

09:00 AM - 11:15 AM



**Traffic Efficiency** 





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport



© MINISTRY OF TRANSPORT BADEN-WÜRTTEM



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 955273



# **TANGENT** Lessons from coordinated and dynamic multimodal traffic management implementation

Arka Ghosh, University of Deusto Daniel Franco, Rupprecht Consult





TANGENT (Horizon 2020, 2021 to 2024) aims to develop **new tools for optimising traffic management operations** in a dynamic way with a **multimodal** perspective.

- Data gathering& fusion of intermodal mobility, from sensors, users, vehicles. Transport schedules, pricing, traffic flows, events, etc.
- Travel behaviour modelling:
  - focused on studying travel patterns of the individual transport users
  - identifying their needs and motivations for choosing the transport modes and routes (based on historical and real time data),

#### • Traffic Network prediction & simulation:

- create new predictive models of demand and supply of transport in different time horizons
- studying different factors: seasonality, time of the day, trip distance, price, public transport schedules etc. enabling to predict traffic congestion and potential bottlenecks.

#### · Transport network optimisation,

• this module will determine a set of actions for optimizing the traffic flows, considering the status of traffic in real time, the predictions and simulations of the future progress of traffic.

### TANGENT



# **TANGENT** dashboard and API



 $\uparrow$ 

POLIS

- The tool coordinates different transport modes (buses, private vehicles, etc.)
- **Real-time** information:
  - state of the transport network (free-flow, congested...), average travel times.
  - alerts on incidents, delays in the • network.
  - **Predictive** information:
    - traffic congestion time ahead, bottlenecks.
    - expected demand for transport services.





- Service 0 (S0). Data Collection and Harmonization Service
- Service 1 (S1). Enhanced Information Service for Multimodal Transport Management Service.
- Service 2 (S2). Real-Time Traffic Management Service.
- Service 3 (S3). Transport Network Optimization for Transport Authorities.







# **TANGENT's Case Studies**



### **TANGENT -** Lessons

- ML perspective, Data Availability and Quality
- Very complex optimisation problems:
  - High dimensionality
  - Costly obtention of KPIs
  - Uncertainty in KPIs
- Probably a lot of room for improvement in terms of optimisation performance:
  - Management of uncertainty
  - Best performing Policy identification
  - Parallel Computing
- Framework to be improved in current and upcoming projects





### Multi-actor co-creation and cooperation processes in TANGENT

Aimed to:

- Effectively consider the **needs and priorities** of local stakeholders, as well as the **context conditions and system requirements** in the design of the TANGENT tools.
- Enable a **cooperative planning** approach for MTM solutions, defining common goals, targets and indicators.
- Support the definition of suitable cooperation structures and agreements, including data governance requirements, consensus reaching and implementation roles.
- Assess and validate results, identifying drivers and barriers towards upscaling and exploiting the TANGENT solutions, and their policy implications.











### Multimodal Traffic Management facilitated through SUMP

Management of implementation and monitoring phase

POLIS



# **Strengthening SUMP implementation**

Steer cooperation and engagement during implementation phase



testing



# Thank you!

https://tangent-h2020.eu/

Arka Ghosh, University of Deusto

arka.ghosh@deusto.es

Daniel Franco, Rupprecht Consult

d.franco@rupprecht-consult.eu





This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 955273



#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport



© MINISTRY OF TRANSPORT BADEN-WÜRTTEM



### **Improving Air Quality with Traffic Management in Hungary:**

Collaborative Solutions and Innovative Strategies from Budapest

#### Kinga Lőcsei-Tóth

**Deputy Head of Department** Municipality of the City of Budapest/Mayor's Office Department for Climate and Environmental Affairs

#### **Patrik Tóth**

Head of Data Analysis and Modelling BKK Centre for Budapest Transport







09:00 AM - 10:30 AM 27 November 2024

# Air quality dilemma



Budapest, the 9th largest city in Europe, faces significant air quality challenges.

**30%** of  $PM_{10}$  emissions come from transportation.

Image 3.: Based on the levels of fine particulate matter measured in the air in cities in 2022 and 2023 (European Environment Agency, 2024).







In urban areas, traffic can cause more than half of total emissions.



Air quality regulations follow **EU directives** but are fragmented and outdated at national and municipal levels.

POLIS CITIES AND REGIONS FOR TRANSPORT INNOVATION



# Vision and goals

• As part of the **100 Climate Neutral Cities Mission and LIFE IP HungAIRy** project Budapest aims to reduce emissions from domestic heating and transport.

#### Projects target:

- Improving air quality
- Mitigating smog
- Reducing the heat island effect

• Focus on promoting health and preserving the environment.





# Planning strategies for cleaner air: Collaborative efforts





Budapest's project highlights the importance of collaboration.

Alignment of goals between MB, BKK, and HPR has driven progress.

Key achievements include:

- Reduced transportation emissions
- Improved air quality

Success relies on:

- Technology and data
- A shared vision for a sustainable future

# Gathering intelligence from pilots

### **C-ITS implementations**

The Hungarian Cooperative Intelligent Transport System (C-ITS) includes 130 fixed roadside units installed along major motorways and traffic lights as well as 28 vehicles equipped with mobile units.



Image 4.: C-ITS (Hungarian Public Roads)

### **HiDALGO Project**

Innovative methods, algorithms, and software for High-Performance Computing (HPC) and HPDA to model and simulate complex global challenges. Using data-driven analysis, it demonstrated how modifying traffic flow can reduce emissions.



Image 5.: Illustration from the test run to the geometry Gyor3 with a mesh of ca.1M cells. NOx concentrations at ground level are plotted in AQD-standardized colours and wind velocity by black arrows (Hungarian Public Roads).





# **Road Traffic Analysis and Trends**

- Daily two-way traffic between Budapest and its agglomeration:
  - 600,000 private vehicle passengers
  - 350,000 public transportation passengers
- **78%** of commuters head from the agglomeration to Budapest.
- Freight transport accounts for **20-30%** of urban traffic, with the highest emissions in road systems.
- Road traffic returned to **95-105%** of pre-pandemic levels during the first wave of COVID-19.
- 14% lower traffic on weekends, 23% drop at year-end.









# Video analysis for age determination and EURO classification based on license plate

- With video analyses
  - Detected first character
- Method of age determination
  - Start and end year of issue of license plate  $\rightarrow$  avarage
    - Avarage  $\rightarrow$  estimated age $\rightarrow$  EURO classification $\rightarrow$  air pollution emission







#### Euro classification in Budapest, Egér út



Year of manufacture, in Budapest, Road 6



#### Year of manufacture, in Budapest, Egér út



# Analyzing road data

- First results of license plate age showed that age is higher in the off-peak hours
  - Year of production and traffic volume research in Budapest Road 6
  - <u>Weekend:</u>
    - Lower traffic volume
    - Higher avarage age



Weekend 18 2.500 16 2.000 14 12 [vehicles/hour] 1.500 10 8 1.000 6 500 2 0 2:00 00:0 4:00 6:00 8:00 10:00 12:00 14:00 16:00 18:00 20:00 22:00

Number of vehicles

Avarage age of vehicles

[year]



### The traffic transformation of the **Chain Bridge**

Based on 0-24 analysis the new traffic scheme on the Chain Bridge results that 30,000 to 60,000 people can now cross in a car-free environment, using active and sustainable modes of transportation daily.

POLIS

















# Thank you for your attention!





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)

#### For more information:

Kinga Lőcsei-Tóth: toth.kinga@budapest.hu Patrik Tóth: patrik.toth@bkk.hu



Baden-Württemberg Ministry of Transport





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport



© MINISTRY OF TRANSPORT BADEN-WÜRTTEM

### From digital routes to physical paths: Route planning and wayfinding in a multimodal world

### Session 4B: Navigating intelligent traffic management. 28 November 2024

Stijn Vernaillen, City of Antwerp, Smart Ways to Antwerp













### Biggest city in Flanders

- 539,000 inhabitants
- 1.500.000 inhabitants in FUA
- +50,000 students
- +260,000 employees
- +80,000 companies



Context





### Big link works

- Massive roadworks until 2030
- Keeping the city accessible
- Modal split 50/50 for FUA

"Don't push people out of the car, but push the car out of the people."

"Stimulate and facilitate walking, cycling, use of tram and bus, combining of transport modes."









City of Antwerp



Belgium





Antwerp Transport Region

LUXEMBOU

BeNeLux

Flanders (region)



TEN-T / EU




	49 min   SMARTEST ROUTE 145 kCal   1,765 steps   ± 5.55 euro	58 mln $16:55 \rightarrow 17:53$ 384 kCal   716 steps   ± 4.4 euro $\hbar$ 325 m $\hbar$ 325 m	58 mln $10:30 \rightarrow 11:28$ > 93 kCal   556 steps   ± 7.9 euro
dvice modes	52 mln 16:55 → 17:47 > ≫ 42 min E-bike   369 kCal   ± 0 euro @6 12,9 km	56 mln $17:02 \rightarrow 17:58$ > 93 kCal   556 steps   ± 7.9 euro	<b>1 hr(s) 9 mln</b> 10:30 → 11:39 > 165 kCal 2,204 steps ± 5.4 euro $\vec{x}$ 325 m > $\vec{w}$ 2,4 km > $\hat{\mu}$ s32 > $\vec{x}$ 1,3 km
s, price)	<b>38 mln   FASTEST ROUTE</b> $17:14 \rightarrow 17:52$ 114 kCal $\pm 5.55$ euro <i>ib</i> 1,4 km $\geq$ $\hat{\underline{m}}$ s32 $\geq$ <i>ib</i> 2,3 km	<b>1 hr(s) 7 min</b> 165 kCal   2,204 steps   ± 5.4 euro <b>1</b> $\frac{1}{100} \times 1200 \times 1200$ <b>1</b> $\frac$	42 min 10:38 → 11:20 > ± 7.68 euro $\implies$ 3,1 km > $\stackrel{\circ}{\boxplus}$ s32 > $\stackrel{\circ}{_{e \rightarrow b}}$ 2,1 km
n policy	58 mln       17:02 → 18:00 >         120 kCal       1,853 steps       ± 7.4 euro <b>抗</b> 1,3 km       > <u><u></u> <u></u> <u></u> </u>	1 hr(s) 6 mln 17:02 → 18:09 > 148 kCal   3,413 steps   ± 2.4 euro 138 kCal   3,413 steps   ± 2.4 euro 148 kCal   3,413 steps   ± 2.4 euro	<b>57 mln</b> 10:42 → 11:39 > 116 kCal   1,648 steps   ± 2.4 euro <i>I</i> → 1,4 km > $\hat{\blacksquare}$ s32 > $\hat{\uparrow}$ 1,3 km
	1 nr(s) 15 min 51 kCal   1,172 steps   ± 11.75 euro $ \frac{1}{1000} 65 > \frac{1}{1000} 2 > \frac{1000}{1000} 2,8 km $	3 hr(s) 11   MOST ACTIVE min ROUTE 16:55 → 20:06 818 kCal   16,739 steps   $\pm$ 0 euro $ \frac{1}{12,7 \text{ km}} $	1 hr(s) 8 mln       10:31 → 11:39 >         144 kCal   3,355 steps   ± 2.4 euro         1 1,3 km         1 1,3 km











- Offstreet parking
- Taxi drop-off
- P&R

Zandvliet

0

**Digital hubs** 

- Bicycle parking
- Taxi parking
- Drop-off zone shared micromobility
- Parking at train station



#### **Modal split residents**



To work



To school







id not travel









#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)

#### For more information:

Stijn Vernaillen

Stijn.Vernaillen@antwerpen.be

www.slimnaarantwerpen.be/en



Baden-Württemberg Ministry of Transport



## Navigating Intelligent Traffic Management:

Digital orchestration of use of public space

Daan van der Tas, City of Amsterdam

Vincent Lau, City of Amsterdam



#### Daan van der Tas

#### d.van.der.tas@amsterdam.nl

Program manager

Digital management of the public space



#### Vincent Lau

#### v.lau@amsterdam.nl

Manager digitization Use of the public space







## Context



# Digital Orchestration is one of the topics in Digital Management of Public Space (DRO-DMI)

DRO-DMI consortium led by Amsterdam





# **DRO** is part of a larger Dutch Metropolitan Innovation ecosystem





#### **DRO opportunity area's**





## Today

<b>Transparency</b>	<b>Orchestration</b>	Correction of the second secon	<b>P</b> <b>Curb &amp; Parking</b> space
Traffic safety	CCC Modal shift for routines	€ Contraction Contraction equity	Intregrated Vision and Design Development





## What is it?



#### Let's make sense of this

- Digital orchestration of use of the public space
  - Choices based on data
    - Automatic
    - Decision support
  - Going beyond <u>car mobility</u>. Parking (car, bike, touringcar), crowd management, use of the waterways, taxi management, logistics, etc











The public space is in high demand.











Every use of the public space in densely populated cities interacts with other interests.

Every square meter counts.





## **Currently in Amsterdam**

- 11 months shorter because of dirty air.
- 67% of inhabitants feel unsafe in traffic
- 1,6 degrees Celcius temperature increase since 1950
- 1164 victims of accidents in traffic





For 2050 we strive for

+10 years of healthy life for vulnerable groups

- +0% of car traffic
- 10 minutes to walk from any front door to a park
- 95% reduction of CO2





## How to get there



#### This is Steve. Steve is our metaphor.





#### 1932 – 1972: The noble traffic light

Australopithecus afarensis







#### 1972 – 2001: Basic intersection **computing**

Homo habilis











## 2001 – 2015: Adding basic tools

Homo erectus









#### 2016 – 2024: Basic intelligence





#### **Basic intelligence inadequate**





### 2024 – 20xx Digital orchestration (DRO)





## **Digital orchestration: next steps**

• Align with policy makers.







### **Digital orchestration: next steps**

• Framework for orchestration solutions





## **Digital orchestration: next steps**

- Work together
  - Public

- Private
- Education
- Citizens







# Thank you for your attention!





#### **27-28 NOVEMBER 2024**

KARLSRUHE (DE)

#### For more information:

Daan van der Tas - d.van.der.tas@amsterdam.nl Vincent Lau - v.lau@amsterdam.nl



**Baden-Württemberg Ministry of Transport** 





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport



© MINISTRY OF TRANSPORT BADEN-WÜRTTEM
#### Car-Free Grand Prix.

1 4

19

CHRIS BRUNTLETT INT. RELATIONS MANAGER POLIS CONFERENCE NOVEMBER 28, 2024 Boels

-----

Boels

Boel

----

Boels

#### **Dutch Cycling: For a Cycle-Friendly World**

The Dutch Cycling Embassy is a vast network of public and private organizations from the Netherlands who wish to share their knowledge and expertise to help cities experience the many advantages of cycling.







**Experience** the Dutch cycling culture first-hand



Think about best possible solutions and achievable results



Act by applying these solutions to your local context



Learn more about effective policies and best practices

























#### **STOMP** Principles



o Stappen (Walking)
o Trappen (Cycling)
o OV (Public Transport)
o Mobility as a Service
o Private Cars





#### 'The Max Express'



o<sup>o</sup> Roughly 55,000 daily attendees of the Grand Prix arrive in Zandvoort by train

• Required permanent infrastructure upgrades needed to allow the seaside station to host 12 trains per hour (at five-minute headways) at peak times

• Flexibility designed into the system to allow for 10,000 greater or fewer passengers—depending on the weather conditions on that given day





#### **Ride Rain or Shine**



- Given the remote and exposed coastal setting, organizers were worried that fans would hesitate to cycle long distances in wind and rain
- But they were pleasantly surprised, and pedalling through the dunes has become a social and enjoyable part of the race day experience for many

• A total of 45,000 popup spaces around the race circuit: the biggest (temporary) bike parking in the world!







### Inspiring the World



• The Paris Olympic Organizing Committee were in attendance in Zandvoort in 2023, in order to study how they might adapt this aspirational model during the 2024 Games

• This month, the DCE visited Los Angeles for meetings with local stakeholders as they prepare to host the 2026 World Cup and 2028 Olympic Games, which officials have promised will accelerate their mobility transition





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport



**TAMARA STRASSHEIM**City of Stuttgart, Traffic Authority

#### **THOMAS OESTERLE** City of Stuttgart, Traffic Authority - IVLZ







## **NAVIGATION 2.0**

**Transmission of strategies to navigation services First examples and experiences in Stuttgart** 



## **Navigation 2.0** Planning of Strategies



STUTTGART



#### Strategy-Planning at the IVLZ

▼ TRAFF-X.stra	tegy					☆ ③ <sup>①</sup> ・	THOMAS.OESTERLE
Globale Suche	2	<b>ک</b> ا	🔗 1/1 Strategie 🗙	5/8 Komplexe Maßr	ahmen X 🔘 6/8 Maßnahmen X		້ ວ
ALEFI	A.	Ser 1	N	THE	Q 😳 T 🖪	Ľ.	Bearbeiten [
			SXI	1 million	IISTE > 😓 STRATEGIE >	PARKLEITSYSTEM	
	TOTAL CONTRACT	Bad Cannst	att		PARKLEITSYSTEM	VERWALTUNG	KOORDINATION
3000	SULUS.			J. The	Name * Lenkung Wasen (Tunnel zu)		
Stuttgart-N	ord	Berg		285 m	Status 🔅 Genehmigt		-
259			<b>A</b>	L	Gebiete und Routen		^
	-267	m Stute	Sturing of Ost	stroße	Parkleitgebiet		+ 🗏 💠 🛈
A Start	行	$\leq$	Dreieck Nr. Forbar		Zusammenfassung		<u></u>
VIII AN	Stutte	gart-Ost	Dreieckin	ckorpark	Cannstatter Wasen (P10)		© \$\$
stuttgart		lefter here	and a second	C	Routen		+ ≣ ◊
a A	J.K.				Zusammenfassung		ŵ
	$\mathcal{O}$		Wanae	Wangen	P10 von ES kommend via Rampe GB	В	• % f2
		ANT	Hoh		P10 aus der Innenstadt kommend	$\searrow$	۵ % 4
	Frailer	Nonf - PA	- 42 - 99- 1-2	Bill	P10 Wasen von WN kommend (Tunn	el zu, alles GBB)	۲) ۵۵ 🕲 ۲
TS CASE	462	m Frau	enkopf	A Carlo Subligari	Pragsattel zu P10 über GBr		۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲. ۲





## Navigation 2.0 Technical Concept







- → publishing multimodal traffic management strategies
- publishing instant traffic management strategies
- $\rightarrow$  ongoing updates of strategies
- publishing strategies for target users (e.g. VIP, busses, disabled, separate fan-groups)

TRAFF-X.st	rategy				☆ ③ ①・	O THOMAS.OESTERLE
bale Suche	æ	<mark>۷</mark> ا	🌘 1/1 Strategie 🗙 🔀 5/8 Komplexe	Maßnahmen X 🔘 6/8 Maßnahmen X		C D
RACE	1A/A	A A		🕘 🤤 🐑 🕇 🖪 🖪	!	Bearbeiten [
		20/	510-	📰 LISTE > 🍃 STRATEGIE > 😪	PARKLEITSYSTEM	
		Bad Cannst	att	PARKLEITSYSTEM	VERWALTUNG	KOORDINATION
DA	and a second			Name * Lenkung Wasen (Tunnel zu)		
Stuttgart-	Nord	Berg	285 m	Status		
N			Se Contraction	Cu Gebiete und Routen		^
	-267	m	Sunta ver Ost	Parkleitgebiet		+ ≣ ♦ 0
	公书		Dreieck N. Korbark	Zusammenfassung		Ô
	Stuttg	art-Ost	Dreieck Wickorpark	Cannstatter Wasen (P10)		© %
tgart		after any	Untertu	Routen		+ 🗏 💠
* Y	K.			Zusammenfassung		ŵ
	SUN-	SU	Wangener	P10 von ES kommend via Rampe GBB		۲) ۵ (C)
1		ART -	Hohe	P10 aus der Innenstadt kommend	a a	• % P
S. C.	13/10	PO - OA	the first and	P10 Wasen von WN kommend (Tunnel zu,	alles GBB)	<u>ی</u> ۲۵
STATE		m Frau	ienkopf	Pragsattel zu P10 über GBr		• 55 P

## Navigation 2.0 Technical Concept







#### **Publishing strategies**

- → activating strategies in the IVLZ
- $\rightarrow$  providing strategies via NAP to be used for public interest





## **Navigation 2.0** Planning & Publishing Strategies





STUTTGART

Navigation starten

### **Navigation 2.0** Example: Frühlingsfest







**PRISMA** solutions

#### **Navigation 2.0 – Using NUNAV-APP** NUNAV 0 0 Frühlingsfest 2024 in.Stuttgart Reichenbachstraße Staufrei für alle und entspannt zu deinem Besucher. Event! Ankommen ist doch ganz Frühlingsfest 2024 einfach. in.Stuttgart Jetzt direkt zum 20.04.2024 - 12.05.2024 vorgesehenen Parkplatz. Europas größtes Frühlingsfest lädt wieder zum Feiern ein! Mit NUNAV erhaltet Ihr einen Parkplatz der dem Verkehrslenkungskonzept entspricht direkt hier als Navigationsansage in NUNAV Navigation, Einfach, digital. in.Stuttgart! + in.Stuttgart NUNAV Navigation C MapTiler C OpenStreetMap contributors **Navigation starten** graphmästers STUTTGART collaborative routing challenging limits

## Navigation 2.0 Example: Frühlingsfest



STUTTGART



Navigation 2.0 – Routing on the Map

#### CONTACT



#### TAMARA STRASSHEIM

Project Manager Traffic Authority **City of Stuttgart** 

Tamara.Strassheim@stuttgart.de





#### **THOMAS OESTERLE**

Project Manager Traffic Authority Integrated Traffic Management Center (IVLZ) **City of Stuttgart** 

Thomas.Oesterle@stuttgart.de



#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport



© MINISTRY OF TRANSPORT BADEN-WÜRTTEM

# Traffic lights can improve road safety!

The Dutch approach

Luuk Misdom, City of Helmond

# City of Helmond

- Brainport region, The Netherlands
- 95.000 citizens and will grow with 20%
- Mobility Living Lab
- Home of the Automotive Campus
- Active member in POLIS
- Roughly 70 casualties and 3 deaths per year!
- Social costs road safety: €60 million





## Our new road safety plan

- Every accident is one too many
- Based on new national framework (Strategic Plan Road Safety)
- Focus shifts from accidents to risk & accidents
  - Prevention is the best cure!
- Challenge is to choose the right indicator





# 1<sup>st</sup> Generation

- Data on an indicator or road design or behaviour, f.e.:
  - Overspeeding
  - Usage of alcohol
  - Trees near a road
  - Width of lanes
  - Curves
  - Red light violation



Afbeelding 1. Ontwikkeling van rijders onder invloed in weekendnachten 2002-2022 (Bron: I&O Research [1]).



# 2<sup>nd</sup> Generation

- Data of risky behaviour or locations in a model
  - Riskprofiles per road based on different indicators
  - Reason of unsafety is usually unknown





## 3<sup>rd</sup> Generation

- Combine data of infrastructure and behaviour
- Location based
- Reason is easy to determine
- Give more insights in day, time, movement, road users, etc

• Risk = chance x consequence


### How it works?

- 1. Has there been a red violation by a vehicle at the intersection?
- 2. Were there vehicles (conflicting traffic) on other lanes that could have been impacted?
- 3. If so, what would be the severity of the impact?
- Severity:
  - Speed (estimation)
  - Mass (estimation)
- Angle of impact
  CONFERENCE
  2024



### What do we see?

	05	06	07	09	10	11	24	26	28
05				47			86		97
06				62	40	58		86	
07						50		78	
09	47	62				58	93	93	93
10		40					93	93	93
11		58	50	58			93		93
24	93			93	93	93			
26		86	93	93	93				
28	97			93	93	93			

50k			$\wedge \wedge$		٨		
305247 / Ernst I	BOS	247 / Erns	21 t/m zo 3	0-05-2021	021 t/m zo	30-05-2021 02	
BOOLA, / Ellisti		. 20-00-20		0 00 2021		22	26
	9	Totaal		02		1	13
			06	22	26		1
Totaal		29813.9	1422.9	41.3	991.9		
zo 23-05-2021	100%	1544.8	93.9		41.3	1	4
ma 24-05-2021	99%	1302.3	151.6				3
di 25-05-2021	99%	6161.9	288.9	41.3	372.0		2
wo 26-05-2021	98%	4833.2	224.1		196.3		2
do 27-05-2021	100%	4672.9	527.2		103.3		1
vr 28-05-2021	100%	5823.3	65.0		186.0		
za 29-05-2021	99%	2946.1			93.0		
zo 30-05-2021	98%	2529.4	72.2				



## Can we improve road safety with our traffic lights?

- Insights: When and where was it unsafe
- Cause: Look into the logging
  of the TLC
- Action: Change parameters
  - Lengthen the greenphase
  - Change gaptimes

POLIS ANNUAL CONFERENCE 2024

- Change signalgroup order
- But the proof is in the eating of the pudding



### **Conclusion & next steps**

- With existing data we can:
  - Determine the risk at a traffic light
  - Compare traffic lights
  - Make changes that do have an impact!
- Hopefully we can:
  - Build a bridge between traffic management and road safety
  - Use one indicator
  - Work together!







# Thank you for your attention!





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)

#### For more information:

luuk.misdom[@]helmond.nl +31 (0)6 2688 1218





Baden-Württemberg Ministry of Transport





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport



© MINISTRY OF TRANSPORT BADEN-WURTTE

#### Introduction

#### Almelo

- City of 75,000 inhabitants within the Twente metropolitan area of 320,000 inhabitants.
- High Tech industry and logistical node in the East of The Netherlands (TEN-T North Sea Baltic Corridor)

#### **Rob Hulleman**

- Traffic & mobility expert
  - Integrated Traffic Management
  - Signposting policy and design
  - Cycling networks and infrastructure (ASPP workshop method)







#### **Talking Traffic (1)**

#### Partnership of Governments, Industries, Consultancies, Telco's and Service Providers

- Started 2015
- Development of a standardized system for connected traffic management
  - Road-side and in-vehicle
  - Based on European standards
- Standardization of iVRI (intelligent Traffic Light Controller) without
- No vendor capture
- Communications using 5G through the cloud
- In-vehicle services by Service Providers
  - Target: implementation of Talking Traffic on 1,200 intersections by 2019





#### **Talking Traffic (2)**

#### **Clusters**

- 1. Road Side based
- 2. Cloud
- 3. In-vehicle based

#### TALKING TRAFFIC PARTNERSCHAP – functionele verbindingen - versie 28-08-2017







#### The Almelo project (1)

#### Phasing

- 27 Intersections on Ring Road and major Access Roads (completed June 2023)
- 15 Intersections within the Built-up Area (complete June 2025)

#### History

- Talking traffic was development during implementation
- First contract for 15 intersections in 2017 contractor could not deliver in time
- Second contract for 27 intersections in 2019 contractor did not manage to deliver
- Third contract for 42 intersections in 2020 implementation is on schedule

#### Finance

- Ministry of Infrastructure and Waterworks
- Province of Overijssel
- City of Almelo





#### The Almelo project (2)







#### The Almelo project (3)

#### **Objectives**

- Reduction of emission of greenhouse gas, particulate matter and noise
- Increase of road safety
- Increase of use of zero emission vehicles
- Being ready for Connected and Cooperative Automated Vehicles
- Facilitating local economic growth, connection to parking guidance system

2050

Facilitating safe and joyful access to big events like football matches

#### **First results**

- Better flow of traffic at individual intersections
- Better flow of car traffic in a series of intersections
- Less hinder caused by priority for emergency and public transport vehicles



#### The Almelo project (4)

#### To be implemented (by 2025/26)

- Implementation of regulated flow of convoys of football spectators (visitors)
- Full implementation of talking traffic in priority of emergency and public transport vehicles replacing the analog short distance radio system (KAR)
  - Implementation of priority for zero emission logistic vehicles, including cargo bikes
  - Regulated flow of platoons of cyclists



#### The CTC-CONDUCTOR truck pilot in Almelo (1)

#### CONDUCTOR

- European innovation project with 15 partners
- Main goal is to design, integrate and demonstrate <u>advanced, high-level traffic and fleet management</u> that will allow efficient and globally <u>optimal transport of passengers and goods</u>, while ensuring seamless multimodality and interoperability, through dynamic balancing and priority-based management of automated and conventional vehicles.

#### **Participants**

CONDUCTOR project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101077049.



- Almelo: infrastructure and data
- University of Twente: research
- Mobicoach: service provider connecting vehicles and infrastructure
- Province of Overijssel: coordination with the logistical companies and partners
- Keypoint Consultancy: technical assistance
- 5 logistical companies and 2 logistical organisations
- Funding European Union (CONDUCTOR)
  - Ministry of Infrastructure
  - Province of Overijssel
  - City of Almelo





#### The CTC-CONDUCTOR truck pilot in Almelo (2)

#### Focus on smooth flow of heavy trucks

- Reduce emissions
- Improve efficiency and uncertainty of logistics operations
- Minimize interruptions and standstill of trucks
- Vehicle-to-infrastructure (V2I) communication
- Main criteria: fuel consumption, emissions, road safety, trip and waiting times

#### **Main characteristics**

- Green-light optimized speed advice
- Truck prioritization using signal timings adaptations
- En-route (ad-hoc) truck platoon forming





#### The CTC-CONDUCTOR truck pilot in Almelo (3)

#### Pilot

- Truck priority is always conditional
- Weeks with truck priority switched on are compared with weeks with priority switched off
- We measure
  - Priority requests sent, feed-backs sent, granted priorities by the controllers
  - Number of stops and waiting time of the pilot-trucks and all other traffic
  - Resulting trip times
  - Etc.
- The opinion of the truck drivers and transport companies is captured in a survey

#### First results



CTC CONDUCTOR ALMELO	2 weeks June/July	2 weeks Sept/Oct	rapen
# Request for priority	470	1000	al aanv
# Messages processed by traffic light controller	310	650	Aanta
# Priorities granted (green comes earlier)	180	450	



Tijdstip van aanvraag



#### **Final remarks**

#### **Prioritization**

- Giving priority to everybody means nobody gets it
- Emergency vehicles and public transport get a higher level of priority
- Truck priority is conditioned and adaptive (truck and traffic lights)
- We monitor side effects on other traffic (cyclists, pedestrians and cars)
- Data: floating car data, CCTV, infra-red, radar, induction-loop-detectors GPS ...

#### Future in Almelo (2025-2026)

- After the pilot prioritization of trucks will be continued
- Higher level of priority for zero emission logistic vehicles, including cargo bikes
- Full implementation of talking traffic in priority of emergency and public transport vehicles replacing the analog short distance radio system (KAR)
  - Regulated flow of platoons of cyclists



#### Thank you for your attention



Twente 2050







#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)



Baden-Württemberg Ministry of Transport



© MINISTRY OF TRANSPORT BADEN-WÜRTTEM

### Driving Towards the Future: TN-ITS and Digital Driven Traffic Management

Christian Kleine

HERE



#### Agenda

- Digital-Driven Traffic Management
- TN-ITS
- Reaching the End User Use Case Speed Limits
- Relevance for Urban Traffic Management



### **Digital Driven Traffic Management**



Travelers want real-time and personalized information.



Traffic information is moving from roadside signs to in-car systems.



Traffic management is becoming more digital.



Cooperation between public and private sectors adds value to traffic management.



### Data Sharing: A Win-Win for All



Service providers improve their navigation and assistance systems by adding real-time traffic and road data from road authorities.



Road users get real-time, personalized traffic updates.



Road authorities manage traffic flow by digitally sharing traffic information with road users.



### **TN-ITS platform**

- Multistakeholder Platform
- Privat Public Cooperation
- Supporting EU Policy on RTTI Implementation
- Focused on map updates
- Platform represents >90% of world's digital map business





### **TN-ITS Data Chain Stages**





## Is this data Available?

#### **TN-ITS** Services in Europe



**Operational Service** 

Service in 2025

**Pilot Service** 



### **Use case speed limits**





### Relevance for Urban Traffic Management



TN-ITS is an established process of publishing road data and automated usage in Navigation Systems



Helps to improve Traffic Management by sharing: Traffic Circulation Plans Speed Limit Changes Preferred Routes Other Traffic restrictions





# Thank you for your attention!





#### 27-28 NOVEMBER 2024

KARLSRUHE (DE)

#### For more information:

Christian KLEINE

HERE



**Baden-Württemberg Ministry of Transport** 

