

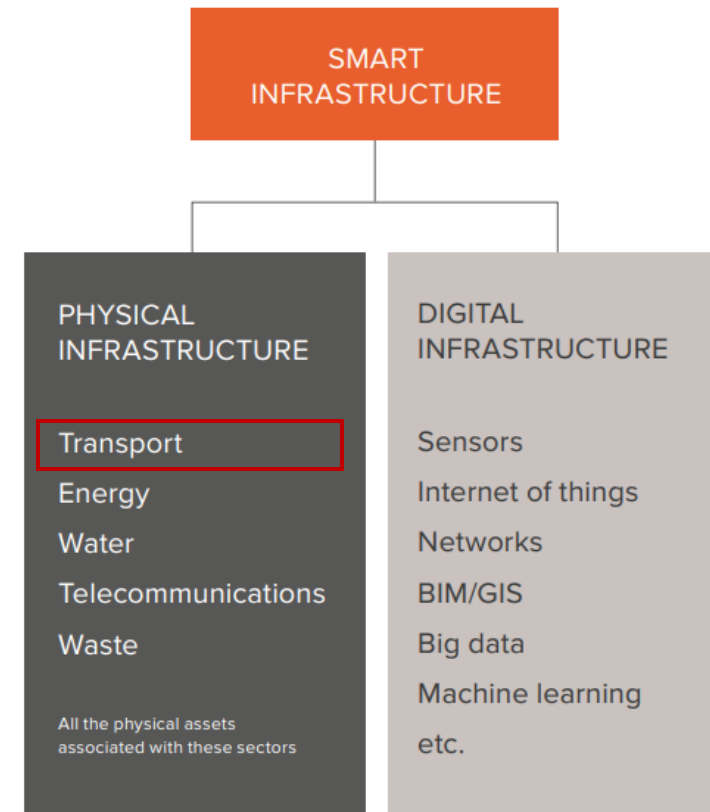
# SMART INFRASTRUCTURE PLANNING

Online workshop

Dovydas Skrodenis

# WHAT IS SMART INFRASTRUCTURE

Smart Infrastructure is the result of combining physical infrastructure with digital infrastructure, providing improved information to enable better decision making, faster and cheaper



# WHAT IS SMART CITY

Smart urban infrastructures are perhaps the systems that play the most role in smart cities getting the title of “smart”. A smart city is seen as an innovative city that offers **well-managed, sustainable, healthy, fair living conditions and its people are happy, and the most critical functions in providing all these are assumed by smart infrastructure systems** and related basic and digital services.

## Key Features of Smart Infrastructure:

- ✓ **Real-time Data Collection** – Uses IoT sensors, cameras, and AI to monitor conditions
- ✓ **Automation & AI-driven Decision Making** – Optimizes traffic flow and maintenance
- ✓ **Connectivity & Smart Systems** – Integrates 5G, cloud computing, and vehicle-to-infrastructure (V2I) communication
- ✓ **Sustainability Focus** – Reduces emissions, improves energy efficiency, and extends infrastructure lifespan

# SMART INFRASTRUCTURE PLANNING: REVOLUTIONIZING ROADS AND STREETS

Before	Now
Manual traffic surveys (people counting vehicles)	AI-powered cameras & IoT sensors
Roadside cameras (limited coverage)	5G-connected smart cameras
Inductive loop sensors under roads	GPS & mobile data from vehicles
Periodic government studies	Real-time data analytics
<b>Guess which link or connection in the network will work</b>	<b>Preparation of transport model</b>

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# INFRASTRUCTURE PLANNING CASE OF LITHUANIA

## PROBLEM

*Dangaus g. – Liepų g. intersection*



*Dangaus g. – Ežero g. – Smeltaitės g. intersection*



*Planetų g. – Pajūrio g. intersection*

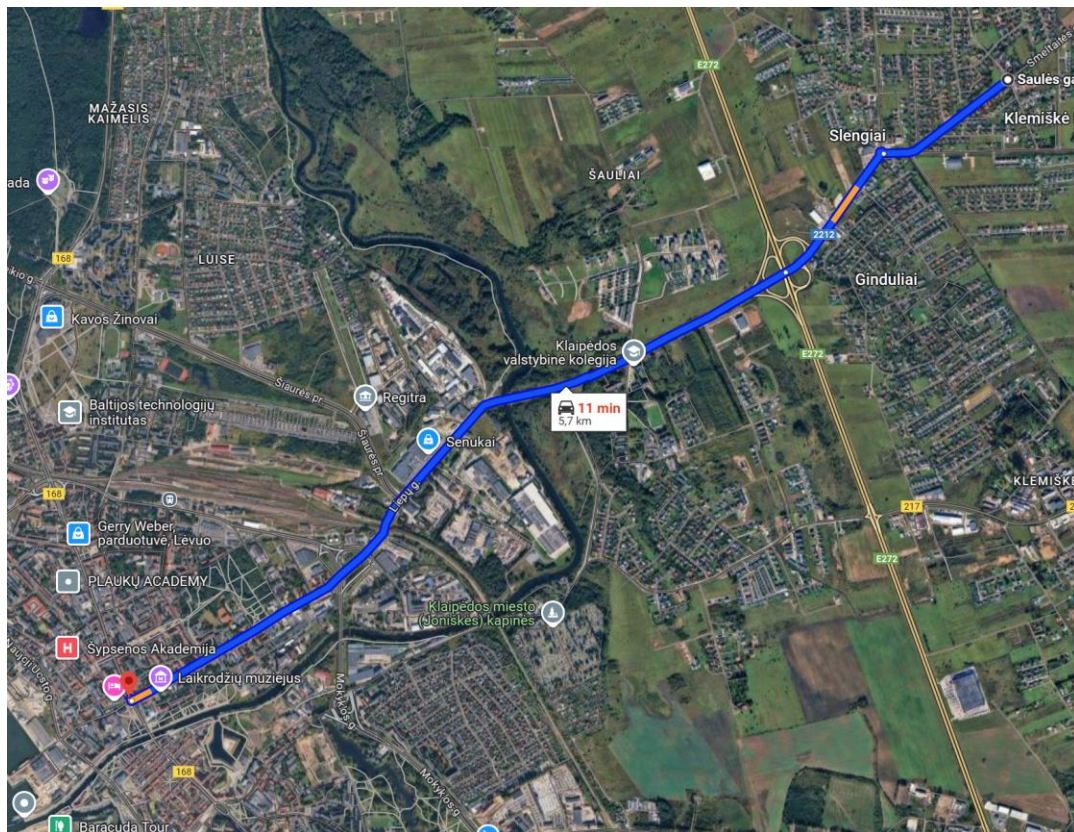


*Dangaus g. – Liepų g. – Palangos pl. intersection*

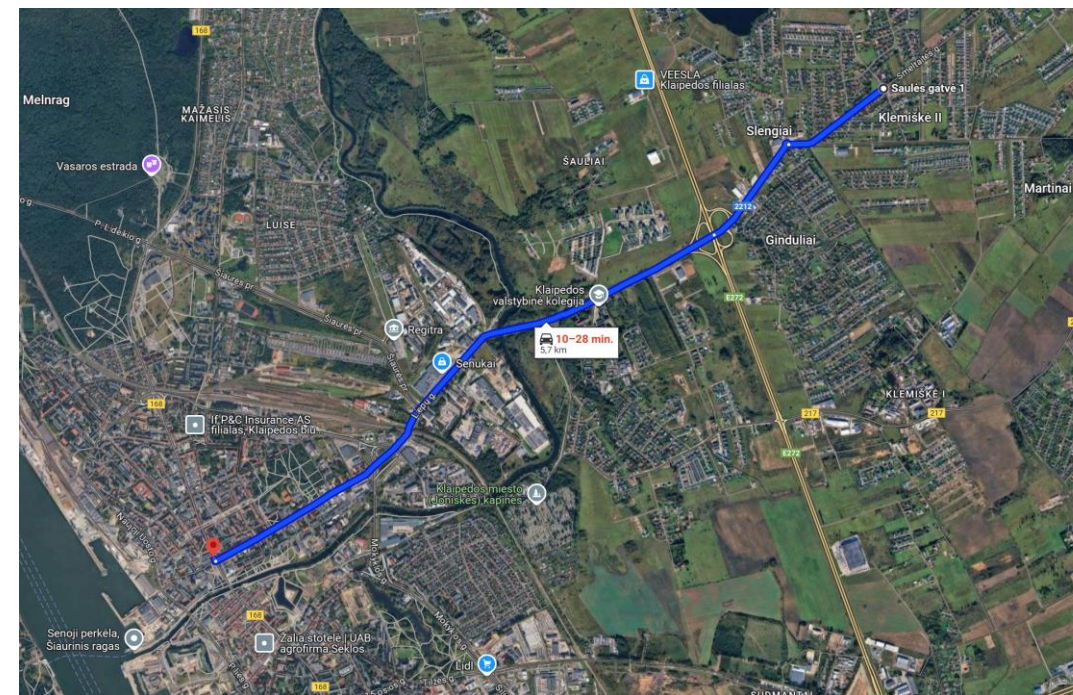


# INFRASTRUCTURE PLANNING CASE OF LITHUANIA

## PROBLEM

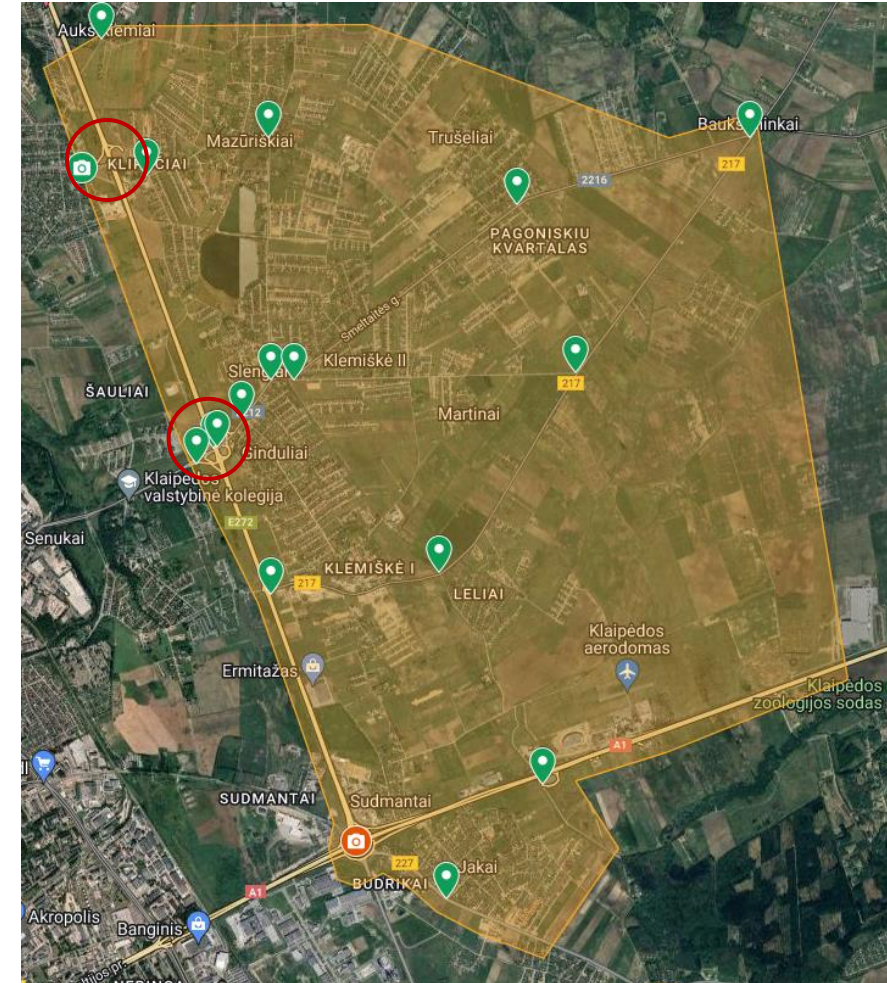


Non-peak hours

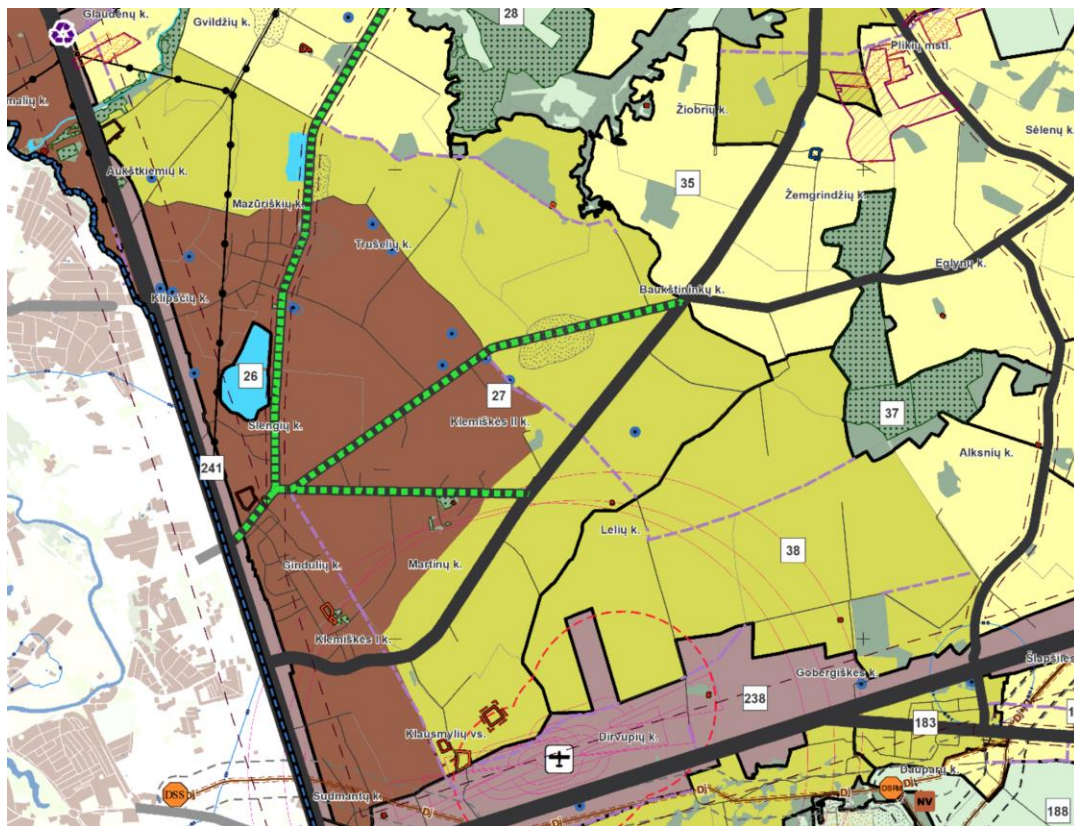


Morning peak hours

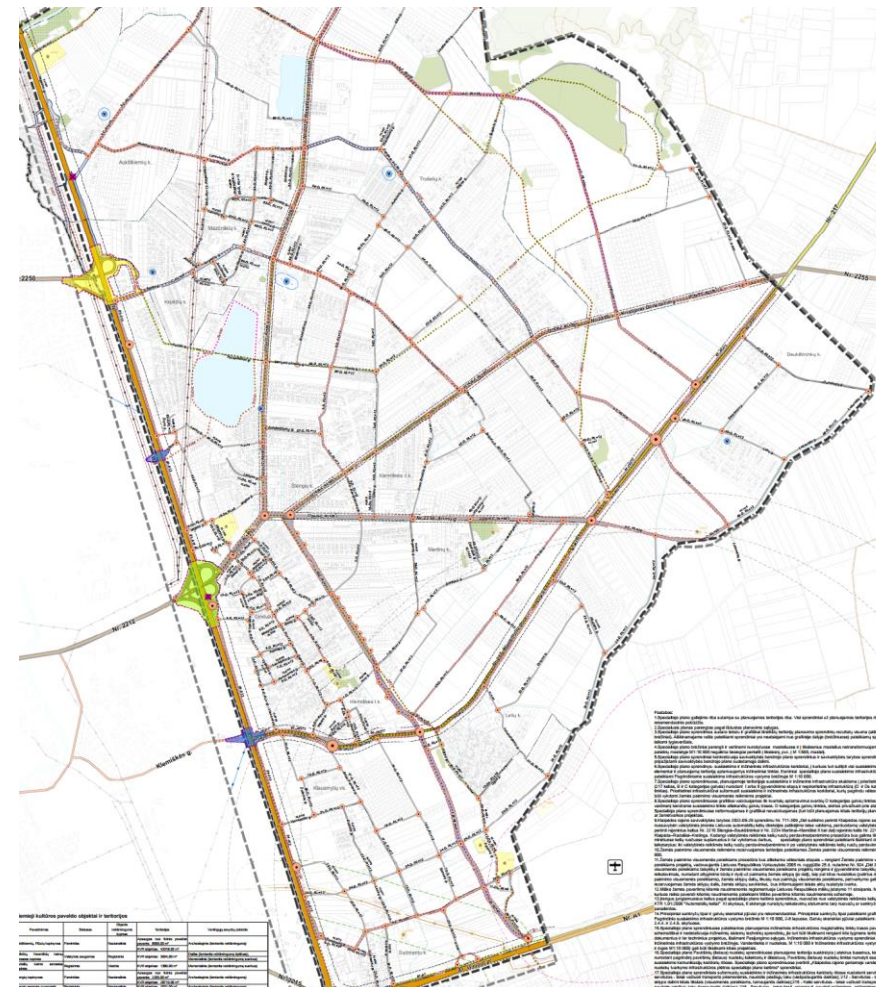
- 📍 The area next to **Klaipėda city** relies on **two major connections** between Klaipėda district and the city.
- 🚚 **Vehicle transit traffic** causes congestion.
- ⌚ **Traffic jams last up to 30 minutes**, affecting commuters, logistics, and air quality.



*Territory plan*



General Territory Plan



Special Territory Plan

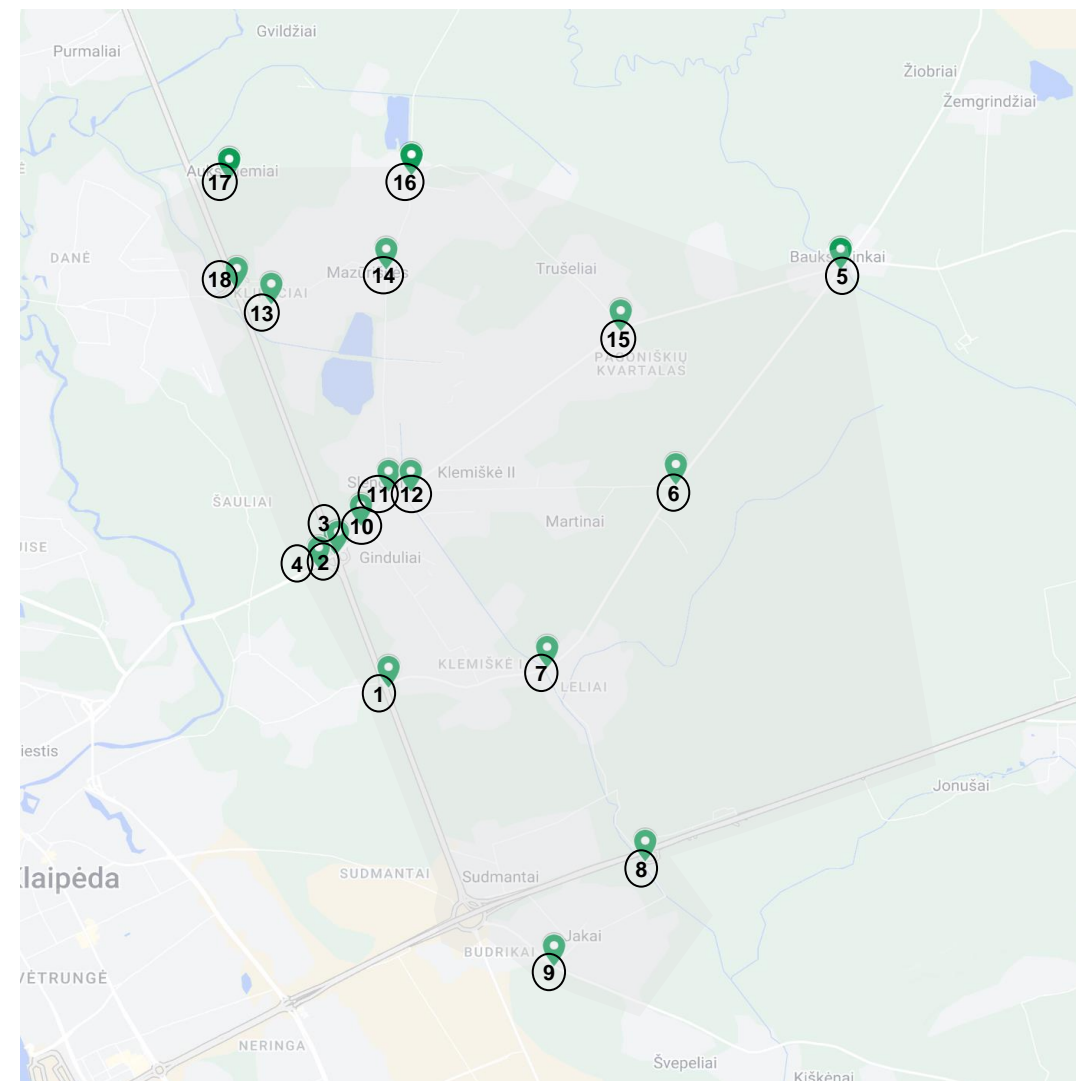
# INFRASTRUCTURE PLANNING CASE OF LITHUANIA

## TRAFFIC COUNTS

Traffic studies were conducted at **18 intersections**, analyzing vehicle movement during the **morning and evening peak hours** for each intersection. In total, **over 100 hours of footage** from all intersections were analyzed.



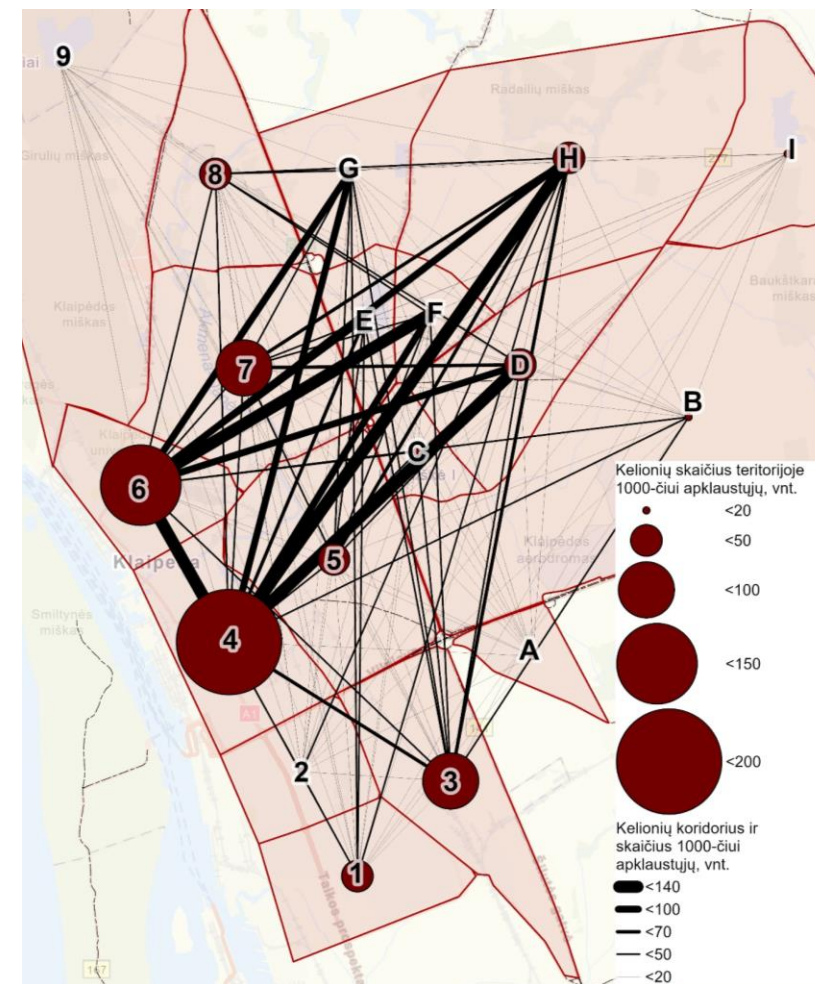
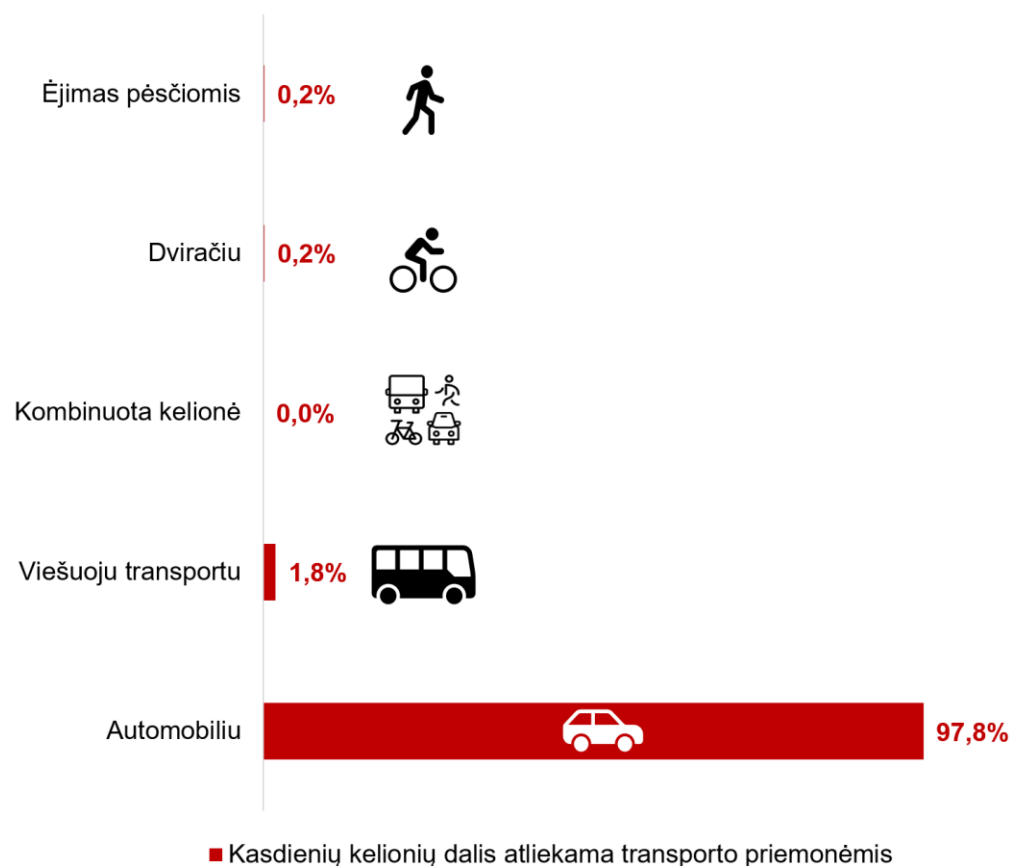
*Screenshot from AI tool from vehicle detection*



*Traffic count collection points in the area*

# INFRASTRUCTURE PLANNING CASE OF LITHUANIA SURVEY

A survey was conducted with **1,183** residents from the studied area of Klaipėda district (including Ginduliai, Slengiai, Klemiškė, and surrounding areas), representing approximately 5.71% of the total 20,710 residents in the municipality.

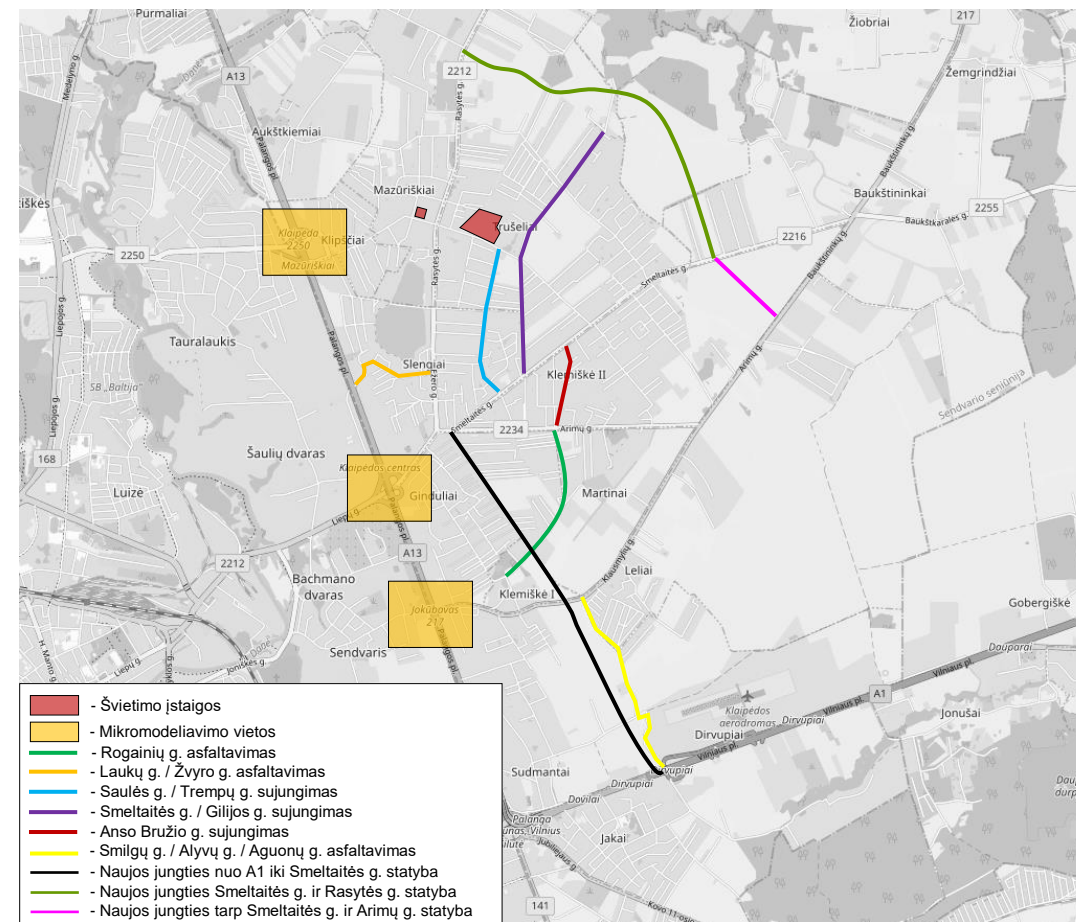


Trip attractions

At the **macro-modeling level**, the plan includes assessing **new infrastructure** that is either under construction or planned for the near future (e.g., educational institutions, street reconstruction, etc.).

Additionally, **future connections** are evaluated to determine their potential impact on **traffic flow redistribution** and whether they would improve connectivity in the studied area.

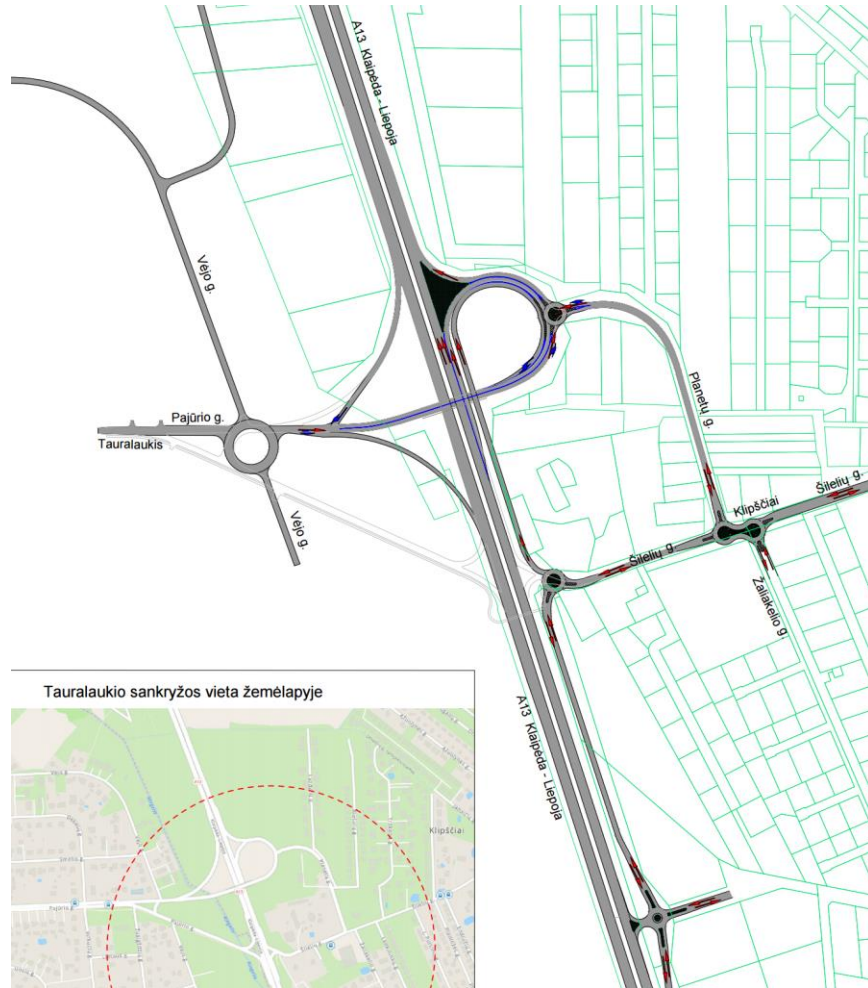
At the **micro-modeling level**, individual intersections—especially those at the **junctions with Klaipėda city**—are analyzed in greater detail. This includes examining **traffic management schemes, lane configurations, movement directions, intersection layouts, and other parameters** to optimize traffic flow.



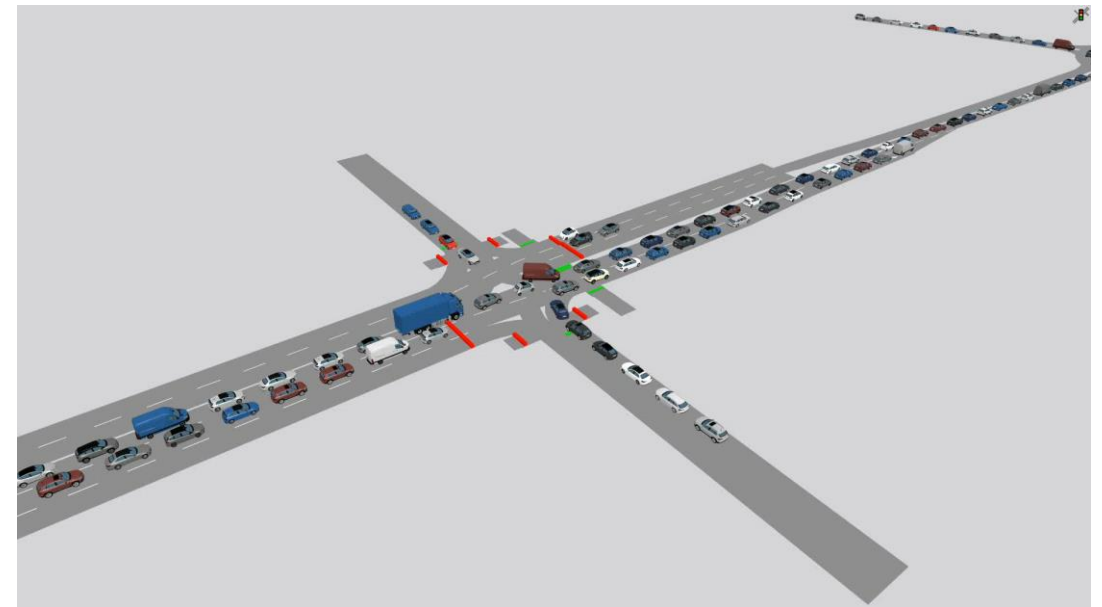
Planned Modeling Work Scheme

# INFRASTRUCTURE PLANNING CASE OF LITHUANIA

## ACTUAL INTERSECTIONS



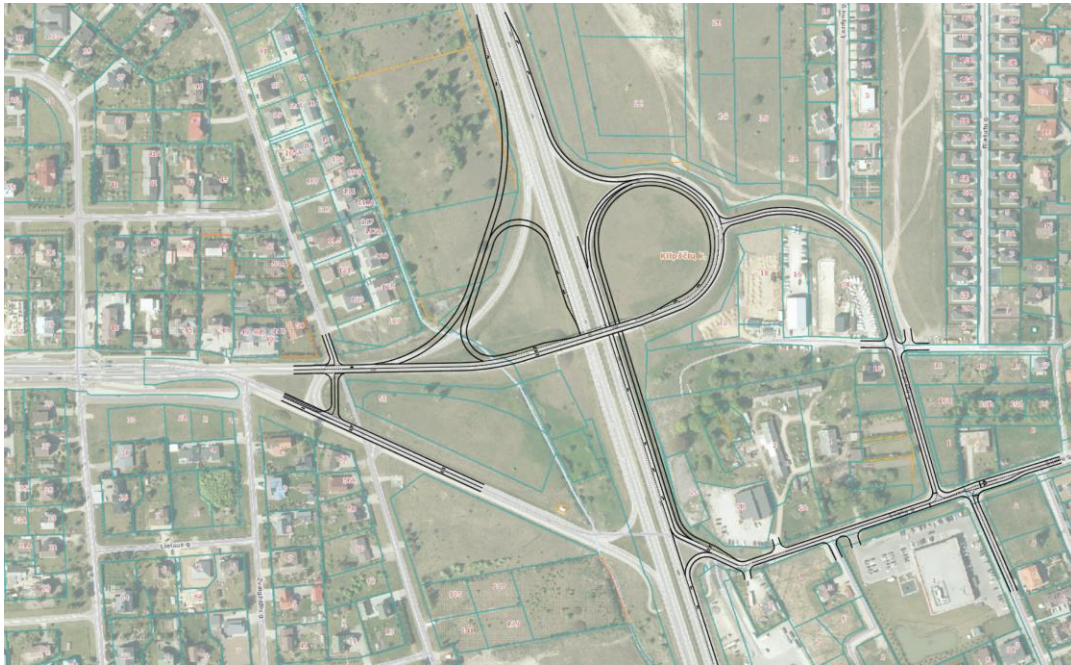
*Proposed traffic organization scheme in Special Plan*



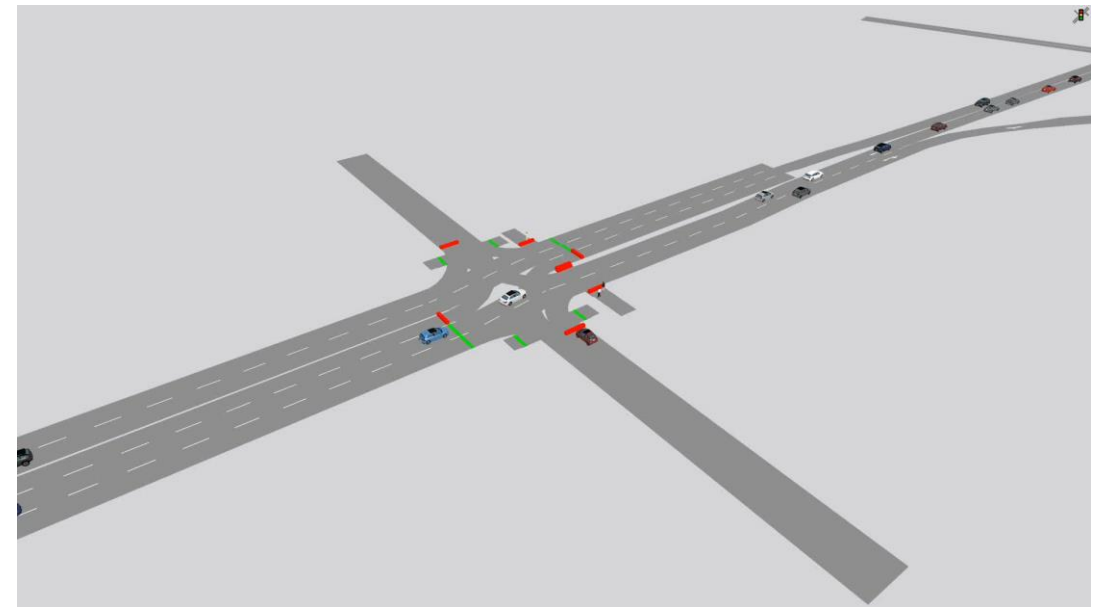
*Micro-modelling of proposed traffic organization scheme in Special Plan*

# INFRASTRUCTURE PLANNING CASE OF LITHUANIA

## ACTUAL INTERSECTIONS



*Proposed traffic organization scheme by Consultants*



*Micro-modelling of proposed traffic organization scheme by Consultants*

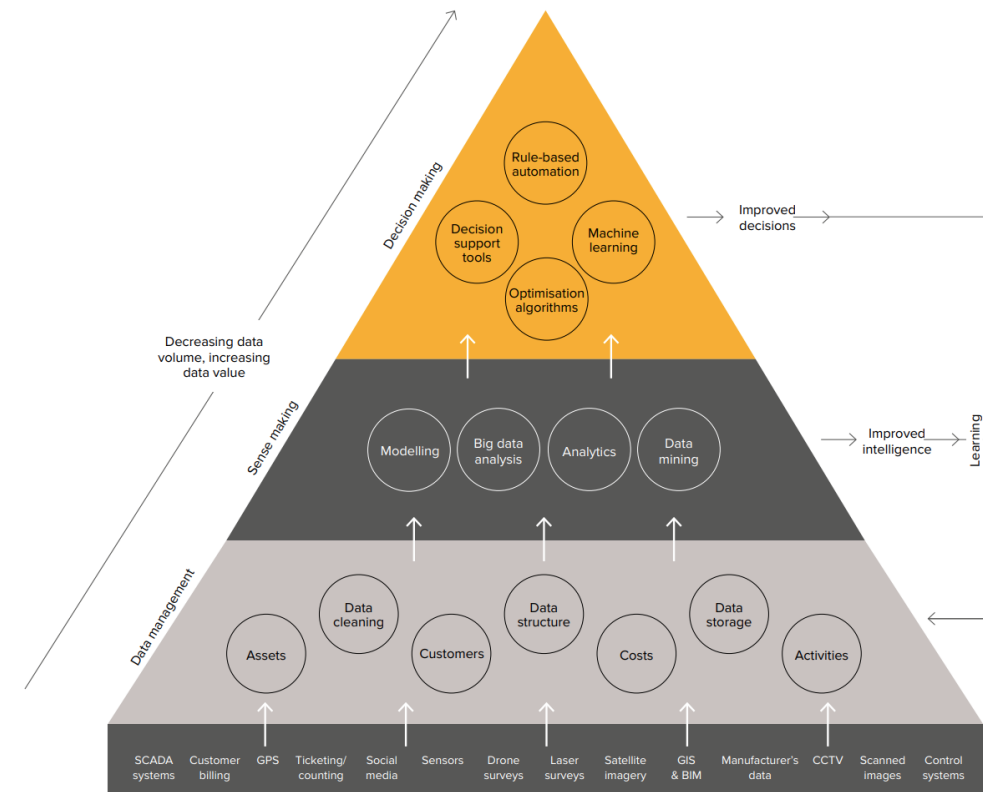
- Calculate the initial investment, maintenance, and renewal costs for each alternative.
- Calculate the potential socio-economic benefits of each street and road infrastructure improvement alternative.
- Identify and assess the risks of each alternative, including technical, financial, and social factors.
- Evaluate the long-term impact on the environment, public health, and the social and economic environment.
- Based on the conducted studies and analysis, provide recommendations for the primary and most effective transportation infrastructure alternative.
- Prepare an implementation plan for the primary alternative.

Kryptis	Esama situacija	Status Quo po 20 metų	Kryptis 1 – naujo viaduko statyba ties Kleimiškės g. / Klausmylių g.	Kryptis 2 – infrastruktūros pakeitimai Dangaus g. / Liepų g.
<b>Prielaidos</b>				
Suminis praleidžiamas laikas vienos piko valandos kelionėse, val.	222:32:07	285:48:23	188:21:29	240:05:37
Vidutinis kelionės greitis, km/h	34,8	32,3	44,9	38,4
Nelaimingų atsitikimų skaičius (sunkus sužalojimas)	1	2	1	1
Nelaimingų atsitikimų skaičius (lengvas sužalojimas)	8	1	7	8
<b>Ekonominiai rodikliai, tūkst. Eur</b>				
Dabartinė kaštų vertė			20899	10714
Dabartinė naudos vertė			28501	13671
Grynoji dabartinė vertė (GDV)			7602	2957
Naudos ir kaštų santykis (N/S)			1,36	1,28

*Cost-Benefit analysis results of proposed alternatives*

# DECREASING DATA VOLUME, INCREASING DATA VALUE

All the main components of Digital Infrastructure have a place in this simple model. It is the overlay of this model onto physical infrastructure that makes it “smart”. At the base is raw data and at the apex are decisions – **the higher up, the more valuable the information; the lower down, the greater the volume of data.** Information processing occurs within each layer and communication connects both the layers and the outside world.



# CONTACTS

## Contacts

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