

Practical Applications of AI and Data Science for Safer Streets and Sustainable Mobility

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Founder & CEO, Mobility Vision+

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Agenda

1. The **objective of artificial intelligence (AI)** for road safety and sustainable mobility
2. The **role of AI** and data science for safer roads
3. **Mobility Vision+** for **practical end-to-end applications** of AI to foster sustainable mobility in “*chaotic*” cities
4. Open forum

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The objective of AI for road safety and sustainable mobility

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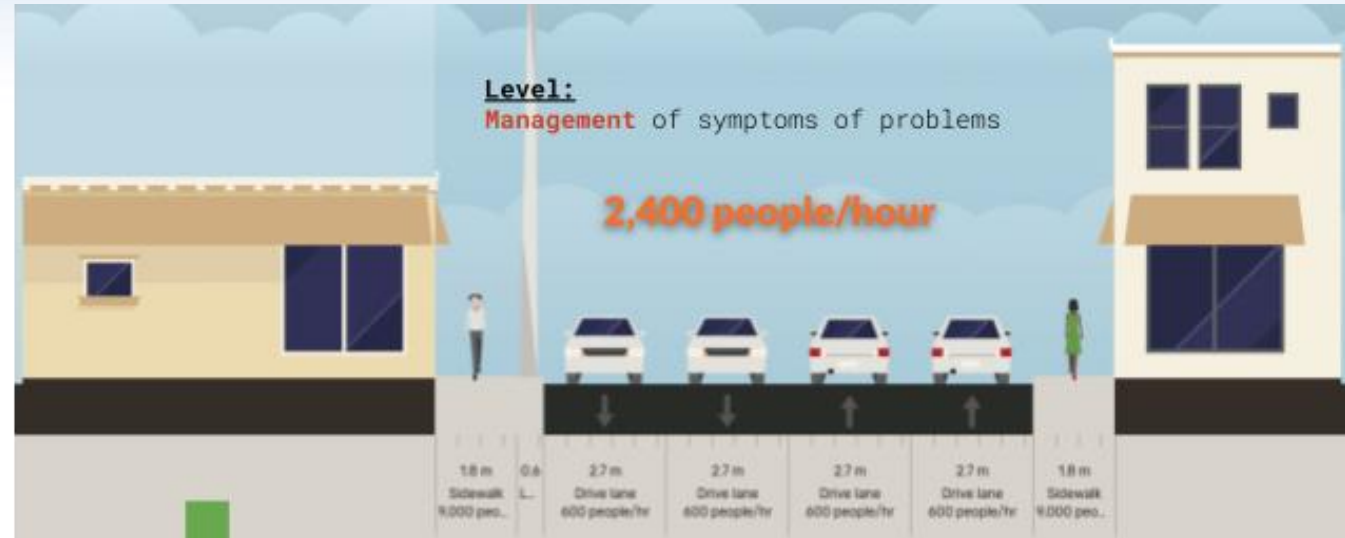


AI for solving traffic vs solving mobility

Last 50 years

Vehicle-oriented
traffic management

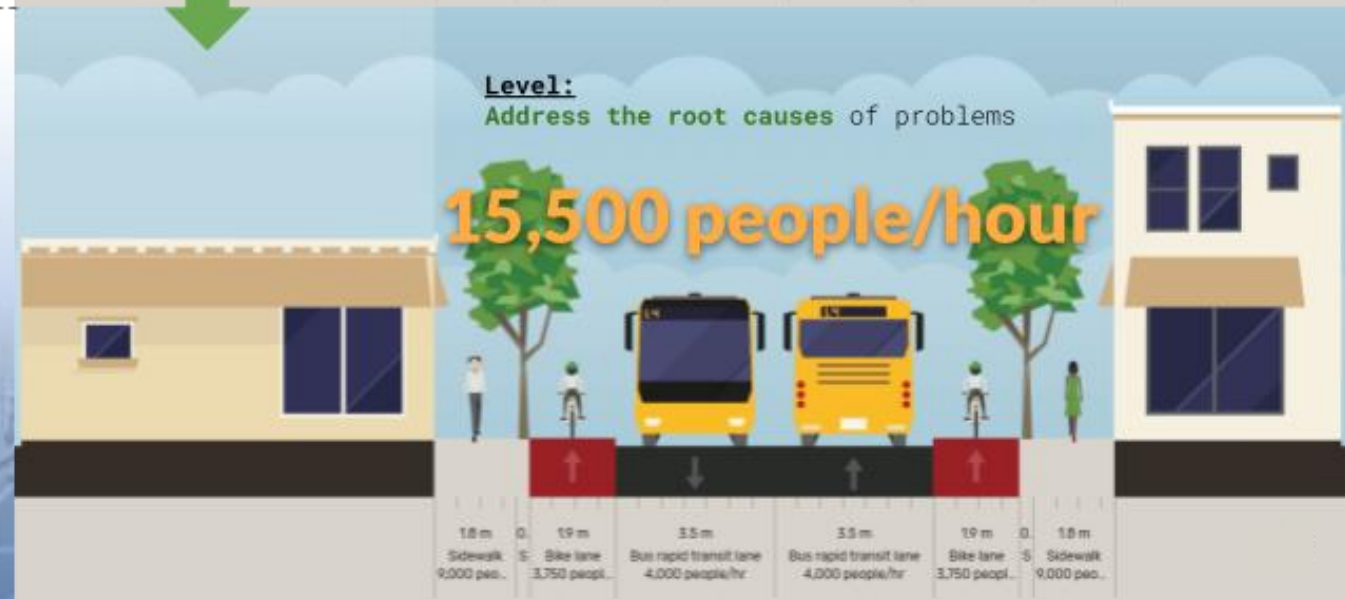
Volume of
vehicles



TOMORROW

People-oriented
sustainable mobility planning

Volume of
people
(occupancy of
vehicles)



The metrics of AI for sustainable mobility

Connected



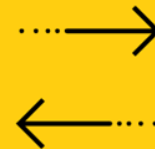
**Accessible
/ Attractive**



Reliable



Direct



Safe



27

The role of AI and Data Science for Safer Streets and Sustainable Mobility

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The role of AI and Data Science

What do you think is the role of AI and data science in increasing road safety and moving towards sustainable mobility and development in our cities.

Give me the top 5 topics that are relevant. And give a 1 sentence summary for each.



Here are the top 5 relevant topics on the role of AI and data science in increasing road safety and promoting sustainable mobility and development:

1. **Predictive Traffic Management:** AI and data science enable real-time optimization of traffic flows and predictive analysis of congestion and accidents, improving road safety and reducing traffic-related emissions.
2. **Autonomous Vehicles:** AI-driven autonomous vehicles promise to reduce human error in driving, enhancing road safety while supporting sustainable mobility through integrated, shared transport systems.
3. **Smart Infrastructure:** Data-driven smart infrastructure, including connected roadways and adaptive traffic signals, enhances safety by responding dynamically to real-time conditions and supporting sustainable transport modes.
4. **Optimized Public Transportation:** AI optimizes public transport systems, improving efficiency, reducing wait times, and encouraging a shift from private vehicles to more sustainable public transport options.
5. **Data-Driven Urban Planning:** AI and data science support sustainable urban development by simulating the impact of various mobility strategies, informing policies that balance safety, efficiency, and environmental goals.

SG

What do you think is the role of AI and data science in increasing road safety and moving towards sustainable mobility and development in our cities. Give me the top 5 topics that are relevant. And give a 1 sentence summary for each.

Here are the top 5 topics relevant to AI and data science in increasing road safety and promoting sustainable mobility and urban development, along with a one-sentence summary for each:

1. **Intelligent Traffic Management Systems Summary:** AI-powered traffic management systems analyze real-time data to optimize traffic flow, reduce congestion, and improve overall road safety in urban areas.
2. **Predictive Maintenance for Infrastructure Summary:** Data science techniques enable predictive maintenance of roads and transportation infrastructure, enhancing safety and reducing long-term costs.
3. **Autonomous Vehicle Integration Summary:** AI and data science are crucial in developing and integrating autonomous vehicles into urban environments, potentially reducing human error-related accidents and improving mobility efficiency.
4. **Smart Public Transportation Optimization Summary:** AI algorithms can optimize public transportation routes and schedules based on usage patterns, encouraging sustainable mobility options and reducing private vehicle dependence.
5. **Pedestrian and Cyclist Safety Systems Summary:** AI-powered computer vision and sensor technologies can enhance the safety of vulnerable road users by alerting drivers and adapting traffic signals in real-time.

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SION
City Health V

The role of AI and Data Science

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The role of AI and Data Science

faster better data

collection

faster scientific

analysis

faster data-driven

actions



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AI-powered data collection (demand)

Problem 1: Fragmented data



Today's Mobility Data
Collection &
Management is
Fragmented and
Expensive

FIXED & LIMITED



MANUAL
OBSERVATION



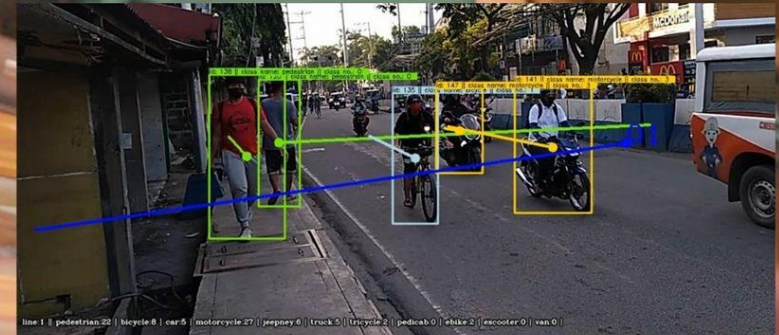
Solution 1: Sustainable data collection (videos, photos, GPS, etc.)

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Smart Traffic Monitoring

Traffic Volume Counts from a Smartphone
Video. No Need for CCTVs.

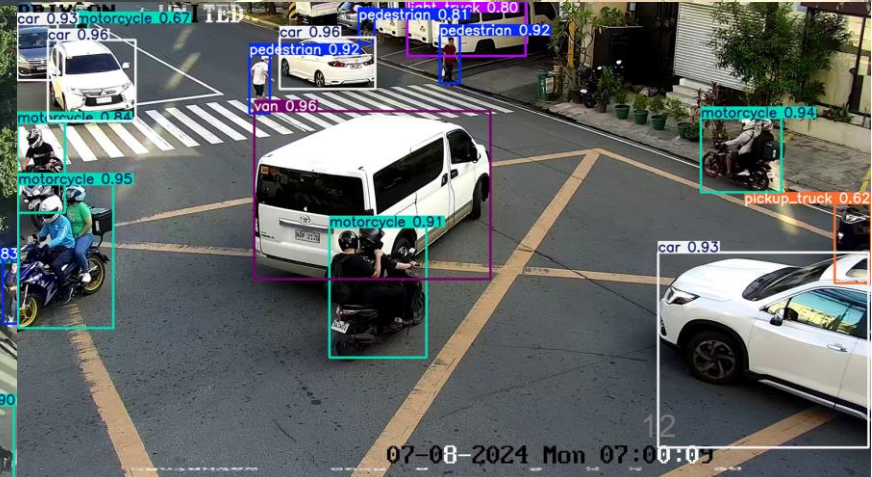
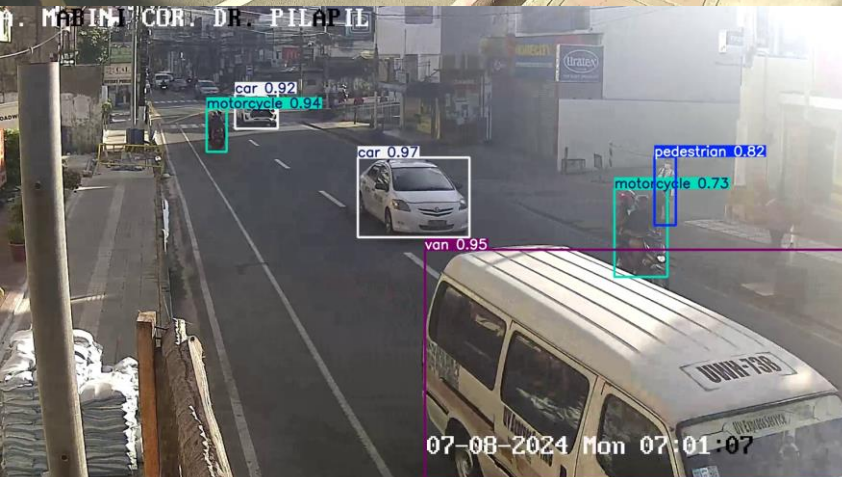
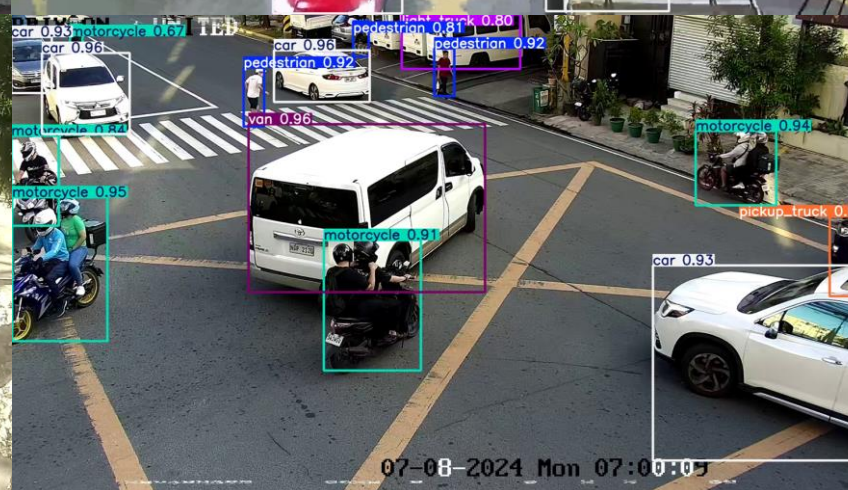


- Automated counts of all modes of transport in the Philippines.
- Flexible and adaptive to any context or camera angle.
- Automatically digitized and mapped into a database.

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AI-hybrid infrastructure data collection (supply)

Problem 2: Complex & unscalable

Solution 2: Make it simple

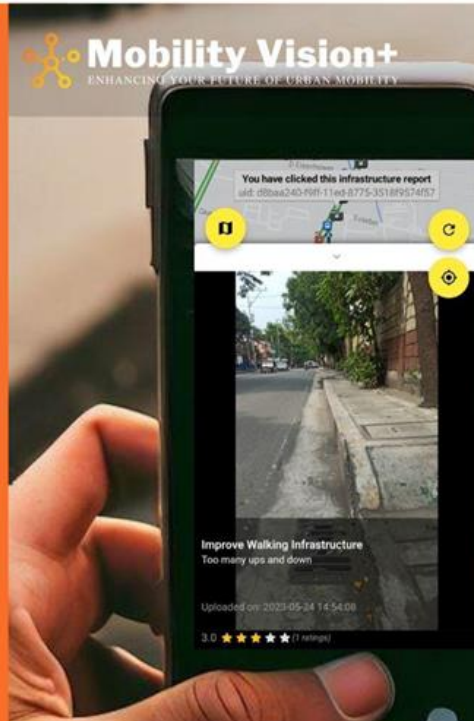


Current Software
Tools are Complex
and Difficult to
Implement

COMPLEX
SIMULATIONS



DIFFICULT TO
TRANSLATE



Infrastructure Asset Management

Ensuring the Optimal Condition and Maintenance of Urban Infrastructure

- Helps city admin staff, planners and decision-makers effectively manage and maintain street infrastructure.
- Gives valuable insights into the state of infrastructure, helping prioritize maintenance and improvement efforts for safer and better-quality public facilities.

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PERKESO

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 UN ROAD SAFETY FUND

VISION ZERO
 Safety. Health. Wellbeing.

Infrastructure Asset Management

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Effortless Traffic Violation Reporting

Report traffic violations easily, empowering enforcers and citizens alike.

- Empowers local government units to effectively monitor and enforce traffic regulations through a mobile app.
- Provides a user-friendly platform for citizens to report traffic violations, facilitating community engagement in road safety initiatives.
- Violation reports help identify dangerous areas and drivers (with Single Ticketing System).

Citizen Engagement & Empowerment

Enable citizens to actively participate by reporting, rating, GPS tracking, and contributing information on urban mobility.

- Enables local government units to tap into community insights and gather valuable feedback on mobility issues.
- Fosters collaborative governance and strengthens the relationship between the government and its constituents.
- Every citizen is empowered to take photos, videos, and track their trips using their phone's GPS. They can also track the progress of reports.

Streamlined Road Incident Management

Digitize and report road incidents for improved traffic management

- Enables efficient reporting and analysis of road incidents to identify accident-prone areas and prioritize interventions.
- Enhances data accuracy and accessibility for evidence-based policy formulation and targeted road safety measures.
- Streamlined forwarding of incidents to relevant authorities.

AI-driven context assessment



CycleRAP as a feature



CycleRAP demonstrator



This file is provided for CycleRAP model testing only.
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V-B

Conflicts with vehicles

32.57



B-B

Conflicts between
bicycles and/or light
mobility vehicles

6.41



B-P

Conflicts with pedestrians

0.00



SB

Crashes which do not
involve others

8.91

CycleRAP Score

47.89

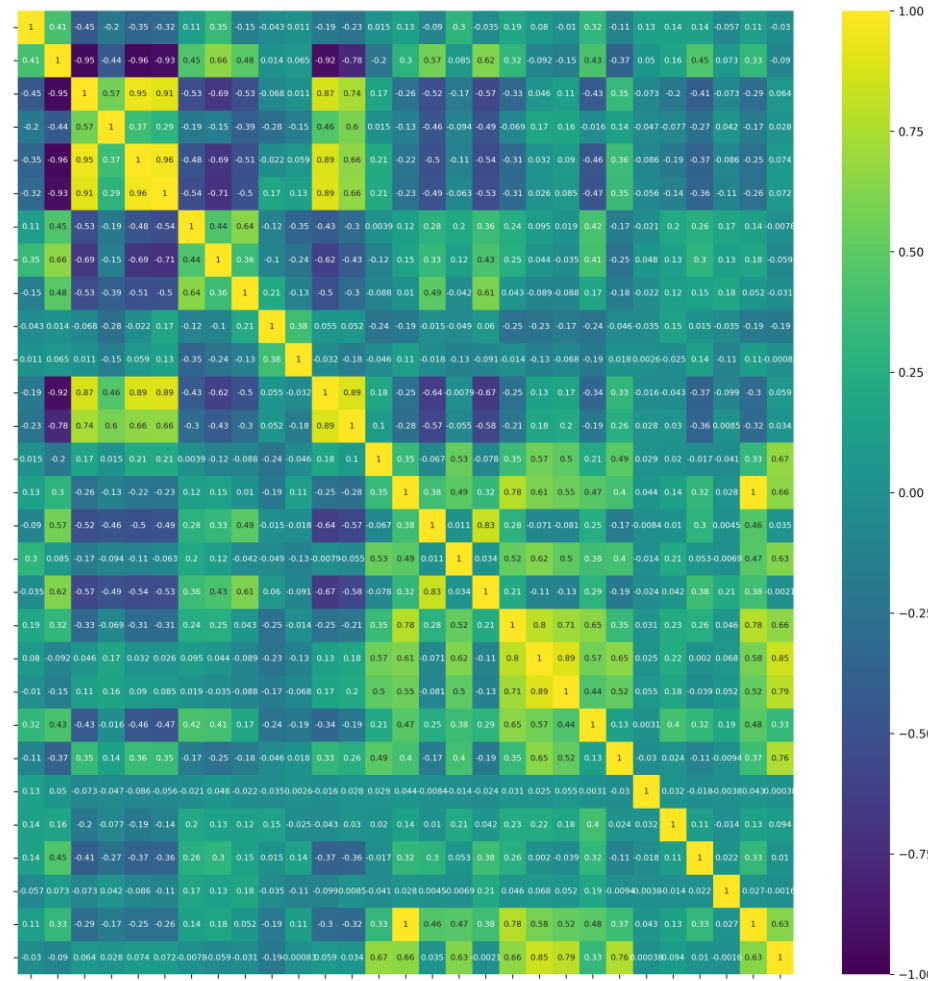
High risk

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AI-supported recommender system

Attributes related to infrastructure supply, traffic demand,
transportation supply, environmental factors, social factors,
economic factors, and other relevant factors



Attributes related to infrastructure supply, traffic demand,
transportation supply, environmental factors, social factors,
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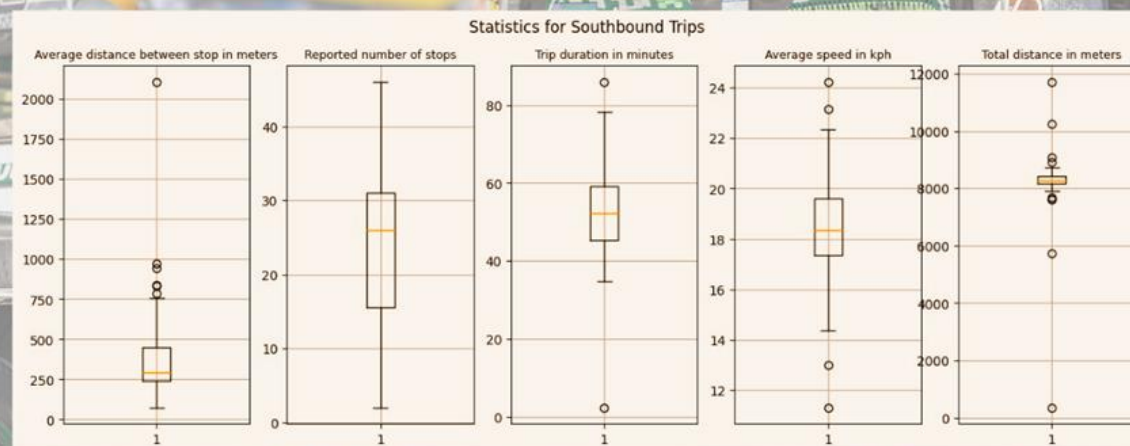
Simple public transport monitoring

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GPS Tracking for Travel Time Survey & Demand-Driven Public Transport Planning

Optimize public transport services through GPS-based analytics and mapping using the Mobility Vision+ Mobile App.



- Directly and automatically aids in public transport planning
- Monitor real-time data on passenger demand, route efficiency, and service performance.

Data science-focused analytics

Problem 3: Interest-driven over evidence-based

Solution 3: Automated analytics & monitoring



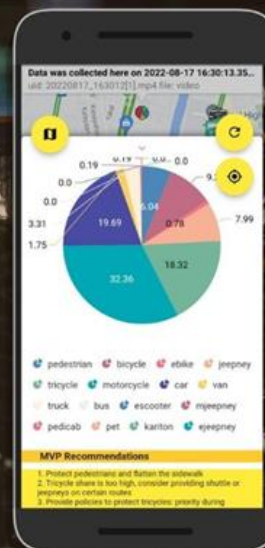
Current Laissez-Faire
(Self-Regulating)
Approach has FAILED

DETRIMENTAL
OUTCOME BASED
ON POPULAR
OPINION

FINGER POINTING
WHEN PROBLEMS
OCCUR

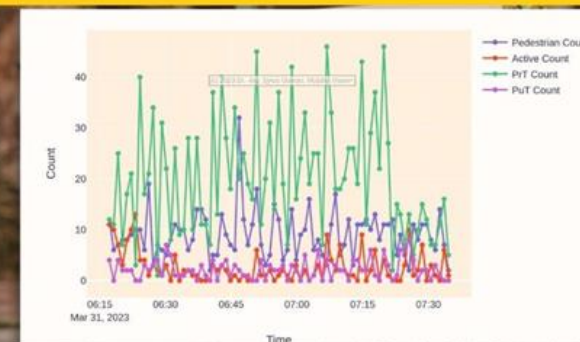


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Evidence-Based Decision-Making

Leverage your data to gain valuable insights and actionable recommendations



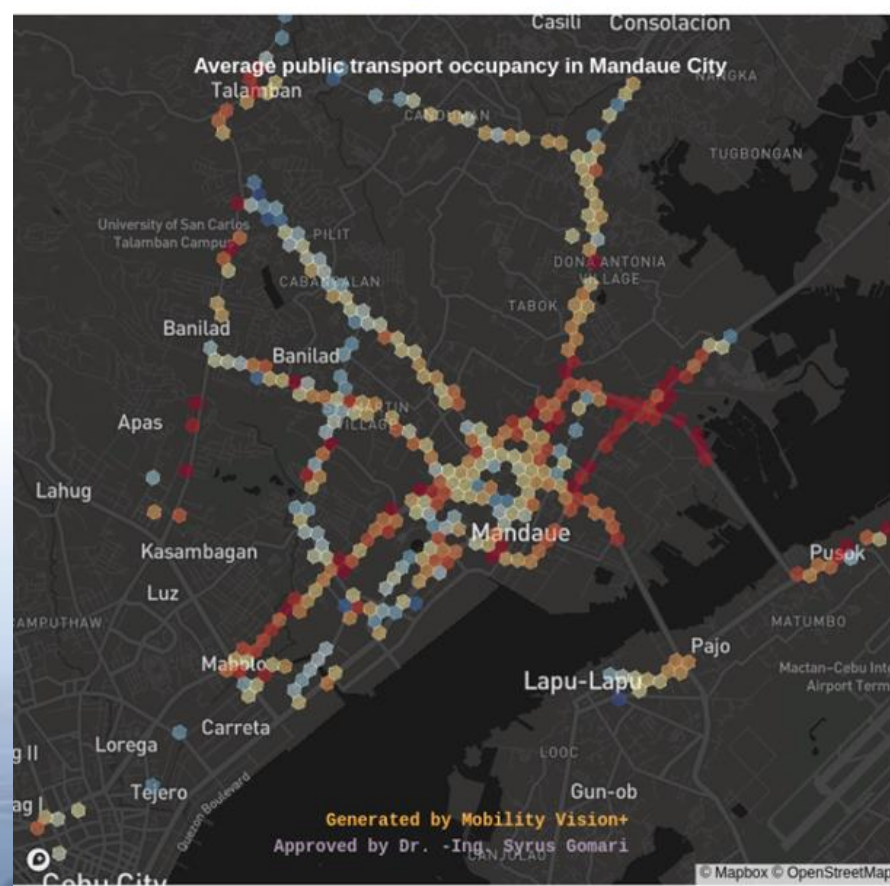
- Analytics on different spatio-temporal levels.
- Translates complex data into actionable insights for evidence-based decision-making.
- Supports urban planning and policy development by offering data-driven recommendations for efficient space allocation.

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Passenger occupancy



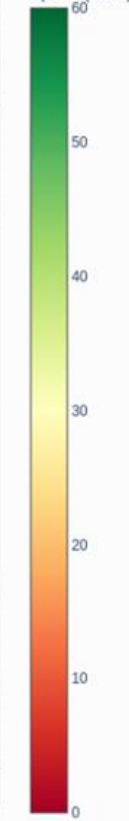
Passenger occupancy %



Public transport operational speed



Speed (km/h)



Science-based platform

End Problem:
**Slow & unguided
 decision making**

Solution 4:
**Science-based recommender system for
 infrastructure & policy development**




Decision-Making is
 Complicated and
 Often Unguided

SLOW



UNCERTAIN

**Evidence. Science. AI.
 Recommendations.**

MoVi+ gives out a list of the best possible decision recommendations based on the MoVi+ comprehensive global best practices database. The recommender system is scientifically developed in combination with the local context data gathered, and gradually learns and improves recommendations with more data.



1. Extend the bike lane network on this street.
 2. Increase greenery to encourage walking & cycling
 3. Traffic calming measure ASAP, high crash rate area!

1. Protect your bike lanes.
 2. Prioritize public transport.
 3. Consider studying e-motorcycle and e-bike lanes.

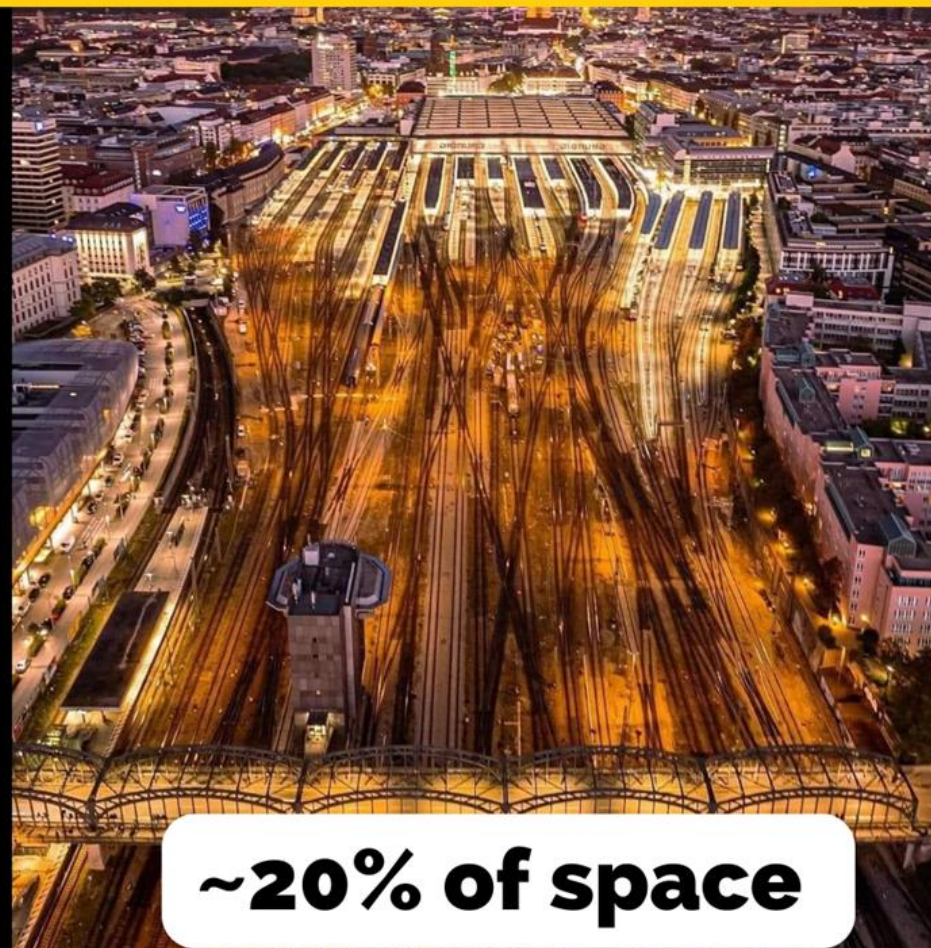
People as the metric in the age of AI

**Our mobility problem is a
space (re-)allocation issue**

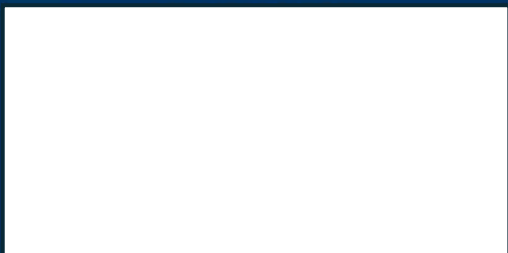
20000-100000 people per day

People as the metric in the age of AI

450000-550000 people per day



~20% of space



Powered by Mobility Vision+

Seermio

Main Dashboard

Traffic Counts

General Reports

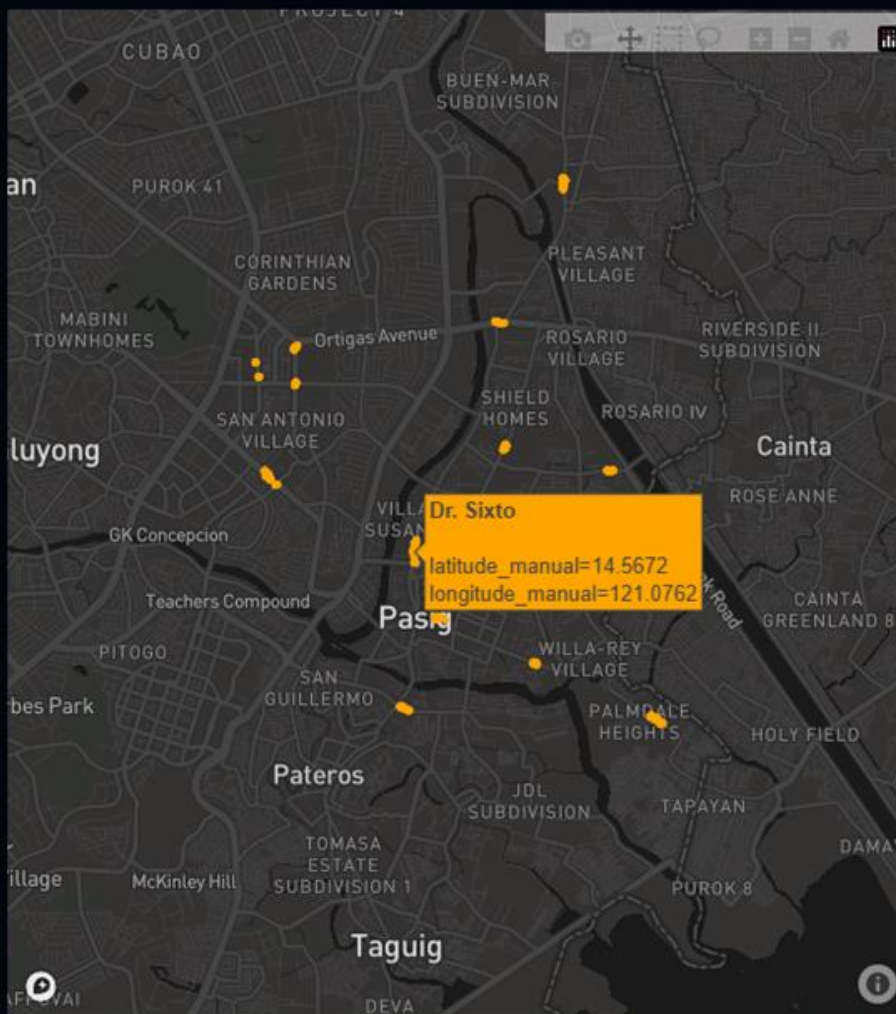
Traffic Violations

Infrastructure Reports

Traffic Speed Profile

Public Transportation

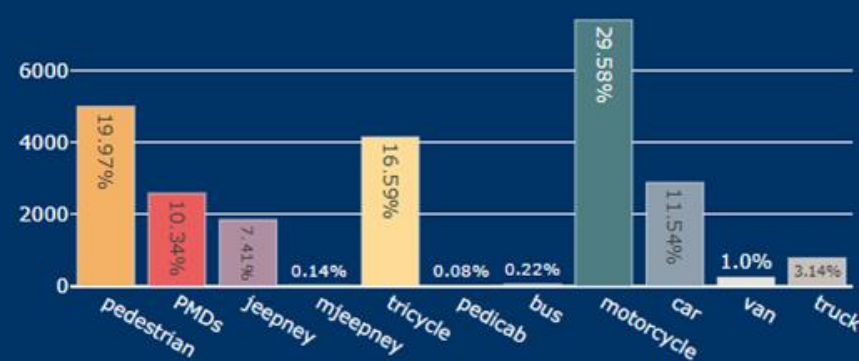
Traffic Counts Summary Dashboard



Total People Throughput (Dr. Sixto) - 16h 56m collected



Total Volume (Dr. Sixto) - 16h 56m collected



AI assistant to simplify tasks 100x

Hey there! You can ask seermo about your data.

Suggested Prompts

What is the summary of data we have?

What are the top 5 findings from our database?

What is the population distribution in my city in relation to mobility in the area?

How many entries are there in our database?

Enter your query here:

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The MoVi+ Solution

CURRENT SOLUTIONS:



FIXED & LIMITED



MANUAL
OBSERVATION



COMPLEX
SIMULATIONS

DIFFICULT TO
TRANSLATE

OUR SOLUTION:

FLEXIBLE



AUTOMATED
RECOGNITION



COMPREHENSIBLE



EASY TO USE



**Cut Sustainable Mobility Planning Time
from Years to Hours**



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