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Improving National Access Point interoperability through harmonisation of their Level of Service

Mobility Data Days

Budapest, 8th November 2023

Co-funded by the European Union

Improving National Access Point interoperability through harmonisation of their Level of Service

1. NAP LoS assessment gaps and actions
   - Nuno Rodrigues and Joao Montenegro

2. Round tabel and panel discussion with NAP operators
   - Ed Ooms (The Netherlands)
   - Ricardo Tiago (Portugal)
   - Jasper Beernaerts (Belgium)
   - George Christou (Cyprus)
   - Kenneth Sørensen (Denmark)

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NAP Level of Service - Gaps and Actions

WG2: Interoperability and level of service of NAPs

Mobility Data Days
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Nuno Rodrigues, João Montenegro

1 NAP LoS KPI Framework (NLKF): quick review

2 NAP LoS - Gaps and actions

WG2 Interoperability and level of service of NAPs

Aiming at defining minimum conditions and coordination efforts for the development and evolution of the NAPs, in order...

- To enhance the compatibility and interoperability of the NAP features
- To enhance the harmonisation of the levels of service of the NAPs

...while

- Taking into account existing architecture of the NAPs in Member States, and
- Maintain and develop common NAP architecture while building upon the existing investments

NAP LoS KPI Framework (NLKF)

NAP Harmonisation starting from NAP state of the art

NAP Common Feature List

	Required	Nice to have	...	...
Access				
1. The NAP is available over the internet	•			
2. NAP can be navigated easily and is design compliant with web design standards / accessibility	•			
3. NAP is provided in the national language and commonly used language(s) of the Member State	•			
4. NAP follows EU data protection and industry data security standards	•			
5. NAP requires data publishers to register to add their data / metadata	•			
6. NAP requires data consumers to register for full access		•		
Communication				
7. NAP provides help for data publishers to register, add data / metadata	•			
8. NAP provides Terms & Conditions	•			
9. NAP is promoted	•			
10. NAP provides means for data consumers to contact NAP operator and / or data provider for assistance	•			
Finding datasets				
11. NAP provides appropriate discovery services	•			
12. Datasets can be searched using a metadata catalogue	•			
13. The NAP provides machine readable metadata		•		
14. The NAP provides a map-based search		•		
Update and maintenance				
15. The NAP service is maintained	•			
16. The NAP content and metadata is maintained and makes best effort is made to keep content up-to-date	•			
17. NAP monitoring and evaluation is undertaken		•		
Dataset information				
18. NAP provides clear descriptions of each dataset	•			
19. NAP provides dataset documentation (or links) where required	•			
20. NAP datasets classified according to standard / controlled vocabularies		•		
Extra category				
1. ...	•			
2. ...	•			
3. ...		•		

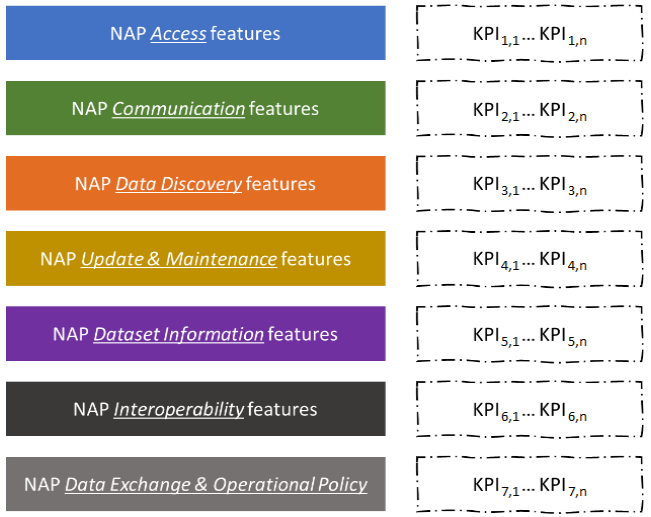
EU EIP A2: Working Group NAP, 2020

Category		Common Feature List
Access	1.1	On-line availability
	1.2	Compatibility with web browsers
	1.3	Compatibility with operating systems / platforms
	1.4	Responsiveness
	1.5	Web performance – Simplicity/ usability
	1.6	Web performance – Visual hierarchy/ navigability
	1.7	Web performance – Consistency
	1.8	Support of commonly used languages
	1.9	Security - Technical
	1.10	Security- providers verification
	1.11	Personal data protection
	1.12	Procedure for publication of data on the NAP
	1.13	Metadata access restrictions
	1.14	Data security and access restrictions for uploading
	1.15	Data security and access restrictions for downloading
	1.16	Indication of data modification
	1.17	Data transfer optimization
	1.18	API usage for data transfer
	1.19	Web performance – latency
	1.20	Data visualization
Communication	2.1	Provision of support to users to register and add data/metadata
	2.2	Promotion of NAP based on number of related projects
	2.3	Number of different channels on the NAP is regularly promoted (conferences, webinars, social network, homepage, printed media, flyers, etc...)
	2.4	Promotion of NAP based on number of related publications
	2.5	Provision of contact means to data consumers
	2.6	Mass notifications
Data discovery	3.1	Search functionalities
	3.2	Display of search results
	3.3	Provision of machine-readable metadata
Update and maintenance	4.1	NAP IT services
	4.2	NAP content and metadata
	4.3	NAP monitoring and evaluation
Dataset information	5.1	Documentation & description of datasets
	5.2	Classification of datasets based on standard/ controlled vocabularies
Interoperability	6.1	Adoption of Coordinated Metadata Catalogue
	6.2	Support of harvesting functionalities
Data Exchange and Operational Policy	7.1	Provision of Terms and Conditions for data reuse
	7.2	Data licenses described with harmonized pre-defined terms
	7.3	Provision of operational procedure information
	7.4	Provision of dataset indicators related to declaration of compliance
	7.5	Facilitation of compliance assessment procedure
	7.6	Association of published datasets with DRs supplementing the ITS Directive
	7.7	Established quality indicators for datasets

NAPCORE: Working Group 2, 2022

NAP LoS defintion based on current NAP features

- LoS based on maturity level approach
- KPI definition per collected NAP feature
- Categories and KPI weights settings based on NAPCORE expert group



KPI	Index i.j	Data platform #1	#2	#3	#4	#5	#6	#7	Weight Wi,j	Initial relevancy	Data directory #1	#2	#3	#4	#5	#6	#7	Weight Wi,j	Initial relevancy
On-line availability	1.1	5	5	4	5	5	5	5	0.96	1	5	5	3	5	5	5	5	0.93	1
Compatibility with web browsers	1.2	5	5	5	5	2	5	3	0.82	1	4	5	5	5	2	5	3	0.79	1
Compatibility with operating systems / platforms	1.3	4	5	5	5	2	3	3	0.71	1	4	5	5	5	2	5	3	0.79	1
Responsiveness	1.4	5	4	4	4	2	2	1	0.54	1	5	4	5	4	2	3	1	0.61	1
Web performance – Simplicity / usability	1.5	4	4	4	4	3	5	2	0.68	1	4	5	5	4	3	5	2	0.75	1
Web performance – Visual hierarchy / navigability	1.6	4	3	4	4	3	3	1	0.54	1	4	2	5	4	3	3	1	0.54	1
Web performance – Consistency	1.7	4	4	4	4	3	3	3	0.64	1	4	3	5	4	3	3	3	0.64	1
Support of commonly used languages	1.8	4	4	3	4	3	5	2	0.64	1	3	4	4	4	3	5	2	0.64	1
Security – Technical	1.9	3	5	5	5	2	5	5	0.82	1	4	4	3	4	2	5	5	0.71	1
Security – Providers verification	1.10	3	4	5	5	2	5	5	0.79	1	3	4	3	4	2	5	5	0.68	1
Personal data protection	1.11	4	5	5	5	1	5	2	0.71	1	4	5	5	5	1	5	2	0.71	1
Procedure for publication of data on the NAP	1.12	3	4	5	4	4	4	3	0.71	1	3	4	5	4	4	5	3	0.75	1
Metadata access restrictions	1.13	3	4	3	4	4	1	4	0.57	1	3	4	4	4	4	1	4	0.61	1
Data security and access restrictions for uploading	1.14	3	4	5	4	4	5	3	0.75	1	4	5	0	4	0	5	3	---	0
Data security and access restrictions for downloading	1.15	3	4	5	4	4	1	2	0.57	1	4	3	0	4	0	1	2	---	0
Indication of data modification	1.16	2	2	3	2	4	3	1	0.36	1	4	2	3	2	0	4	1	0.42	1
Data transfer optimization	1.17	3	3	3	3	3	1	1	0.36	1	4	2	0	2	0	4	1	---	0
API usage for data transfer	1.18	2	3	3	3	4	3	2	0.46	1	5	2	0	2	0	5	2	---	0
Web performance – latency	1.19	4	4	4	4	2	2	3	0.57	1	5	3	3	3	2	4	3	0.57	1
Data visualization	1.20	2	1	1	1	5	1	3	0.25	1	2	0	1	1	0	3	3	---	0
Support to users to register and add data/metadata	2.1	3	3	3	3	4	5	3	0.61	1	5	4	4	4	0	5	3	0.79	1
Related projects monitoring service	2.2	4	1	3	1	1	3	1	0.25	1	2	0	3	1	0	3	1	0.25	1
Related projects built on the NAP data	2.3	4	1	3	1	1	3	1	0.25	1	2	0	3	1	0	3	1	0.25	1
NAP promotion – number of channels	2.4	2	1	3	2	1	1	1	0.14	1	2	0	3	1	1	1	1	0.13	1

NLKF supporting harmonization of NAP LoS

1. **NLKF as a reference to be used by**
   - NAPCORE
   - NAP operators / policy makers

2. **NLKF basis for NAP LoS European benchmarking:**
   - NAP LoS yearly self assessment workshop
   - European averages or minimum, basic or advanced Level of Service by NAPCORE

3. **NLKF inspiring NAP roadmap development and monitoring**
   - Listing of gaps and actions needed towards harmonisation
   - Decision -making on future developments/investments

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NLKF: NAP Self-assessment workshop

1- Analysis of the European aggregated results

Outputs:

- 1.1 – Displays, through box plots, the distribution of the Grades of achievement (GA) for each feature category and for the Total GA. Also displays the average GA and Most Frequent value for comparison.

- 1.2 – Displays the number of NAPs in each maturity level, for each Feature category and for the Total GA

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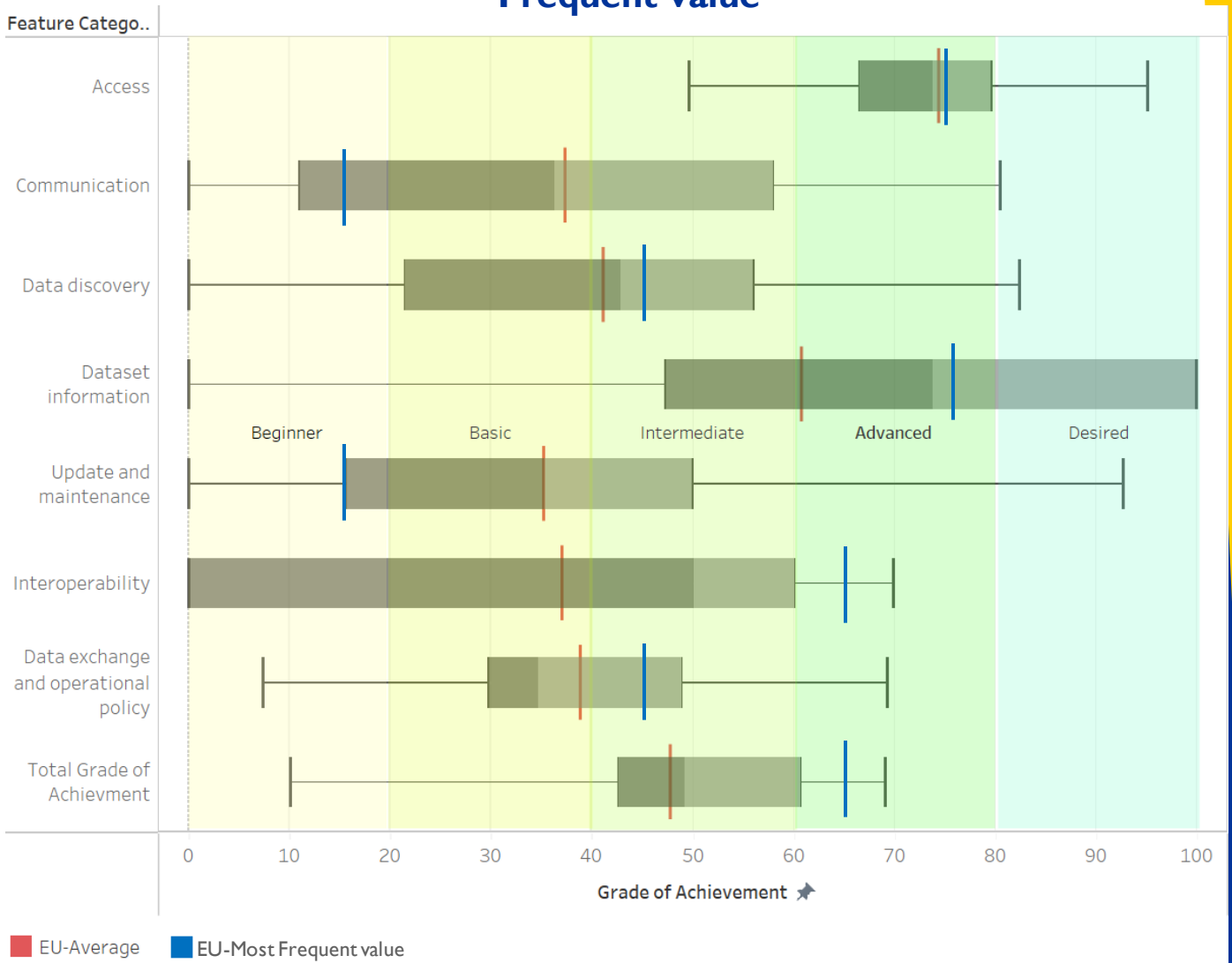
1- Analysis of the European aggregated results

- **Highlights:**
  - Feature "Access" presents higher grades and less variance
  - Feature "dataset information" presents the largest variance, even though the EU average and Most Frequent value are within the "Advanced" level of maturity
  - Most frequent value of the "Interoperability" Feature is within the advanced level of maturity, although the average GA is close to 40
  - The EU average for the Total GA is at the "Intermediate" maturity level
  - Several features have considerable variance and minimum values equal to zero, which demonstrates a strong need for harmonization

Graph 1.1: Distribution of GA vs Feature + Average & Most Frequent value



1- Analysis of the European aggregated results

- **Highlights:**
  - Communication has the largest number of NAPs at the beginner level (followed by Update and maintenance)
  - Only a few NAPs and features have reached the desired level
  - Results for data discovery and dataset information vary a lot (several MS in different maturity levels)

Graph 1.2: Number of NAPs in each level of maturity per Feature

Definition and identification of gaps

- Milestone 2.2 - Overview of gaps and actions needed
- Definition of "gaps", which could be:
  - Non-satisfied requirements from the DR
  - Gaps from the NAP Reference Architecture
  - Statistical approach using the results from the NAP LoS self-assessment **– adopted (for now)**
- Identification of gaps:
  - Gaps at the **feature category level**
  - Gaps at the **KPI (single feature) level**

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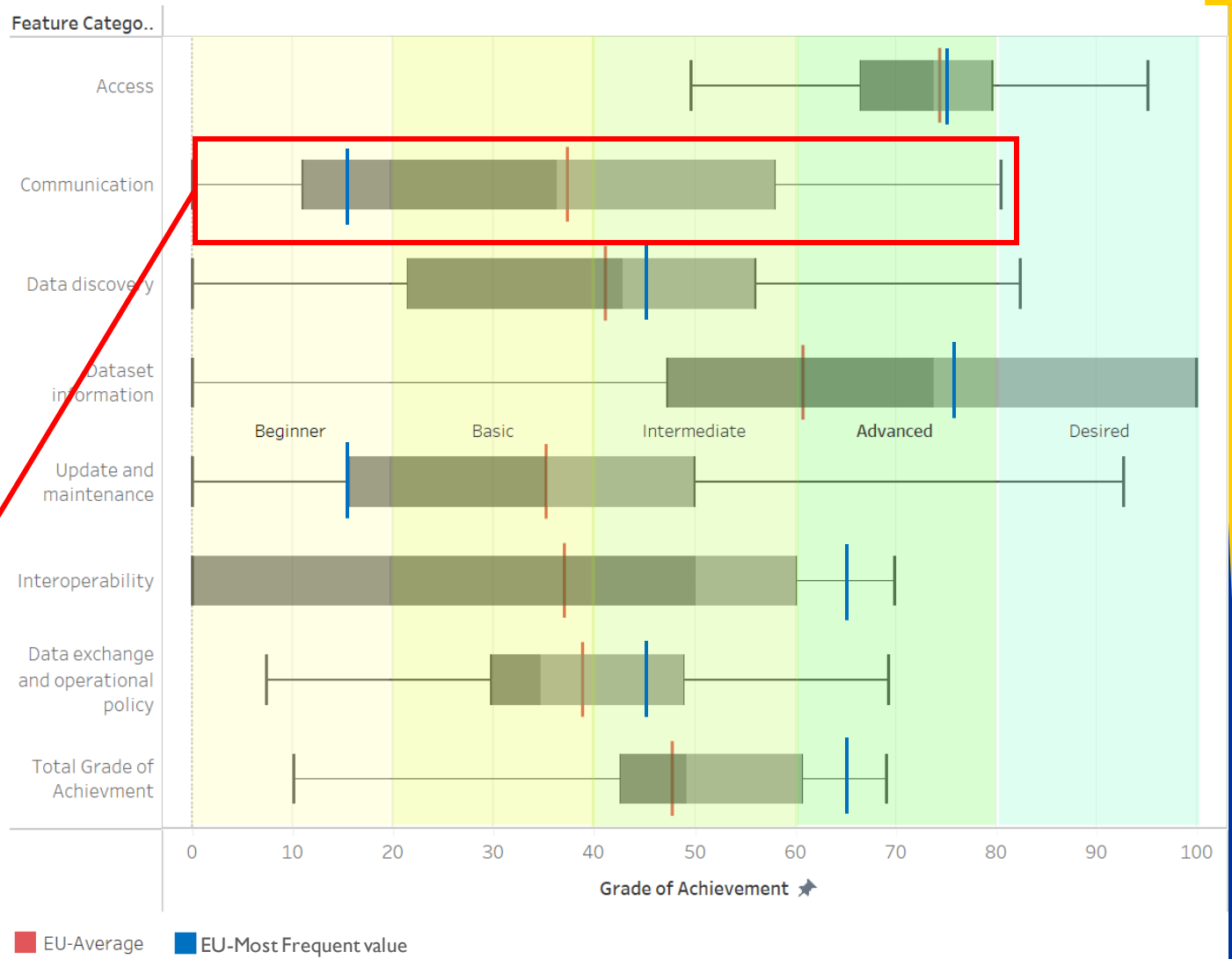
Identification of gaps in the feature categories

- Identification of gaps in the **feature category level**
  - Underperforming categories (lower Maturity levels)
  - Lack of harmonisation in certain categories

Example of "Gap" in the feature category level



Identification of gaps in single features (KPIs)

- Methodology based on the "minimum" value established by "experts" in NLKF
- KPIs with "significant gaps" were identified according to the following assumptions:
  1. Occurrence of insufficient features – related to the number of NAPs that are not reaching the "minimum acceptable LoS"
  2. Significance of relevant features – related to the weights assigned for each KPI
- Criteria (Metrics) adopted:
  A. weighted % of NAPs with non-acceptable KPI – for all NAPs regardless of type
  B. weighted % of NAPs with non-acceptable KPI – for the "data directory" NAP type
  C. KPI weights – for all NAPs

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Identified gaps in single features

- According to the pre-established criteria, 14 KPIs have been identified with the most significant gaps,
- These were considered for recommended "actions"

Metric A

#	KPI	KPI name	Weighted % NAPs below min LoS
1	3.3	Machine-readable metadata	43.7
2	6.1	Metadata catalogue	38.1
3	1.15	Data security and access restrictions for downloading	36.7
4	1.14	Data security and access restrictions for uploading	34.8
5	7.2	Data reuse – data provider	26.6
6	2.6	Contact means	25.4
7	5.1	Documentation & description of datasets	25.3
8	1.12	Procedure for publication of metadata or data on the NAP	24.8
9	7.3	Operational procedure information	23.9
10	1.16	Indication of data modification	B*
11	4.2	Content and metadata	B*
12	6.2	Harvesting Functionalities	B*
13	3.1	Search functionalities	C*
14	3.2	Search results	C*

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Proposed actions to close the identified gaps

- Actions were divided into:
  1. Organisational
  2. Technical
- And further classified as:
  1. European/National/NAPCORE level
  2. Short term/long term
  3. One time/recurring
- In total, 35 actions have been drafted

Search functionalities		KPI 3.1: Not featured by 4 of 22 NAPs

KPI definition: Search functionalities
Possible KPI values:
• **0**: Not available discovery services;
• **1**: Available discovery services not necessarily based on harmonized metadata;
• **Value+1** for each of the following options:
  ○ a. text search based on harmonized metadata (free text);
  ○ b. text search based on harmonized metadata (proposed keywords);
  ○ c. search options AND, OR, wild card (*), range (from... to...) available;
  ○ d. enumeration search based on harmonized metadata;
  ○ e. map-based search;
  ○ f. other location-based search (e.g., NUTS-Code);
  ○ g. option to save search pattern or settings
• **Acceptable minimum: 2**		

Organizational actions	• Propose keywords and harmonised naming conventions for the data sets	• NAPCORE level • Short term • One time
	• Propose a roadmap from the simple search functionality to minimum search functionality (the metadata guideline)	• European level • Short term • One time
Technical actions	• NAP operators to implement search functionalities with basic search options	• National level • Short term • One time

Recommendations for stepwise approach towards an interoperable NAP landscape in Europe

- Sequence of recommended actions - the identified actions with a clear assignment for NAPCORE are grouped into four higher goals:
    1. Improve metadata of data offers
    2. Improve contact details and terms and conditions of data offers
    3. Improve data quality of data offers
    4. Align user experience of data consumers
- The assigned actions (next slide) within the groups are ordered according to an estimation of how quickly they can be completed

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Grouped and ordered NAPCORE actions (1)

Higher goals	Actions		
	No.	Description	Related KPI
Improve metadata of data offers	1	NAPCORE to develop and publish (European) mobilityDCAT-AP (Ongoing work – sWG 4.4)	3.3
	2	NAPCORE provide guidelines / support to data providers about the adoption and use of standardized metadata	6.1
	3	NAPCORE to propose keywords and harmonised naming conventions for the data sets	3.1
	4	NAPCORE should agree on a common framework how to describe datasets and when possible or available provide templates or examples	5.1
	5	NAPCORE to develop of a metadata quality and completeness check framework to facilitate the decentralization of metadata creation and maintenance burden.	1.12
	6	NAPCORE to provide mobilityDCAT-AP validator / test centre	3.3
Improve contact details and terms and conditions of data offers	1	NAPCORE to make the provision of data providers and NAP operator (of a minimum) contact details mandatory in mobilityDCAT-AP	2.6
	2	Include contact of NAP operator and of the data providers as part of the NAPCORE NAP Reference Architecture	2.6
	3	NAPCORE should agree on a common framework how to describe terms and conditions and when possible or available provide templates or examples	7.2
Improve data quality of data offers	1	NAPCORE to provide a template for NAP Operators on governance aspects, requirements concerning processes and responsibilities for data quality assessment and maintenance should be harmonized among the NAP Operators	7.3
	2	NAPCORE should agree on a common procedure for how data can be supplied by data providers	1.12
	3	NAPCORE to further develop a common data quality framework for assessment (Quality Frameworks are being developed under WG3)	4.2
Align user experience of data consumers	1	NAPCORE should agree on a common procedure how data modifications are displayed in DCAT-AP and dealt with at server level.	1.16
	2	NAPCORE guideline on how to make search results available to users	3.2
	3	NAPCORE to create a guideline for harvesting metadata from and to the NAP	6.2

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Prioritizing actions in the perspective of the NAP operators

- Focusing on the NAP operators perspective, technical actions targeted at a national level were gathered:

Action	Estimated temporal segmentation	Recurrence
Implement sufficient security mechanisms able to authenticate the users. (KPI only applicable for exchange of content data, not for metadata.)	Short term	One time
Implement search functionalities with basic search options	Short term	One time
Implement search functionalities displaying search results in different ways	Short term	One time
Implement harvesting functionality (checks, crosschecks, updates, etc)	Short term	One time
Require data providers to provide documentation describing datasets according to provided framework or template.	Short term	Recurring
Provide guidelines / support to data providers about the adoption and use of standardized metadata	Short term	Recurring
Implement DCAT-AP in the NAP	Long term	One time
Provide guidelines on how to describe and document datasets published on NAPs	Long term	One time

- Summarized set of actions can be incorporated into the NB's plans for improving their NAPs
- Short/long-term division may help to draw a roadmap for such an upgrade

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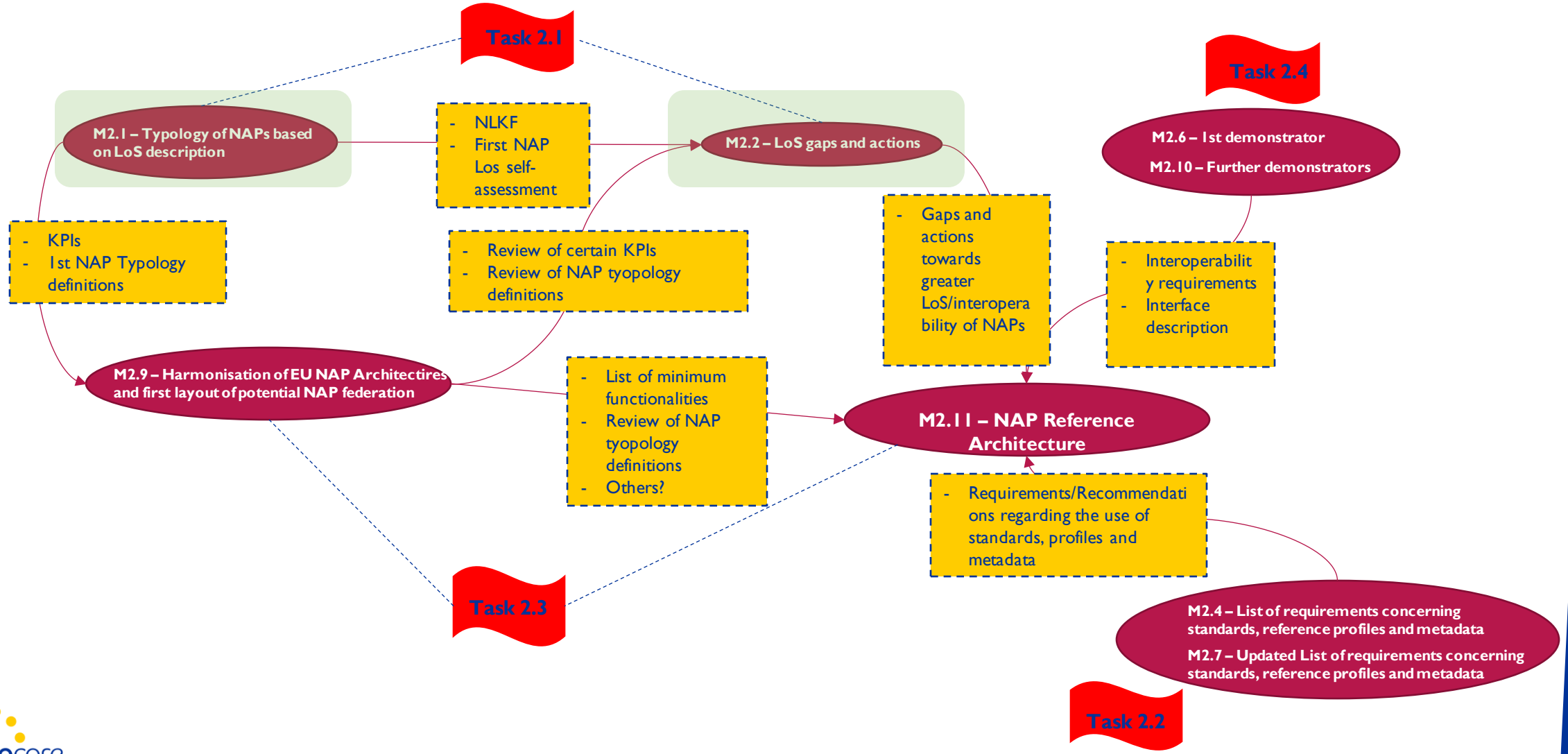
WG2 alignment - Interoperability



Conclusions and next steps

1. NAP LoS KPI Framework to be updated to a 2024 iteration
2. 2nd NAP LoS self assessment Workshop in Q1-2024
3. NAP European LoS Benchmark 2024

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Thank you

Do you have any questions?

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Improving National Access Point interoperability through harmonisation of their Level of Service

Mobility Data Days

Budapest, 8th November 2023

Ed Ooms - Dutch National Access Point for Mobility Data

Nationaal
Toegangspunt
Mobiliteitsdata

Public transport
Travelers
Parking
Vehicles
Signage
Logistic
Road traffic
Bike
Access zones
Traffic management
Road safety
Statistical
Network layer
Road features
Road signs
DOVA
RDW
ndw
NBd
portbase
NATIONAAL WEGENBESTAND

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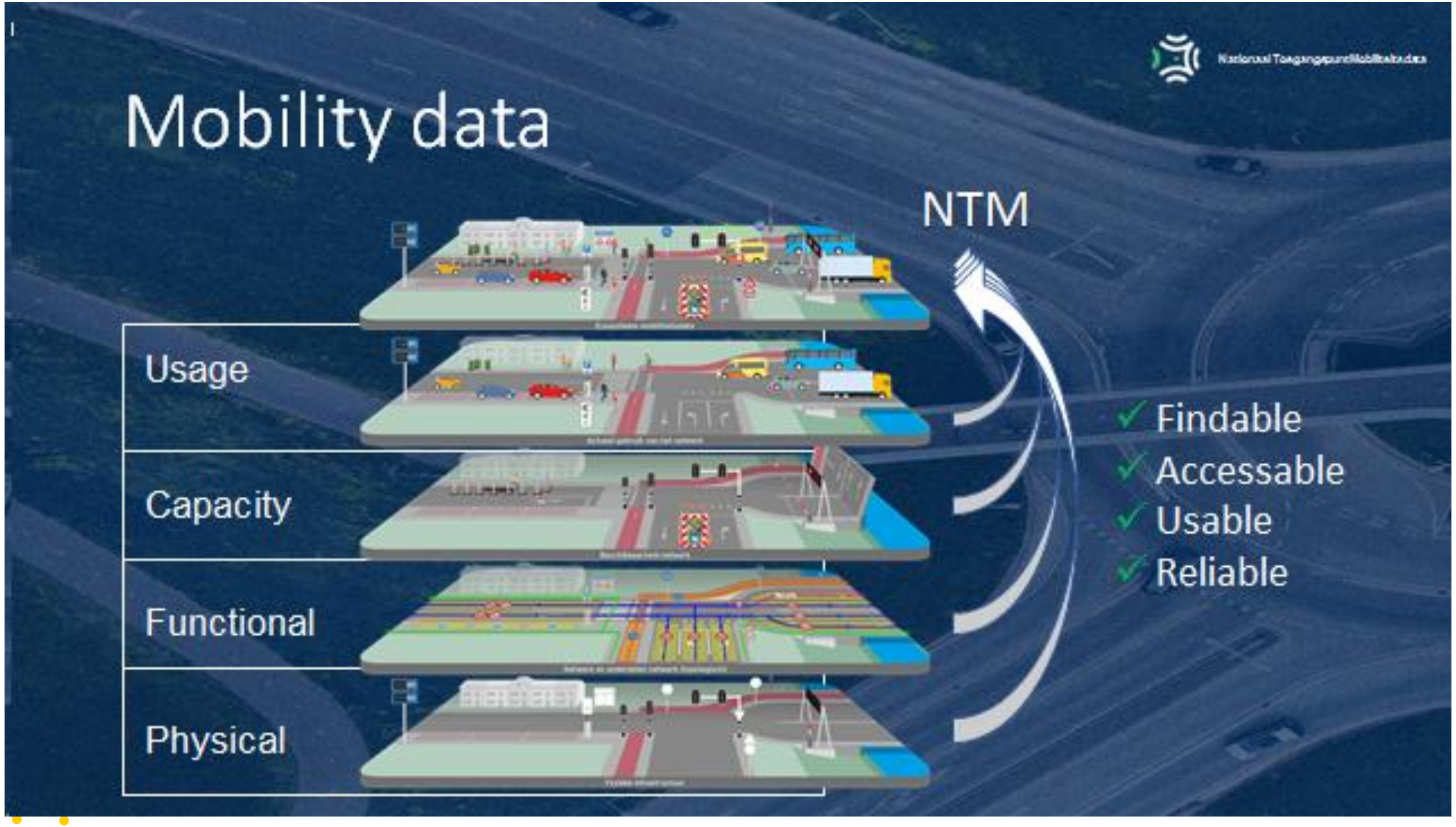

Mobility data
NTM
Usage
Capacity
Functional
Physical
Findable
Accessable
Usable
Reliable

Some figures

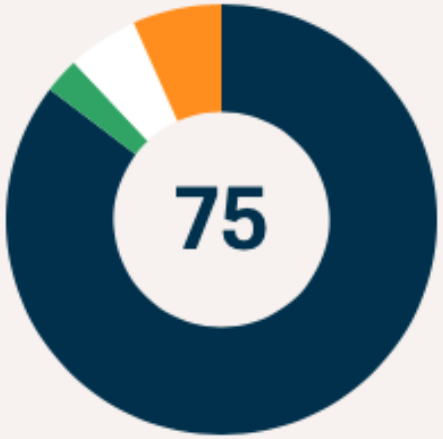
Rapportage

Organisaties

Actief	15
Aangevraagd	5

Rapportage

Gebruikers



Gebruikers	64
Publicisten	2
Hoofdpublicisten	4
Administrators	5

Rapportage

Datasets

SSTP	0
SRTI	3
RTTI	41
MMTIS	23

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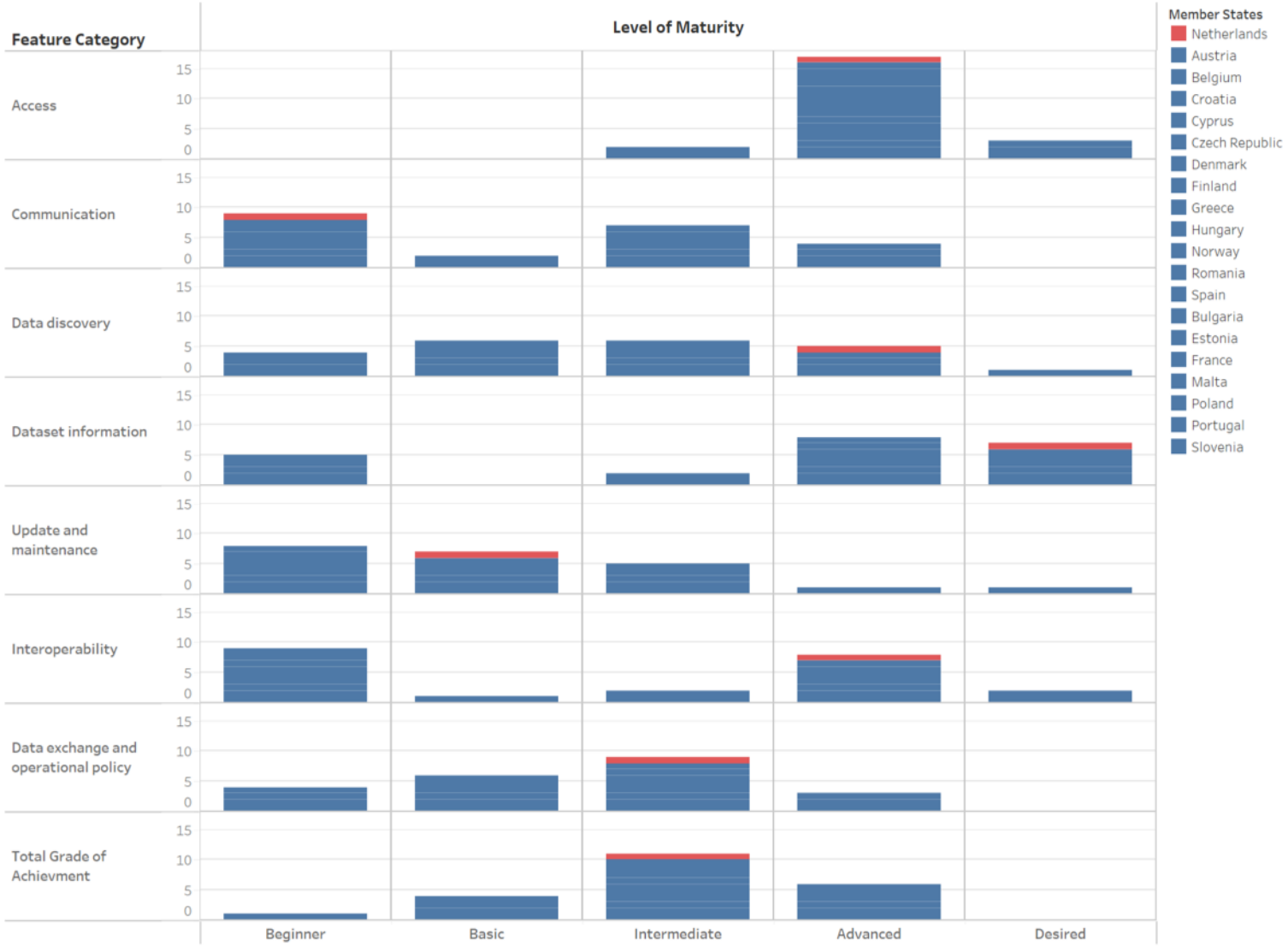
2- Individual results (NL)

b) Maturity level of the Dutch NAP's features in the EU landscape



Example I

Machine-readable metadata

a. Not available machine-readable metadata
b. Provision of machine-readable metadata in a self-describing format (JSON, XML, …)
c. Provision of machine-readable metadata as Linked Data (“RDF” that also can be expressed in JSON-LD, ...) in a self-describing format according to harmonized metadata application profile

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Example 2

Monitoring and evaluation

a. counting of the access to the NAP or subscribers
b. collecting statistics on the consumption of datasets (e.g., downloads, page views, re-use)
c. measuring performance of the system (e.g., downtime, consequences for other systems, etc.)
d. measuring usefulness of the NAP (e.g., qualitative feedback, re-use rating of quality, surveys, etc.)

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Thank you

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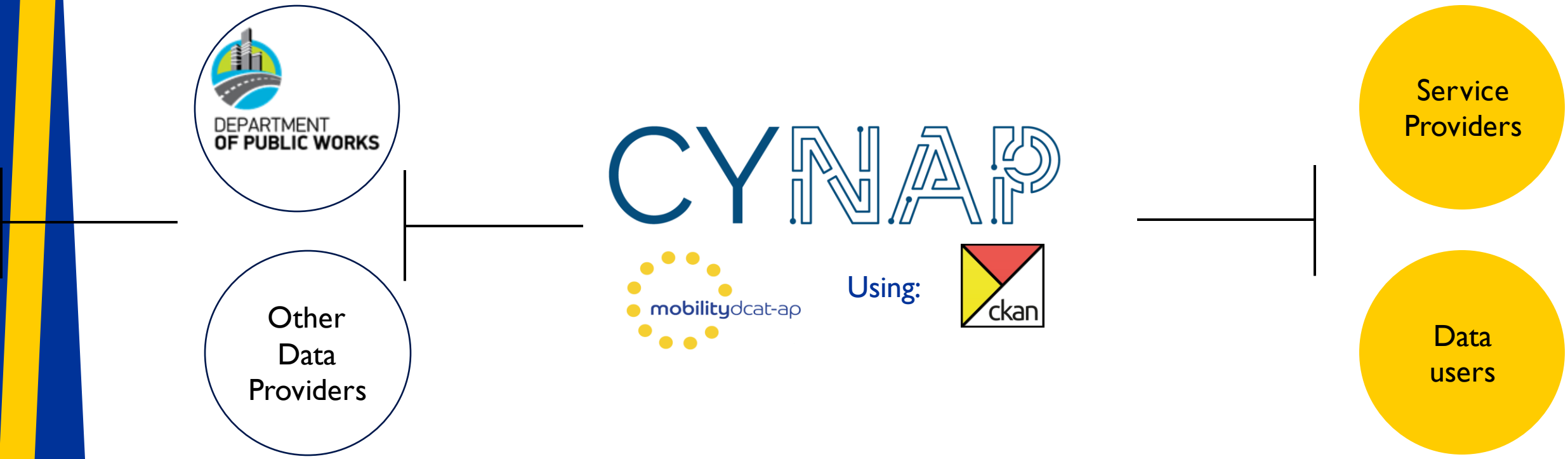
NAPCORE
Cyprus National Access Point - LoS

8th November 2023

The Cyprus National Access Point

Metadata repository | traffic4cyprus.org.cy



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CYNAP

Data (metadata) collection

Services for data discovery and download

Visualise data related to the traffic conditions

Current Access Status And Conditions
The CyNAP offers a variety of real time data such as traffic congestion levels, vehicle speeds, public transport live feed etc.

Regulations And Restrictions
The CyNAP accommodates data related to regulations and restrictions (e.g. weight / length / width / height / speed restrictions e.t.c)

Infrastructure
The CyNAP gives access to infrastructure data such as road network topology, recharging and refuelling points and stations.

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Data in the CYNAP

Satellite data (GNSS/GPS)

Floating Car Data (FCD) / Telematics

CCTV Data

CCTV for road monitoring

Environmental Data

Data related to weather conditions and air quality

Sensor data

Loop detectors and Bluetooth sensors

Surveys

Data from Sustainable Urban Mobility Plans

Third party data

Data from WAZE and other sources

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CYNAP

Data (metadata) collection

Services for data discovery and download

Visualise data related to the traffic conditions

The Cyprus National Access Point LoS

Next Steps: Improve LoS

Stage 1

Focuse on prioritizing feature categories with low score

Stage 2

Identifiy areas to improve LoS of feature categories

Stage 3

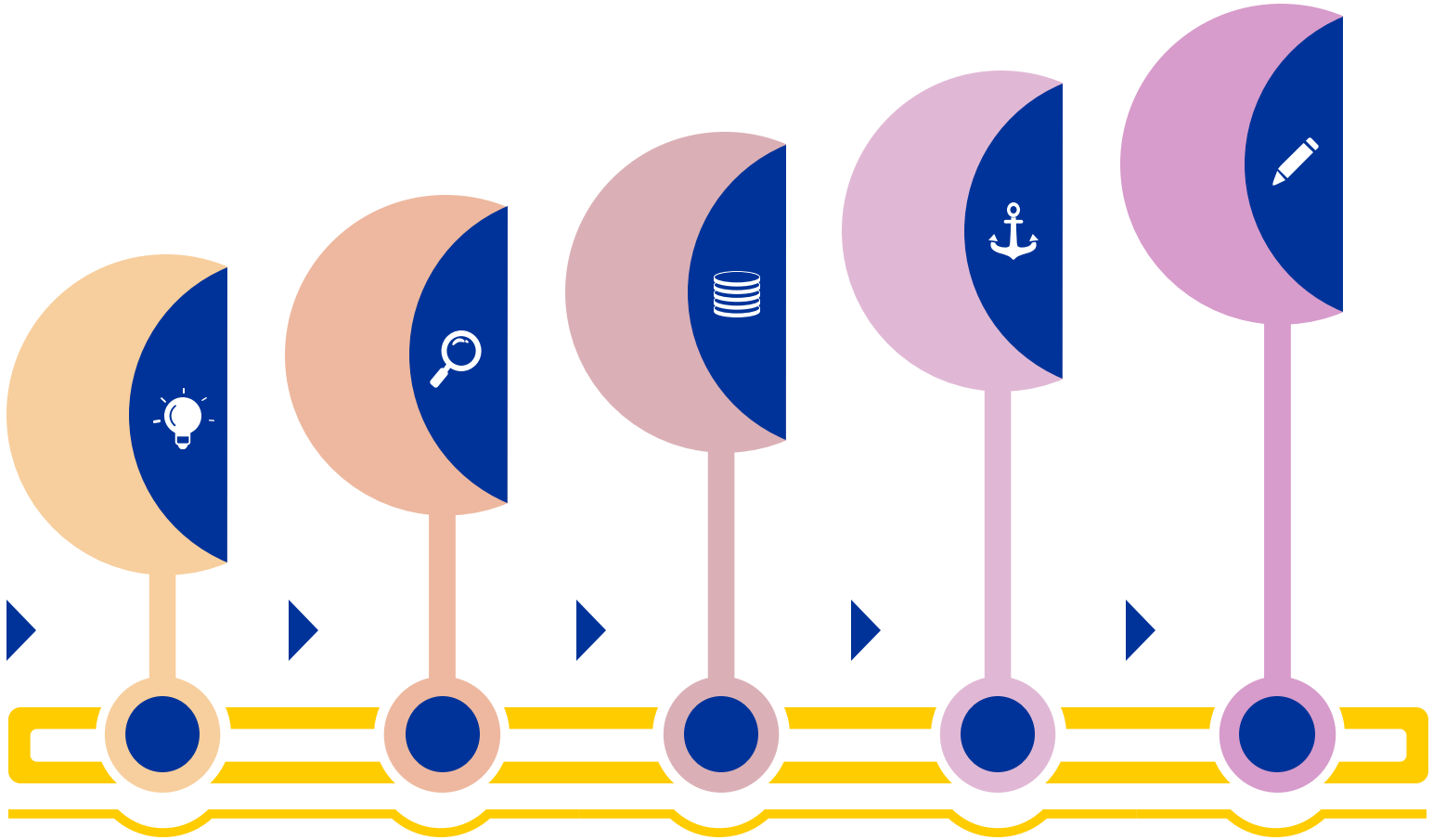
Create a plan to improve the LoS

Stage 4

Implement changes on CY NAP

Stage 5

Use the LoS tool to re-assess the CYNAP LoS



Thank you for your attention

George Christou

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