Minimal Interoperability Mechanisms (MIMs), MIM7 Geospatial, and INSPIRE

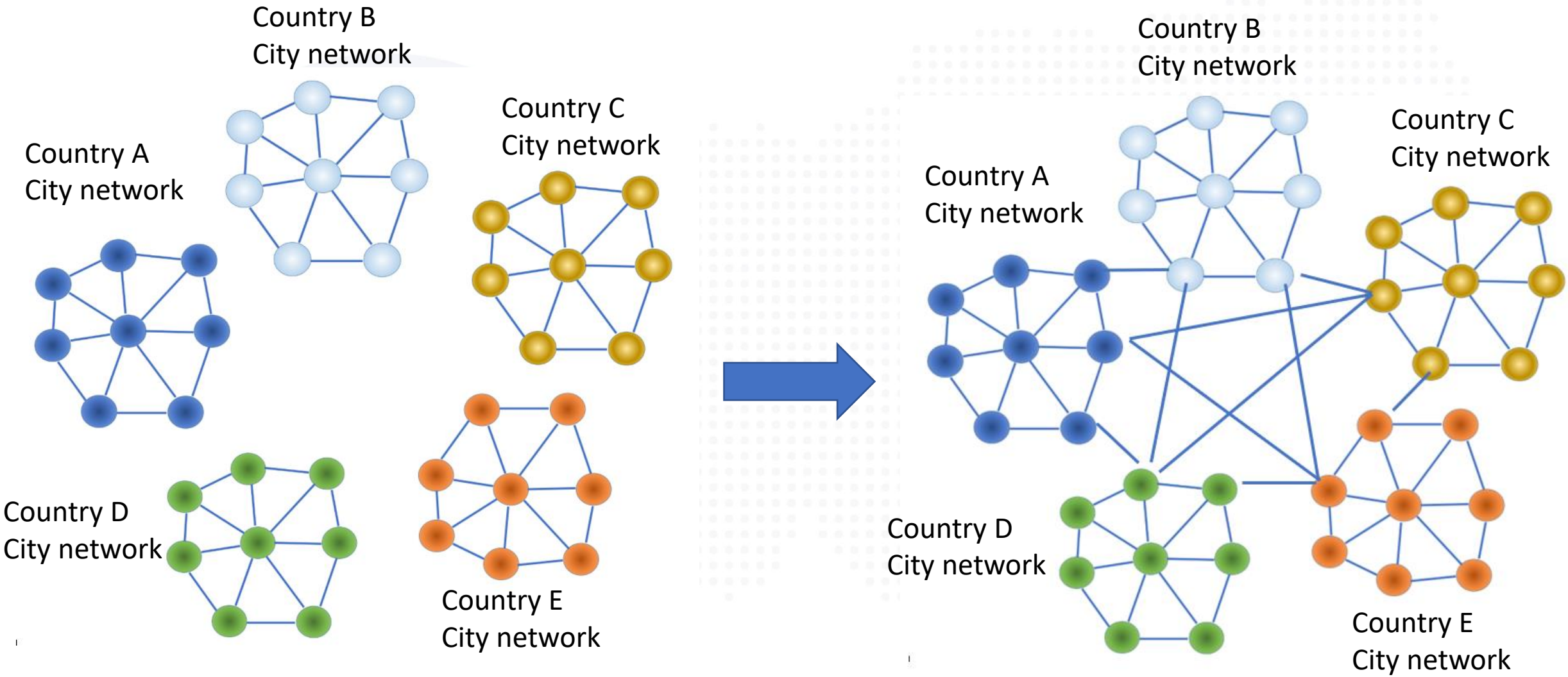
Michael Mulquin MIMs Ambassador

REPUBLIKA SLOVENIJA
MINISTRSTVO ZA OKOLJE IN PROSTOR
GEODETSKA UPRAVA REPUBLIKE SLOVENIJE

Open and Agile Smart Cities

168 cities in over 30 countries

We are a global network of national networks



OASC announced
January 2015
Brussels

Based on a set of basic interoperability tools to support data sharing

There is a lot happening in a city or local community

- **All these systems interact with each other**
- **All of them generate data**
- **All of them require good data to work well**

A local data sharing ecosystem is needed

.. where increasing amounts of useful data about a community are collected and used by the public administration, by business, and by the citizen to help the community work better

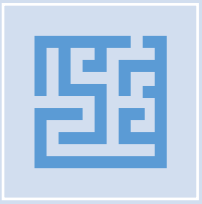
The many challenges of managing a local data sharing ecosystem

This is the role of the MIMs

We are working with our cities and communities to develop Minimal (but sufficient) Interoperability Mechanisms to enable ALL communities, whether large or small, to put in place effective local data sharing ecosystems

… and to enable solutions to be shared between cities and communities around the world

Minimal Interoperability Mechanisms – practical tools that can be used by communities of any size to tackle the challenges of a local data ecosystem



Minimal to ensure:

no unnecessary complexity or time-to-implement

Sufficient Interoperability to allow:

“Good enough” integration of systems

Clearly defined Mechanism so that:

It is easy to determine if a product or service is compliant

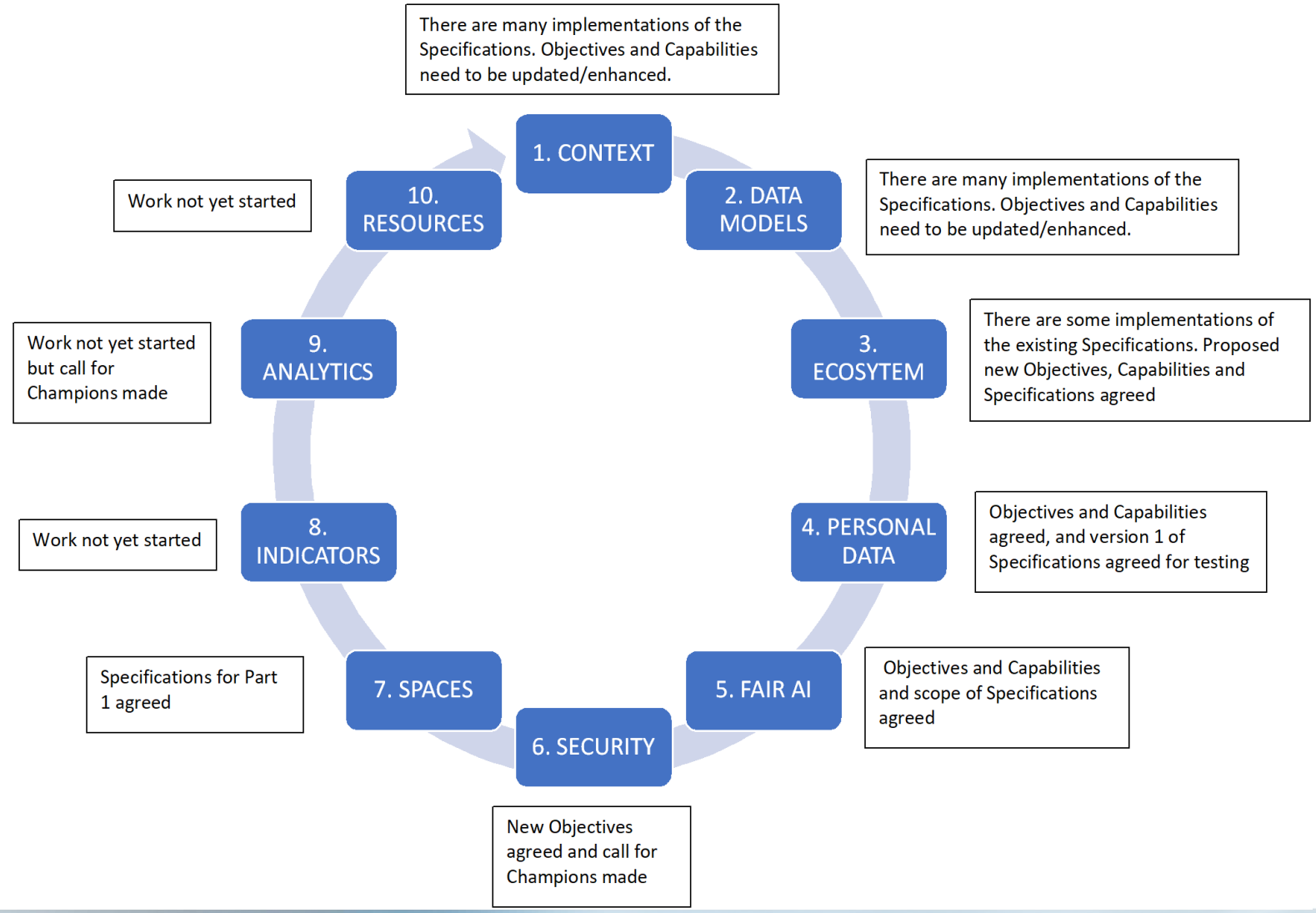
We are not re-inventing the wheel!

- Where there are existing authoritative standards, MIMs will point to their core requirements to enable communities to see immediate benefit in developing the local data ecosystem.
- Where there are several competing standards or approaches, MIMs identify Points of Interoperability that will make it easy to link products and services that comply with those different standards/approaches.
- Where there are no existing standards then MIMs can act as Minimum Viable (standards) Products

The MIMs so far – tackling the requirements of a local data ecosystem

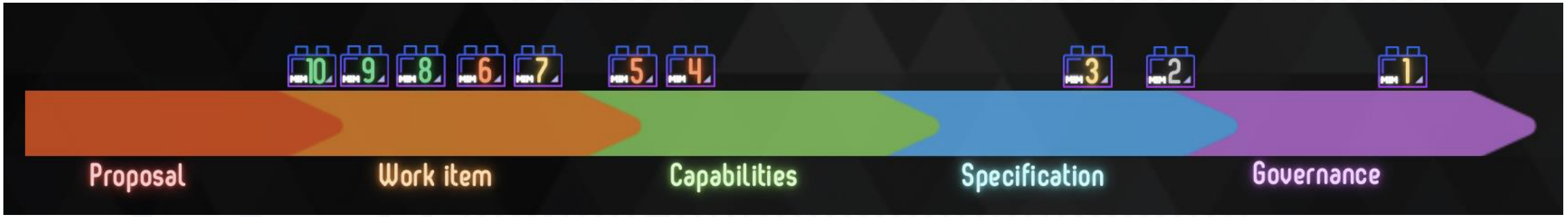
MIM	Subject	Name
MIM1	Context	Context Information Management
MIM2	Data Models	Shared Data Models
MIM3	Contracts	Ecosystem Transactions Management
MIM4	Trust	Personal Data Management
MIM5	Transparency	Fair Artificial Intelligence
MIM6	Security	Security management
MIM7	Places	Geospatial information management
MIM8	Indicators	Ecosystem indicator management
MIM9	Analytics	Data Analytics Management
MIM10	Resources	Resource Impact Assessment

State of play of the MIMs



The development of the MIMs

STAGES



Governance process

Members and partners → Working Groups → Technical Council

General Assembly ← Board of Directors ← Council of Cities

MIMs and MIMs Plus

MIMs are aimed at providing consistent global processes to enable a global market

MIMs Plus set these in the European Policy landscape and are managed through Living-in.EU

LIVING-IN.EU

The European way of digital transformation in cities and communities

JOIN,
BOOST,
SUSTAIN

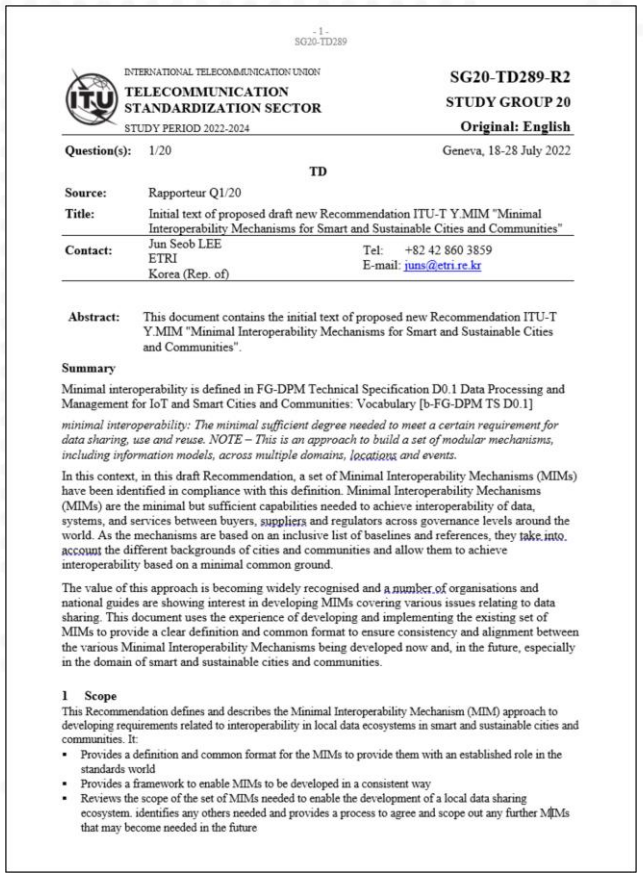
‹ Home ‹ Technical ‹ Commitments

MIMs Plus version 5 Final

Technical specifications for the MIMs Plus version 4 final

Taking the MIMs globally

https://www.itu.int/en/publications/Documents/tsb/2022-U4SSC-Redefining-smart-cityplatforms/index.html#p=1



SG20-TD289

INTERNATIONAL TELECOMMUNICATION UNION
TELECOMMUNICATION STANDARDIZATION SECTOR
STUDY PERIOD 2022-2024

SG20-TD289-R2
STUDY GROUP 20
Original: English

Question(s): 1/20 — Geneva, 18-28 July 2022

TD

Source: Rapporteur Q1/20

Title: Initial text of proposed draft new Recommendation ITU-T Y.MIM "Minimal Interoperability Mechanisms for Smart and Sustainable Cities and Communities"

Contact: Jun Seob LEE, ETRI, Korea (Rep. of) — Tel: +82 42 860 3859, E-mail: juns@etri.re.kr

Abstract: This document contains the initial text of proposed new Recommendation ITU-T Y.MIM "Minimal Interoperability Mechanisms for Smart and Sustainable Cities and Communities".

Summary

Minimal interoperability is defined in FG-DPM Technical Specification D0.1 Data Processing and Management for IoT and Smart Cities and Communities: Vocabulary [b-FG-DPM TS D0.1]

minimal interoperability: The minimal sufficient degree needed to meet a certain requirement for data sharing, use and reuse. NOTE – This is an approach to build a set of modular mechanisms, including information models, across multiple domains, locations and events.

In this context, in this draft Recommendation, a set of Minimal Interoperability Mechanisms (MIMs) have been identified in compliance with this definition. Minimal Interoperability Mechanisms (MIMs) are the minimal but sufficient capabilities needed to achieve interoperability of data, systems, and services between buyers, suppliers and regulators across governance levels around the world. As the mechanisms are based on an inclusive list of baselines and references, they take into account the different backgrounds of cities and communities and allow them to achieve interoperability based on a minimal common ground.

The value of this approach is becoming widely recognised and a number of organisations and national guides are showing interest in developing MIMs covering various issues relating to data sharing. This document uses the experience of developing and implementing the existing set of MIMs to provide a clear definition and common format to ensure consistency and alignment between the various Minimal Interoperability Mechanisms being developed now and, in the future, especially in the domain of smart and sustainable cities and communities.

1 Scope

This Recommendation defines and describes the Minimal Interoperability Mechanism (MIM) approach to developing requirements related to interoperability in local data ecosystems in smart and sustainable cities and communities. It:

- Provides a definition and common format for the MIMs to provide them with an established role in the standards world
- Provides a framework to enable MIMs to be developed in a consistent way
- Reviews the scope of the set of MIMs needed to enable the development of a local data sharing ecosystem. identifies any others needed and provides a process to agree and scope out any further MIMs that may become needed in the future

MIM7 Spaces

It has become clear that there are considerable inconsistencies between two different ecosystems of standards that do not seem to align at the moment.

The geospatial world is strongly based on the OGC ecosystem of standards, whereas MIM1 & MIM2 are based on the ETSI ecosystem of standards.

The aim of MIM7 is to help align these two ecosystems.

Key points

- The Feature and Thing in OGC (entity in NGSI-LD) is the essential item for integrating between the two ecosystems of standards.
- Context will be created from data from various sources, for example geodata and building information models.
- A main challenge for municipalities will be to both establish and maintain the number of connections between NGSI-LD entities and their representations in the SDI (identifiers, existence, location) over time and that this process will need to be automated, most probably based on geospatial techniques like geodata or in the more complex case a digital twin.

MIM7 part 1

MIM7 Part 1 comprises two minimal requirements and two recommendations.

Requirements.

1. Expose data through a service interface either through OGC wfs or OGC API features
2. Ensure that all published features have unique identifiers that follow either the requirements of the Inspire directive data specifications, chapter 14 Identifier management: https://inspire.ec.europa.eu/documents/Data_Specifications/D2.5_v3.4rc3.pdf , or the work of W3C in the data on the web best practice: https://www.w3.org/TR/dwbp/#DataIdentifiers

Recommendations

1. If data is shared through wfs, a proxy OGC API could be considered on top of that
2. The use of standard-based encoding such as GeoJSON, GML, GeoPackage and CityGML

Rationale

- MIMs are Minimal Interoperability Mechanism that should be relatively easy for cities and communities to achieve.
- The Inspire Directive, leveraging data sharing, description principles and standards like WMS and WFS, has transformed the European geospatial landscape in the last decade, and is making geodata interoperable throughout Europe.
- A main recognised challenge for European municipalities is to integrate and transfer data between internal and external IT systems.
- Most municipalities with minimal effort can establish OGC services like WFS, WMS and OGC APIs with minor investments.
- Geodata-based features need to be accessed as linked data by many IT- and IoT-systems, and over a long period of time, thus persistent identifiers are vital for the integrity of IT- and IoT-systems over time.
- For municipalities with more technical and financial strength the OGC ecosystem of standards for both geodata and sensor data are a good basis for more complex services.

Where we are now in general

- OASC has new projects and new staff
  - Go-lieu, DS4SSCC, CommuniCity
  - More resources – but a need to coordinate and align work
- Need to take account of data spaces and federation
- The opportunity of the ITU work to review and revise

We are planning a new start to the work from January.

Plans for MIM7

- The text for MIM7 needs to be reviewed by cities, modified if necessary and then properly tested.
- A process needs to be identified to validate compliance with MIM7 and with the MIMs in general.
- JRC have funding until the end of 2024 to further develop and use the ETF, an open-source validation framework which is also reused for the INSPIRE Reference Validator. Two (non-exclusive) options are possible: deployment of a custom instance of the ETF (e.g. hosted by OASC) and development of new customised tests for the ETF, e.g. to test specific requirements of the MIMs.

Key actions

1. Hold meeting to review MIM7 December/ early January, see if it needs to be tightened up and whether any other documentation is needed, and plan how best to get initial feedback from cities as to its value and relevance.
2. Get feedback from cities and modify if necessary.
3. Use the ETF software to put in place a process to validate the implementations in cities and see how it works.
4. Plan a next step for MIM7/use of the validation tool - to test a non-INSPIRE geospatial standard – e.g., city GML or cityJSON
5. Test and validate the relevant standard

Please get in touch to find out more

michael@oascities.org