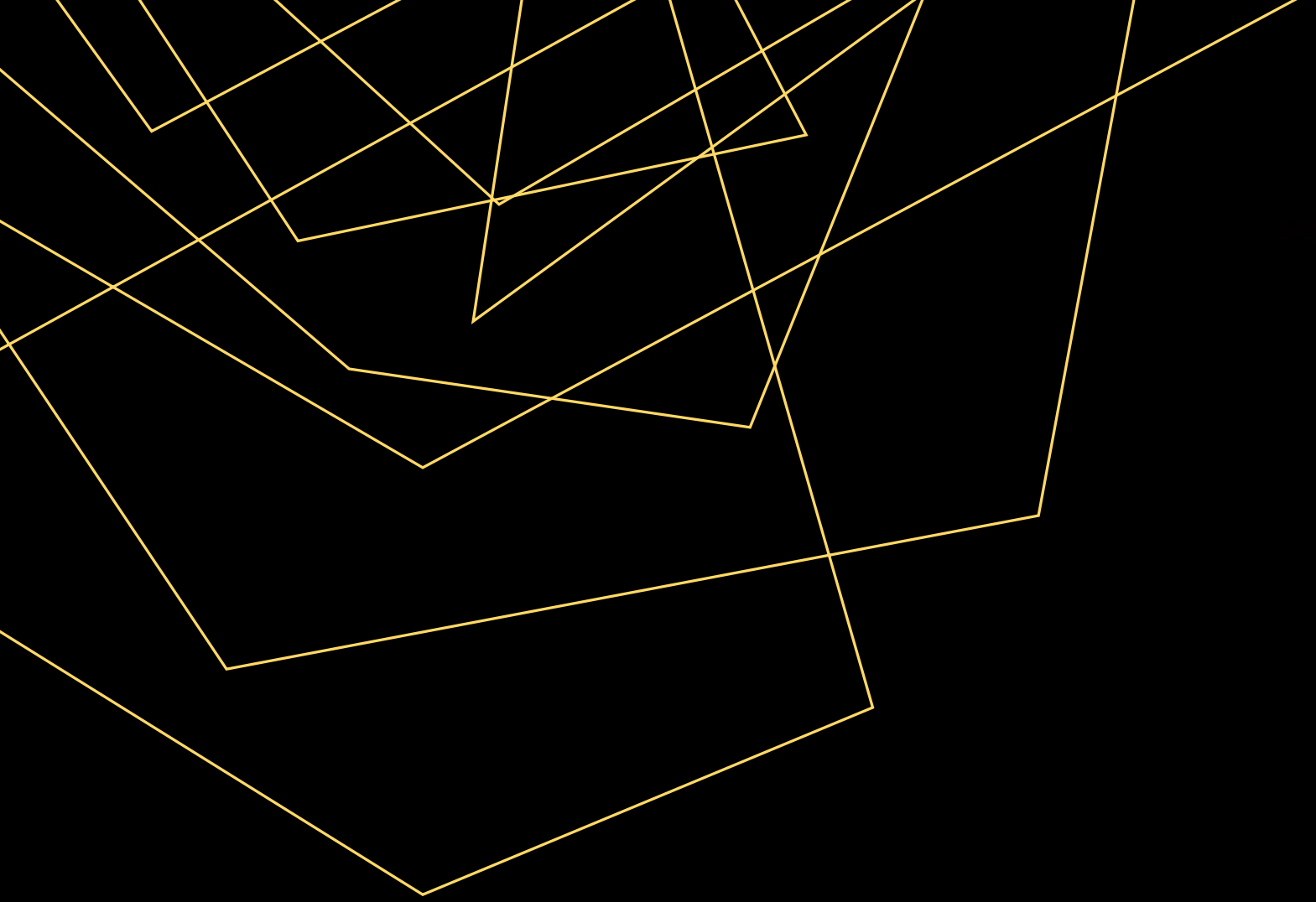

LOKI

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THE PROBLEM:

Road infrastructure decay is a huge issue, with delayed detection of defects contributing to accidents and increasing maintenance costs.

The most used method to detect defects is **visual inspection**, a method:

- slow
- costly
- dangerous for the technicians

WHAT'S URGENT:

Rapid identification of damages to avoid risks for road users

STATE OF THE ART

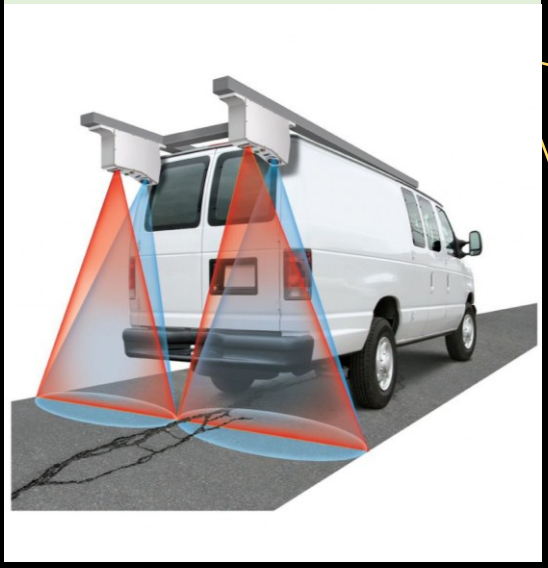
Visual

Traditional visual inspections are **costly, inefficient**, and reactive, missing opportunities for timely interventions.

Smartphone

Smartphones have **limited field of view/ optic limitations** and limited resources (e.g. memory)

Laser based



LIDAR equipped vehicles are precise but **extremely expensive**, futhermore a specialiezed vehicle is needed

OUR SOLUTION

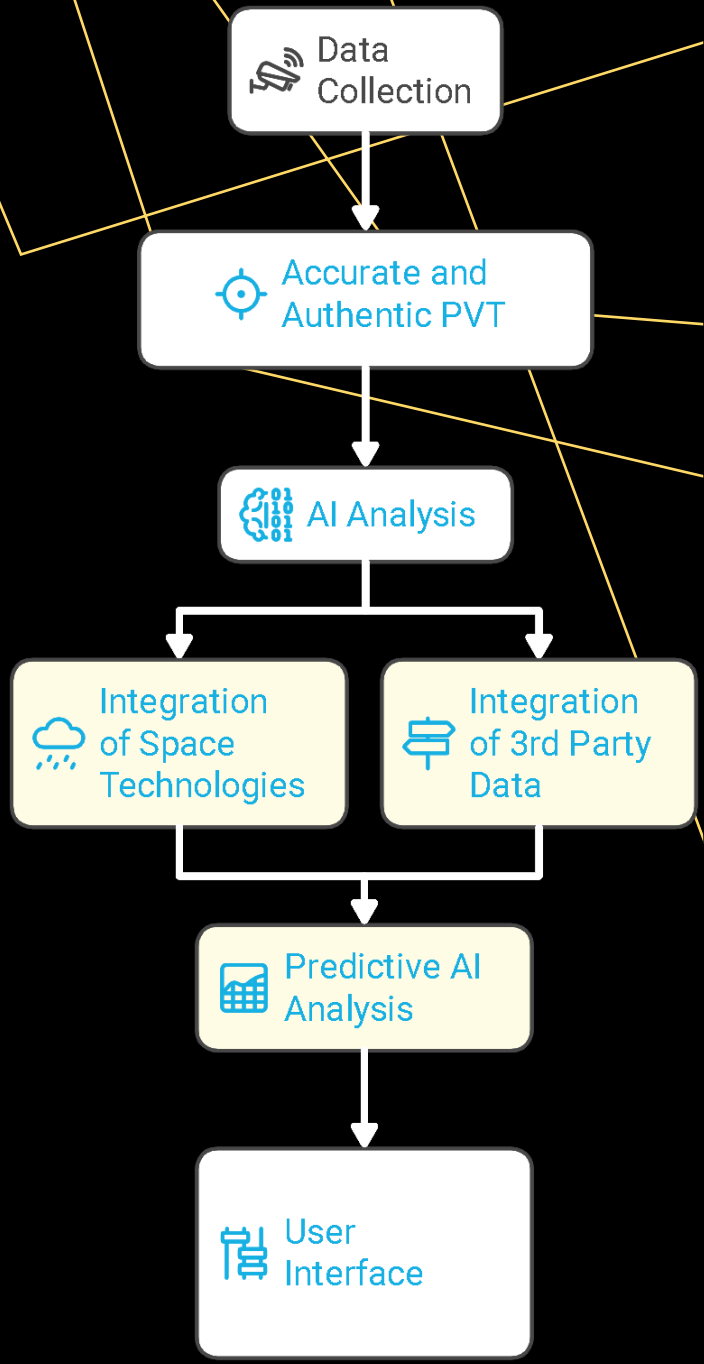
Asfalto Sicuro® is an AI-driven road infrastructure monitoring solution using advanced, **plug & play**, hardware.

It can be installed in **any vehicle** to detect:

- Road damages even in early stage
- Vertical and Horizontal signs
- Crosswalk accessibility
- Street and sidewalks measurements
- And much more

ASFALTO SICURO ® COMPONENTS

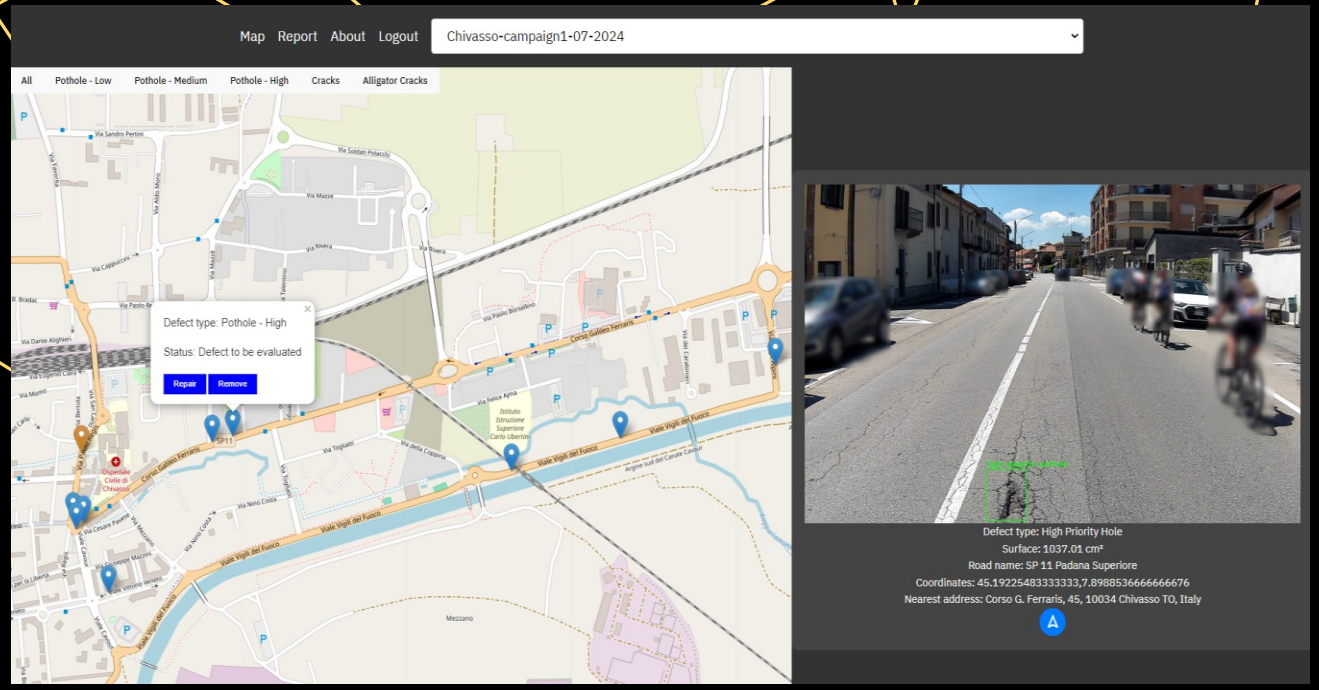
1) **Data collection on the road**: high-resolution cameras, IMU sensors, and GNSS modules to acquire and geolocate road defects.
2) **Galileo HAS and OSNMA** to ensure accuracy and authentication of the position velocity and time
3) Advanced **AI algorithms** process the collected data, identify, and classify road defects and road elements.
4) Integration of **space technologies**: Incorporates Earth observation data, including meteorological information and Copernicus ground motion, to enhance situational awareness and support predictive analysis.
5) Integration of **3rd parties data** such as historic road traffic to predict evolution of a specific damage and defining priorities for road maintenance
6) AI analysis using data recorded on ground, space data and 3rd parties data to generate **predictive road damage report**.
7) **User-friendly webapp** provides intuitive interfaces and tools for managing maintenance interventions.



Under development (2025)

Developed

THE CITY ONE CLICK AWAY



Through a dedicated WebApp the user will have access to all road data elements such as:

- Photo of the road element (e.g. damage, crosswalk) and accurate geolocation
- Estimated size and depth of the damage
- All the data are authenticated
- All sensitive data are anonymized
- All the data can be exported in a custom format (e.g. xls, csv, gis)
- All the data can be ordered and filtered by severity, type (e.g. potholes, cracks, crosswalks) or location

HOW CLIENTS SAVE MONEY WITH OUR SOLUTION

- **Road Repair Costs:** Reduced up to 50% through proactive maintenance (Source: European Asphalt Pavement Association)
- **Legal Claims and Settlements:** Lowered **up to 80%** as a result of fewer accidents (Source: European Road Federation)
- **Labor Costs:** Reduced **up to 50%** through automation and efficient resource allocation (Source: European Research Institutions)
- **Enhanced Road Safety: Reduced accident rates** leading to fewer injuries and fatalities improving traffic flow and reduced congestion
- **Environmental Impact:** Lowered carbon emissions from reduced vehicle fuel consumption and maintenance, minimized environmental damage from road construction and repairs
- **Furthermore there is a huge savings on vehicle Maintenance Costs for private and public road Users: up to 20%** due to improved road conditions (Source: Eurostat)

Use case based on Leeds Municipality (UK) data:
2100km (20% of road damaged, only 3% maintained)
data source: World Bank Report, RateGenius Report, Easy Engineering, European Asphalt Pavement Association (EAPA), EUROSTAT, European Road Federation (ERF)

Category	Current Scenario Costs (M€)	With "Asfalto Sicuro®" (M€)	Savings (M€)
Repair Costs	29.45	14.73	14.73
Legal Claims and Settlements	0.12	0.02	0.10
Labor Reallocation Savings (estimated)	1.59	0.80	0.80
Total Annual Savings	**N/A**	**N/A**	**15.62**

VALUE PROPOSITION

1. **Reduced Maintenance Costs:** Early defect detection and intervention **lower maintenance expenses by up to 53%,** avoiding extensive repairs and extending the road lifespan.
2. **Minimized Accidents and Claims:** Proactive maintenance reduces accidents related to road defects (e.g., 600 pothole-related accidents per month in the UK). **Claims against road administrators can be reduced by up to 80%,** enhancing road safety and reducing financial liabilities.
3. **Enhanced Operational Efficiency:** Automated monitoring **reallocates up to 50% of manual inspection labour**, optimizing resources and improving worker safety.
4. **Authentic Geolocated Data:** Using **authenticated and accurate GNSS data** (Galileo OSNMA and HAS), "Asfalto Sicuro®" supports insurance business case.
5. **Environmental and Sustainability Impact:** Preventive maintenance **reduces traffic disruptions, emissions, and material waste**, aligning with sustainability goals and reducing the environmental footprint of road repairs.

OUR MARKET? WHEREVER THERE IS A ROAD

1.Global Market Potential (TAM - Total Addressable Market):

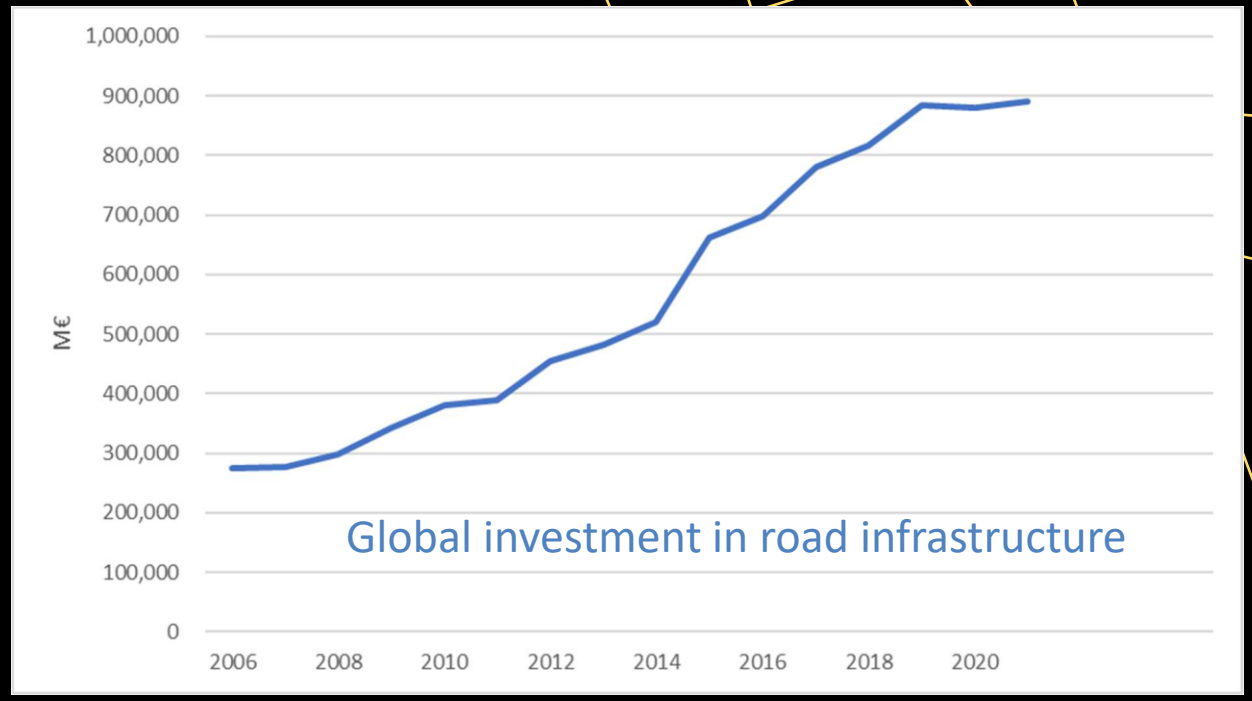
- **Road Monitoring and Maintenance Market:** Estimated at $338 million (CAGR 6.4%, 2022-2027) *Source:* Proficient Market Insights.
- **Global Road Infrastructure Investment:** Over **€900 billion annually**, with increasing focus on digitization and sustainability. *Source:* European Road Federation.

2.European Opportunity (SAM - Serviceable Addressable Market):

- **European Market for Road Monitoring:** Estimated at **€80 million**.
- Public and private sectors are investing heavily in infrastructure, with over **€450 billion in EU road investments annually** *Source:* Eurostat.

3.Focused Entry (SOM - Serviceable Obtainable Market):

- Starting with **Italy**, targeting **5% of municipalities we estimate an Annual Revenue Potential:** €5 million.



The market of automatic road monitoring is being created now. Our goal is making it accessible to all road managers!

TARGET CUSTOMERS AND FUTURE EXPANSION

Primary Target:

- **Municipalities and Public Administrations (B2G):** Focus on providing cost-effective and accurate road monitoring services, tailored to meet the needs of public road administrators.
- **Insurance Companies (B2B):** Leveraging authenticated geolocation data for accurate claims validation.
- **Highway Authorities (B2B):** Real-time monitoring of extensive road networks to improve safety and reduce maintenance costs.

Future Expansion Opportunities:

- **Customer's Vehicles or Fleet setup (B2B & B2G):** Offering scalable solutions for road maintenance across public or corporate-owned infrastructure.

BUSINESS MODEL AND PRICING STRATEGY

Current Service:

- Our system is a portable, plug-and-play solution that can be installed in any vehicle for flexible deployment.
- Pricing: The service is offered at a rate of €50 - €150 per kilometer, depending on the level of information requested by the client.
- Potential Revenue/vehicle 3M€/year (measure 300km/day@200days@50€/km

Future Vision:

- Miniaturized On-Board Solution: In Q1 2025 an integrated miniaturized version of our system that can be installed directly on clients' vehicles will be avaiable
- Subscription Model: Transition to a subscription-based service, charging clients a fixed monthly fee for continuous road monitoring.
- Potential Pricing: €5000 per month (TBC) , depending on data requirements.

THE TEAM

Francesco Papa
Co-founder and Co-CEO
Hardware and Firmware –PMP

Caterina Lia
Co-founder and AI lead
AI, Cloud and SW development

Giovanni A. Vecchione
Co-founder and Co-CEO
Space tech & business development

Pritam Ghosh Roy Chowdhury
Business Developer - Sales
Marketing & business development

Prof. Roberto Garello
Advisor
Communication Systems & Satellite networks

TRACTION & ACHIEVEMENTS

Città di San Sebastiano da Po

Città di Chivasso

Some municipalities are already using Asfalto Sicuro®

eit Urban Mobility

Co-funded by the European Union

Winner of the UE call Raptor to automatically detect the accessibility of pedestrian crossings with AIPECRA

NVIDIA INCEPTION PROGRAM

Nvidia inception program

Google Cloud for Startups

Google cloud
for startup program

esa BUSINESS INCUBATION CENTRE Turin

Incubated by ESA BIC Turin

CEE StartUp Network

Finalist at European competition
CEE Startup Voucher

DIGITHON® 2024

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Winner of the award assigned by
"Distretto produttivo dell'informatica" @DigithON 2024

SUCCESS STORY

Our technology has been shown by several media in Spain:

- TeleMadrid - Inteligencia artificial para evitar atropellos de personas discapacitadas en Las Rozas
- El Español - IA y navegación global por satélite para que los pasos de peatones de Las Rozas sean inteligentes

EL ESPAÑOL invertia
DISRUPTORES

TeleMadrid

Thank you for your time

Feel free to reach out for any clarifications or even a virtual coffee, so we can discuss how we can work together to solve the issue of poorly maintained roads.

info@lokisrl.eu www.lokisrl.eu