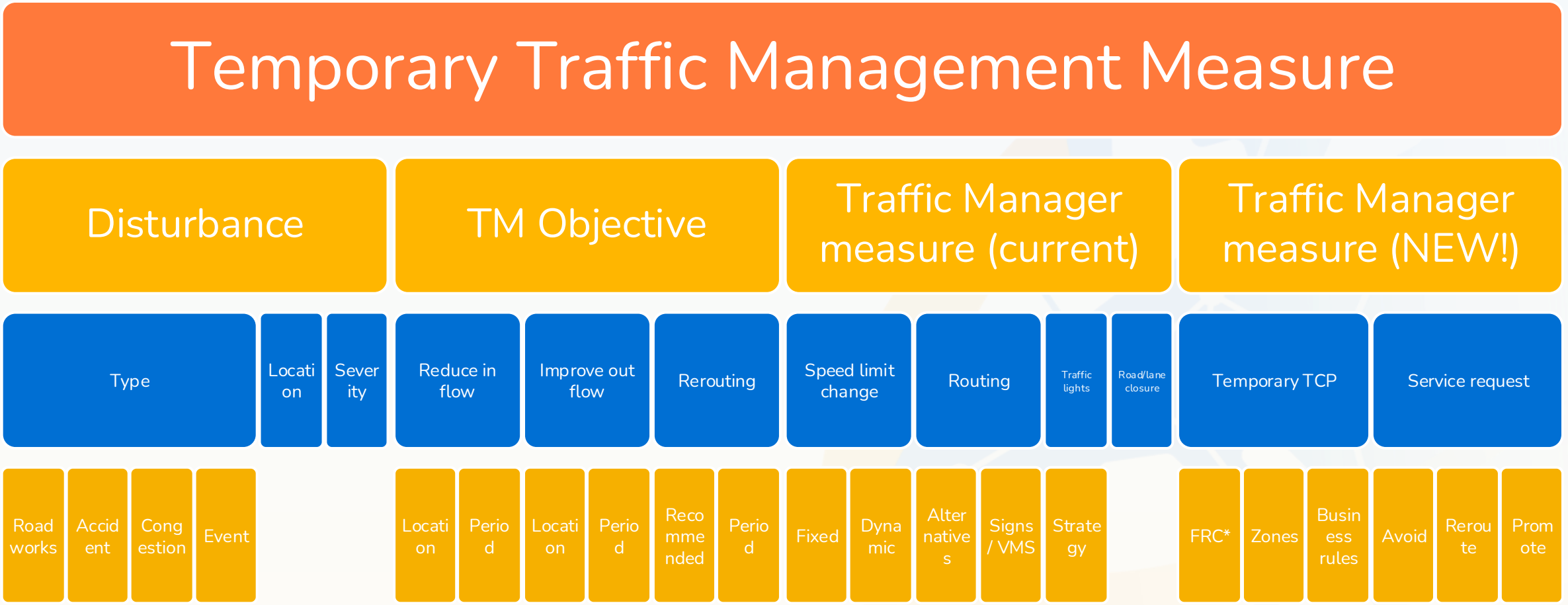
TMM modelling



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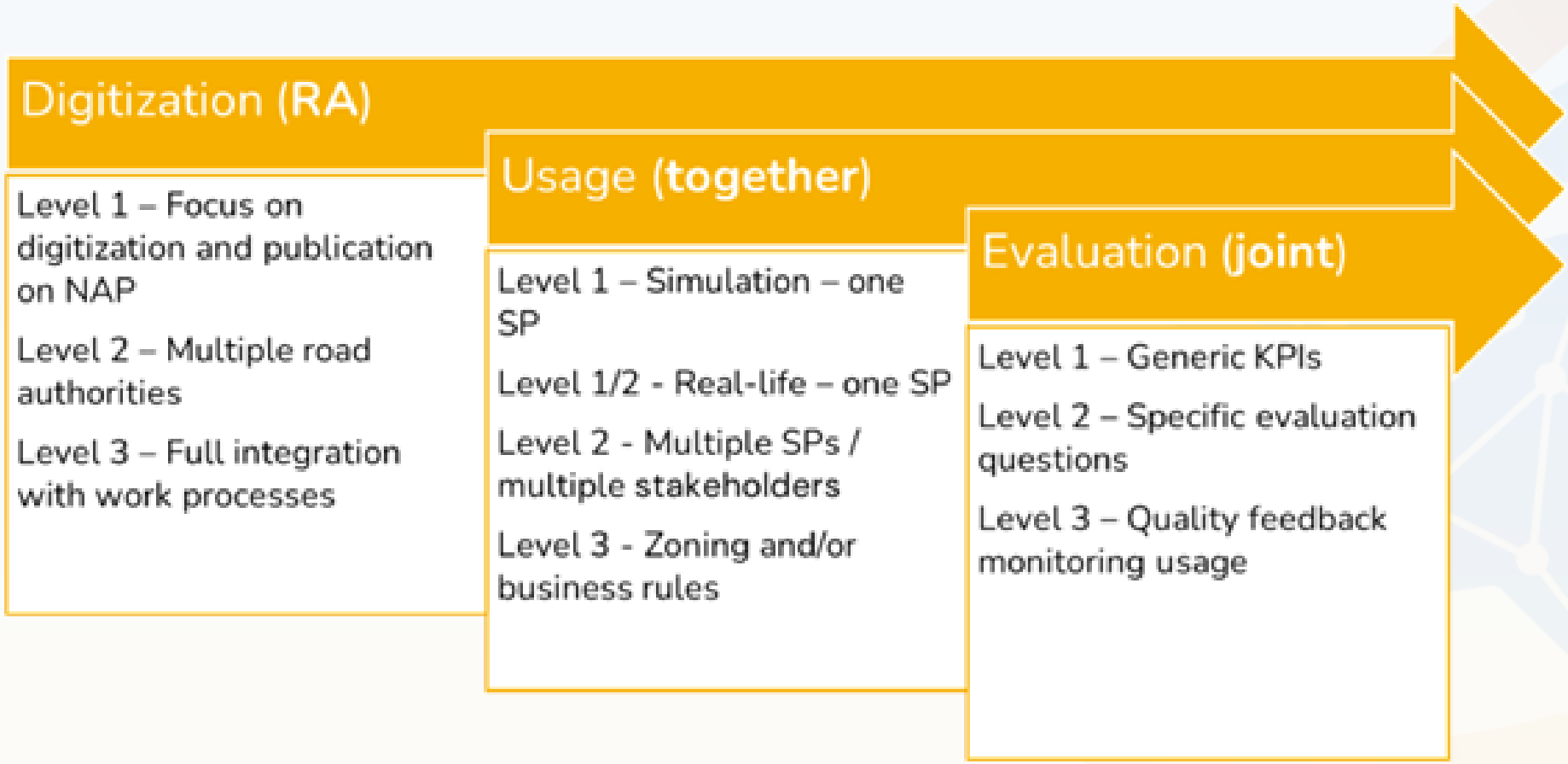
PDV Dimensions



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Questions

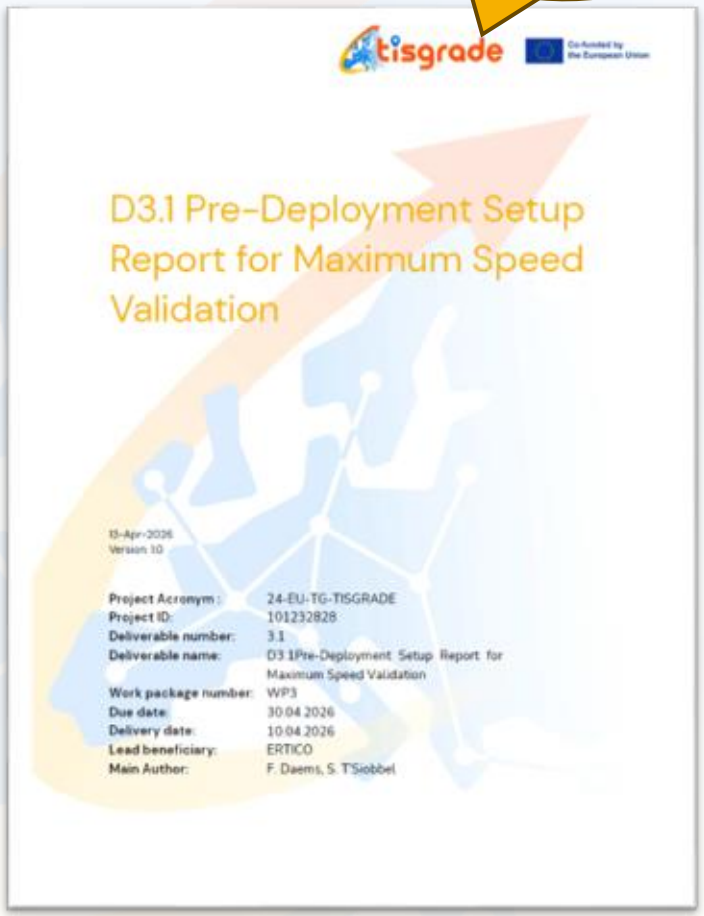
4. Static data validation

Stephen T'Siobbel (ERTICO, BE)
Frank Daems (ERTICO, BE)

Pre-Deployment Setup Report for Maximum Speed Limit Validation (D3.1)

Find me on:
Tisgrade.eu
Data and Products
Reports and Documentation

- Objective: Establish a validation framework for MSL
- Scope: Analysis across multiple Pre-Deployment Validation (PDV) sites in Europe (8 sites in 7 EU MS)
- Work done Nov 2025 – April 2026
- Coordination by ERTICO ITS Europe
- Approach:
  - Survey + stakeholder engagement (1-on-1s)
  - Review of existing data validation practices
  - Initial mapping of data chains, roles, and responsibilities, etc.
- Outcome:
  - Initial baseline validation plan for PDVs
  - Foundation for gap analysis & improvements (next phase D3.4)



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MSL Pre-Deployment Validation sites

- Urban nodes
  - Amsterdam & Helmond, Goteborg, France (Med), Athens
- Regional roads
  - France (Med), Slovenia, Cyprus
- Interurban roads
  - France (Med), Spain, Slovenia
- Motorways
  - France (Med), Spain, Slovenia, Cyprus

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Validation Framework & Approach

Description of a validation ecosystem

- Core principle: no single source of truth
  → reconcile:
  - Legal: traffic regulation orders
  - Digital databases, various representations
  - Physical signage/markings
- Key elements:
  - Defined roles & responsibilities (RASCI)
  - Data sources
  - Validation workflows & triggers
  - Quality metrics (TISA 5-star, ISO standard 1957101)
  - Feedback-driven validation for continuous improvement
  - Modular design → adaptable to different PDV maturity levels

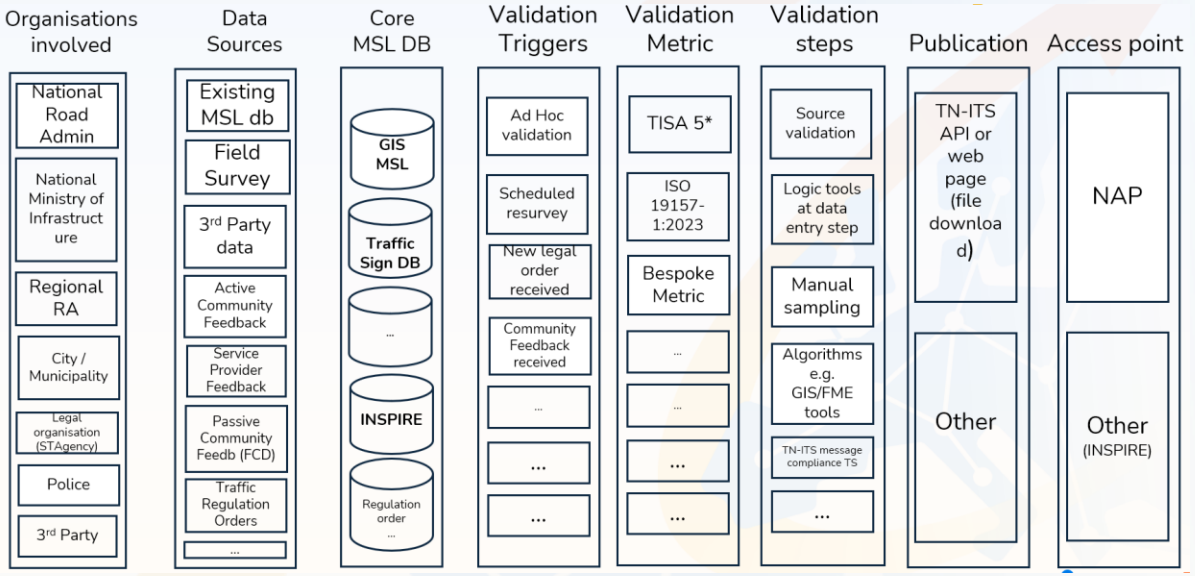

Fig.1: **PDV Operational Landscape**

Current State & Key Findings

From the survey and interviews we learned:

- PDVs show high variability in maturity and capabilities
- Common issues identified:
  - Lack of automated validation workflows
  - Fragmented governance across the stakeholders
  - Missing or ‘weak’ feedback loops
  - Data inconsistencies occur (legal vs digital vs physical signs)
  - Incomplete availability & coverage
- Technical landscape:
  - Mixed standards (INSPIRE, TN-ITS, DATEX II, other)
  - Uneven technical maturity (low → high) across PDV sites

Defined Validation Framework

Validation Framework for MSL describes:

- Scope and boundaries
- Roles and responsibilities
- 5 validation building blocks
- Validation triggers
- Quality dimensions, TISA 5*, KPIs, acceptance criteria
- Implementation recommendations
- Maturity levels for MSL validation

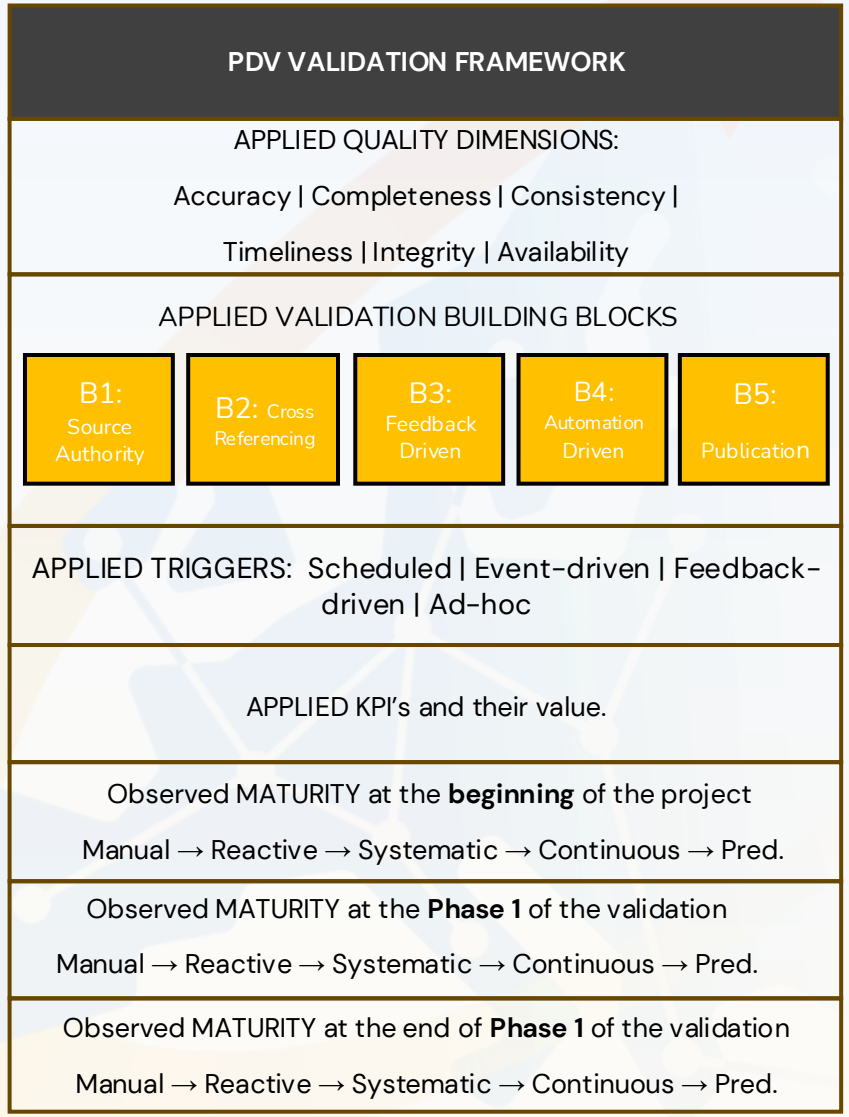

Fig.2 - **Summary MSL validation framework**

PDV specific validation approach

Validation of quality of MSL data & improvements in availability

- 7 PDV sites (note: Greece)
  - Initial site-specific validation plans were established
  - Introduction of a stepwise/phased approach

- Contribution by Map & Service Providers: the Feedback Loop (FBL):
  - HERE: comparative data analysis to highlight inconsistencies & provide actionable feedback
    - Agreements established with Dutch and Swedish PDVs, more will follow
  - Be-Mobile: support application of TISA 5* in 2 phases: simple & advanced
    - Flitsmeister app feedback is candidate for FB loop

Deliverable D3.1 – Annexes

- ANNEX 1: **Precedent practices**
  - EU-EIP
  - TN-ITS GO
  - ISA-FIT
  - NAPCORE M4.2.7

All references included! See: www.tn-its.eu/documents

- ANNEX 2: **Validation Plan per PDV site**
  - Phased approach: start/base line/FB-loop operational

Most relevant

Questions

5. Dynamic data validation

Linde Vande Velde (BE-MOBILE, BE)
Bart Lannoo (BE-MOBILE, BE)

Pre-Deployment Setup Report for Roadworks, Roads and Lane Closure Validation (D3.2 – D3.3)

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- Objective: Establish a consistent, measurable and scalable validation framework for RW, RC & LC
- Scope: Analysis across multiple Pre-Deployment Validation (PDV) sites in Europe (15 sites in 10 EU MS)
- Work done Nov 2025 – April 2026
- Coordination by Be-Mobile
- Approach:
  - Survey + stakeholder engagement (1-on-1s)
  - Review of existing data validation practices
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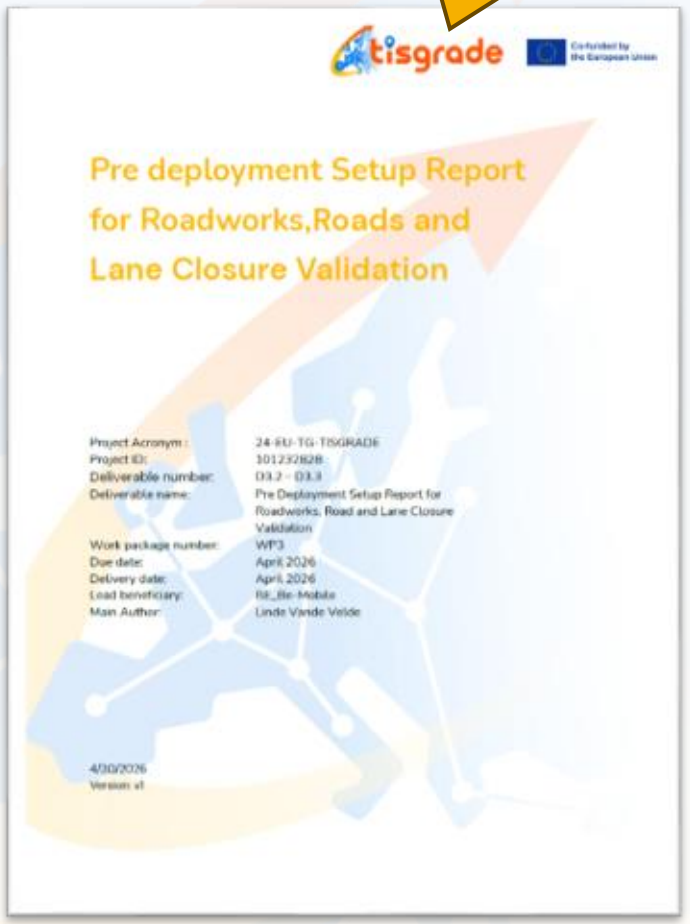
  - Initial baseline validation plan for PDVs
  - Foundation for gap analysis & improvements (next phase D3.5-D3.6)



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Where does Europe stand today?

General situation

- Fragmented, largely manual validation approaches across countries
- Inconsistent data quality: gaps in completeness, timeliness and accuracy
- Service providers have limited trust in data published by road authorities

Coverage

- Good coverage on major roads; gaps on secondary roads & on smaller road works
- DATEX II widely adopted, data published via National Access Points (NAPs)

Timeliness & Quality

- Real-time in more mature PDVs; manual/ad hoc in others
- Validation mostly manual, ad hoc – limited automation or feedback loops

Maturity Range

- Most mature PDVs: leveraging FCD, structured coordination *(cf. best practices)*
- Early-stage PDVs: still paper-based or non-digital

TISGRADE approach

Key objective: common validation method (based on TISA 5-star rating) & shared measurement language to close the loop (harmonized for 15 PDVs)

- 3-phased approach based on TISA 5-star framework
  - Phase 1: Historical data collection (baseline for later evaluation + validation)
  - Phase 2: Desk analysis & manual self-assessment (based on the data feed)
  - Phase 3: Automation of final validation (based on real-world / ground truth data)
- Common KPI-based quality improvement
  - **KPIs aggregated into TISA 5-star**
    Standardized quality score per PDV: baseline value at start PDV phase, re-evaluated after 12 months
  - **KPIs enable measurement of improvement**
    5-star enables cross-country comparison

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Best practices – data input

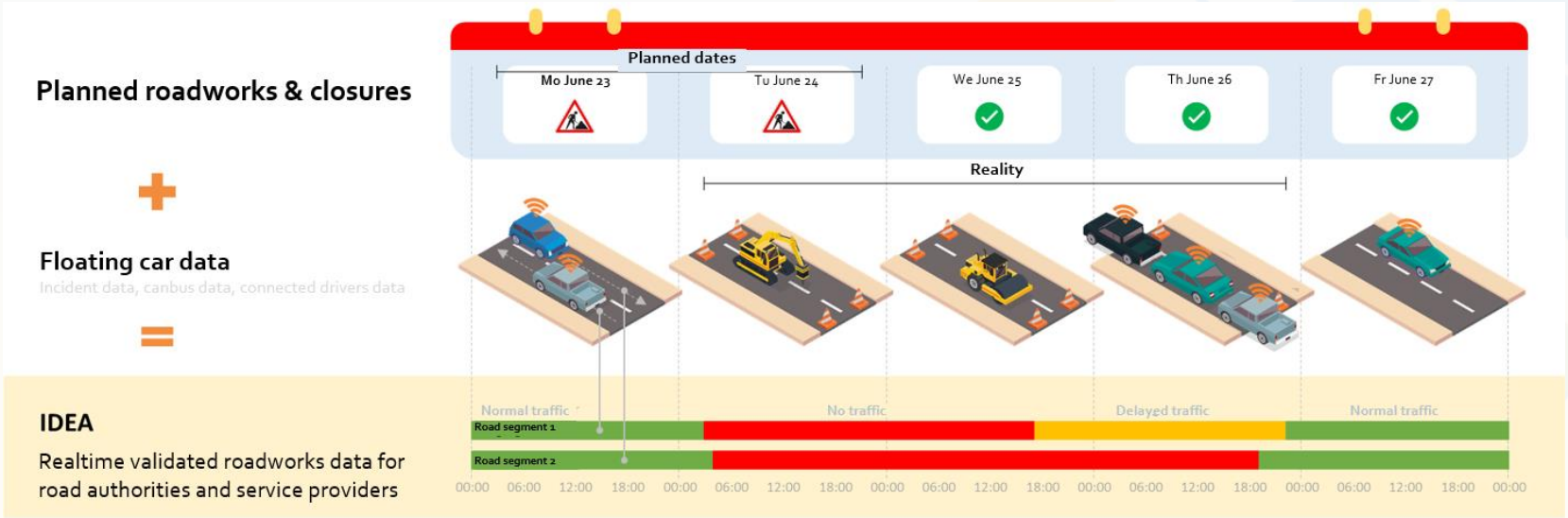
- MELVIN – NDW Netherlands: National coordination platform for roadworks & crowd-generating events
  - Prevents conflicting closures; interfaces with national (RWS/Spin) and local planning tools + Prorail
  - Public portal (melvin.ndw.nu) – transparent, accessible coordination across all road authorities
  - Key lesson: **Coordination at source prevents downstream quality failures** – reducing duplication, gaps & conflicts

- Connected Cones – DGT Spain: IoT device transmitting exact roadwork location at activation – enabling “virtual visibility”
  - High-quality, real-time data: exact section location, immediate (de)activation
  - Legal framework established (DGT Resolution Jan 2025); now included in new maintenance tenders
  - Key lesson: **IoT provides high quality source data** – a model for automated, reliable publication

Best practices – data enrichment

- IDEA – City of Amsterdam Netherlands: Roadwork Validation with Floating Car Data
  - Compare vehicle detection patterns against historical profiles – calculates probability of active road closure
  - Insight into whether roadworks are executed as planned; improved data quality & real-time closure info for road users
  - Key lesson: **Insight into whether roadworks are executed as planned** – improved data quality & real-time closure info for road users

Gemeente Amsterdam



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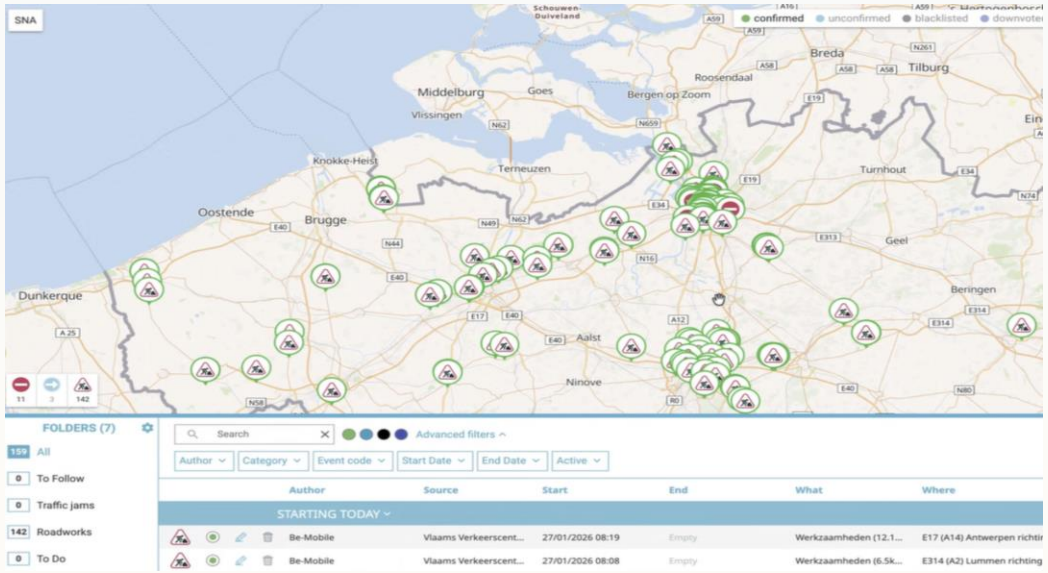
Best practices – data validation

- Be-Warned – Be-Mobile: centralizing and normalizing multi-source traffic data into trusted data
  - Hub: Data sources → Validation → Normalisation → Merge & Decide → OEM / Driver Apps (bidirectional)
  - Framework: use case relevance → sniff test (desk analysis) → ingest → 5-star validation → enrich → release
  - Key lesson: **start with "good enough“ data**, measure continuously, improve at source



Key gaps identified across PDVs

Too much manual processing

- Validation relies heavily on human input; limited automation across most PDVs
- Priority action: implement rule-based & automated checks

Limited use of FCD & feedback

- External data (FCD, SP feedback) not yet systematically integrated
- Priority action: integrate ground-truth validation as standard

Completeness & timeliness gaps

- Missing events, late activations, delayed deactivations reduce trust
- Priority action: monitor via KPIs & enforce publication timelines

Fragmented standards & low digitalization

- Less mature PDVs still use paper-based or non-DATEX II processes
- Priority action: digitalize workflows, adopt DATEX II, define minimum data scheme

Feedback loop largely absent

- SP feedback on data quality not flowing back to road authorities
- Priority action: establish structured SP feedback channel (WP5)

Baseline, Evaluation & Next Steps

- Baseline now established: 5-star rating self-assessment & KPI values documented for all 15 PDVs
- Re-evaluated after 12 months → evaluation covers: maturity, KPI/5-star impact, FCD use, SP uptake, workload
- Immediate next steps: PDV Plans finalized & frequent reporting cycles activated
- 3-phase validation rollout: data collection → 5-star assessment → automation
- Feedback loop integration across all PDVs (WP5)

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Questions

6. General questions and discussion

Be involved

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Newsletter (subscribe via website)

TISGRADE@ndw.nu

Via Public Private Tactical Group

- Next meeting: Autumn 2026