

FROM VISION TO REALITY: BLUEPRINT FOR THE ROAD ASSET MANAGEMENT SYSTEM IMPLEMENTATION

Online workshop

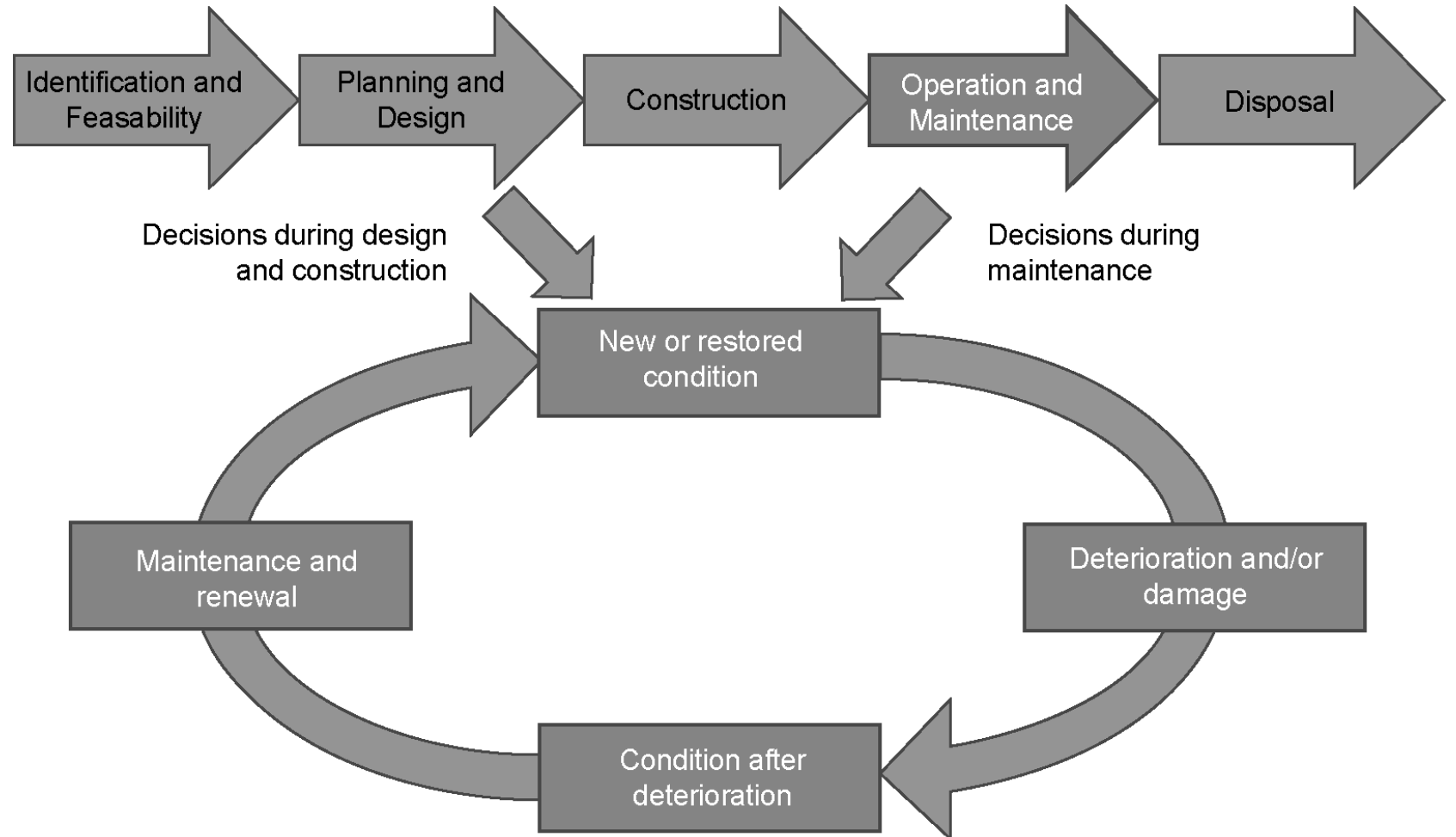
Egidijus Skrodenis
Ieva Markuceviciute-Vincke

01

PURPOSE OF ROAD ASSET MANAGEMENT SYSTEMS

DEFINITION

Comprehensive and structured approach to the whole of life management of assets (such as roads, bridges, tunnels, buildings, plant and equipment, and human resources) as tools for the efficient and effective delivery of services.



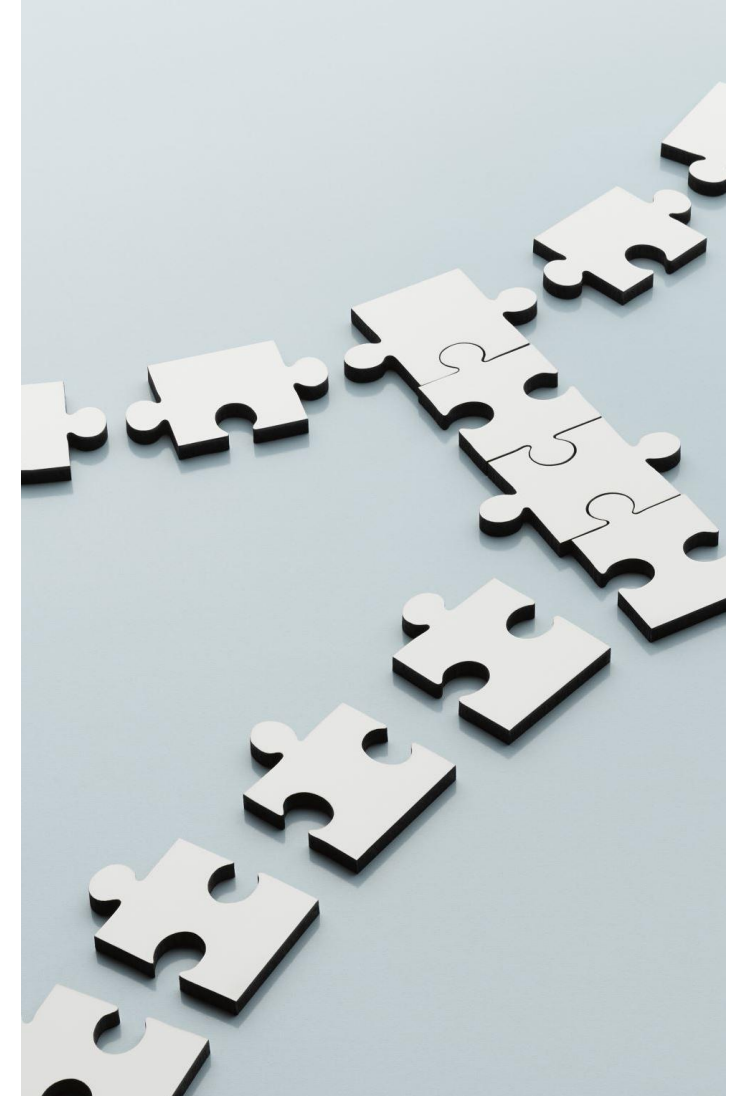
Like any physical asset, road infrastructure needs to be regularly taken care of, maintained, upgraded and renewed in order to keep on providing the citizens with the level of service they are entitled to expect and maintaining its value for society.

This requires investing regularly in the infrastructure.



Road networks are managed in different ways:

- Most are under the **responsibility of authorities**, in charge of planning, construction, supervision, operation, maintenance and road safety.
- They are working with **annual budgets** generally decided by Parliaments.
- Just a few road authorities have the chance to **optimize spending on multi-annual basis**, although it would help to ensuring standards at significantly lower costs, and to establishing a transparent decision process enabling a close communication between road authorities, politicians and the citizens.



20 year frame: National development strategy;
National security strategy; National
Comprehensive Plan (Territorial Spatial Plan)

10 year frame: National development plan

4-10 year frame: development programs,
regional development programs

3 year frame: strategic action plan

1 year: annual activity plan

Strategic framework

Road law:

- Road Classification
- Development and Strategy
- Information Management
- Road Maintenance and Safety
- Responsibility and Liability
- Financing

Road maintenance and development program

Road maintenance rules

Road traffic rules

Legal framework for road transport

INSTITUTIONAL FRAMEWORK OF ROAD ASSET MANAGEMENT

Authority	Scope of responsibilities
The Office of the Government	General objectives and principles for government service digitalization
Ministry of the Economy and Innovation	Policy design, implementation coordination and control
Ministry of the Interior	Management and development of national public administration systems
State Digital Solutions Agency	Institutional support, monitoring of policy implementation, coordination support
State data agency	Maintenance and management of national data infrastructure
Other public entities	Policy implementation, data management

Government data management responsibilities

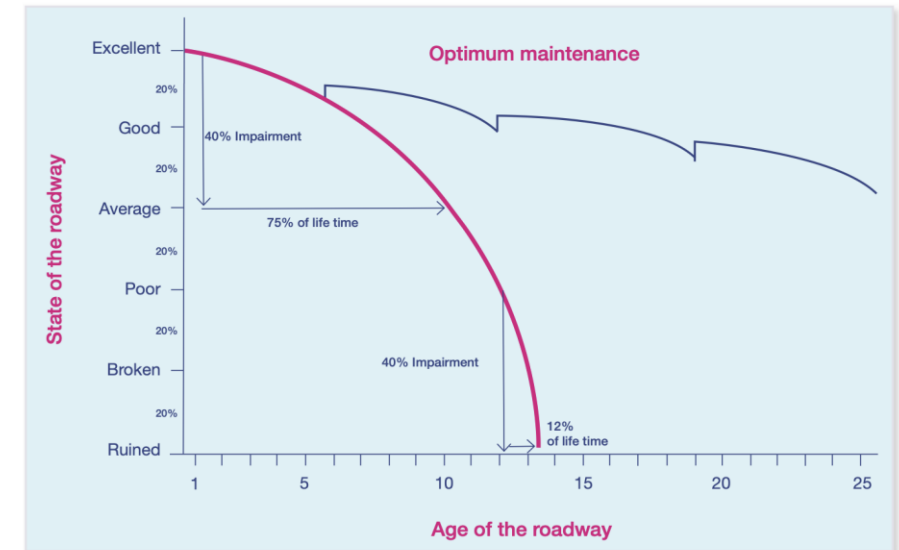
Authority	Scope of responsibilities
Via Lietuva	Management and maintenance of national road network
Ministry of Transport and Communications	National connectivity system policy development
Road safety administration	Management and maintenance of assigned transport information systems
Municipalities	Management and maintenance of municipal transport infrastructure and equipment

Transport data management responsibilities

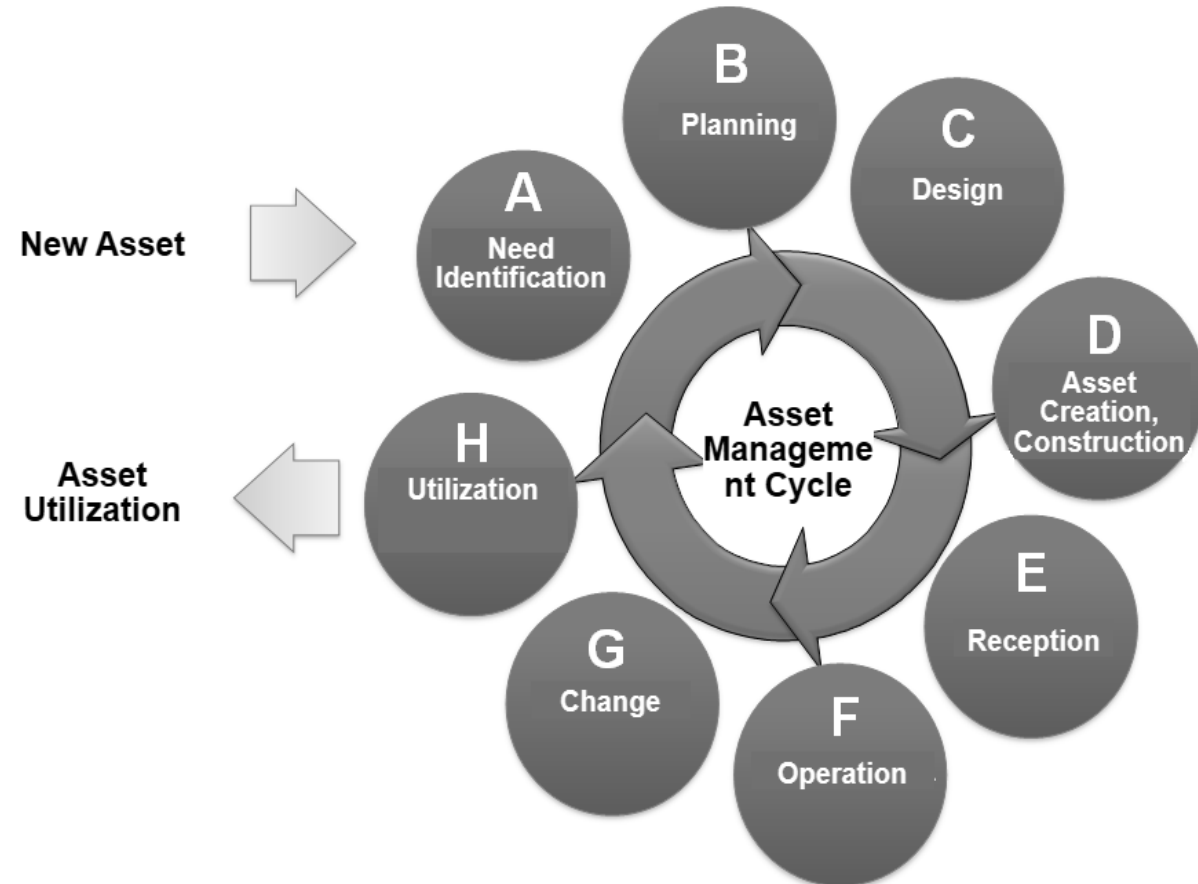
THE TRADITIONAL BUDGETING APPROACH

Traditional budgeting focuses on annual spending, allowing politicians to adjust priorities yearly. However, this approach has limitations for efficient infrastructure management and maintenance, as investment consequences often take longer to become apparent than a typical legislative term. Other disadvantages:

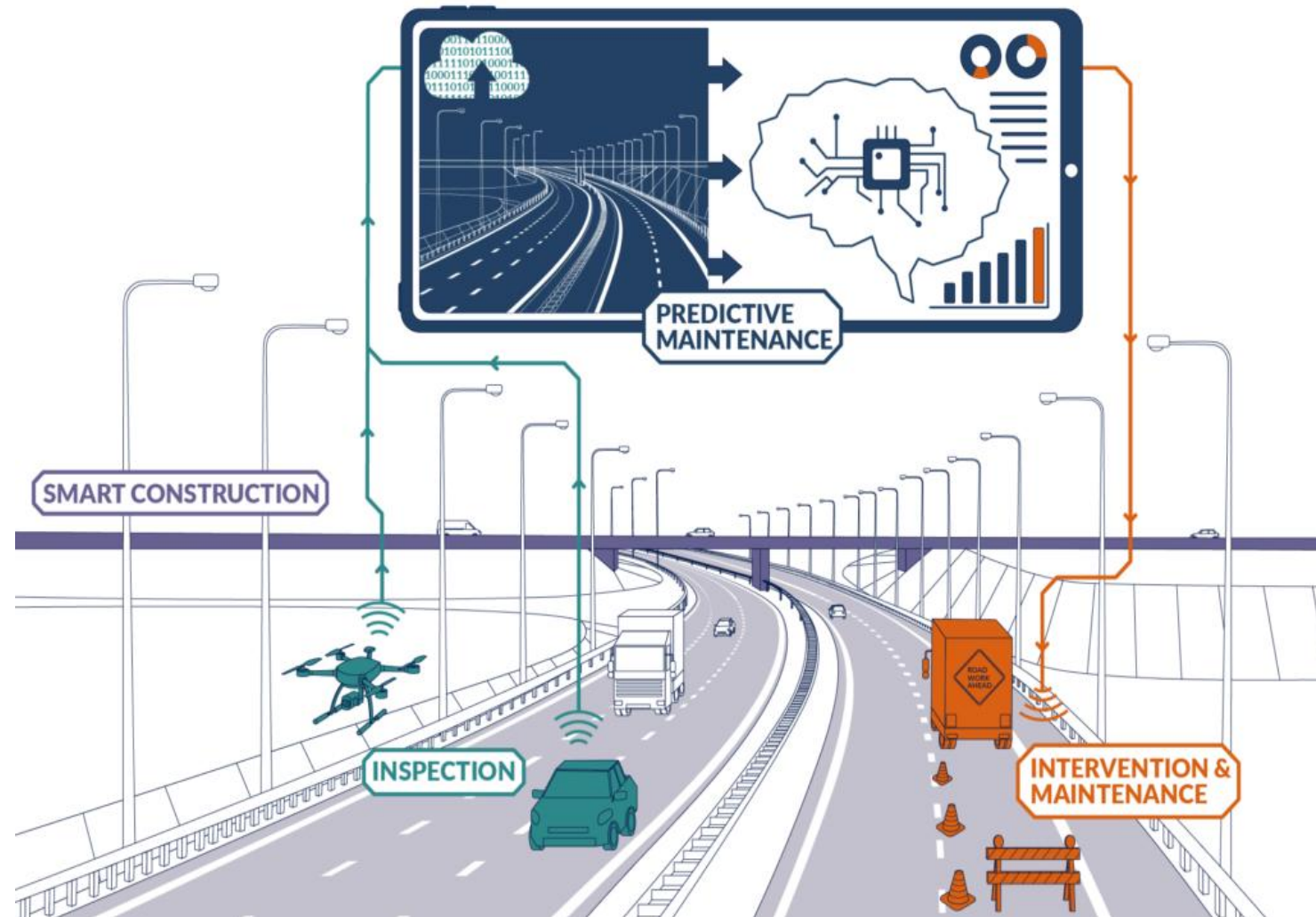
- Money is not spent in infrastructure when the infrastructure needs it most, but when it is available.
- Maintenance and management costs of infrastructure are not optimised over the life-time of the roads.
- Due to the lack of reliable data on the condition of the roads and the absence of a data-based calculation on future mid- and long- term investment requirements, is difficult to make the decisions necessary to properly maintain the infrastructure.
- And it's even more challenging to integrate other political objectives like noise reduction and road safety.



- Maintenance and modernisation are the key issues of Road Asset Management. It is a systematic and permanent process aiming at cost effective maintenance, upgrading and operation of physical assets.
- Asset Management combines engineering disciplines with solid business practices and financial theories.
- In this way, Road Asset Management can help achieve sustainable and effective management of a safe and efficient road network.
- **The primary goal of Road Asset Management is to think, plan and act on the basis of long-term decisions aiming at optimizing maintenance while keeping costs at a minimum and contributing to other political objectives while modernising the network.**



- ROAD ASSET MANAGEMENT is based on an analysis of road data related to inventory, condition, traffic, unit costs, and road deterioration models.
- RAMS: Any system that is used to collect, manage and analyse road data for road planning and programming purposes. The data is entered into RAMS allows the data to be analyzed, and optimal budget levels and allocations to be determined.
- Purpose of RAMS: Optimizing the level and the allocation of road funding in relation to medium- and long-term results regarding road conditions and road user costs.



Data collection

- Road data (inventory, condition, traffic, other)
- Maintenance data (costs, performance, etc.)
- Missing / outdated data makes a RAMS useless

Data management (database)

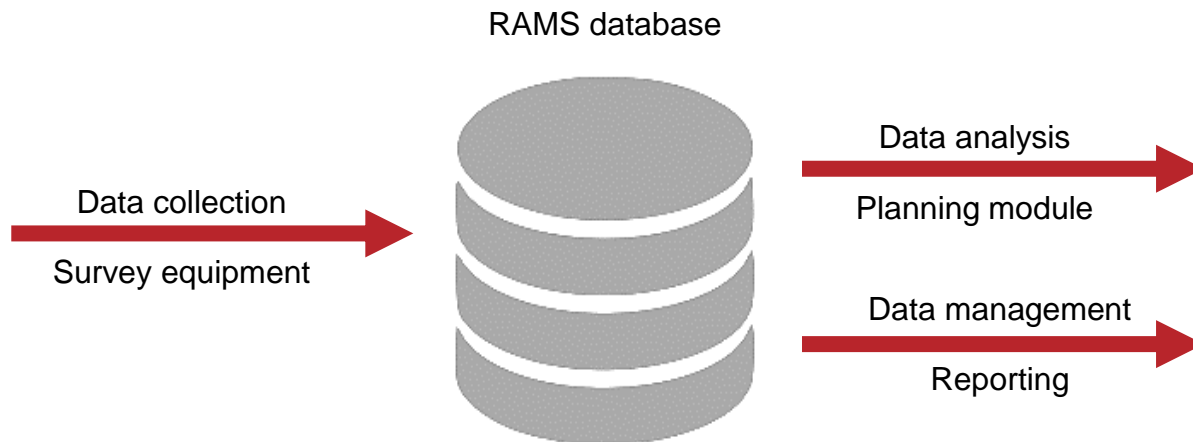
- Combine different data sets
- Prepare reports - provide statistics for the network

Data analysis (planning tool)

- Identify required budget
- Criteria for prioritization + allocation of specific budget
- Algorithms for predicting future road deterioration and user costs

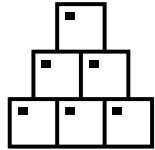
May incorporate other modules

- Bridge or tunnel management system
- Contract management system



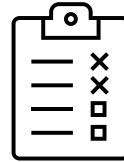
02

PLANNING AND DESIGNING RAMS



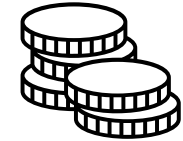
ASSET INVENTORY AND LOCATION

- What is the total number of assets owned by the organization?
- Where are the organization's assets geographically located?



ASSET CONDITION AND ISSUES

- What is the average age of the organization's assets?
- Are there any current issues or problems with the assets?
- If yes, where are these issues located?
- How many active issues are currently affecting the assets?



MAINTENANCE AND COSTS

- When was the most recent maintenance or work completed on a specific asset?
- What are the annual costs associated with maintaining the organization's assets?

Assets of a public (urban) road network

Road	Equipment	Structures
Asphalt lanes	Drainage	Bridges
Walking paths	Signs	Tunnels
Parking areas	Markings	Ports
Bicycle roads	Street lighting	Playgrounds
Gravel roads	Crash barriers	Underpasses
Curbs	Urban furniture	Parks
Cobblestones	...	Galleries
Shoulders		Noise barriers
Ditches		...
Bus bays		
Verges		
Speed bumps		
..		

DATA SETS

Infrastructure dataset

Centerlines and parameters of roads and bridges, junctions, pavement layers, lay-bys, lighting, steel guard rails, traffic monitoring and management devices, horizontal marking, road and kilometer signs, crossings, culverts.

Road safety and environment protection data

Information about accidents, black spots and dangerous sections, speed humps, pedestrian and bicycle ways, noise barriers, wildlife underpass, wildlife fence, greenery, road wastewater treatment plants.

Road reconstruction projects dataset

Information about road projects, reconstruction, maintenance and other works

DATA PROVIDERS

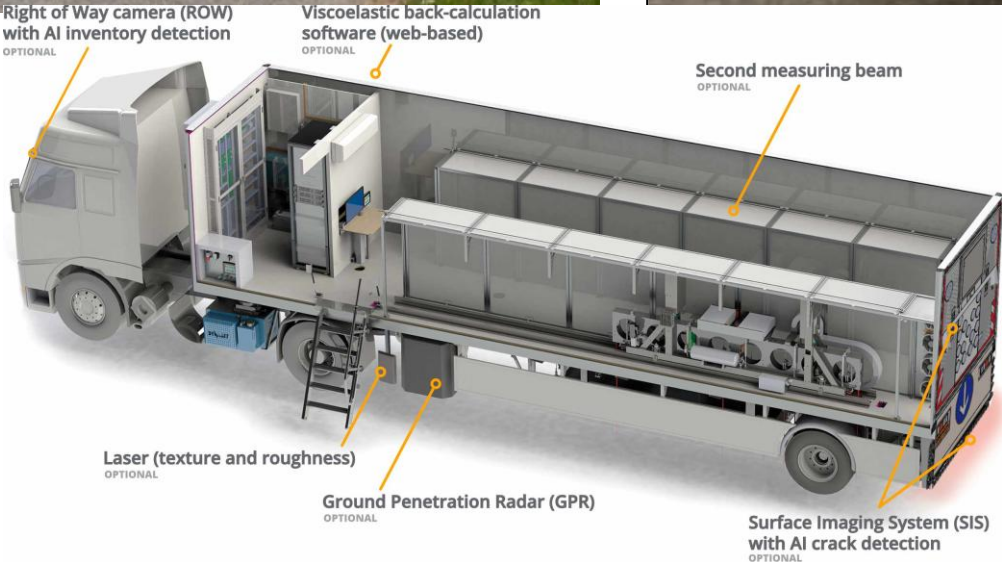
Road maintenance (State) enterprises

Contractors for road construction

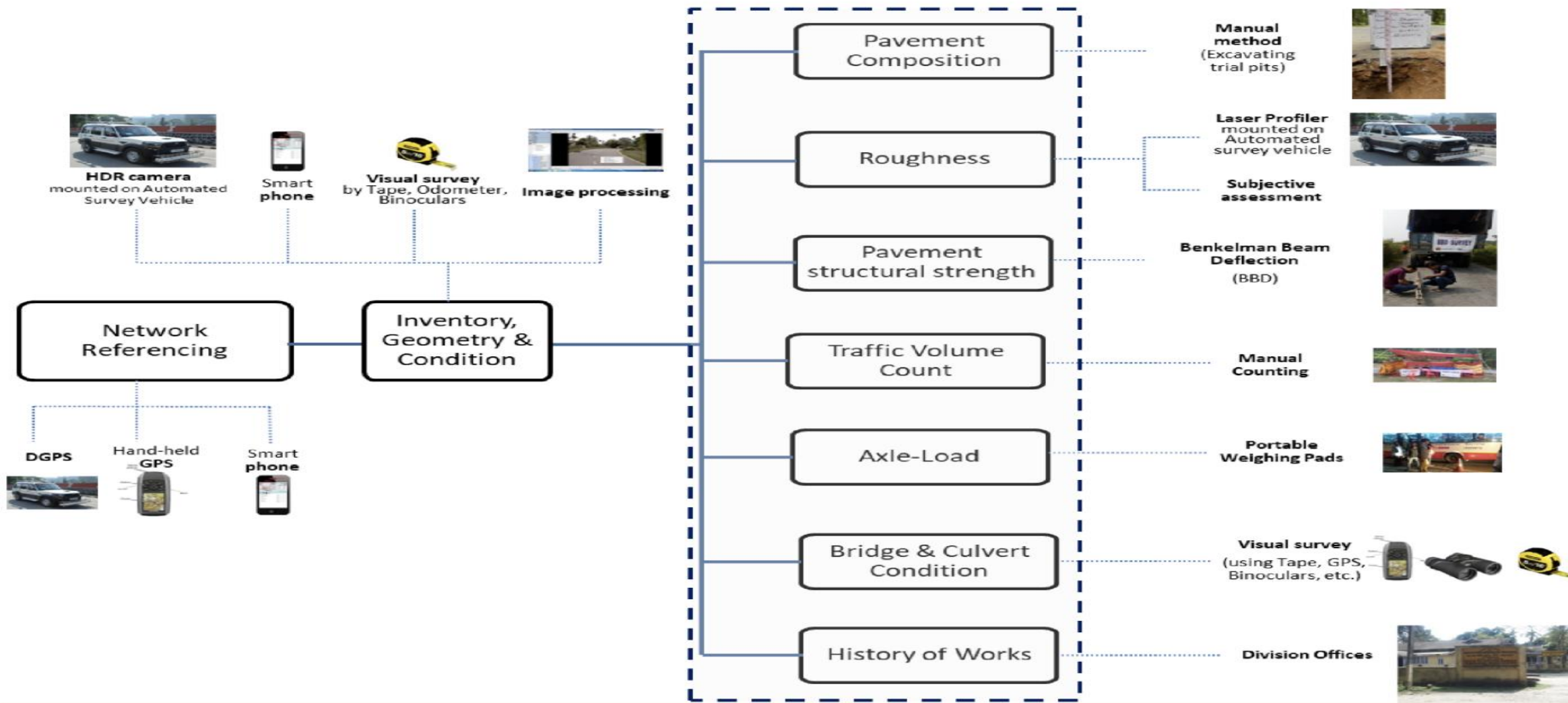
Map service providers

Contractors for data collection

ROAD ASSET DATA COLLECTION SOURCES



SENSORS FOR DATA COLLECTION





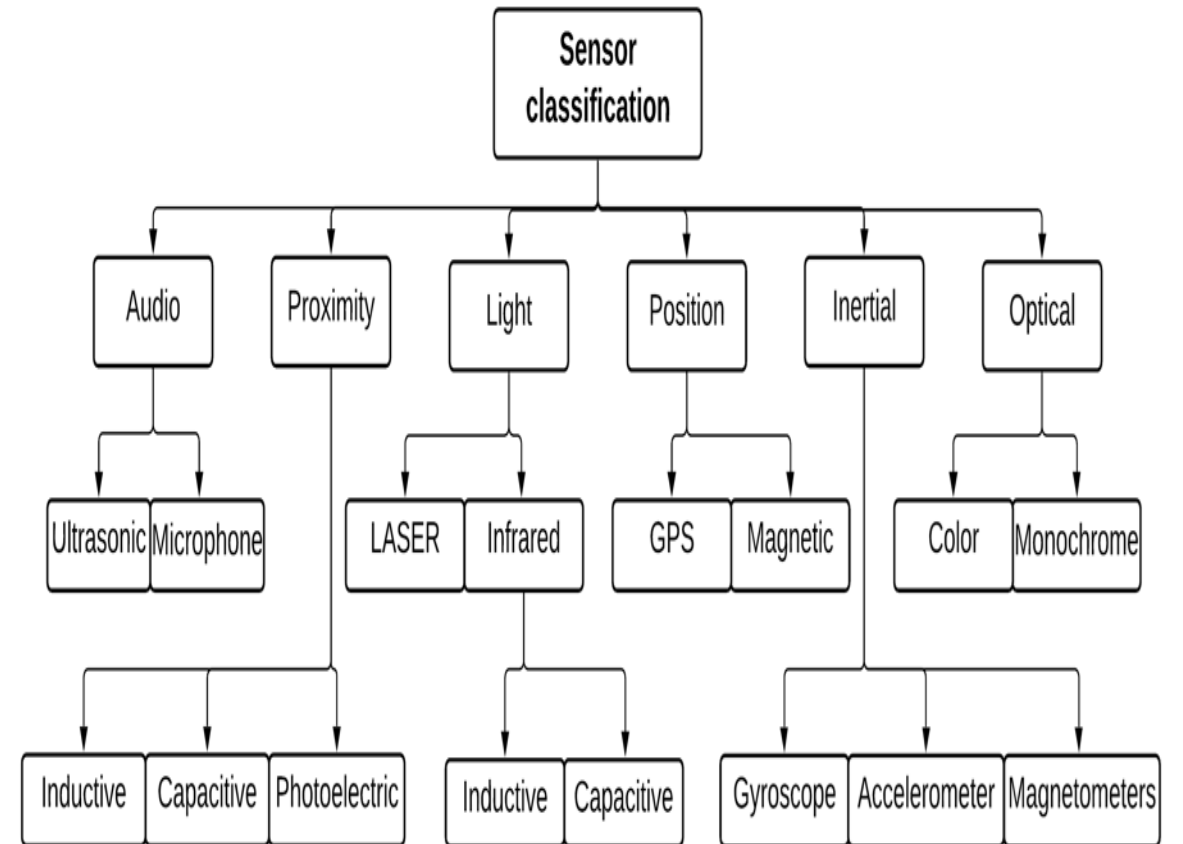
Cameras

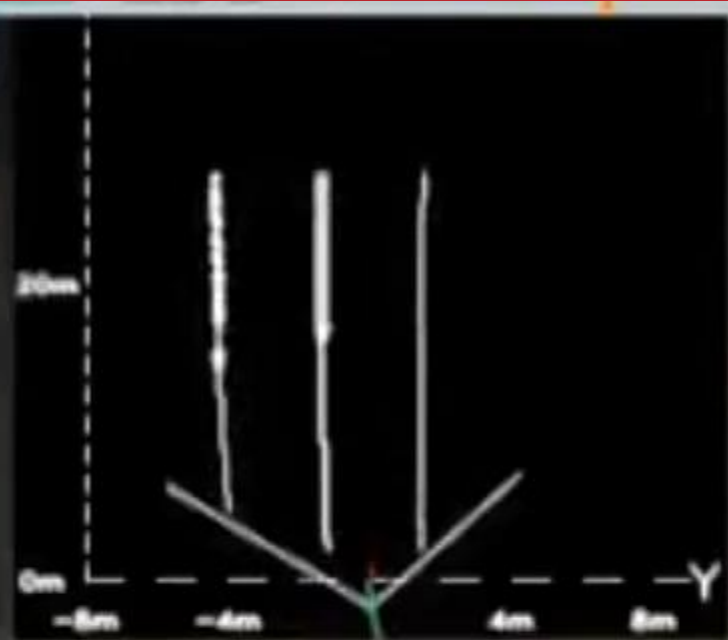


RWIS



Traffic counters





ROAD ASSET MANAGEMENT SYSTEM. LITHUANIAN EXPERIENCE



LAKD objektų peržiūra ir redagavimas

Kelias | Objektas | Teritorija

Pavadinimas: []

Intervalas, km nuo [] iki []

Atstumas nuo ašinės linijos, m: []

Objektų pavadinimas

- Sustojimo aikštelės (inventorika)
- Aikštelės plotas (inventorika)
- Apšvietimo planavimas (inventorika)
- Apšvietimo lygis (inventorika)
- Apšvietimas (inventorika)
- Aptvėrimas (Aplinkosauga)

Akustinės sienelės (Aplinkosauga)

Kelio Nr.	Pradžia, km	Pabaiga, km	Važ. data	Paddirni	Perstumi
A1	37.4	38.67	Antro važiuojam.	<input type="checkbox"/>	<input type="checkbox"/>
A1	37.739	38.233	Viena/pirma važi...	<input type="checkbox"/>	<input type="checkbox"/>
A1	53	54	Viena/pirma važi...	<input type="checkbox"/>	<input type="checkbox"/>
A1	53	55	Viena/pirma važi...	<input type="checkbox"/>	<input type="checkbox"/>
A5	3.732	4.222	Antro važiuojam.	<input type="checkbox"/>	<input type="checkbox"/>
A5	3.734	4.196	Viena/pirma važi...	<input type="checkbox"/>	<input type="checkbox"/>
A5	57.314	57.468	Viena/pirma važi...	<input type="checkbox"/>	<input type="checkbox"/>
A5	57.34	57.464	Antro važiuojam.	<input type="checkbox"/>	<input type="checkbox"/>

Rodoma įrašų 11 iš 11 galimų

Naujas | Redaguoti | Pašalinti | Atsisakyti | Išsaugoti | Eksportuoti | Eksportuoti viską

Veidrosinio traukimo zonos Lden | Veidrosinio traukimo zonos Ln | Zeldynai | Akustinės sienelės | Aptvėrimas | Aptvėrimo vartai | Pabrėžimas gyvūnų pereinai | Vardena valymo įrenginiai

Į Aplinkosauga | Į Dangos kokybė | Į Eismo apskaita | Į Eismo informacija | Į Eismo saugumas | Į Inventorika | Į Kelio tinklės | Į Kita | Į Regionas | Į Remontai | Į Tiltai

Kelio tipas: Magistralinis, Krašto
Objektai: Akustinės sienelės

Surasti | Kelijų matavimai

Įvedimo data: 2009-03-05 15:02:43
Redagavo: 76
Redagavimo data: 2009-04-16 14:28:44
Kelio Nr.: A11
Pradžia, km: 113.6
Pabaiga, km: 113.94
Įvedimo tipas: Pagal santykinę padėtį
Važ. data: Viena/pirma važiuojamoji dalis
Statusas: Egzistuojantis
Įrengimo data: 2008-12-05 15:09:42
Sutarties numeris: []
Rangovas: []
Finansavimo šaltinis: []
Prizivini įmone: VĮ "Klaipėdos RK"
Matavo: VĮ "Klaipėdos RK"
Remonto data: 2008-12-05 15:09:42
Akust. sienut. Tipas: Garaž atspindinti
Statybos modifika: Metalas
Aukštis, m: []
Kaina su įrengimu, 1 m: []

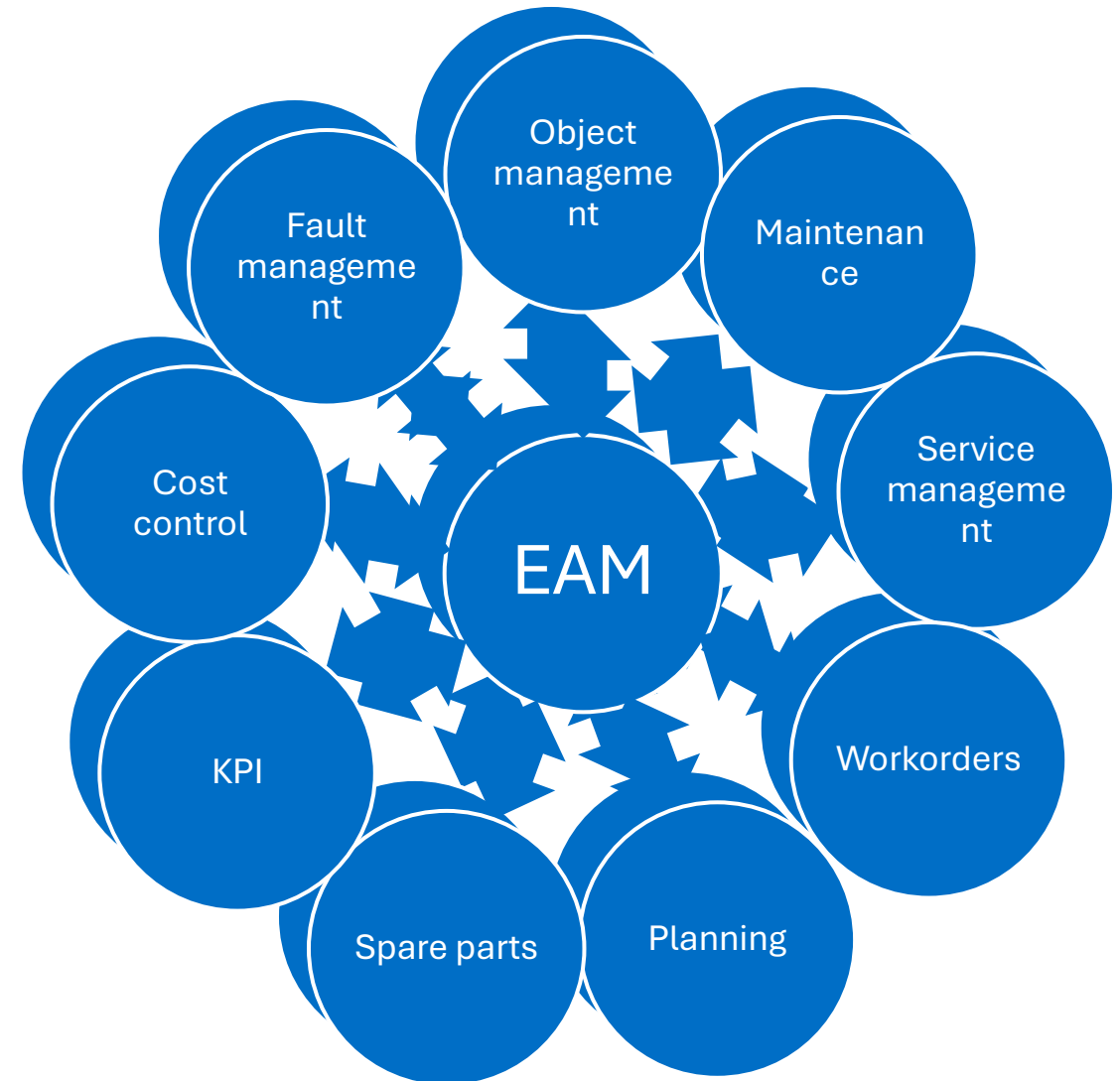
03

RAMS ARCHITECTURE AND APPLICATION EXAMPLES

Definition: a software that helps organizations to plan, monitor, and optimize the maintenance and lifecycle of their physical assets such as road infrastructure, railway infrastructure, buildings, and other fixed assets.

Core application: to systematically monitor, control, and optimize the entire lifecycle of an organization's fixed assets. This includes planning and procurement, tracking asset details, managing maintenance schedules, assessing risks, and making informed decisions based on real-time data.

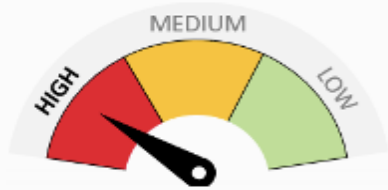
Outcome: efficient and strategic management of an organization's fixed assets throughout their lifecycle.



TECHNOLOGY REQUIREMENTS



MARKET



Available diversity of suppliers, ranging from niche offerings by a limited number of suppliers (high) to multiple suppliers (low)



SKILL



Technical proficiency needed to implement and maintain technology solution, ranging from advanced expertise (high) to basic skills (low)



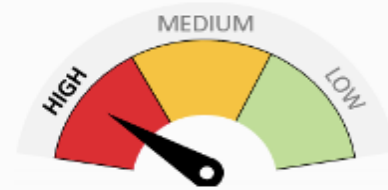
INTEGRATION



Integration need with external systems, ranging from highly demanded integration, strong system dependency (high) to standalone solutions with limited integration need (low)



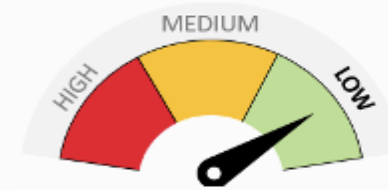
COST



Amount of upfront and ongoing costs needed, ranging from extensive upfront costs and ongoing expenses (high) to low upfront investment and ongoing expenses (low)



DIGITAL ENVIRONMENT

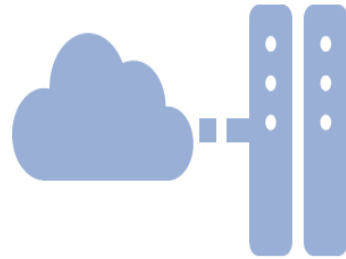


The technology's dependencies within digital environment, ranging from advanced infrastructure needs (high) to minimal requirements and low dependencies (low)

ENTERPRISE ASSET MANAGEMENT PLACEMENT OPTIONS



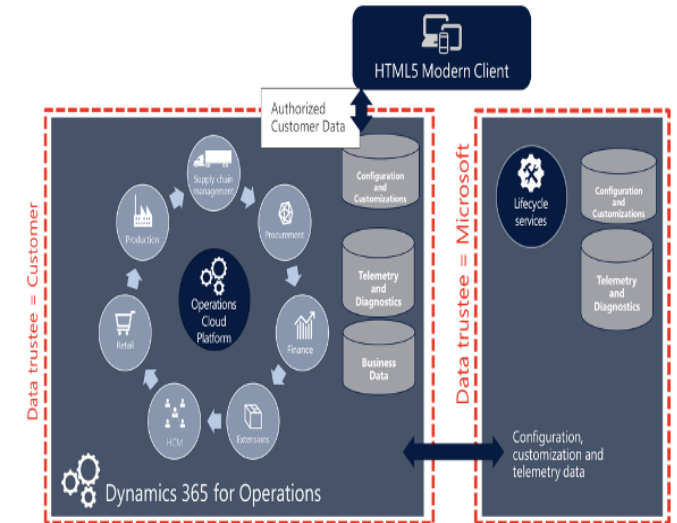
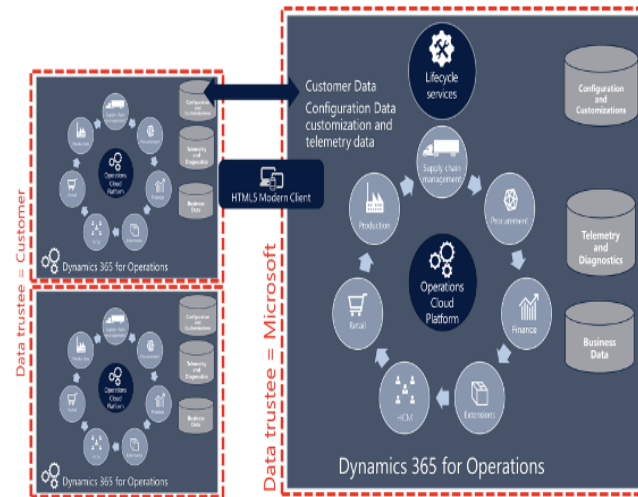
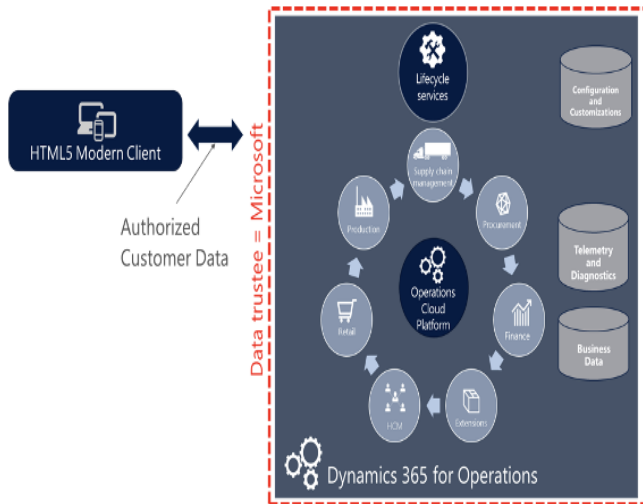
Cloud



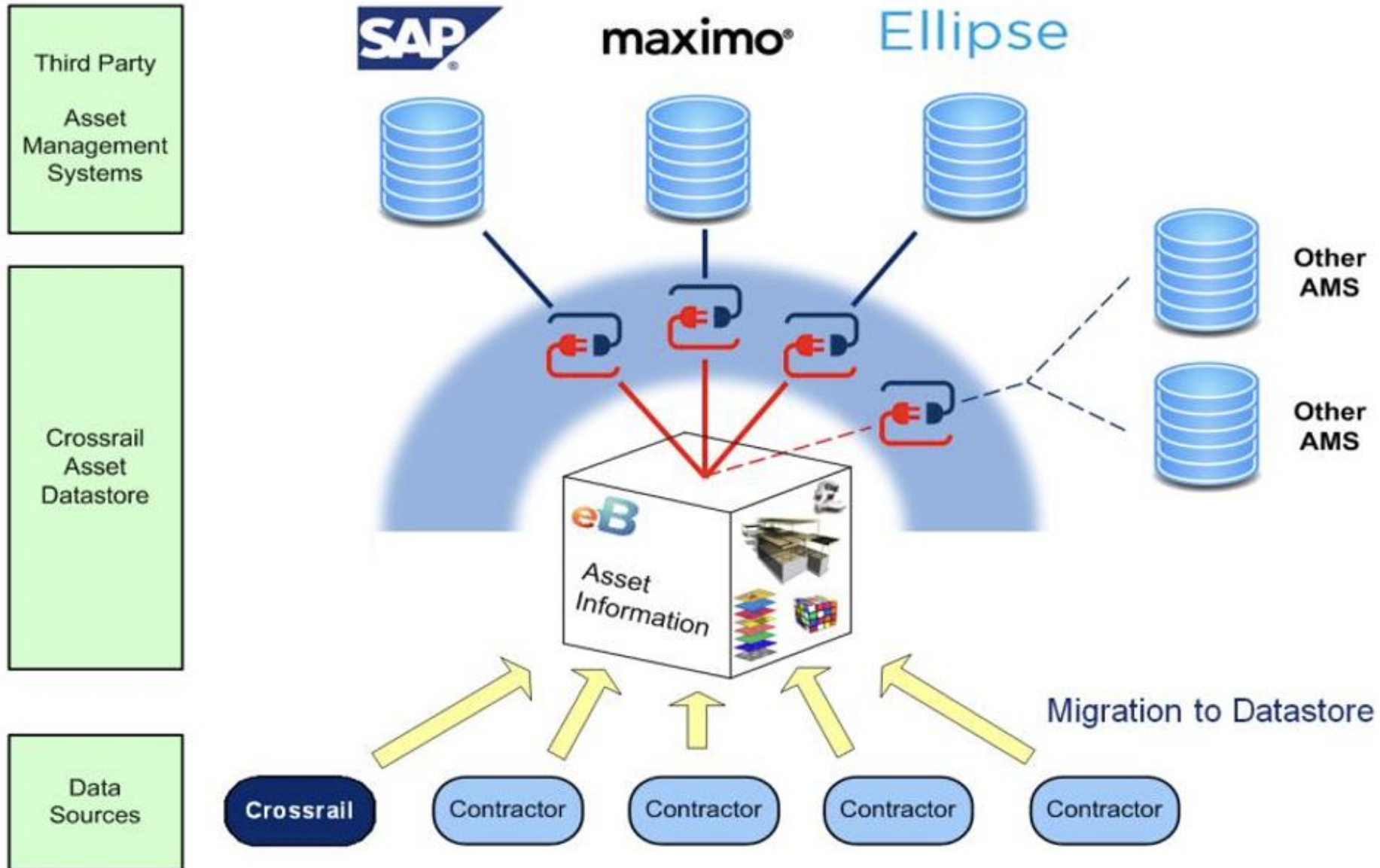
Cloud and Edge Deployment



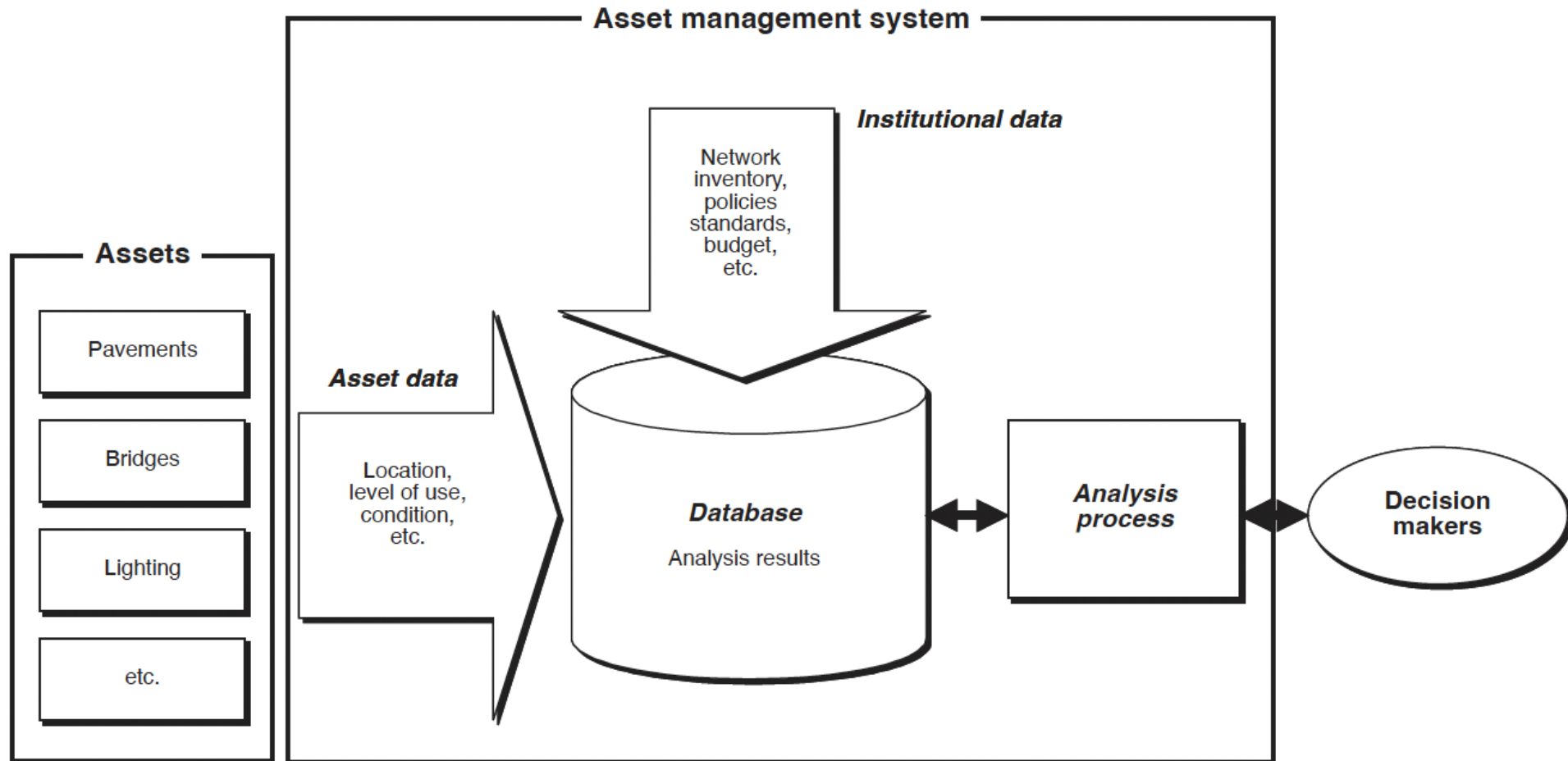
Local Business Data (On-Premises) Deployment



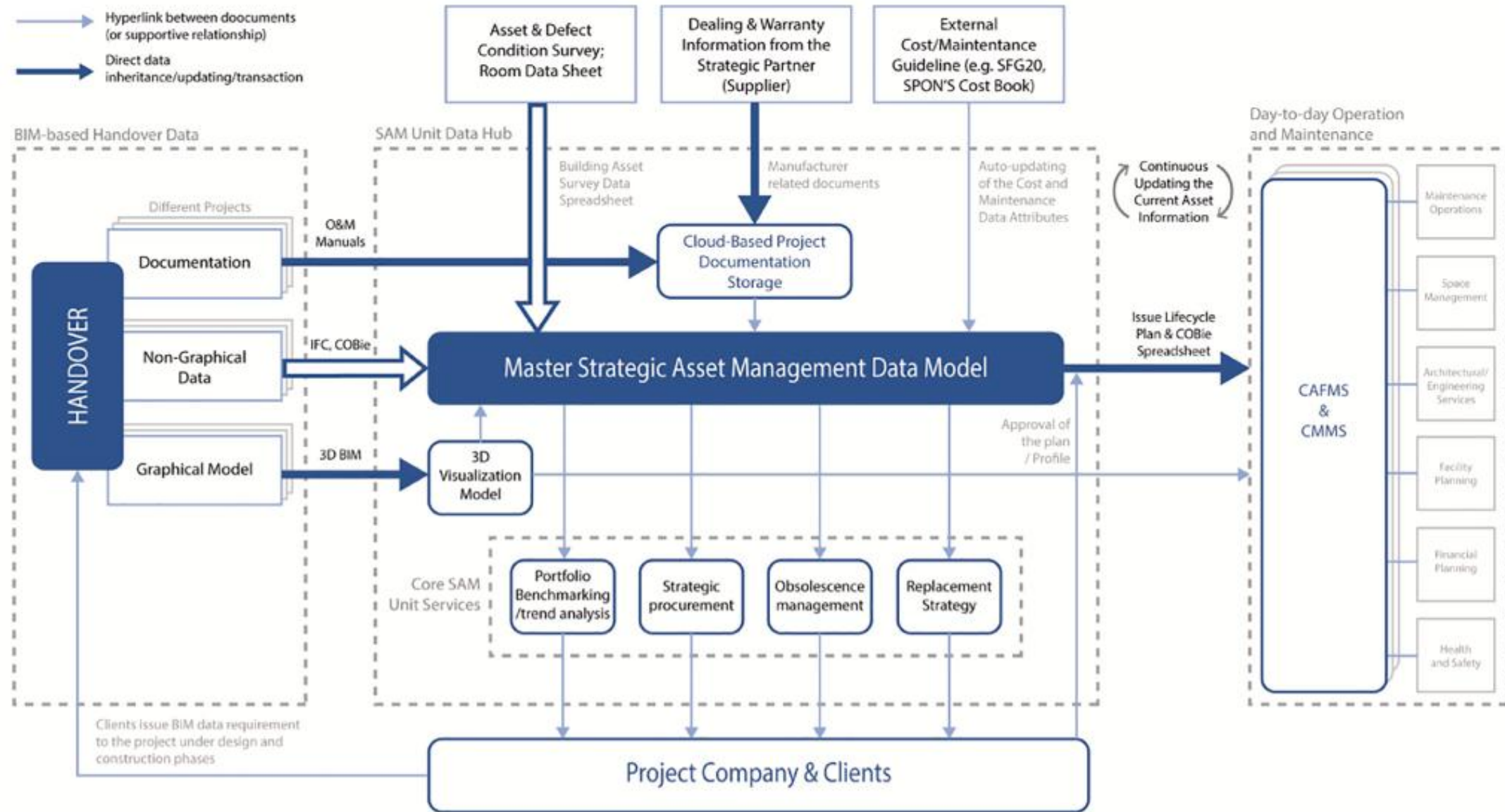
ENTERPRISE ASSET MANAGEMENT PLACEMENT OPTIONS



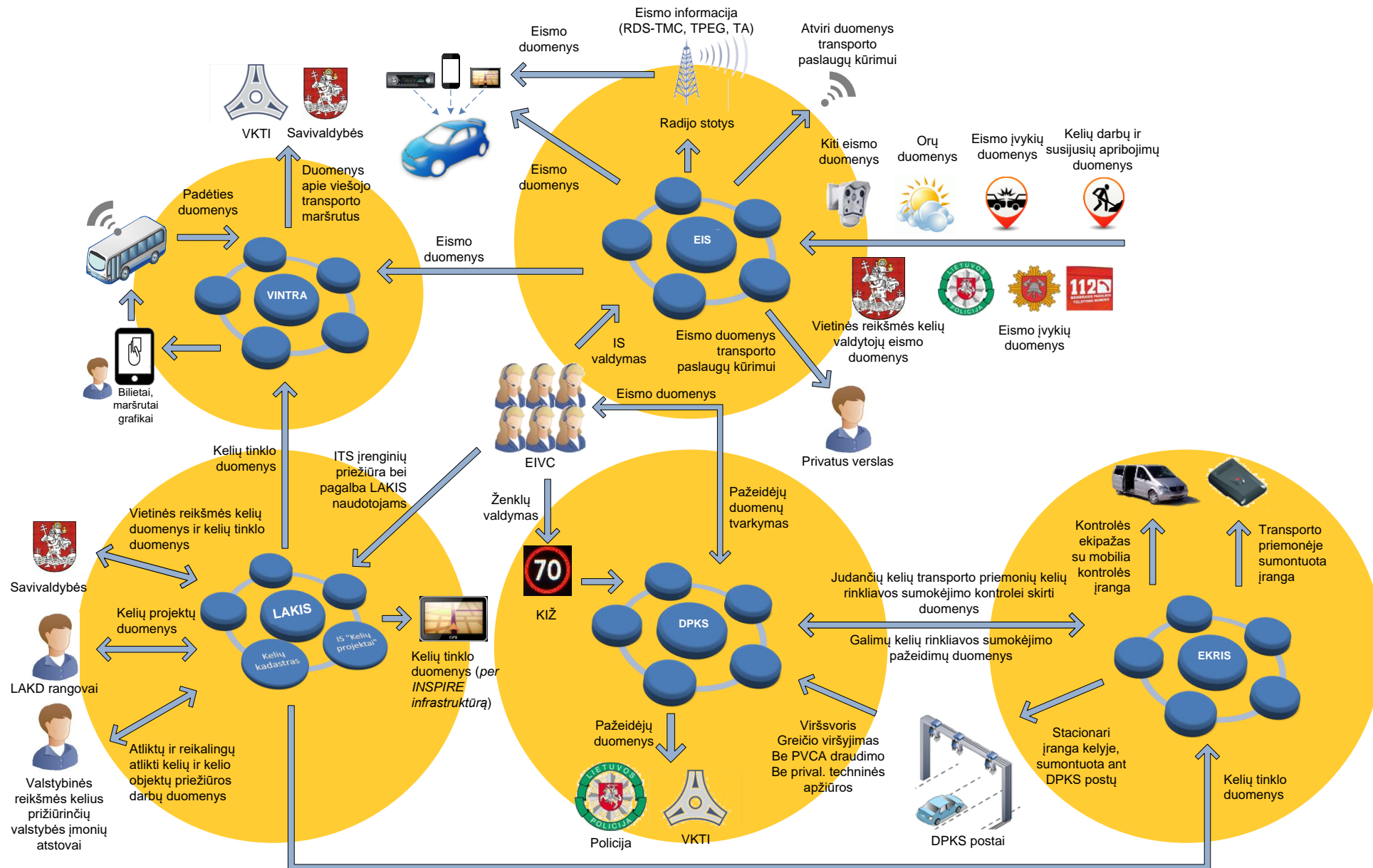
TYPICAL FLOW OF DATA INTO AND OUT OF A GENERIC ROAD ASSET MANAGEMENT SYSTEM



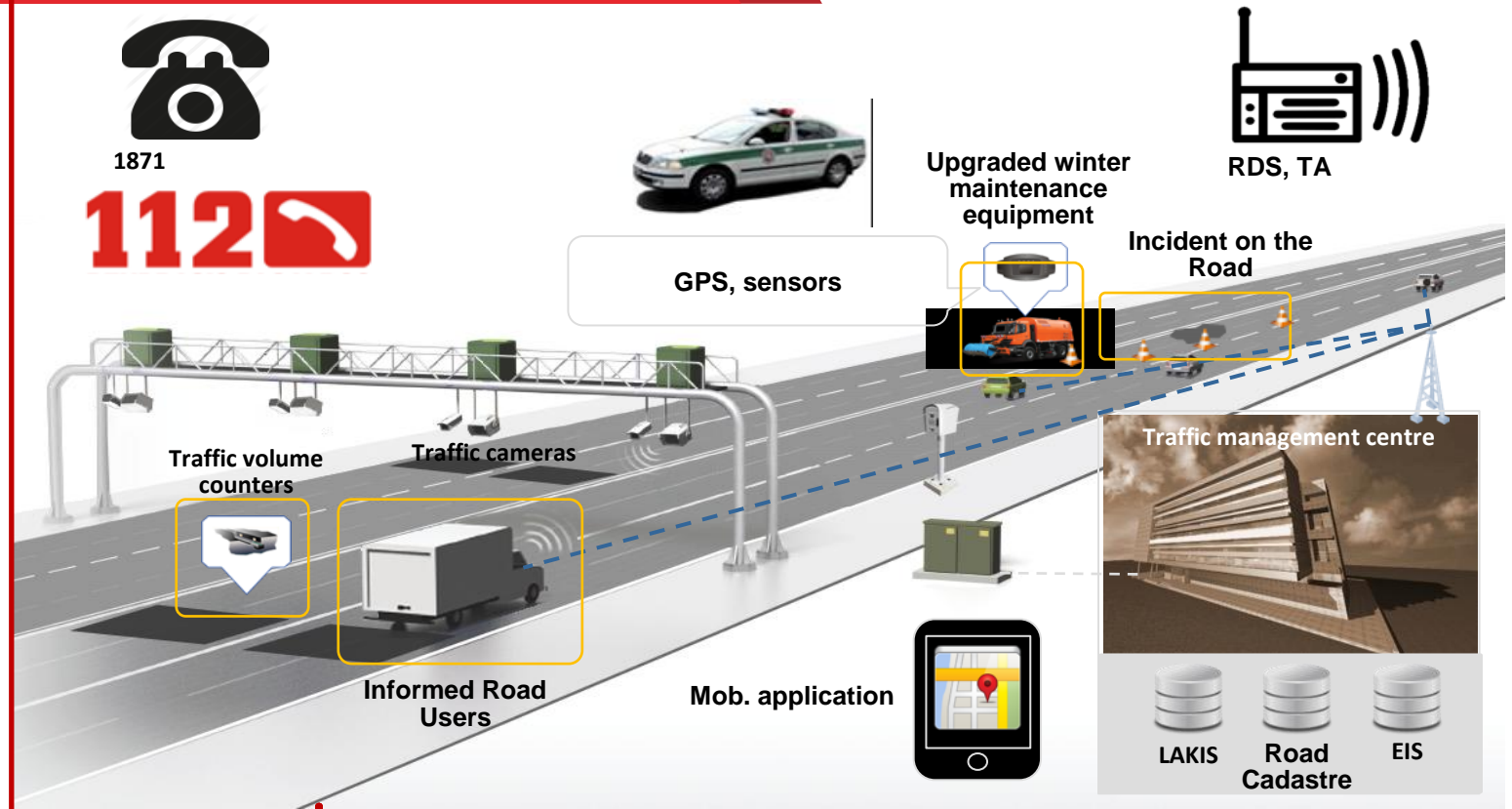
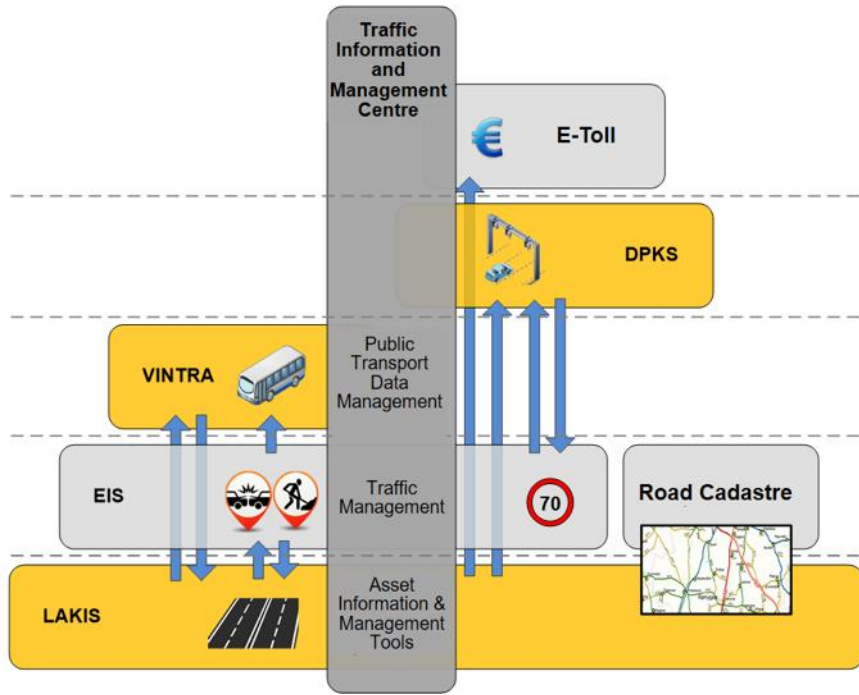
TYPICAL FLOW OF DATA INTO AND OUT OF A GENERIC ROAD ASSET MANAGEMENT SYSTEM



INTEGRATION WITH OTHER SYSTEMS. LITHUANIAN EXAMPLE



INTEGRATION WITH OTHER SYSTEMS. LITHUANIAN EXAMPLE



Register of suspects, accused and convicted persons	Register of tractors, self-propelled machines and trailers	Register of events recorded by the police	Road information system of national importance	Address register of the Republic of Lithuania	Register of preventive measures	Official register of wanted persons, unidentified corpses and unknown helpless persons	Information system of the service for determining disability and working capacity	Register of road vehicle drivers	Register of road vehicles	Register of wanted vehicles	Database of the Insurance Supervisory Commission of the Republic of Lithuania	Register of foreigners
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DATA COLLECTION AND ANALYSIS

Selection of dangerous points and stretches (experts, society)

Network Safety Ranking procedure

Road Safety Impact Assessment procedure

Road Safety Audit procedure

Black Spots determination and Investigation procedure

Accidents Prediction procedure

Investigation of every fatal accident

Road Safety Inspection procedure

Traffic police patrolling sections selection

Providing information for society

Improvement of the legislation

COST-BENEFIT ANALYSIS AND SELECTION OF MEASURES

Installation of post-accident and preventive infrastructure

Planning the traffic control activities and updating the legislation

Society awareness raising and social campaigns planning

RAMS INTEGRATION WITH TRAFFIC ACCIDENT INFORMATION SYSTEM.

INFORMATION SYSTEM
ADMINISTRATIVE AND USER'S
MANAGEMENT SUBSYSTEM

SERVERS AND MANAGEMENT

TRAFFIC ACCIDENTS INFORMATION SYSTEM SUBSYSTEMS

TRAFFIC ACCIDENT SUBSYSTEM

1. Data collection and storage 2. Data and documents formation

SPATIAL DATA SUBSYSTEM

Spatial data identification and mapping of traffic accident locations

REPORTING SUBSYSTEM

Traffic accident data processing, detalisation, systematization and formation of traffic accident statistical reports

ADMINISTRATION SUBSYSTEM

Administration of authorizations and rights of employees of EIS manager and processors, management of classifiers, management of internal and external EIS data flows

DATA EXCHANGE SUBSYSTEM

Ensuring EIS data exchange with state registers, external and internal systems

INTEGRATIONS WITH OTHER PUBLIC SYSTEMS

Register of suspects, accused and convicted persons

Register of tractors, self-propelled machines and trailers

Register of events recorded by the police

Road information system of national importance

Address register of the Republic of Lithuania

Register of preventive measures

Official register of wanted persons, unidentified corpses and unknown helpless persons

Information system of the service for determining disability and working capacity

Register of road vehicle drivers

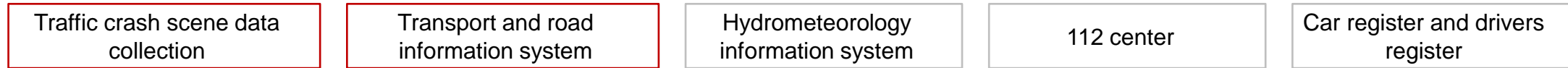
Register of road vehicles

Register of wanted vehicles

Database of the Insurance Supervisory Commission of the Republic of Lithuania

Register of foreigners

USERS OF EXISTING TRAFFIC ACCIDENTS INFORMATION SYSTEM

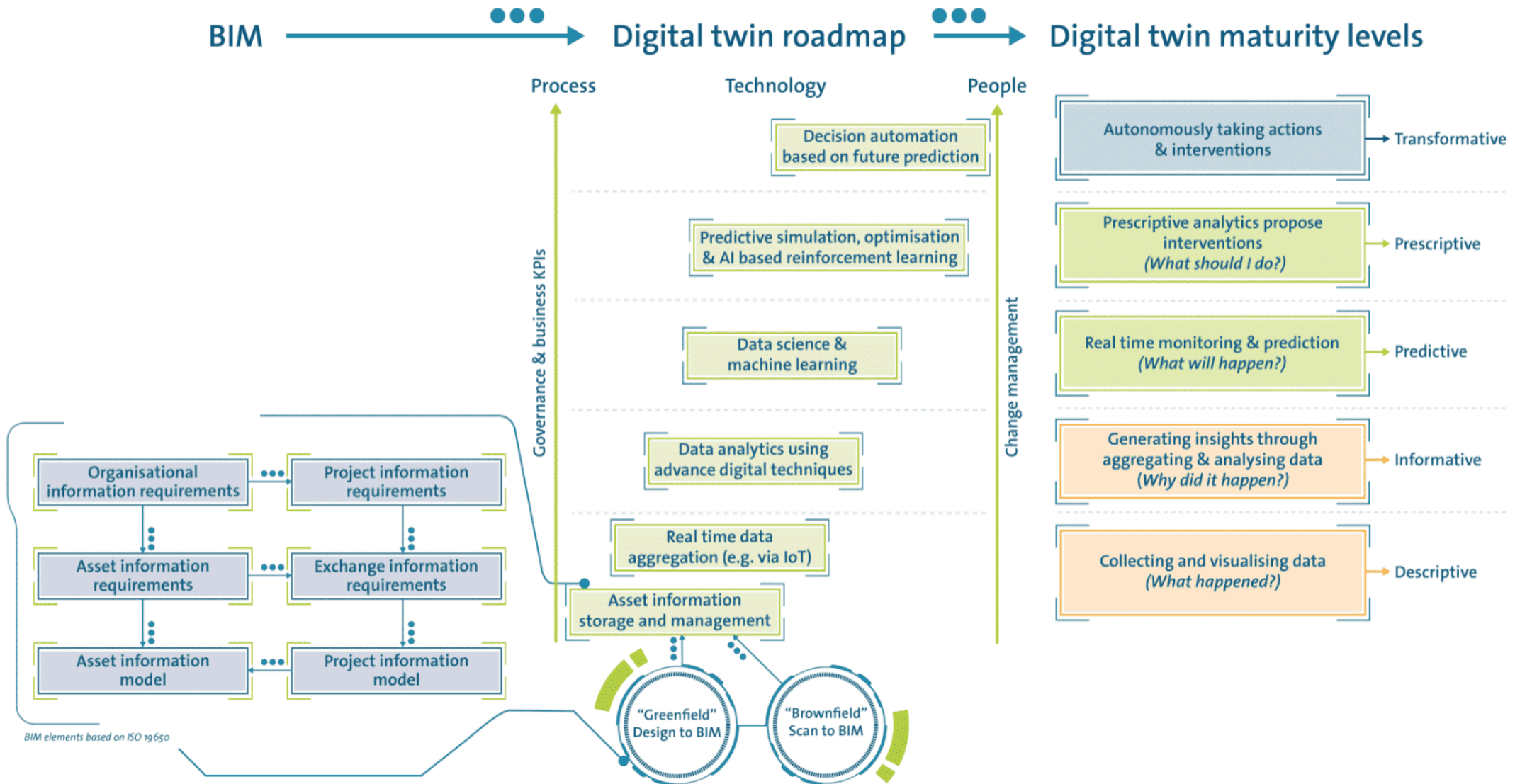


DATA SOURCES

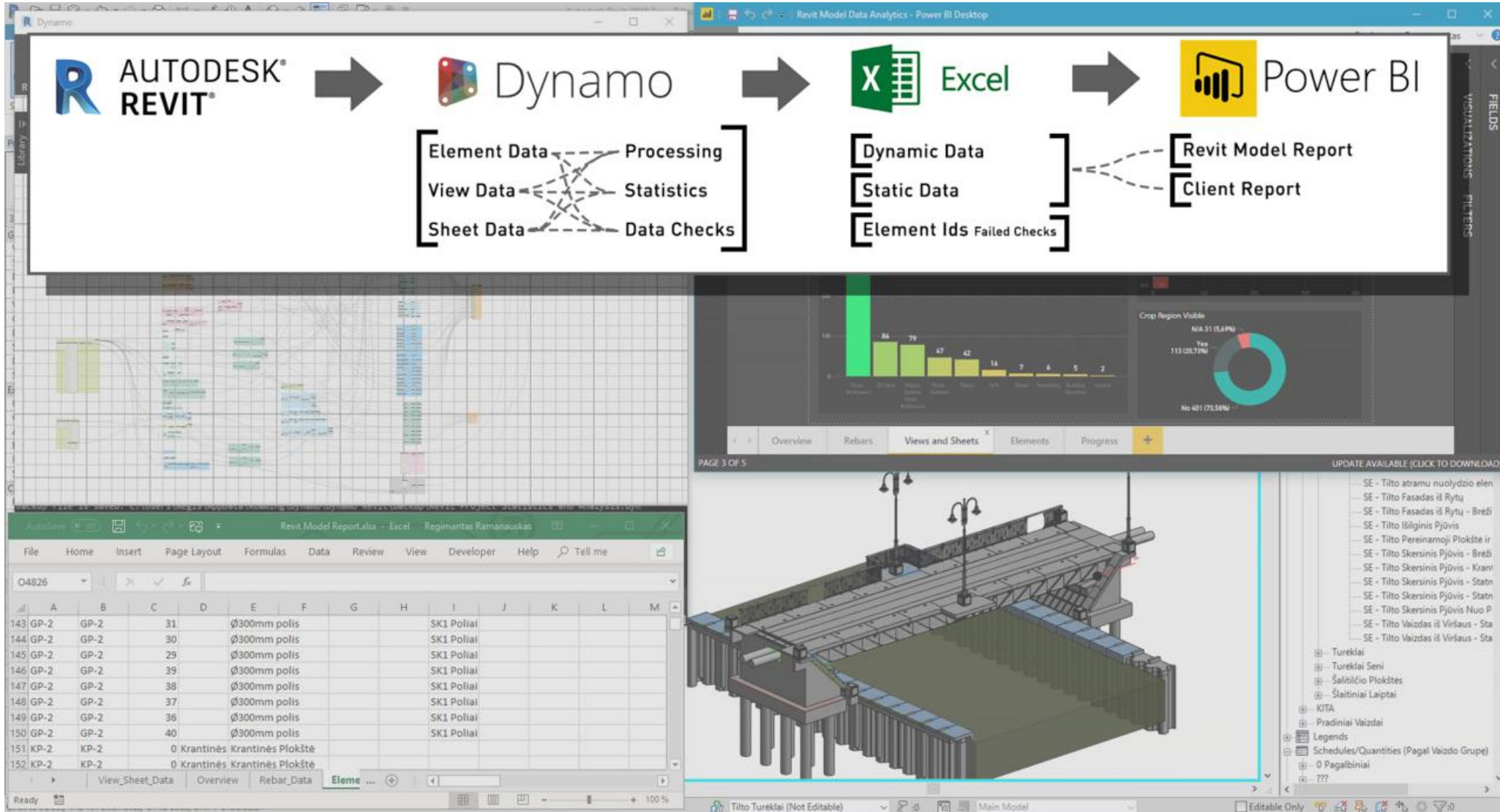


DATA USERS





RAMS FOR DIGITAL TWINS AND BIM



AUTODESK REVIT → **Dynamo** → **Excel** → **Power BI**

Dynamo Processing:

- Element Data
- View Data
- Sheet Data
- Processing
- Statistics
- Data Checks

Excel Data:

- Dynamic Data
- Static Data
- Element Ids Failed Checks

Power BI Reports:

- Revit Model Report
- Client Report

Excel Data Table:

	A	B	C	D	E	F	G	H	I	J	K	L	M
143	GP-2	GP-2	31	Ø300mm polis					SK1 Poliai				
144	GP-2	GP-2	30	Ø300mm polis					SK1 Poliai				
145	GP-2	GP-2	29	Ø300mm polis					SK1 Poliai				
146	GP-2	GP-2	39	Ø300mm polis					SK1 Poliai				
147	GP-2	GP-2	38	Ø300mm polis					SK1 Poliai				
148	GP-2	GP-2	37	Ø300mm polis					SK1 Poliai				
149	GP-2	GP-2	36	Ø300mm polis					SK1 Poliai				
150	GP-2	GP-2	40	Ø300mm polis					SK1 Poliai				
151	KP-2	KP-2	0	Krantinės Plokštė									
152	KP-2	KP-2	0	Krantinės Plokštė									

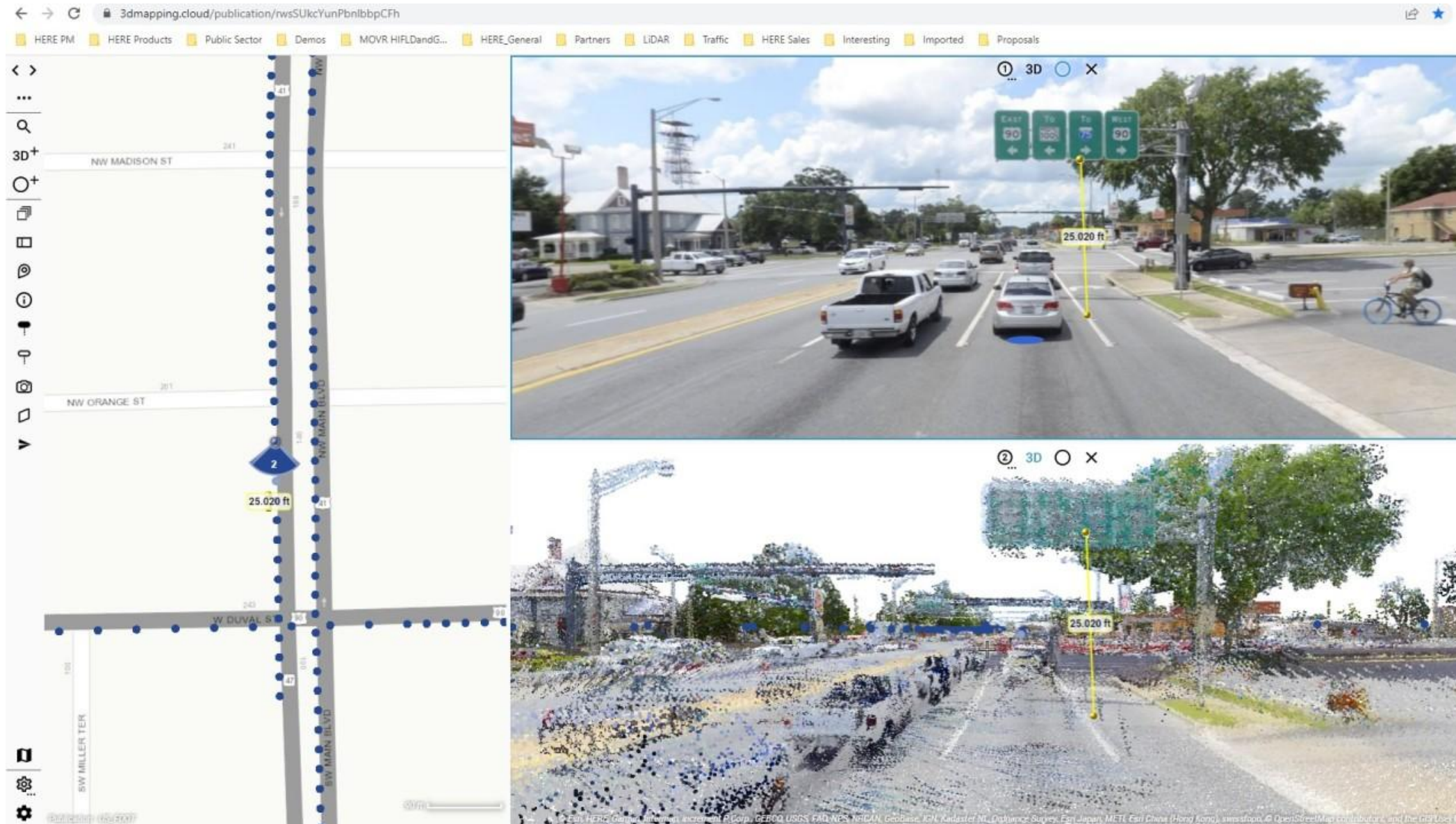
Power BI Dashboard:

- Bar chart showing data distribution.
- Donut chart showing 'Crop Region Visible' status: Yes (113 (20.73%)) and No (401 (75.58%)).
- Navigation tabs: Overview, Rebars, Views and Sheets, Elements, Progress.

3D BIM Model:

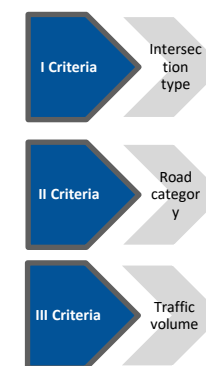
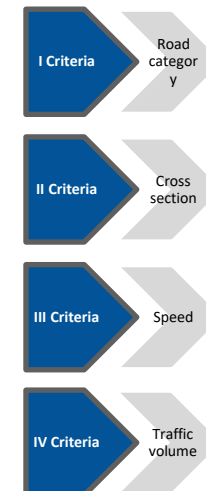
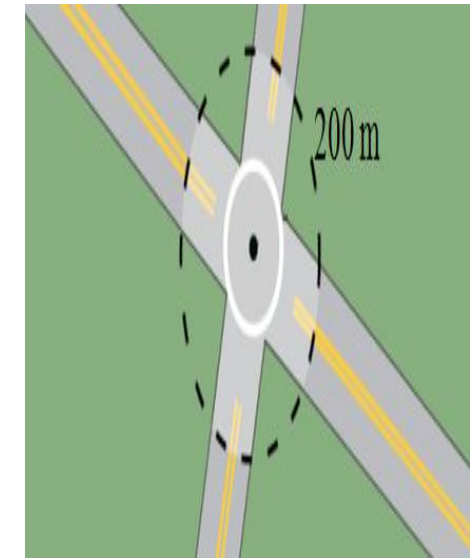
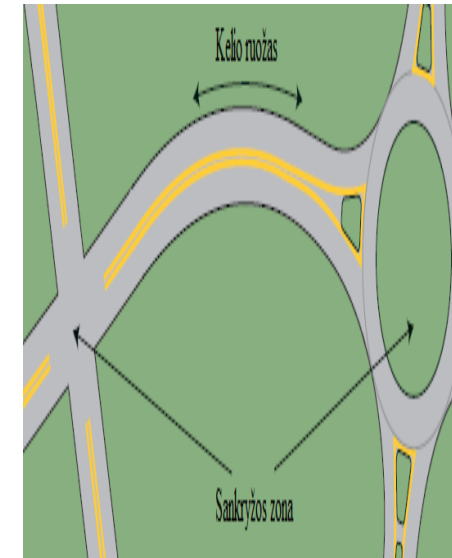
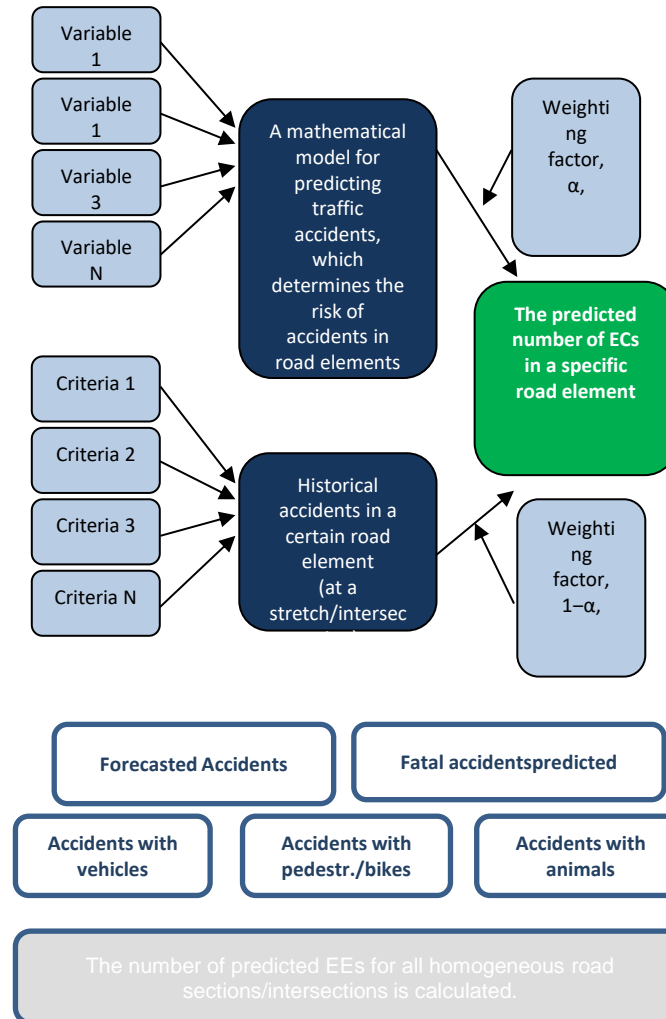
- 3D visualization of a building structure.
- Legend: Tureklai, Tureklai Seni, Šaltinio Plokštės, Šlaitiniai Laiptai, KITA, Pradiniai Vaizdai, Legends, Schedules/Quantities (Pagal Vaizdo Grupę), 0 Pagalbiniai, ???

RAMS FOR DIGITAL TWINS AND BIM



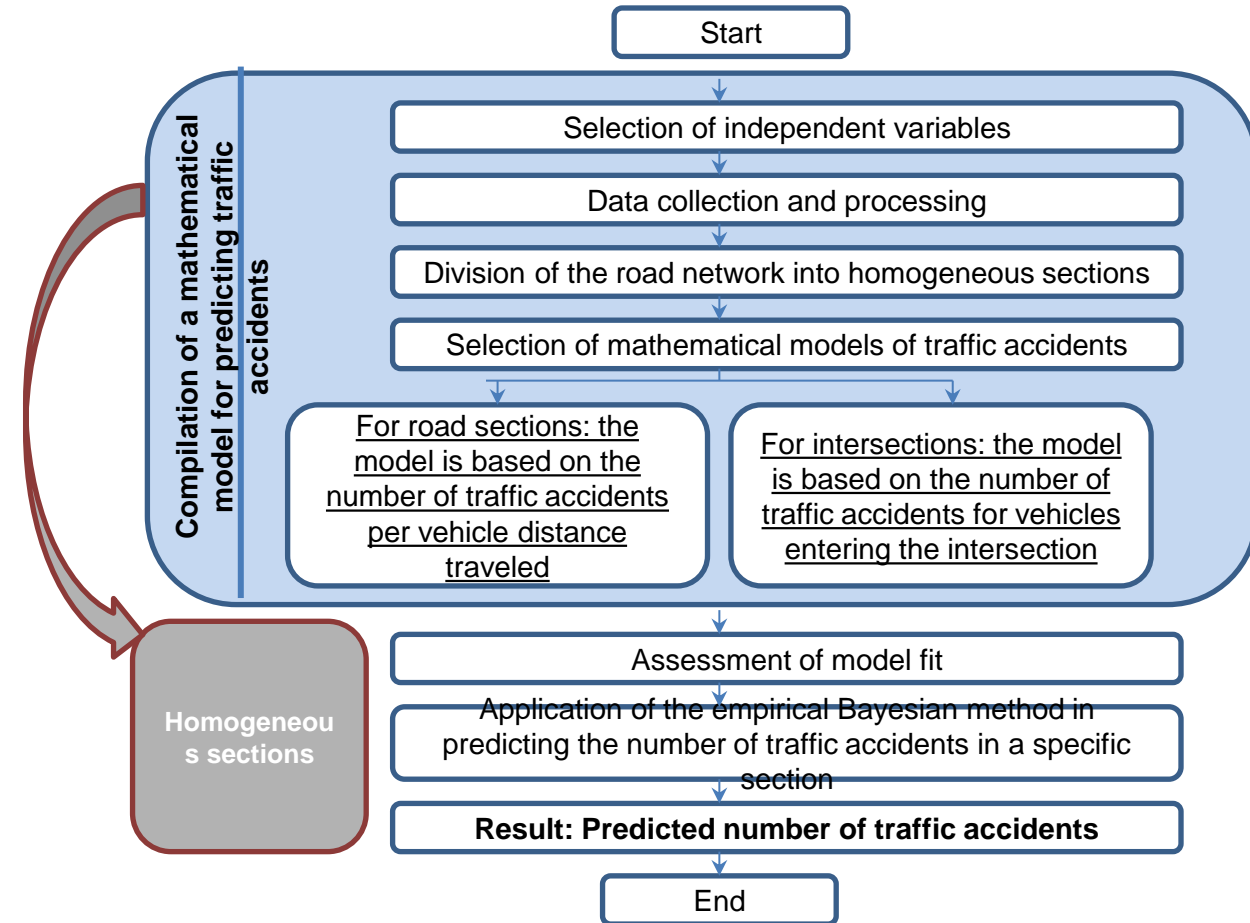
TARVA LT TOOL FOR EFFECTIVENESS CALCULATION OF ROAD SAFETY MEASURES (1)

- Many researchers note that the empirical Bayesian method is well developed and widely used in the field of traffic safety
- This approach is based on the assumption that there is a similar risk of accidents in similar environments with similar traffic conditions
- Using an empirical Bayesian method, the predicted number of traffic accidents is determined by combining two sources of information: 1) historical traffic accidents data on a certain element of the road; and 2) a mathematical model for predicting traffic accidents, which determines the risk of traffic accidents in road elements similar in their environment

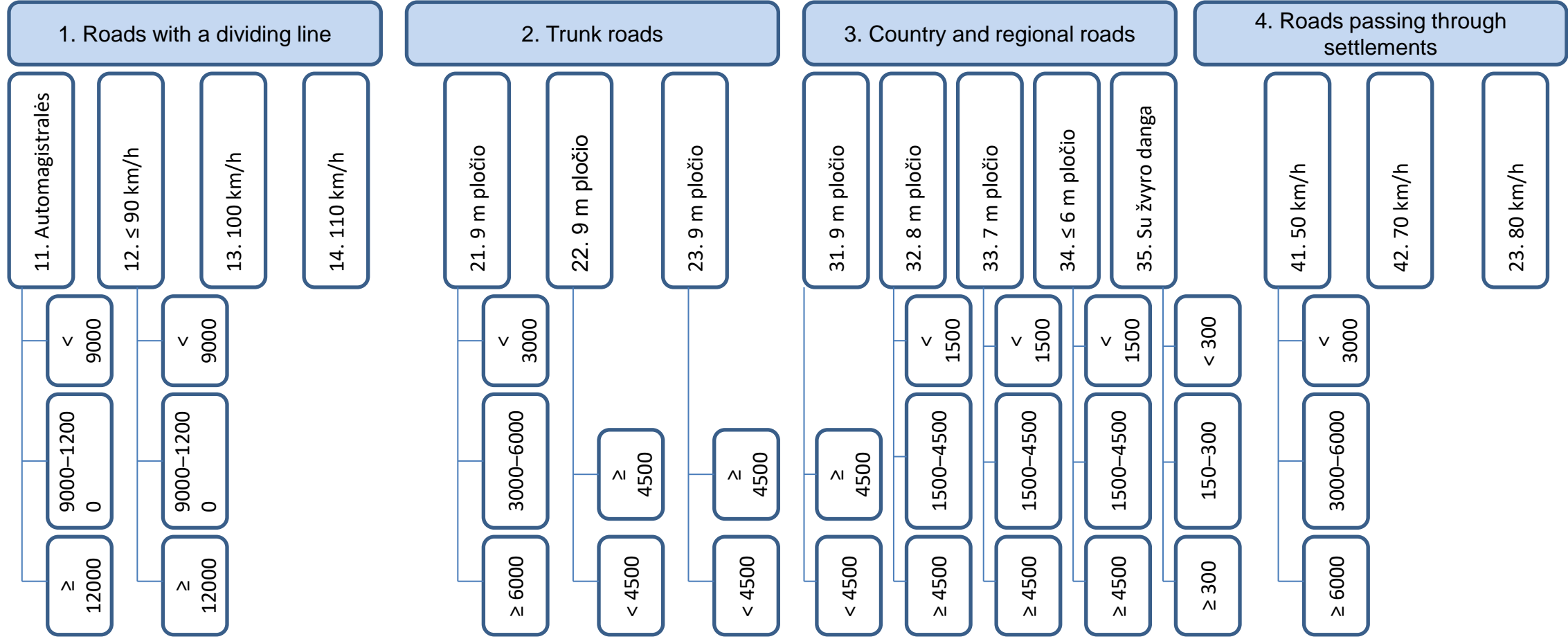


TARVA LT TOOL FOR EFFECTIVENESS CALCULATION OF ROAD SAFETY MEASURES (2)

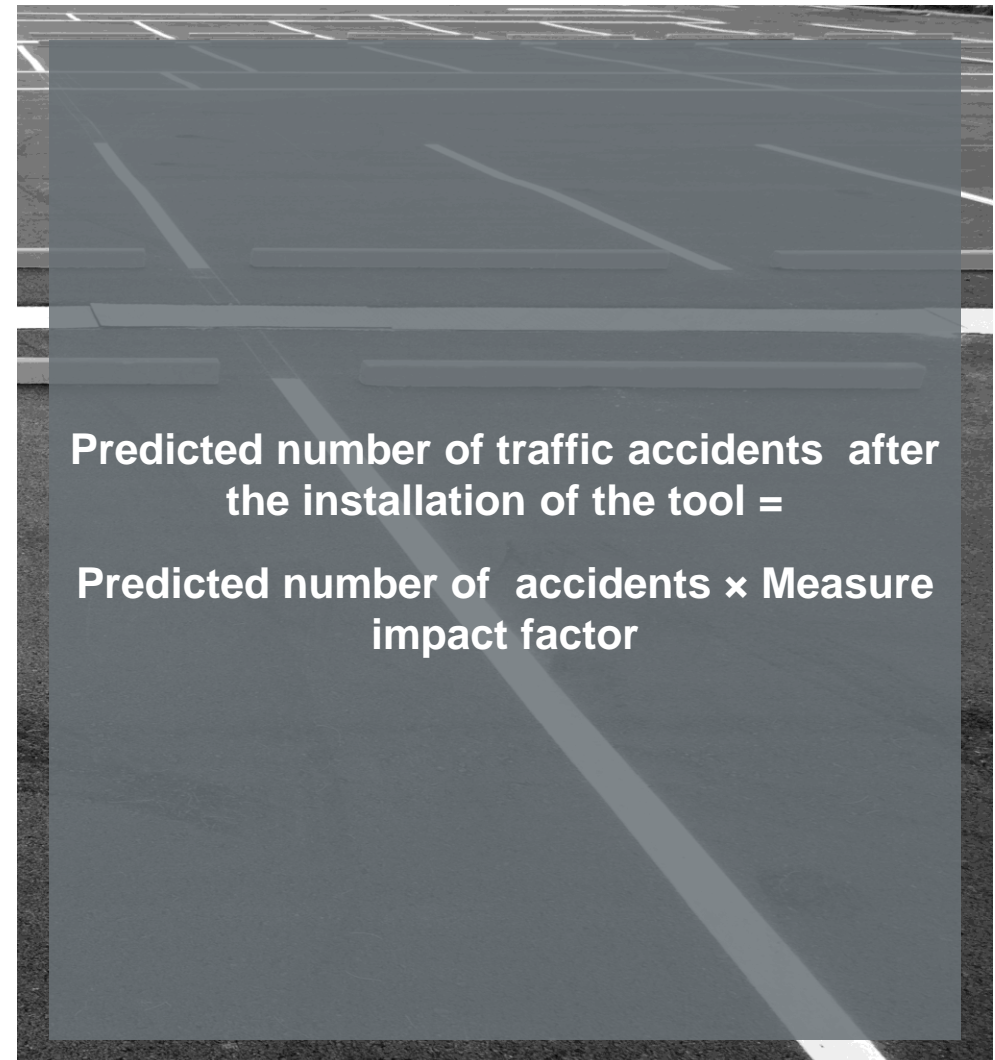
- It should be noted that the frequency of traffic accidents is influenced by many variables, which are usually related to traffic flow, section length, geometric parameters of the road infrastructure, condition of the road surface, lighting, weather conditions, driver behavior, etc.
- When driving on different sections of the road, the probability of getting into a traffic accident is different due to different geometric parameters of the road, different traffic conditions, different road environment, etc.
- Taking this into account, the functional purpose of the road, the transverse profile of the road, traffic volume, the environment surrounding the road, and the permissible driving speed are selected as the main variables.
- Different mathematical models for predicting traffic accidents are created for different types of roadbed elements.
- For road sections: the model is based on the number of traffic accidents for the distance traveled by vehicles, and for intersections - the number of traffic accidents for the number of vehicles entering the intersection.



TARVA LT TOOL FOR EFFECTIVENESS CALCULATION OF ROAD SAFETY MEASURES (3)



- Tarva LT, a computer program for assessing the safety of the road network, was created for roads of Lithuanian state importance.
- The program was created in cooperation with the specialists of the Public Road and Transport Research Institute, the Finnish Technical Research Center VTT and the computer equipment company Simsoft Oy.
- Tarva LT allows the user to perform simple actions, without entering additional information, to predict the expected number of traffic accidents on a certain road or road section, and to assess the impact of road safety-improving measures on accidents.



TARVA LT TOOL FOR EFFECTIVENESS CALCULATION OF ROAD SAFETY MEASURES (5)

Tarva LT 5.1 Web

Byla | Traukti | Išėiti | Pagalba

Projekto pavadinimas:

Apibūdinimas:

Rodyti: Kelio ruožo duomenų lentelė Priemonių pasirinkimo lentelės

Kelias: Tikslus ruožo vertinimas

Pažymėkite stulpelius, kuriuos norite matyti:

Stulp...	Mato...	Stulpelio ar stulpelių grupės pavadinimas
-	<input checked="" type="checkbox"/>	Kelio ruožo informacija
-	<input type="checkbox"/>	Priemonės ir jų efektyvumas
-	<input checked="" type="checkbox"/>	Duomenys apie istorinius ir tikėtinus E
-	<input checked="" type="checkbox"/>	Sankryžų pogrupių informacija
-	<input checked="" type="checkbox"/>	Kelio ruožų pogrupių informacija

Kelias	Ruoža		Ilgis	Kelių priežiūros įmonės	VMPEI	Rida	Viso	Tikėtinas EĮ metus		
	Pradžia	Pabaiga						EĮ su	EĮ su pėsč. ir dvir.	EĮ su gyvūnais
A2	45.010	126.941	81.931		7360	220.28	7.12940	5.72192	1.07831	0.32917
A2	45.010	46.196	1.186	Automagistralė	9104	3.94	0.10543	0.07165	0.03052	0.00327
A2	46.196	46.196	0.000	Automagistralė	9898	0.00	0.01282	0.00649	0.00627	0.00007
A2	46.196	50.913	4.717	Automagistralė	9104	15.67	0.46915	0.31782	0.13779	0.01354
A2	50.913	50.913	0.000	Automagistralė	10196	0.00	0.01324	0.00687	0.00630	0.00007
A2	50.913	57.401	6.488	Automagistralė	9104	21.56	0.57271	0.45900	0.09513	0.01859
A2	57.401	57.401	0.000	Automagistralė	9286	0.00	0.09097	0.05234	0.03856	0.00007
A2	57.401	64.620	7.219	Automagistralė	9104	23.99	0.60954	0.44832	0.14058	0.02064
A2	64.620	64.620	0.000	Automagistralė	10113	0.00	0.01312	0.00676	0.00629	0.00007
A2	64.620	70.020	5.400	Automagistralė	9104	17.94	0.47328	0.34028	0.11750	0.01550
A2	70.020	70.026	0.006	Automagistralė	8586	0.02	0.00222	0.00119	0.00049	0.00054
A2	70.026	70.026	0.000	Automagistralė	10474	0.00	0.01364	0.00723	0.00633	0.00008
A2	70.026	72.156	2.130	Automagistralė	8586	6.68	0.22927	0.19513	0.01861	0.01553
A2	72.156	72.156	0.000	Automagistralė	8923	0.00	0.11302	0.05056	0.06240	0.00007
A2	72.156	74.726	2.570	Automagistralė	8586	8.05	0.26464	0.22677	0.02068	0.01719
A2	74.726	74.726	0.000	Automagistralė	14104	0.00	0.01958	0.01277	0.00670	0.00010
A2	74.726	78.436	3.710	Automagistralė	8586	11.63	0.34815	0.30194	0.02528	0.02092
A2	78.436	78.436	0.000	Automagistralė	8854	0.00	0.01143	0.00524	0.00613	0.00007
A2	78.436	78.450	0.014	Automagistralė	8586	0.04	0.00425	0.00252	0.00084	0.00088
A2	78.450	90.737	12.287	Automagistralė	6243	28.00	0.68977	0.61728	0.03961	0.03288
A2	90.737	90.737	0.000	Automagistralė	6730	0.00	0.00896	0.00309	0.00582	0.00005
A2	90.737	103.670	12.933	Automagistralė	6243	29.47	0.97118	0.79536	0.14210	0.03372
A2	103.670	103.670	0.000	Automagistralė	6447	0.00	0.05958	0.03718	0.02235	0.00005
A2	103.670	110.382	6.712	Automagistralė	6243	15.29	0.54574	0.47038	0.02924	0.04612
A2	110.382	110.382	0.000	Automagistralė	6286	0.00	0.05779	0.03624	0.02150	0.00005
A2	110.382	119.517	9.135	Automagistralė	6243	20.82	0.67546	0.58716	0.03424	0.05406
A2	119.517	119.517	0.000	Automagistralė	6285	0.00	0.00848	0.00269	0.00574	0.00005
A2	119.517	121.595	2.078	Automagistralė	6243	4.74	0.18876	0.16059	0.01529	0.01287
A2	121.595	121.595	0.000	Automagistralė	6872	0.00	0.07663	0.06712	0.00946	0.00005

Kelio ruožų pogrupių informacija

Pasirinkite ir apibūdinkite priemonę

Numeris	Priemonės pavadinimas	EĮ su TP	EĮ su...	EĮ su...
0	Esama eismo saugumo situacija	1	1	1
101	Pėsčiųjų/dviračių tako įrengimas už važiuojamosios dalies	1	0.8	1
102	Dviračių tako įrengimas ant važiuojamosios dalies	0.9	0.85	0.95
103	Pėsčiųjų ir dviratininkų eismo atskyrimas gerai juostomis	1	0.9	1
104	Pėsčiųjų/dviračių tako rekonstravimas	1	0.9	1
105	Tinklo tvoros nuo pėsčiųjų/dviratininkų kelkraščių	1	0.7	0.6
106	Tinklo tvoros nuo pėsčiųjų/dviratininkų skiriamųjų juostų	1	0.85	1
107	Pėsčiųjų/dviratininkų tikrosios važiuojamosios dalies	1	0.7	1

Poveikio plotas: Kelias:
 Pradžia: Km:
 Pabaiga: Km:
 Bendras ilgis:
 Km:

Informacija apie projektą ir kainą: Projekto numeris:
 Kaina (1000Lt): Vieneto kaina
 Kaina/km

Priemonės pavadinimas iš sąrašo

Komentaras:

TARVA LT TOOL FOR EFFECTIVENESS CALCULATION OF ROAD SAFETY MEASURES (6)

Object data		
Title	Meaning	
1	2	
Road no.	A2	
Road name	Vilnius - Panevėžys	
Beginning of the section, km	46.00	
End of section, km	126.00	
Length of the section, km	80.00	
VMPEI, TP/day	7159	
Emergency during the period (from-to)	2010-2014	
Historical traffic events/year	6.6	
Forecasted traffic incidents/year	7,129	
Measures to improve traffic safety are proposed		
	Traffic accidents decrease/year	
	Option 1	Option 2
Installation of road lighting on flexible supports	0.258	0.258
Installation of a long mesh fence against animals (≥ 5 km)	0.091	
Installation of steel fences on roadsides	0.090	
Installation of a net fence from people on the roadsides	0.131	
Implementation of an automated speed control system		1,242
	Total:	
	0.570	1,500
Investments required to prevent the 1st traffic accident, thousand. EUR	142,534	42,466



- Traffic restrictions (temporary)
- Traffic restrictions
- Cameras
- Variable information signs
- Speed cameras
- Average speed control sections
- Electric vehicle charging stations
- Levels of road maintenance
- Road surface course
- Toll roads
- Vignette selling points
- Accident-prone road sections
- Places to visit (source lietuvon.lt)
- Rest areas
- Annual average daily traffic
- Traffic control equipment
- Frost zones
- Asphalt surface temperature zones

TRAFFIC ACCIDENTS' PREDICTION MAP AND MEASURES PLANNING PLATFORMS

arogis.com/apps/instan/minimalist/index.html?appid=d0994fc74c4348158c0916dc3b37314d

Vij Transporto kompetencijų agentūra | 2017-2023 m. eismo įvykių, kuriuose nukentėjo asmenys, žemėlapis

Open layer list

- Eismo įvykiai 2023 m.
- Eismo įvykiai 2022 m.
- Eismo įvykiai 2021 m.
- Eismo įvykiai 2020 m.
- Eismo įvykiai 2019 m.
- Eismo įvykiai 2018 m.
- Eismo įvykiai 2017 m.

Eismo įvykio vieta

Kelio Nr.: 1709
Vieta, km: 25.300
Eismo įvykio rūšis: Apribojimas

eismoinfo.lt

Naujienos Kelių oro sąlygos Vaizdo kameros

Kur vyksite?

Kelmė

Surinkimo data: 2024-06-24 01:35
Oro temperatūra (°C): 14.0
Rasos taškas (°C): 13.53
Sausa
Kelio dangos būklė
Kelio dangos temperatūra (°C): 15.7
Maksimalus vėjo greitis (m/s): 2.3
Vidutinis vėjo greitis (m/s): 1.5
Vėjo kryptis: Vakarų
Sukibimo koeficientas: Labai geras(0.82)

NVŽR GIS

https://maps.ird.lt/map/

ird EISMO ĮVYKIŲ INFORMACINIS SISTEMOS DUOMENŲ ŽEMĖLAPIS

Duomenys apie eismo įvykį

Įvykio data ir laikas: 2023-08-27 00:30:00

Dalyvių skaičius: 2

Žuvusiųjų skaičius: 0

Sužeistųjų skaičius: 0

Meteorologinės sąlygos: Apsiniaukę

Žemėlapis informacija

Apibendrinta | Detali

- Kelių oro sąlygos
 - Stotelė neveikia
 - Nėra perspėjimų
 - Silpnas lietus
 - Slidi kelio danga
 - Drėgna kelio danga
- Eismo intensyvumas
 - Lėtas eismas
 - Normalus eismas
 - Eismo sutrikimai
- Eismo ribojimai dėl darbų
 - Perkėla
 - Kliūtis
 - Pažeista kelio danga
 - Priežiūros darbai
- Eismo apribojimai
 - Greičio apribojimas

Tables Affiliated with Crash Statistics:

Table 10-3: Distribution for Crash Severity Level on Rural Two-Lane Two-Way Roadway Segments plus Locally-Derived Values

Crash severity level	Locally-Derived Values?	No	HSM-Provided Values	Locally-Derived Values (Oregon)
Fatal		1.3	1.3	3.1
Incapacitating Injury		5.4	7.7	7.7
Nonincapacitating Injury		10.9	25.2	25.2
Possible Injury		14.5	19.0	19.0
Total Fatal Plus Injury		32.1	54.0	54.0
Property Damage Only		67.9	46.0	46.0
TOTAL		100.0	100.0	100.0

Table 10-4: Default Distribution by Collision Type for Specific Crash Severity Levels on Rural Two-Lane Two-Way Roadway Segments plus Locally-Derived Values

Collision type	Locally-Derived Values?	No	HSM-Provided Values		Locally-Derived Values (Oregon)	
			Total fatal and injury	Property damage only	TOTAL (all severity levels combined)	TOTAL (all severity levels combined)
SINGLE-VEHICLE CRASHES						
Collision with animal		3.8	18.4	12.1	3.1	7.2
Collision with bicycle		0.4	0.1	0.2	0.6	0.3
Collision with pedestrian		0.7	0.1	0.3	0.8	0.4
Overturned		3.7	1.5	2.5	6.6	4.4
Ran off road		54.5	50.5	52.1	47.2	43.5
Other single-vehicle crash		0.7	2.9	2.1	1.7	1.5
MULTIPLE-VEHICLE CRASHES						
Angle collision		10.0	7.2	8.5	6.8	6.8
Head-on collision		3.4	0.3	1.6	3.4	3.6
Rear-end collision		16.4	12.2	14.2	18.8	20.1
Sideswipe collision		3.8	3.8	3.7	4.4	5.6
Other multiple-vehicle collision		2.6	3.0	2.7	6.2	10.6
Total multiple-vehicle crashes		36.2	26.5	30.7	38.6	40.7
TOTAL CRASHES		100.0	100.0	100.0	100.0	100.0

Table 10-12: Nighttime Crash Proportions for Unlighted Roadway Segments plus Locally-Derived Values

Roadway Type	HSM Default Values		Locally-Derived Values	
	Proportion of total nighttime crashes by severity level	Proportion of crashes that occur at night	Fatal and Injury P _{se}	P _{no}
2U	0.382	0.370	0.640	0.280

Instructions Segment_1 Intersection_1 Summary Tables (Site Totals) Summary Tables (Project Total) Reference Tables (Segment) Reference Tables (Intersection)

NUSIKALSTAMOS VEIKOS ADMINISTRACINIAI NUSIZENGINIMAI EISMO ĮVYKIAI

EISMO ĮVYKIAI VISO: 23282

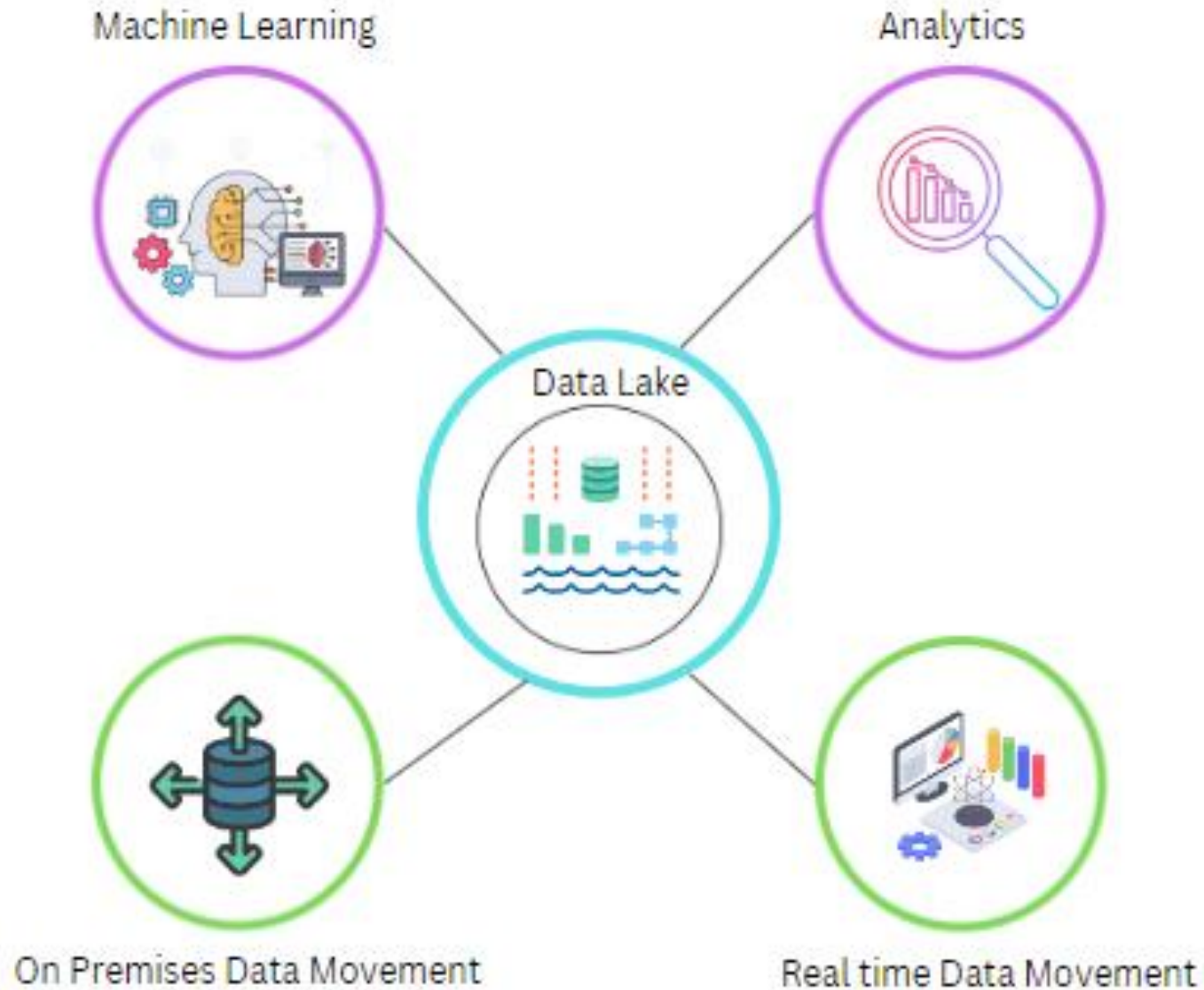
Pasirinkite datas

Nuo: 2022-01-01 iki: 2022-12-31

Galite nurodyti ne ilgiau nei 1 metų laikotarpį nuo 2014-01-01 iki šios dienos (imtinai).

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NEAREST FUTURE – TRANSPORT SECTOR DATA LAKE



ROAD ASSET MANAGEMENT SYSTEMS (RAMS) SERVE MULTIPLE CRITICAL PURPOSES

01 OPTIMIZATION OF MAINTENANCE AND RESOURCE ALLOCATION

02 DATA COLLECTION AND MANAGEMENT

03 IMPROVED DECISION-MAKING

04 ECONOMIC EFFICIENCY AND COST SAVINGS

05 ENHANCED SAFETY AND USER EXPERIENCE

06 COMPLIANCE AND REPORTING

07 SUSTAINABILITY AND ENVIRONMENTAL CONSIDERATIONS