



Boosting
Digital Transformation



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Co-Founder and Executive Chairman of Cosmo Tech

HALF OF SF'S INCREASE IN TRAFFIC CONGESTION DUE TO UBER, LYFT

Ride-hail services account for

- **51 percent** of the increase in daily vehicle hours of delay
- **47 percent** of the increase in vehicle miles traveled
- **55 percent** of the average speed decline on roadways during that same time period.

Source: University of Kentucky + SFCTA Study

FIGURE 4. % CHANGE IN VEHICLE HOURS OF DELAY



HOW TO TAKE ADVANTAGE OF COMPLEXITY?

The SystemX Approach

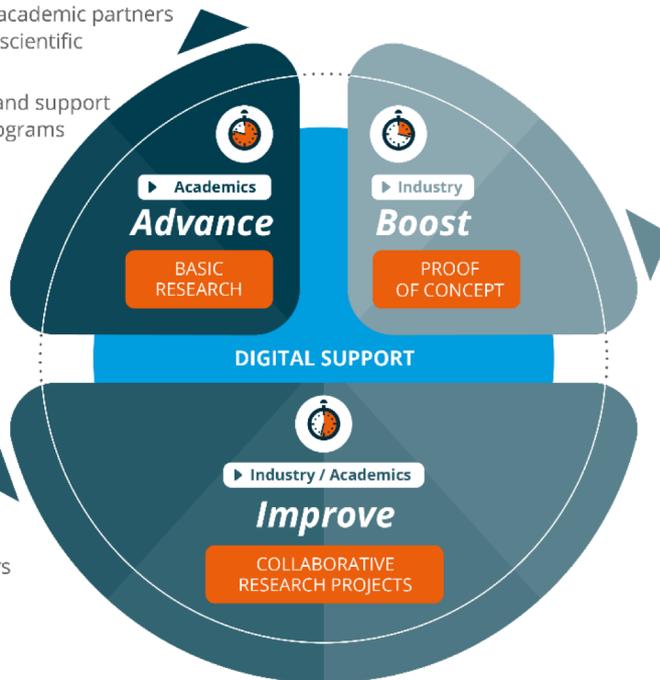
**Technological Research
at the Core of**

Big Corporations/Startups/Academia

Nexus

Stimulate the production of knowledge

- ▶ Federation of academic partners around major scientific challenges
- ▶ Coordination and support of doctoral programs



Strengthen the collaborative R&D capacities of companies

- ▶ Resolving scientific and technical obstacles
- ▶ Accompanying the rise in skills of partners

Accelerate the use of technology for the value creation:

- ▶ Responding to innovation challenges
- ▶ Carrying out pre-industrial proofs of concepts

4 SCIENTIFIC DISCIPLINES

Data Science and Interaction

Computational Science and Optimization

Systems and Software Engineering

Infrastructure and Networks

4 RESEARCH MARKETS



Agile Industry

Supporting the digital transformation
of the engineering profession



Autonomous Transport

Designing smart,
safe and secure systems



Smart Territories

Building the regions
of the future



Internet of Trust

Developing digital trust
in the Internet of Everything

3 TYPOLOGIES OF PLATFORMS

Integration and Federation
of Software Components

Modeling and Simulation
of Cyber-physical Systems

Tooled Methods and Processes

INDUSTRIAL PARTNERS



ACADEMIC PARTNERS



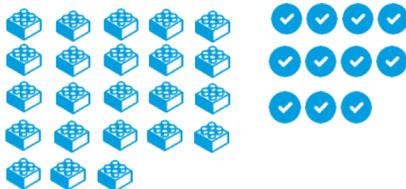
Creation



Partners



Research projects



European projects

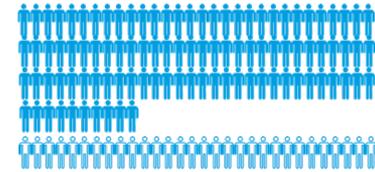


TOICA, IN2RAIL,
Holiship, ICN2020

Finance



Research and Tech fellows PhD students



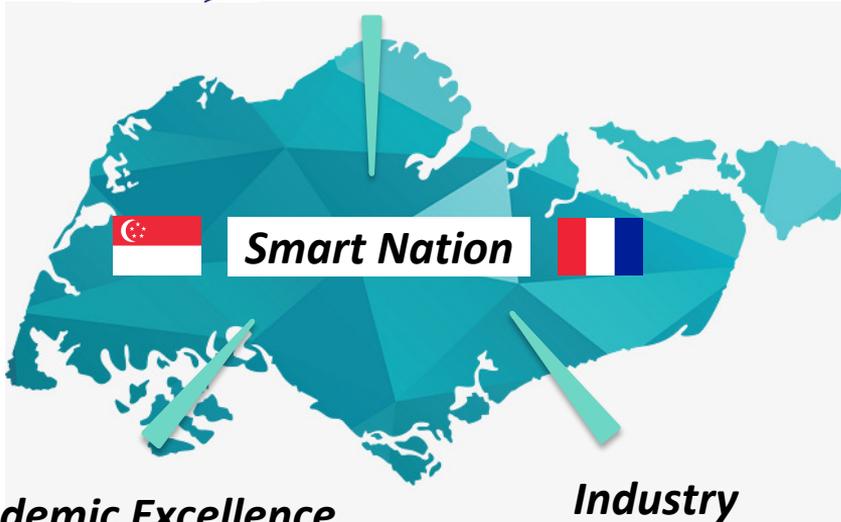
150 researchers-engineers,
30 doctoral students

Valorisation





Governmental Agencies



Academic Excellence

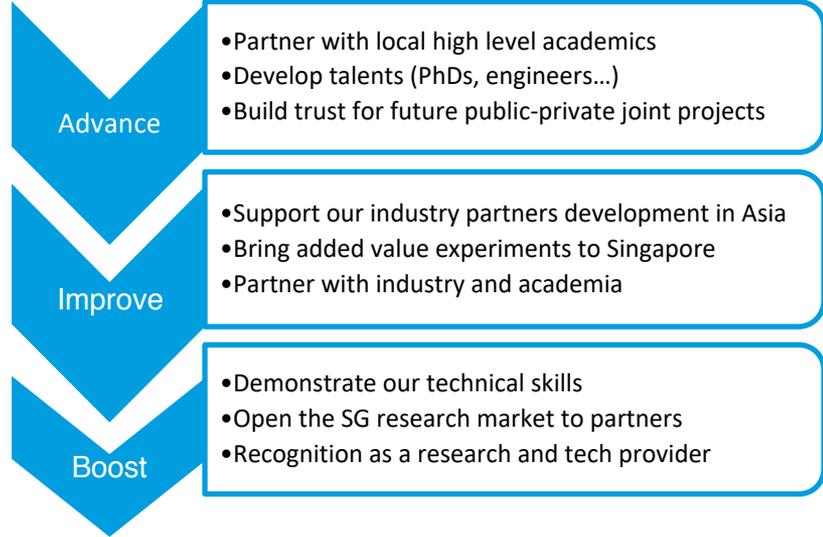
Industry



Established in collaboration with MIT



Offer:



Ambition:

- Multiply academic partnerships in order to gain trust and recognition from local partners
- Build joint projects between academia and industry
- Proper R&D centre with key partner

MoU signed on March 27, 2017, during the Singapore-France Innovation Forum



CETRAN

- Centre of Excellence for Testing & Research of Autonomous Vehicles ERI@N (NTU) 2,5 (+ 2,5 year) project funded by LTA (Land Transport Authority) to determine **standards & conditions for Autonomous Vehicles (AVs) deployment in Singapore**
- NTU assigned to SystemX a workpackage related to “**Digital modelling & simulation for safety & digital security, applied to autonomous transport**”.
- First commitments of SystemX industrial partners:



Research Agenda on Autonomous Transport & Mobility @SystemX

Research Roadmap



Security

Decision support for the design and validation of **autonomous** and **connected** transport systems in **complex** and open operational domains. Mastering the **reliability, safety** and **cybersecurity** of these **interoperable** and **evolutive** systems.



Acceptability

Decision support to enhance the **acceptability** of autonomous and connected transport systems by addressing the **human factors** and **HMI**. Mastering the **flexibility** and **modularity** in design for more **adaptable** and **customizable** systems depending on the user and operational context.



Sustainability

Decision support for the **planning**, design and supervision of **new mobility** systems in order to anticipate **urban transformations, user behaviors** and **technology evolution**. Preparing & shaping the **progressive deployment** of the new sustainable mobility systems.

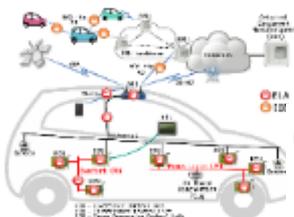
Examples of ongoing projects



SVA: Simulation & Validation of Autonomous Vehicles



EVA: Eco-mobility by Autonomous Vehicles



CTI: Cybersecurity of Intelligent Transport Systems



SCA: Secure Cooperative Autonomous systems



Examples of ongoing projects



**IVA : Augmented
« Voyage » Information**



**LCE : Lyon Car-sharing
Experimentation**



**MSM : Modeling Solutions for
new Mobility systems**



**BST : Blockchain for Smart
Transactions**





Launch: juin 2016

Duration: 4 years

Site: Saclay

START@SystemX : 2 seasons



Increase and fluidify users displacements in urban zones

Simulation

Field experiments in real conditions

Industrial Partners



COSMOTECH



GROUPE RENAULT

Academic Partners



CentraleSupélec



ÉCOLE
POLYTECHNIQUE
UNIVERSITÉ PARIS-SACLAY



IFSTAR



Institut Mines-Télécom



Laboratoire
Ville
Mobilité
Transport

URBAN TRANSPORT OPERATORS CHALLENGES

Real time optimization of the supervision of a transport node (multimodal hub: junction of train, subway & bus networks)

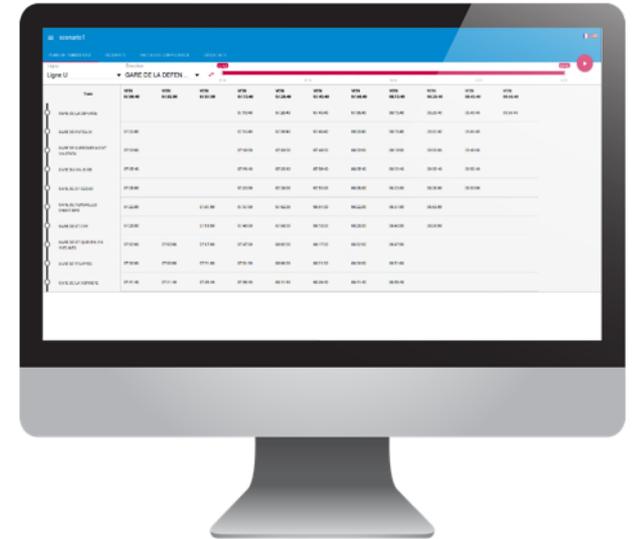
Activate the right levers that will bring a maximum value to passengers



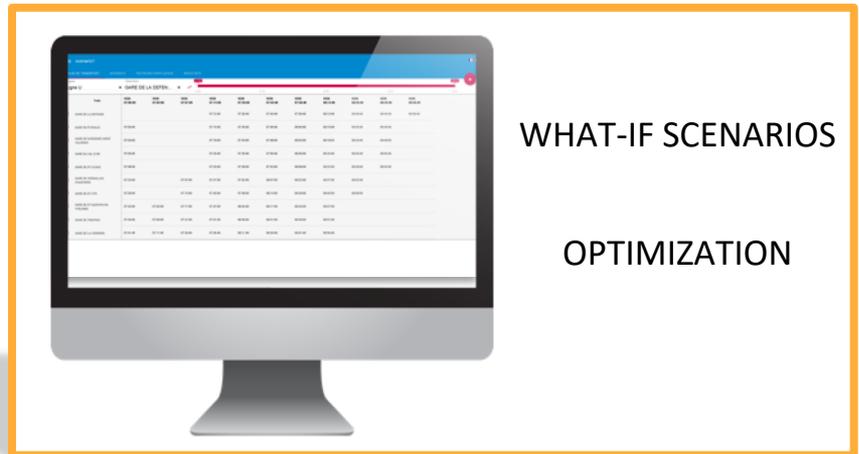
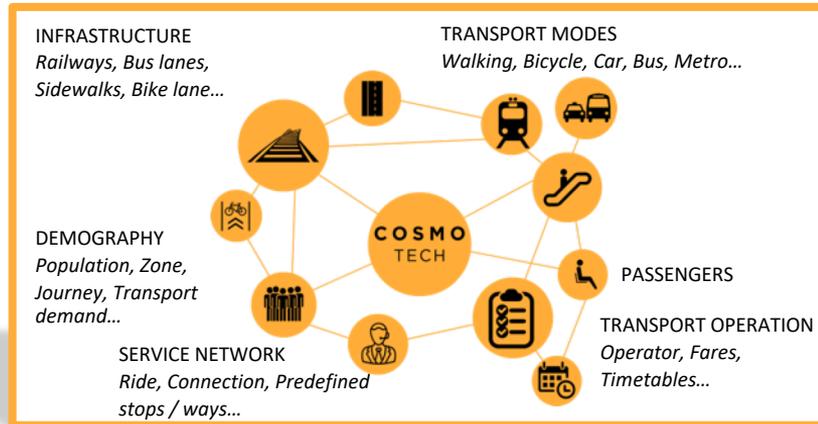
Test multiple supervision scenarios

Find rules optimizing multimodal traveling for passengers

- 1) Predict traffic state for the next 20-30 minutes.
- 2) Test supervision rules (stations skipping, trains acceleration, in-station waiting time reduction...) and observe their potential impact.
- 3) Immediately inform passengers of their new optimal itinerary.



Simulate, compare and optimize
the whole system with **Cosmo Tech solutions** ...



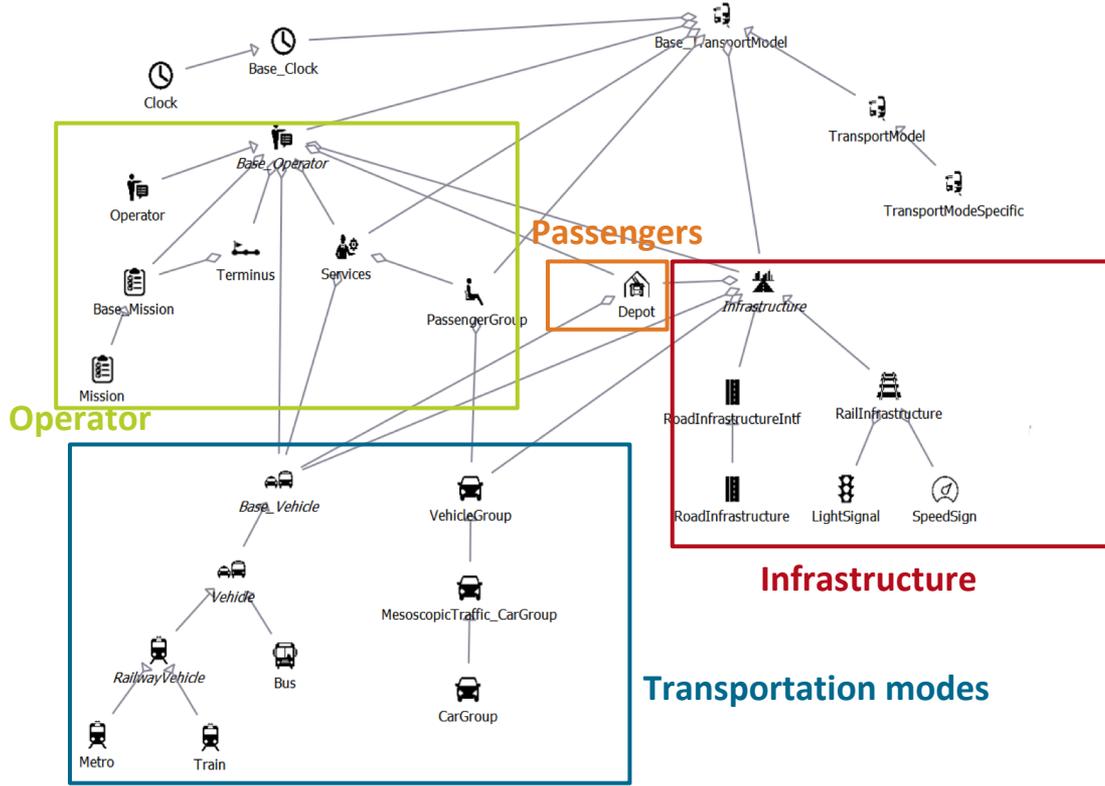
... to help make optimal decisions

Conceptual model files

OMI_RTE

Conceptual Model Tree View

Name	Type
Data Types	
Boolean	Bool Type
Int	Int Type
Float	Float Type
String	String Type
MapIntInt	Map Type
MapStringInt	Map Type
IntegerEnumCa...	Map Type
ListeNbGdP	List Type
ListString	List Type
EnumTypeOper...	Enumeration Type
EnumTypePoliti...	Enumeration Type
EnumCableFam...	Enumeration Type
EnumEtatOpera...	Enumeration Type
EnumEtatFoncti...	Enumeration Type
EnumCategorie...	Enumeration Type
EnumTypeElem...	Enumeration Type
EnumStrategie...	Enumeration Type
Date	Composite Type
MSRFlag	Composite Type
BlocAEqComm...	Composite Type
IdentifiantEntite	Int Type
ListIdentifiants...	List Type
NbESS	Composite Type
IntervalsReelsP...	List Type
BusinessValue	Composite Type



Thank you!