EasyWay

DATEX II User Forum
20/21 March 2012 - Stockholm

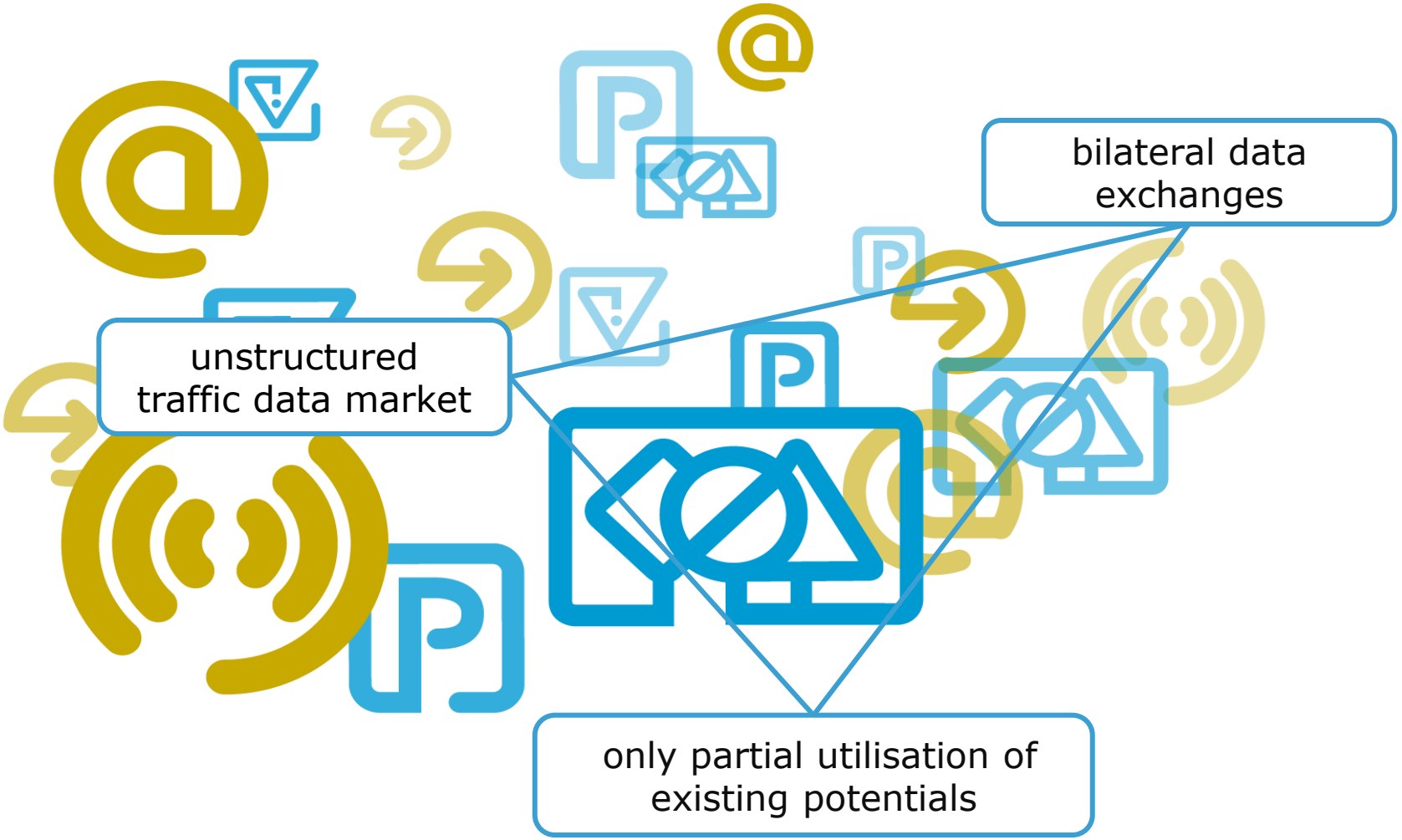
Jörg Freudenstein

Use of DATEX II in the German Mobility Data Marketplace by local road authorities

Framework conditions in Germany

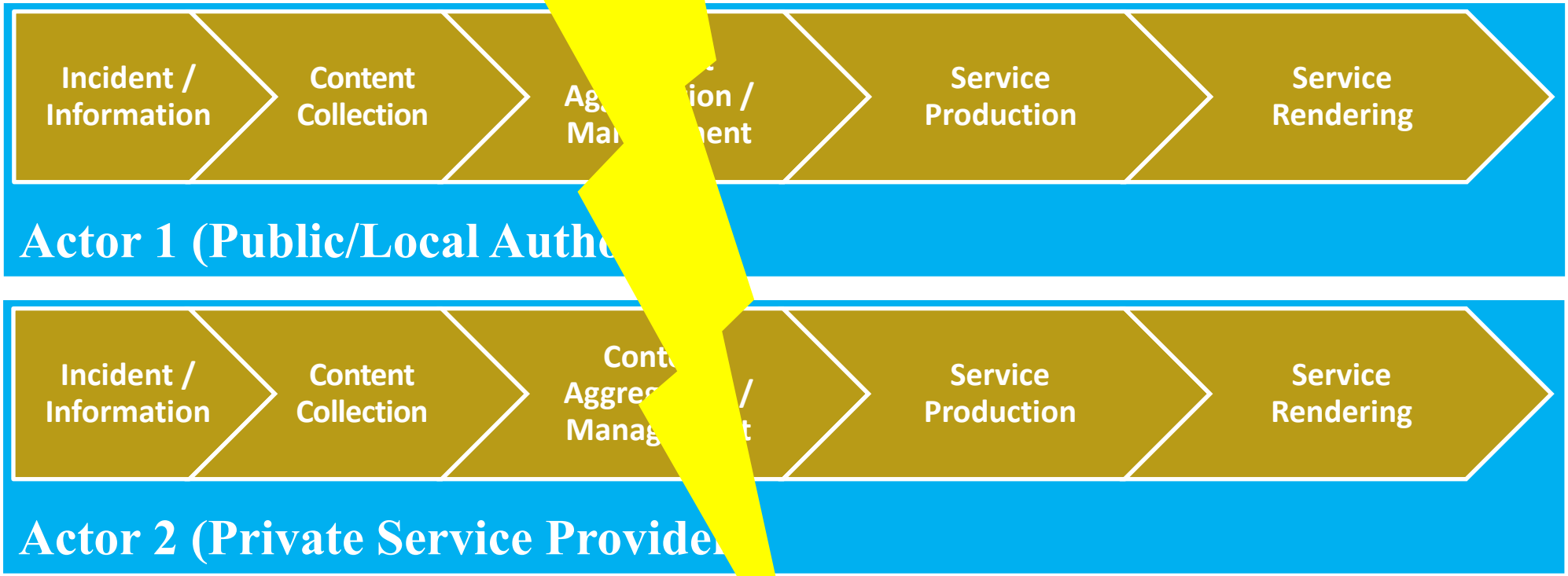
- Germany is a Federal State – stakeholder roles & responsibilities in the public sector are governed by constitutional constrains, i.e. no central road operator
- We have Federal Roads (motorways and trunk roads) but operation (in the broadest sense) is delegated to the Länder
- The subsidiarity principle holds of course for municipalities (as everywhere in Europe)
- Germany is large
  ⇒ many stakeholders need to be involved
- Consequence: taking data exchange and interoperability forward is unlikely to be achieved “per order de Mufti”
  ⇒ need to convince stakeholders of benefit of suggested actions

Initial Situation in Germany



Current situation

- **Contradicting/missing services due to broken chains**

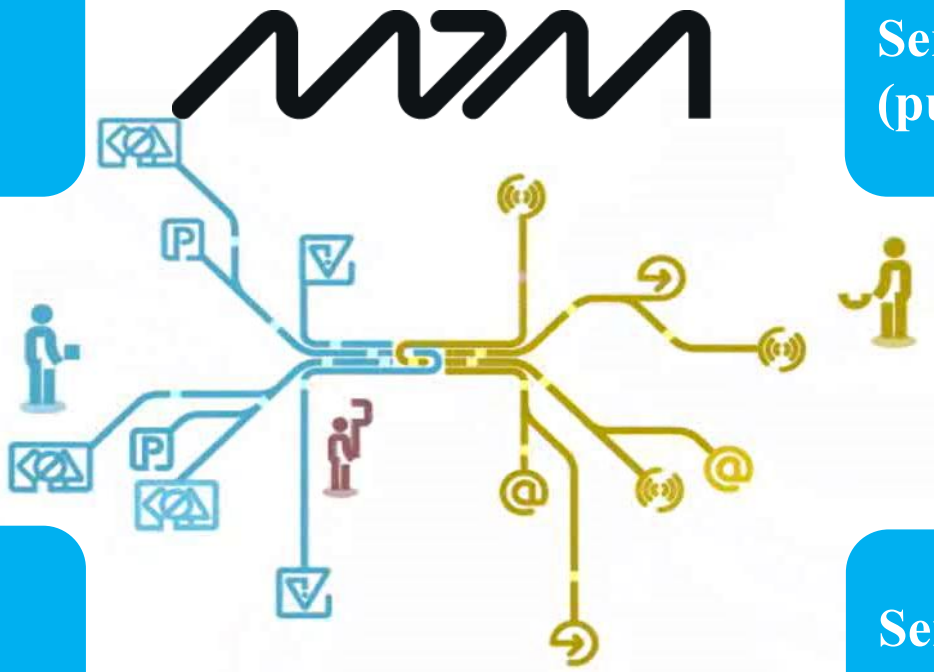


What needs to be done?

Incident / Information → Content Collection → Content Aggregation / Management → Service Production → Service Rendering

Content Collection (public)

Service Provider (public)



Content Collection (private)

Service Provider (private)

Mobility Data Market Place (MDM)

Innovation program of the German Federal Government

Metadata Platform Traffic Information

Metadata Platform Public Traffic

Metadata Platform Individual Traffic

System

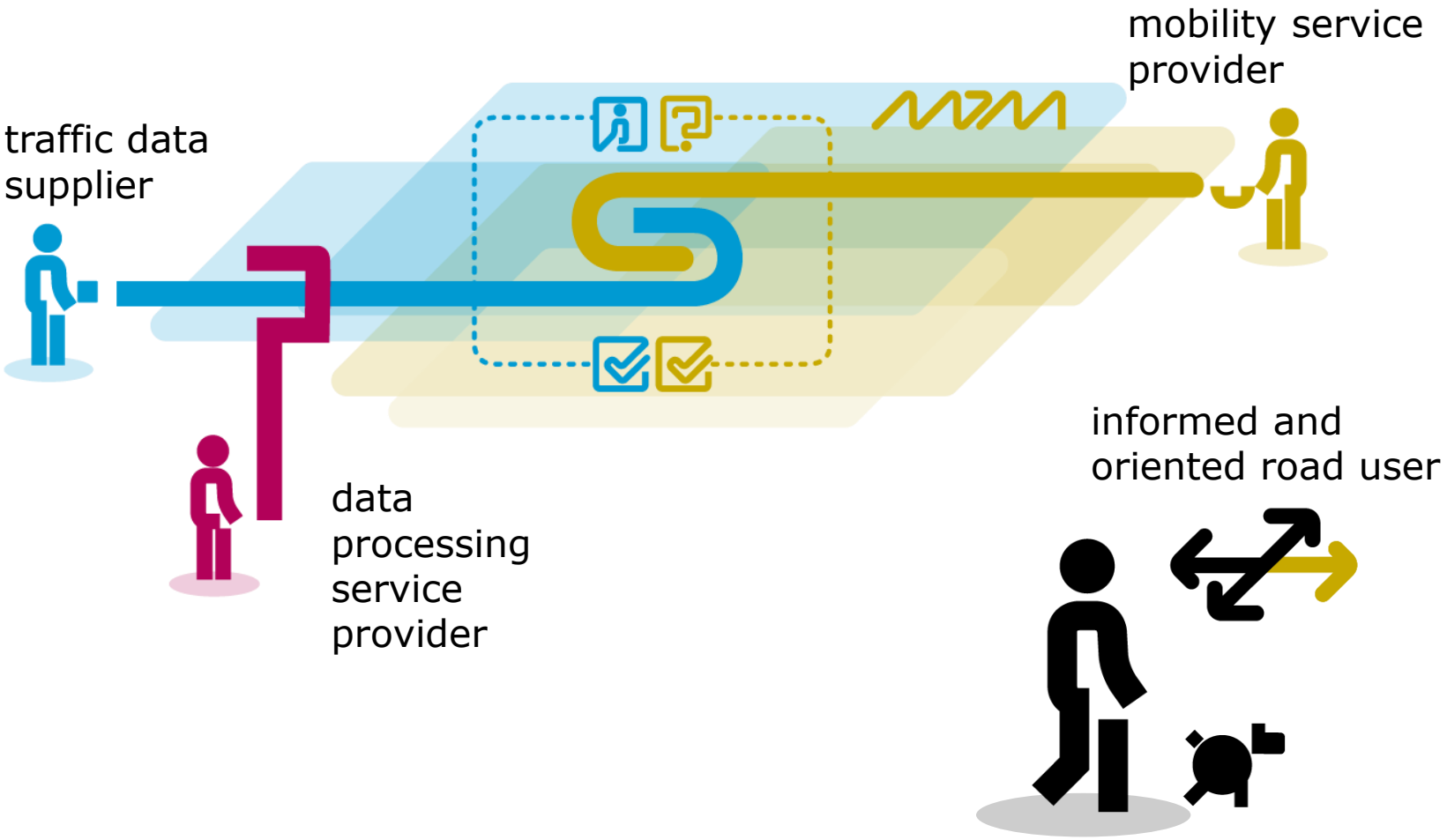
funded by

Federal Ministry of Transport, Building and Urban Development

project management

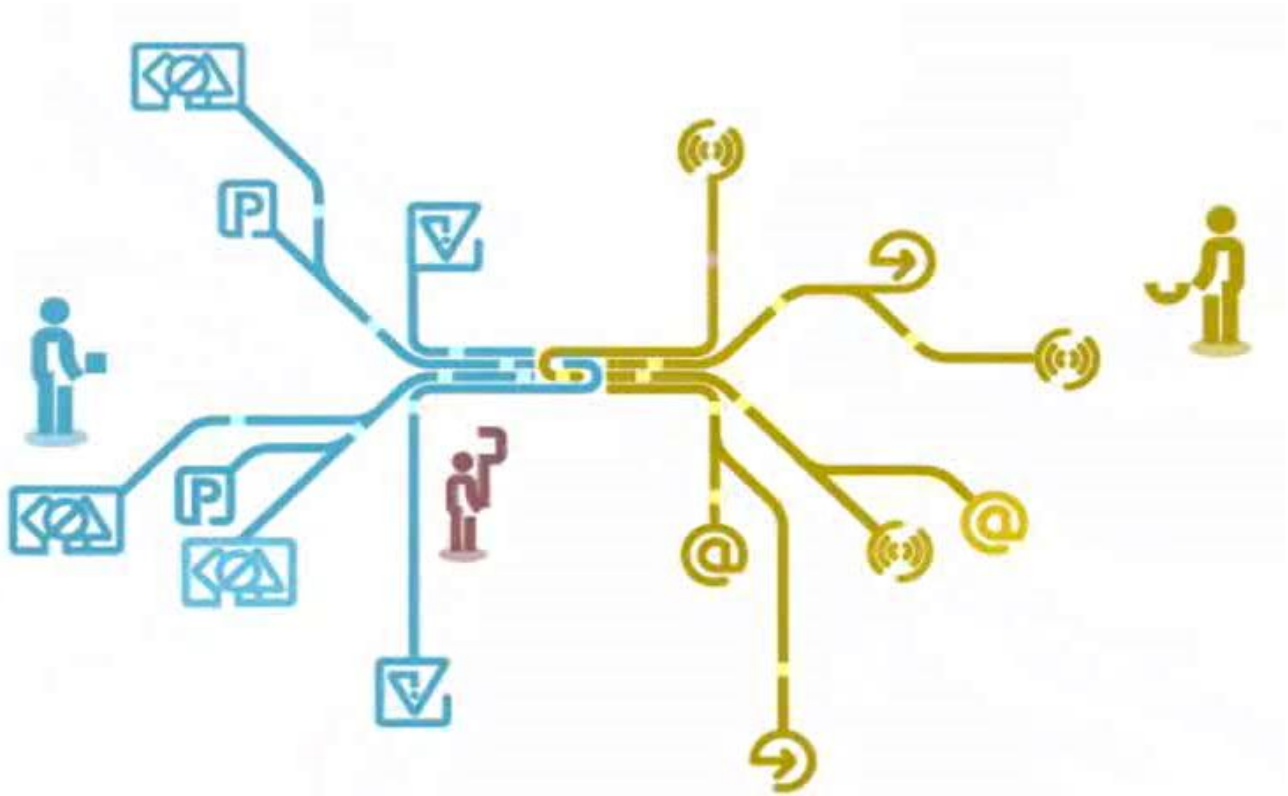
bast

The Mobility Data Marketplace



Focus on Local Road Authorities

Content Collection
Local Road Authorities



Content form Local Road Authorities for MDM

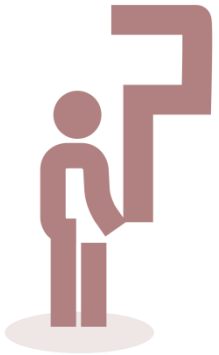
- **Need of publication from public traffic data to external services**
  - urban- / interurban traffic management data
  - strategic routing information for private services / navigation
  - ……
- **MDM provides platform**
  - Description of available data
  - Two hop data delivery (broker architecture)
- **Standards for data coding**
  - DATEX II (recommended)
  - XML generic
- **MDM working group of Local Road Authorities defines harmonized data profiles for different services**

MDM working group for traffic data from Local Road Authorities

- **Cities**
  - Bremen
  - Cologne
  - Düsseldorf
  - Frankfurt
  - Munich
  - Stuttgart
  - Ruhrpilot (conurbation area)

- **Industry / Service provider**
  - BMW
  - MILE
  - TomTom
  - ADAC
  - Siemens
  - GEVAS software

- **Letter of interest**
  - Berlin
  - Leipzig



Process of harmonizing data profiles

- **Collection of information about available data and data formats**
  - not very harmonized: Free text messages, different georeferencing methods, bespoke data models and formats …..
- **Harmonised (!) decision about data to be delivered**
  - main types/categories of data
  - data model details (attributes, relationships…)
- **First drafts of data profiles (with/without extensions)**
- **Several Iterations amongst different kinds of stakeholders**
  - Local Road Authorities
  - Software companies (for implementation)
  - Service providers
- **Implementation phase**
- **Pilot phase**

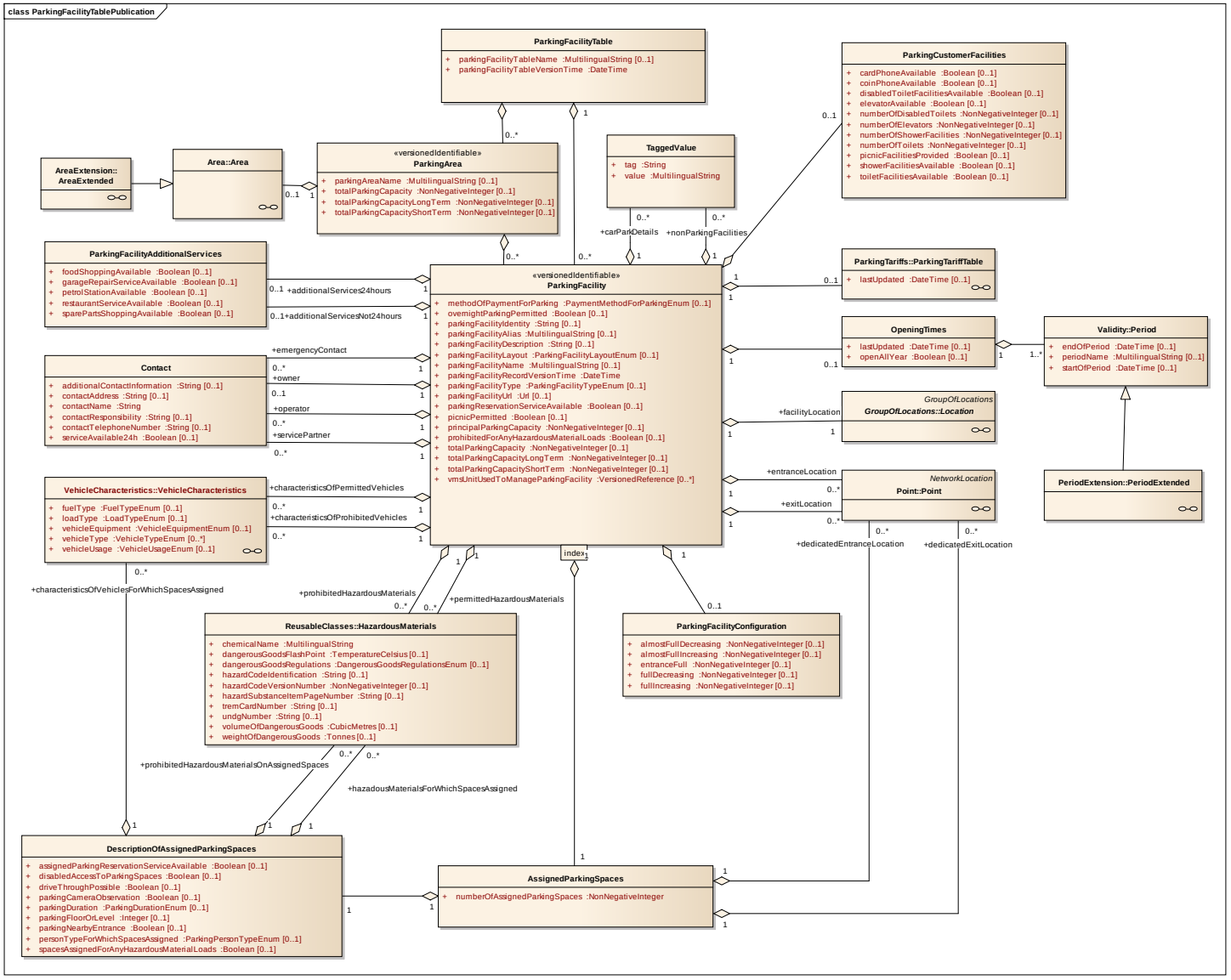
Data available from local road authorities

- **Parking**
- **TMP Based Routes for Navigation**
- **Traffic Messages**
- **Traffic Measurements**
- **Level Of Service / Travel Times**

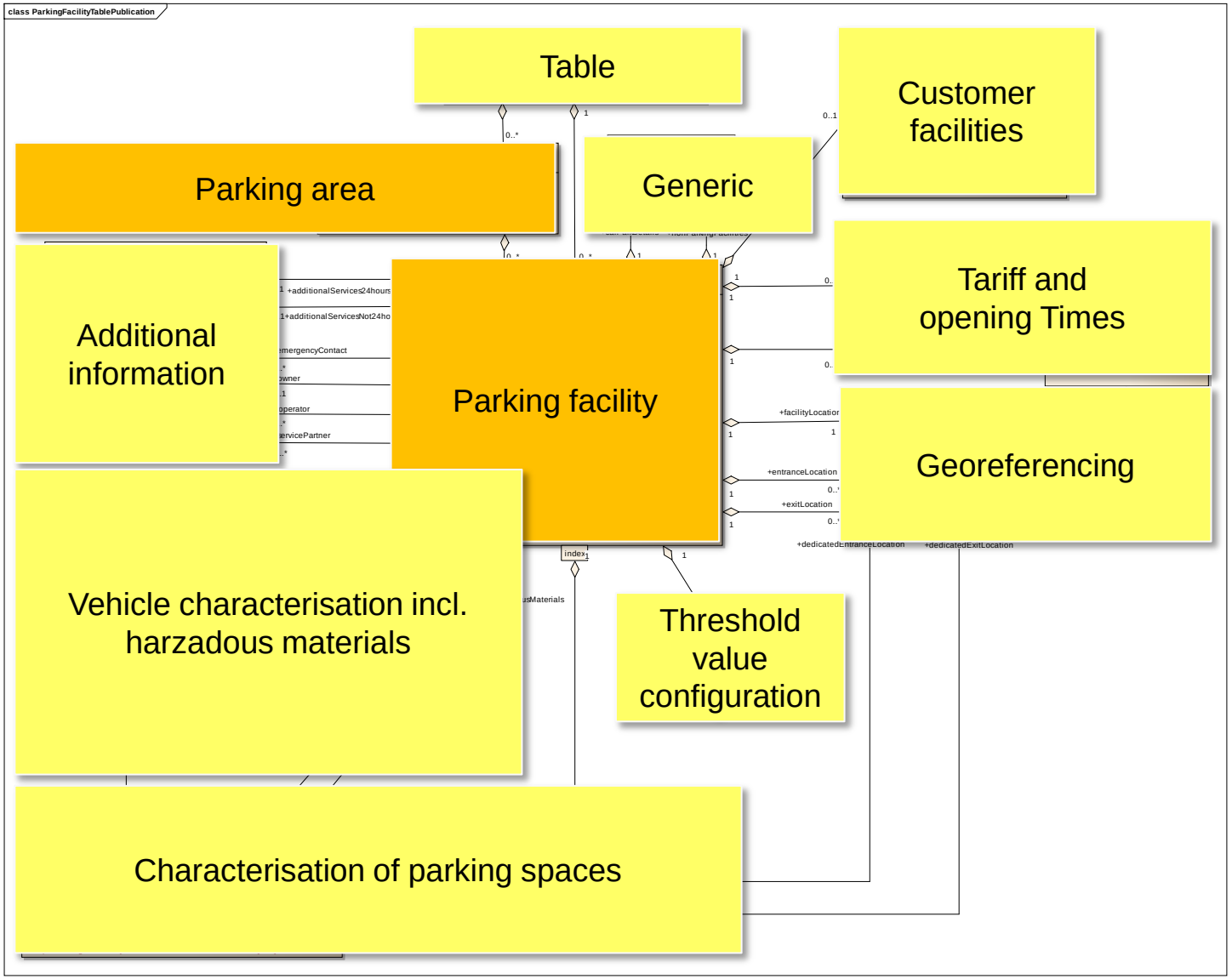
Parking

- **Complete new DATEX extension *(initially created by UK)***
  - substitution of existing class “CarParks”
  - static and dynamic part
  - Available in version 0.3 on DATEX website
  - Covers wide range of topics
    - parking areas (e.g. part of the town)
    - rest areas (e.g. for truck parking on motorways)
    - parking facilities (e.g. multi storey car park)
    - …. plus a lot of restrictions, supplementary and additional description
- **MDM community uses a subset**
  - only urban topics
    - e.g. no rest areas
  - several simplifications
    - e.g. simplified model for opening times
- **Current activities**
  - review of version 0.3 by DATEX community
  - addition of Intelligent truck parking requirements (ITP)
  - official integration of parking extension into DATEX version 2.1 (to be released soon)

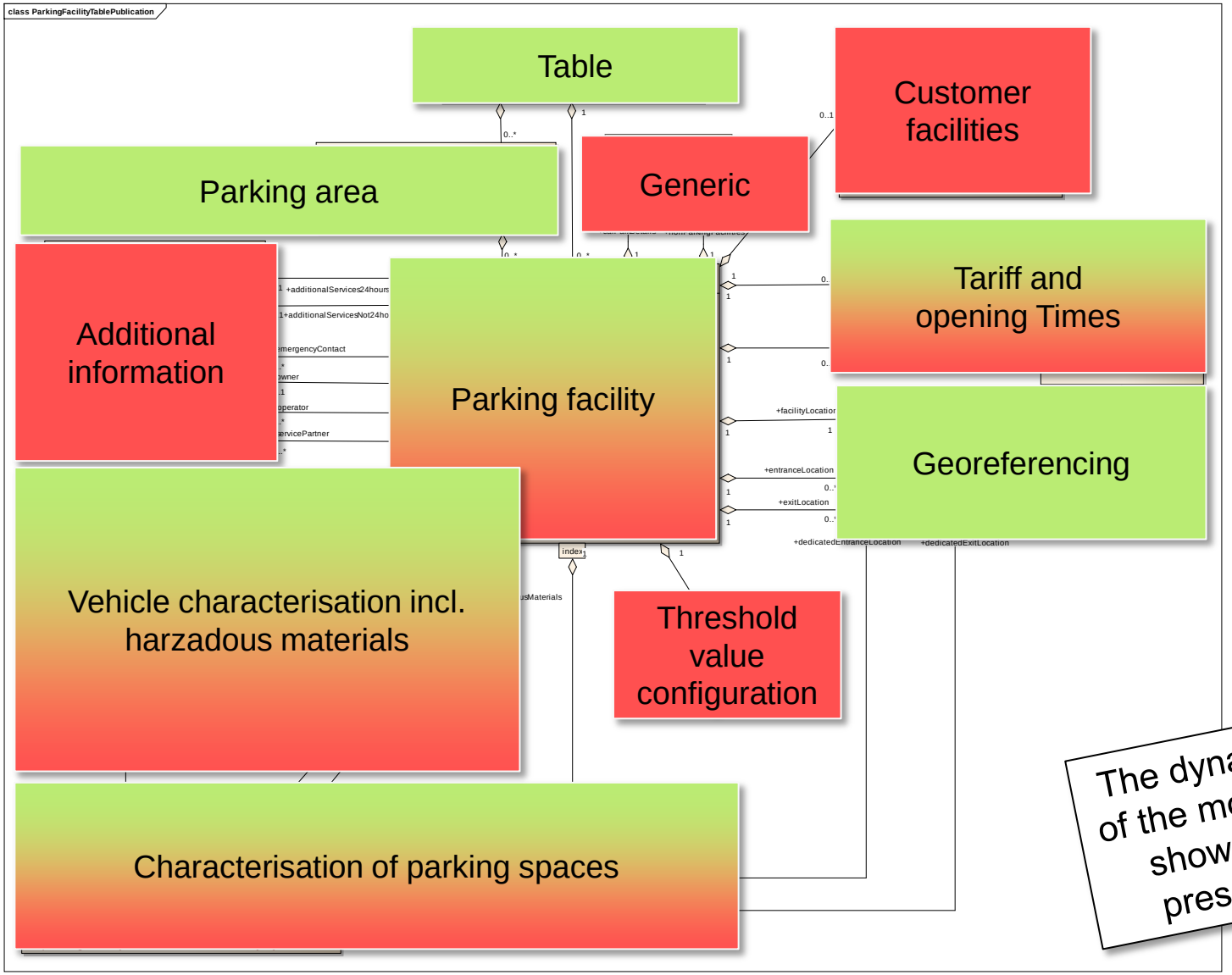
Parking v0.3 – static information



Parking v0.3 – static information



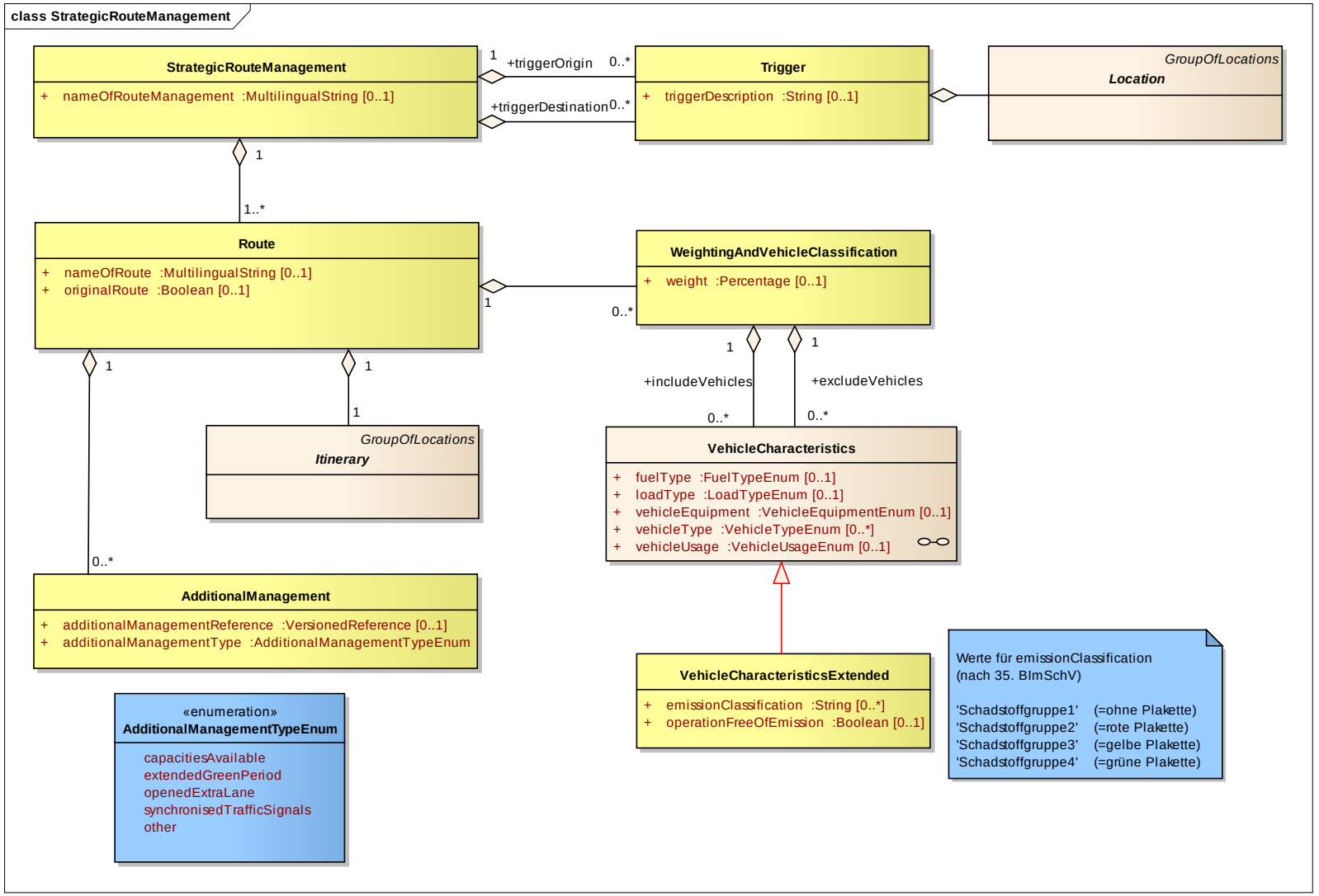
Parking v0.3 – MDM subset (green)



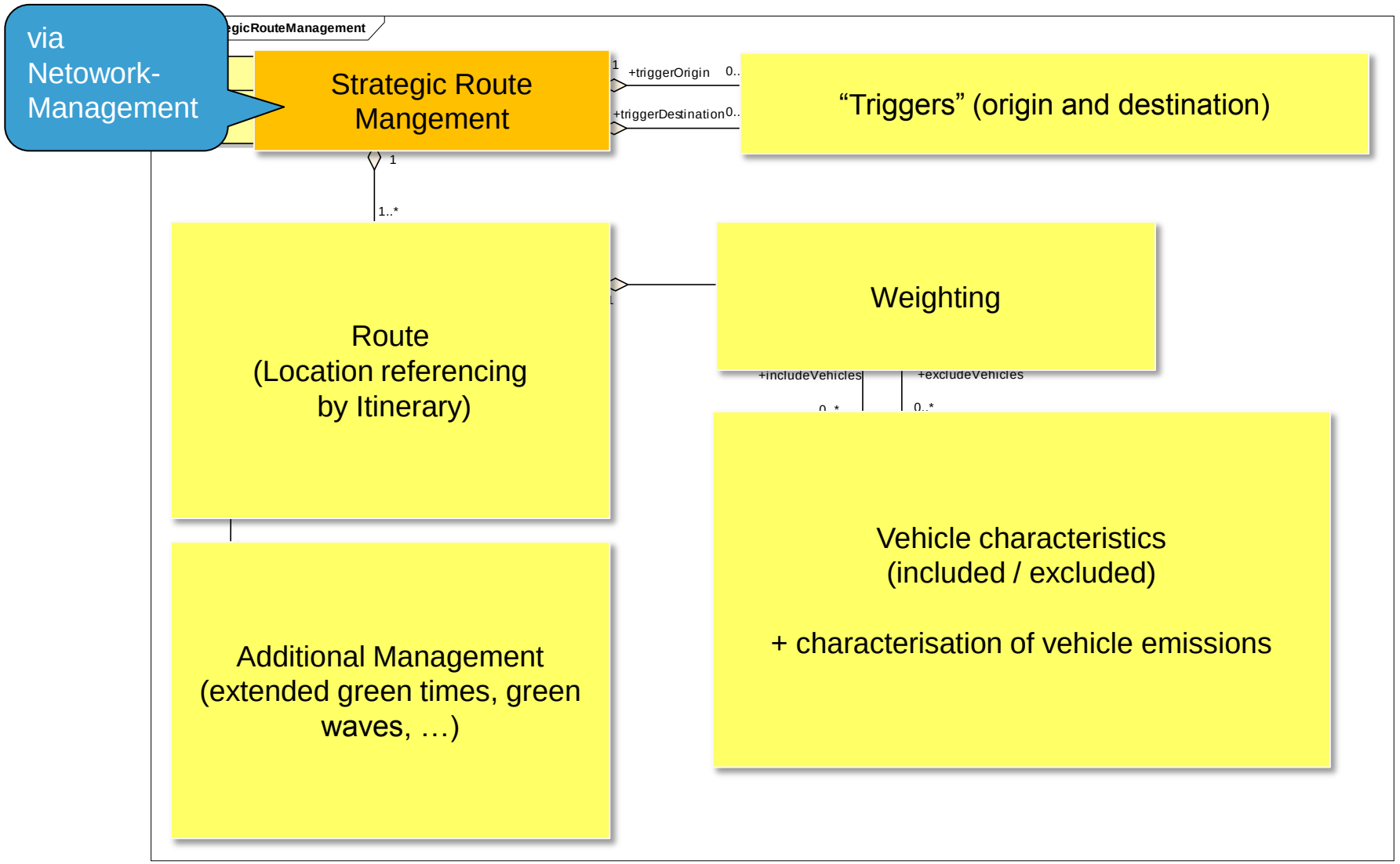
TMP based routes for navigation

- **New object “Strategic Route Management” (existing “Rerouting Management” did not fit the needs)**
  - **Origin- and destination “Trigger”**
    - Linear / Area / Point
    - select affected traffic flow (which crosses both triggers)
    - several route alternatives may be provided
    - use of “weights”
    - distinguish by vehicle characteristics
    - extension for vehicle characterisation by emission had to added
- **Links to additional management**
  - **extended green period**
  - **opened extra lanes**
  - **synchronized traffic signals**
  - **additional capacities available**

TMP based routes for navigation



TMP based routes for navigation



- **Using Situation Publication**
  - Georeferencing
  - Validity
  - Impact
  - Comments
  - URL
- **Special requirements**
  - ALERT C event code tunnel
    - in addition to DATEX description
    - Level B extension following CEN/TC 278 WG8 recommendation
  - Only five types of SituationRecords selected for profile (see next slides)

Traffic Messages

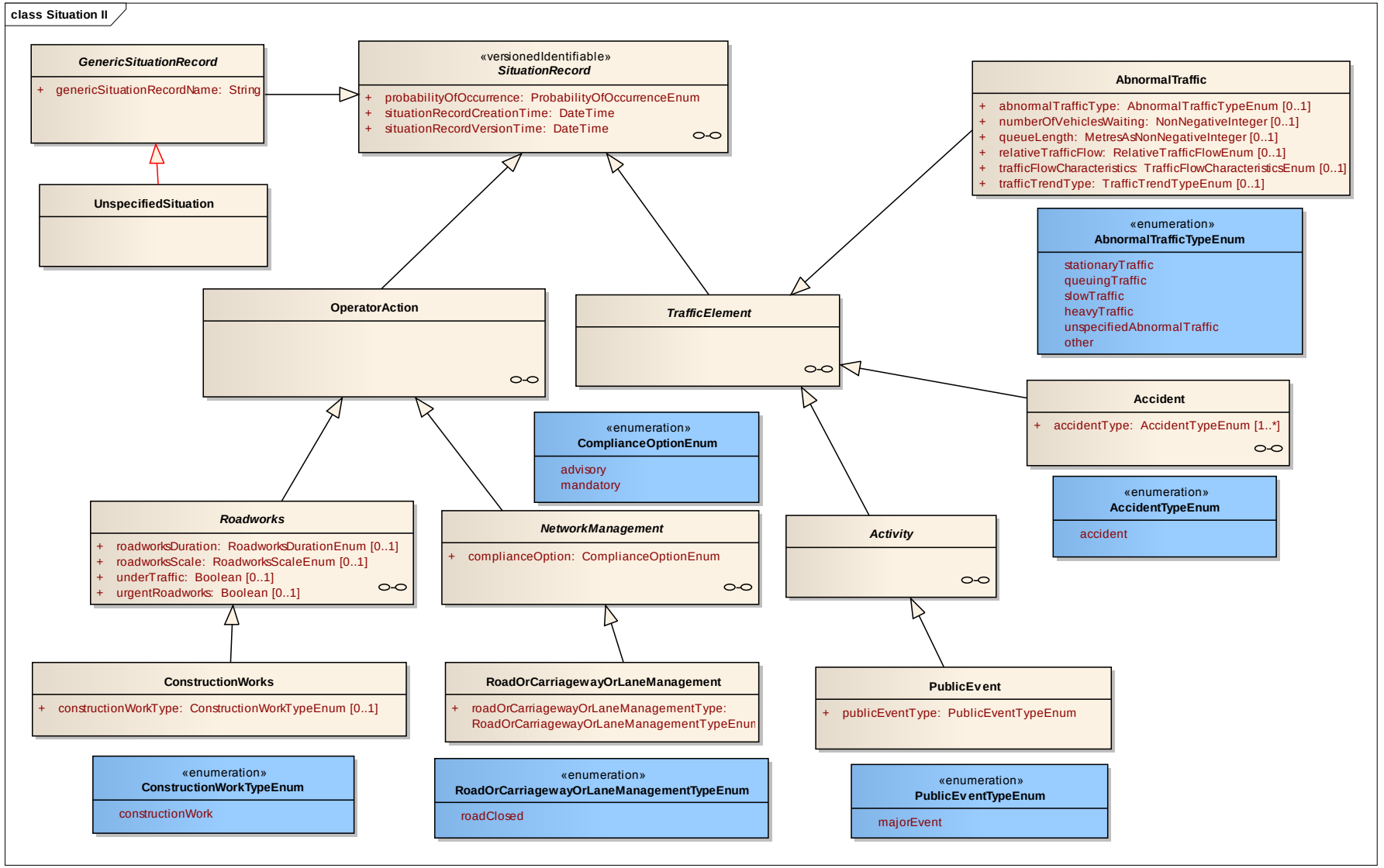
Situation model of DATEX is quite large → need of reduction for MDM traffic messages

NonRoadEvent-Information	Carparks		
	RoadSideServiceDisruption		
	RoadOperatorServiceDisruption		
	TransitInformation		
TrafficElement	Conditions	RoadConditions	WeatherRelatedRoadConditions (1+)
			NonWeatherRelatedRoadConditions
		PoorEnvironmentConditions (6+)	
	AbnormalTraffic		
	EquipementOrSystemFault		
	Accident (3+)		
	Obstruction (1)	AnimalPresenceObstruction	
		EnvironmentalObstruction	
		InfrastructureDamageObstruction	
		GeneralObstruction (1)	
		VehicleObstruction (1)	
	Activity (1)	AuthorityOperation	
		PublicEvent	
		DisturbanceActivity	
OperatorAction	Roadworks (3)	ConstructionWorks	
		MaintenanceWorks	
	SignSetting (1)		
	NetworkManagement (1+)	ReroutingManagement (1+)	
		SpeedManagement	
		RoadOrCarriageWayOrLaneManagement	
		WinterDrivingManagement	
		GeneralInstructionOrMessageToRoadUsers	
		GeneralNetworkManagement	

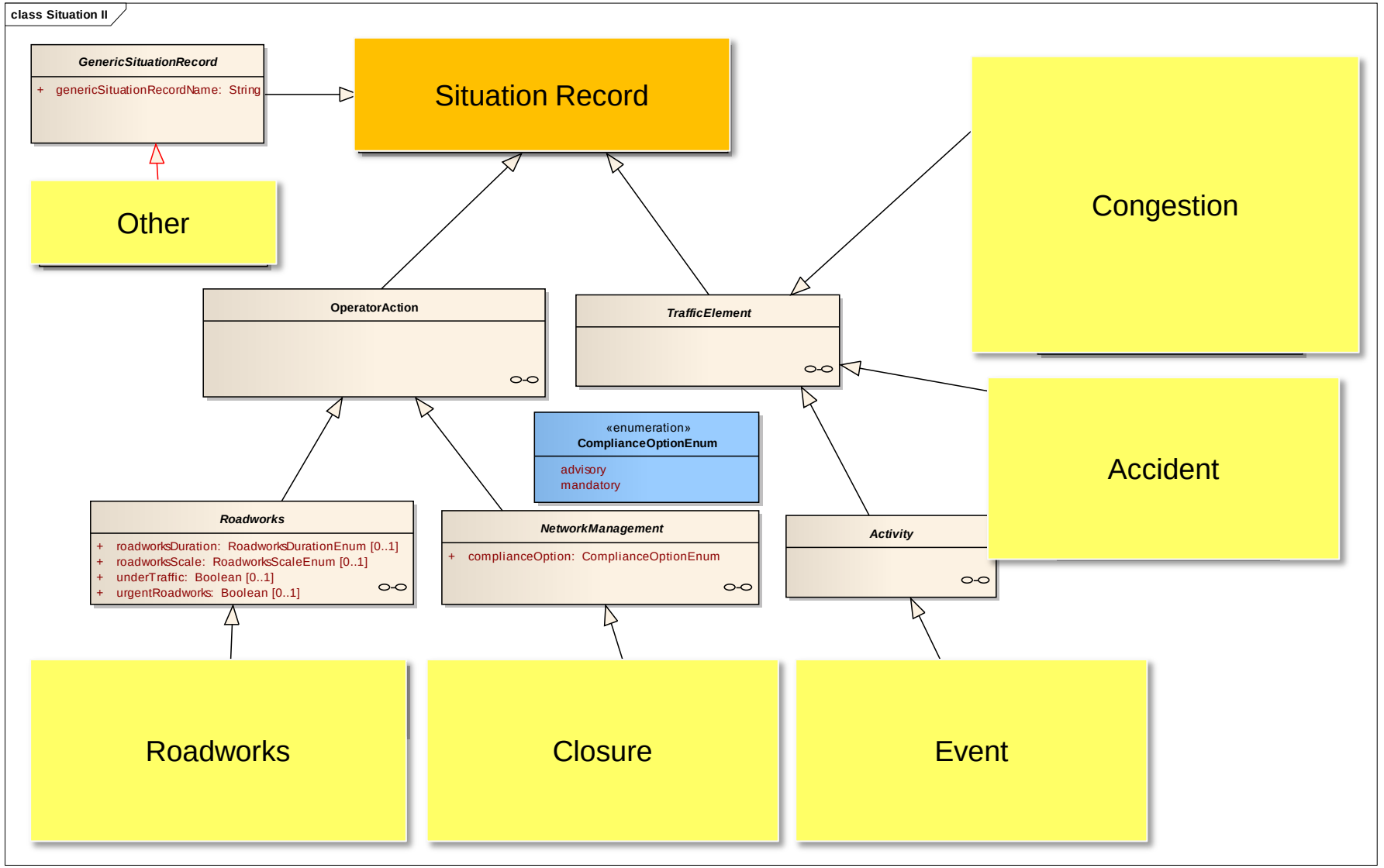
Reading from left to right

Parenthesis mean additional model elements not shown here

Traffic Messages



Traffic Messages

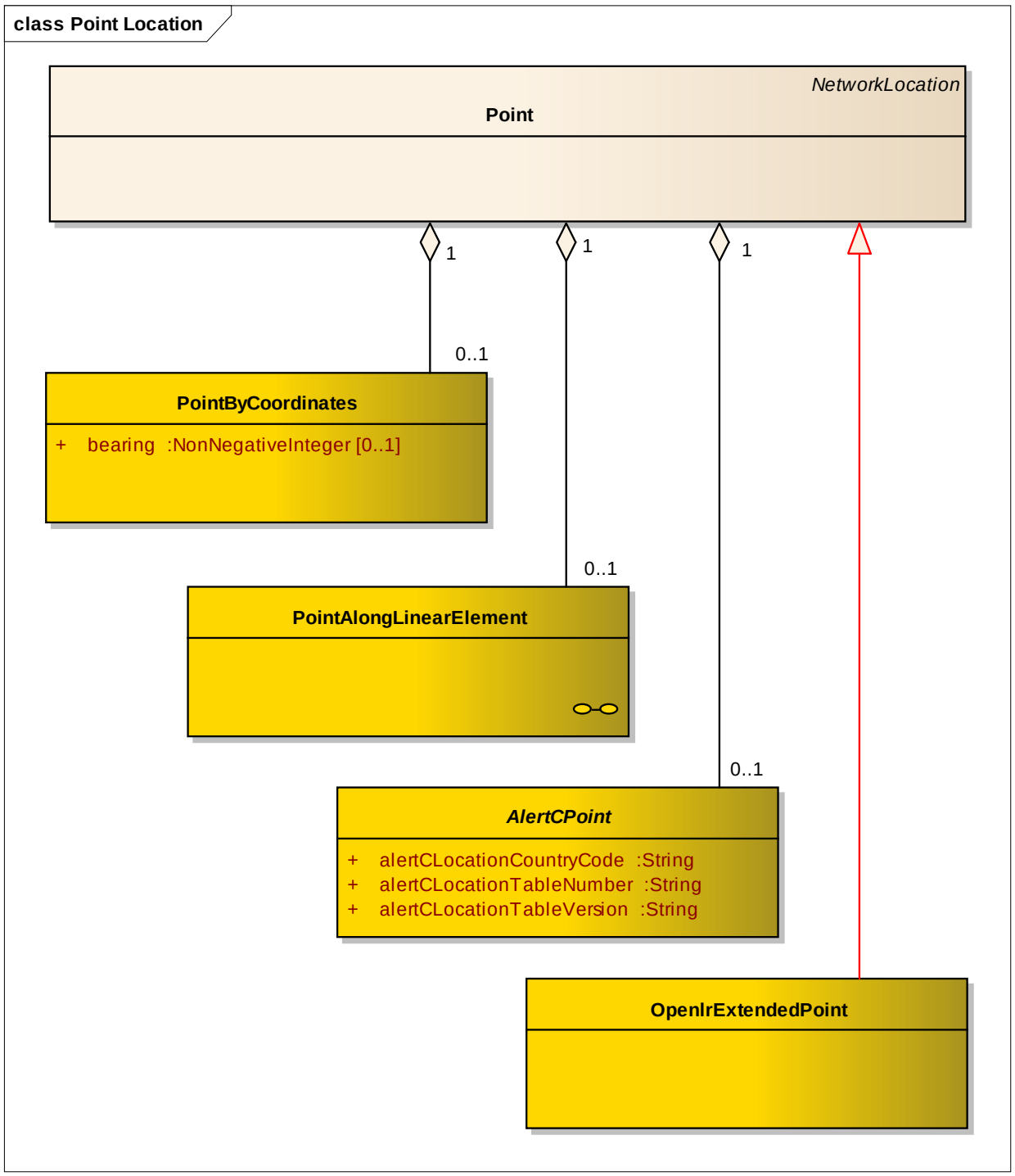


Traffic Measurements

- **Data of induction loops or other sensors**
- **Use of Measured Data Publication**
  - static and dynamic part
  - dynamic data every 60 seconds
- **Extension to provide more than just one measured value per message**
  - Reason: Some sites provide a lot of values at once within large intervals (e.g. when wireless connected).
    These values (except for the last one) would be lost otherwise.
- **Extension to provide min- and max speed**
  - *You saw this example on the hands-on workshop Tuesday morning*

Measurement Sites

- **Four methods for referencing points (≈ placement of induction loops):**
  - by coordinates
  - along a linear
  - ALERT C
  - OpenLR (Extension)



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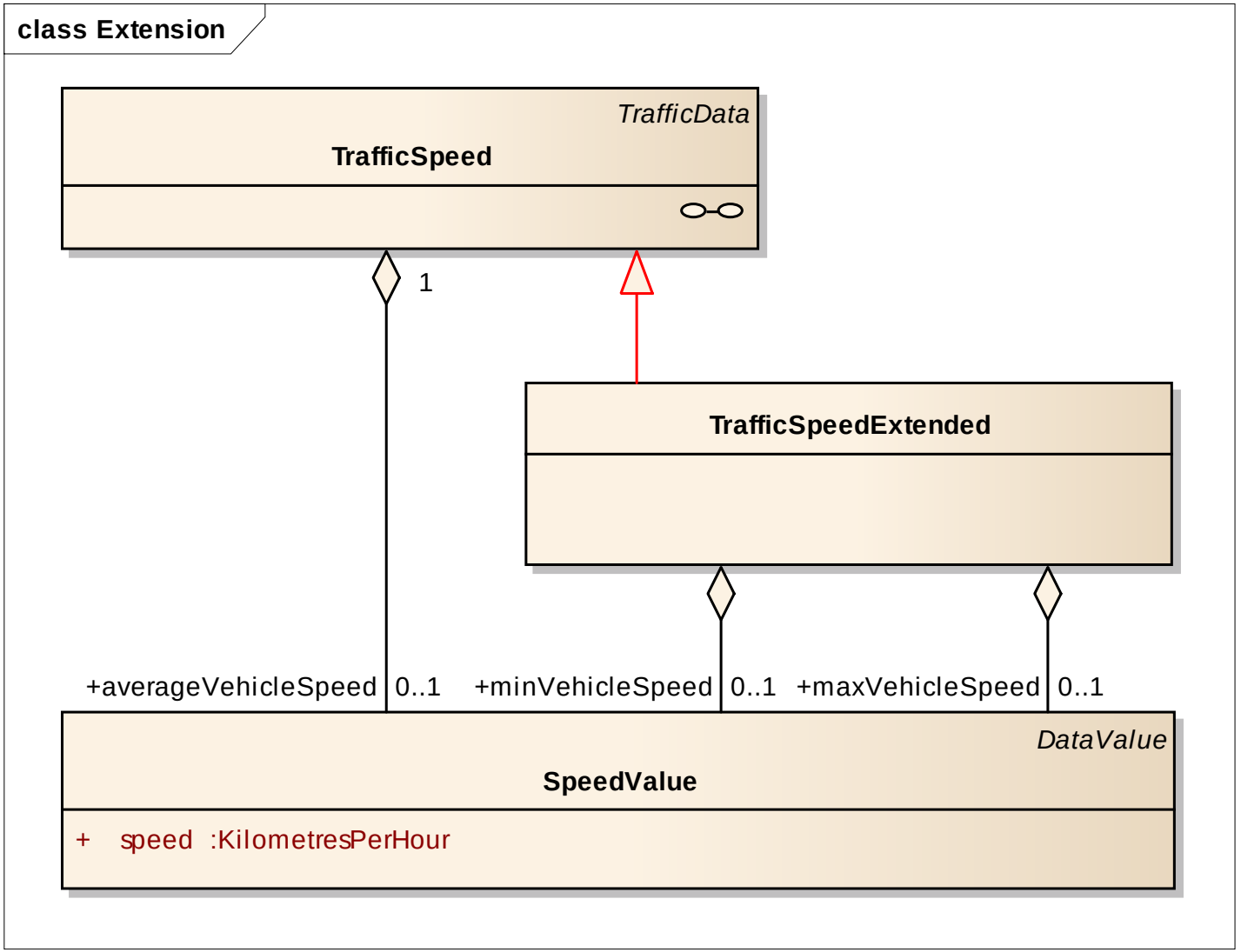
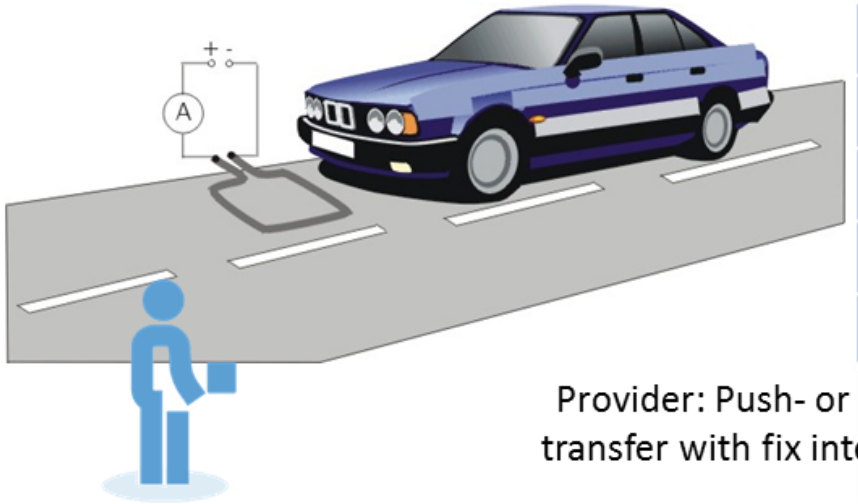
Measurement Sites – Extension traffic speed



Measurement Sites – Extension measured value



Measurement values

Measurement site → time →

A	A0	A1	A2	A3	A4	A5				
B	B0		B1		B2		B3		B4	
C	C0			C1			C2			C3
D	D0				D1				D2	
E	E0					E1				

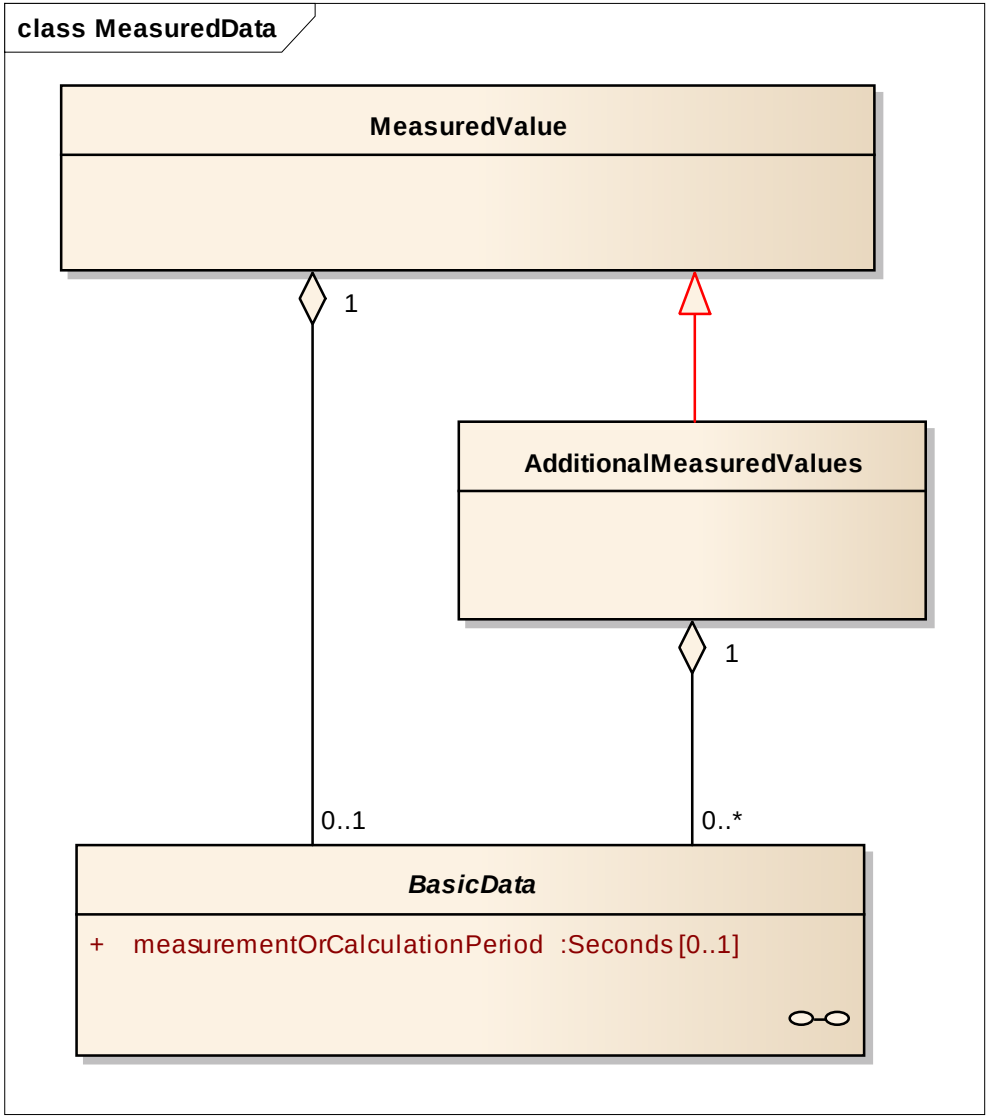
Provider: Push- or Pull-transfer with fix interval

↓			↓			↓			↓	

MDM-Broker

A0			A1,A2,A3			A4,A5				
B0			B1			B2,B3			B4	
C0			C1			C2			C3	
D0						D1			D2	
E0						E1				

Measurement Sites – Extension measured value



Summary

- **DATEX II offers possibility to harmonize and standardize data publication on MDM**
  - this is very welcome by initiators BMVBS and BASt
- **Improving interfaces for DATEX communication is a new experience for local authorities**
  - requires resources (time, knowledge, money)
- **Catalogue of DATEX offers a variety of useful elements for this task**
- **Some useful additional features have been developed as a result**
  - some of them might improve following DATEX versions

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Thank you for your attention !

Jörg Freudenstein
AlbrechtConsult GmbH
Aachen, Germany
joerg.freudenstein@albrechtConsult.com