PREFEITURA DE SÃO PAULO
TRANSPORTES

CET

SPTrans

CIMU

Integrated Centre for Urban Mobility

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USP

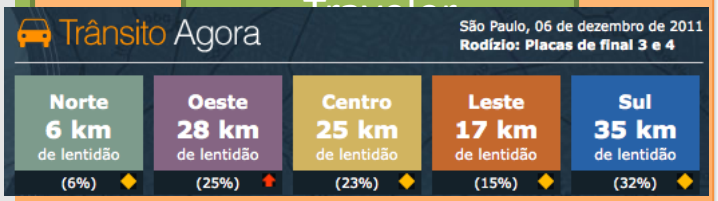
- The existing infrastructure in SP
- Why to change?
- What is CIMU?
- Which are the goals?
- How it will be done?

Infrastructure in SP

Fig. 4

Fig. 5

Fig. 6



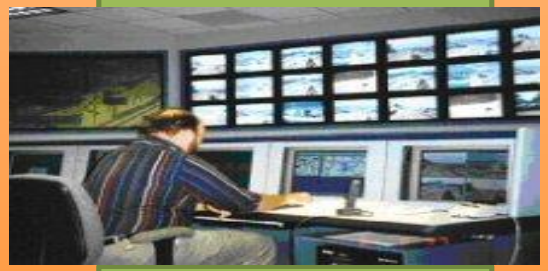


Fig. 7

Fig. 9

Fig. 11

Fig. 8

Fig. 10

Why to change?

- Build more infrastructure is difficult and expensive
- Isolated systems restricts the implementation of new functionalities
- There is space to improve the coordination and intelligence of the systems for the benefit to the end users
- The decision makers and managers aren't isolated like in the past (urban mobility issue)
- Will more infrastructure solve all the problems?

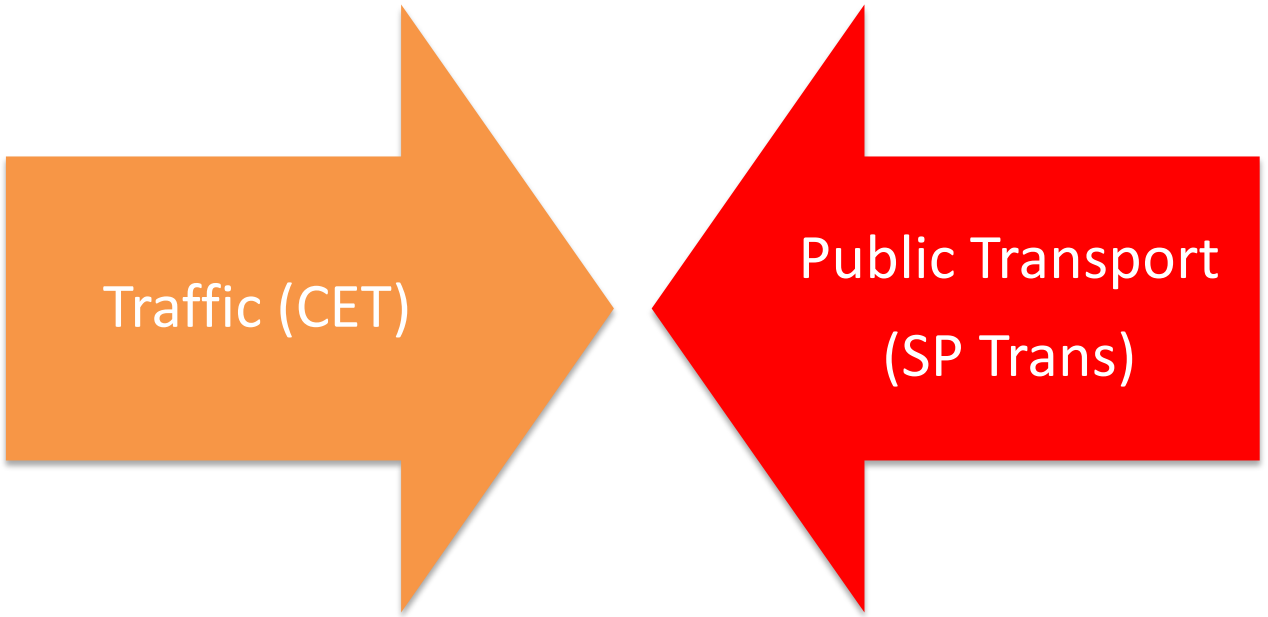
NO

What will CIMU be?

Centro Integrado de Mobilidade Urbana

ONE database that integrates **ALL** the data/information of traffic and transportation using systems based on **OPEN PROTOCOLS and OPEN STANDARDS**

What will CIMU be?



Integration = **Visualization** + **Coordination** + **Control**

Will CIMU solve all the problems?

NO

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How will it help?

> safety **< journey time** **> presicion**

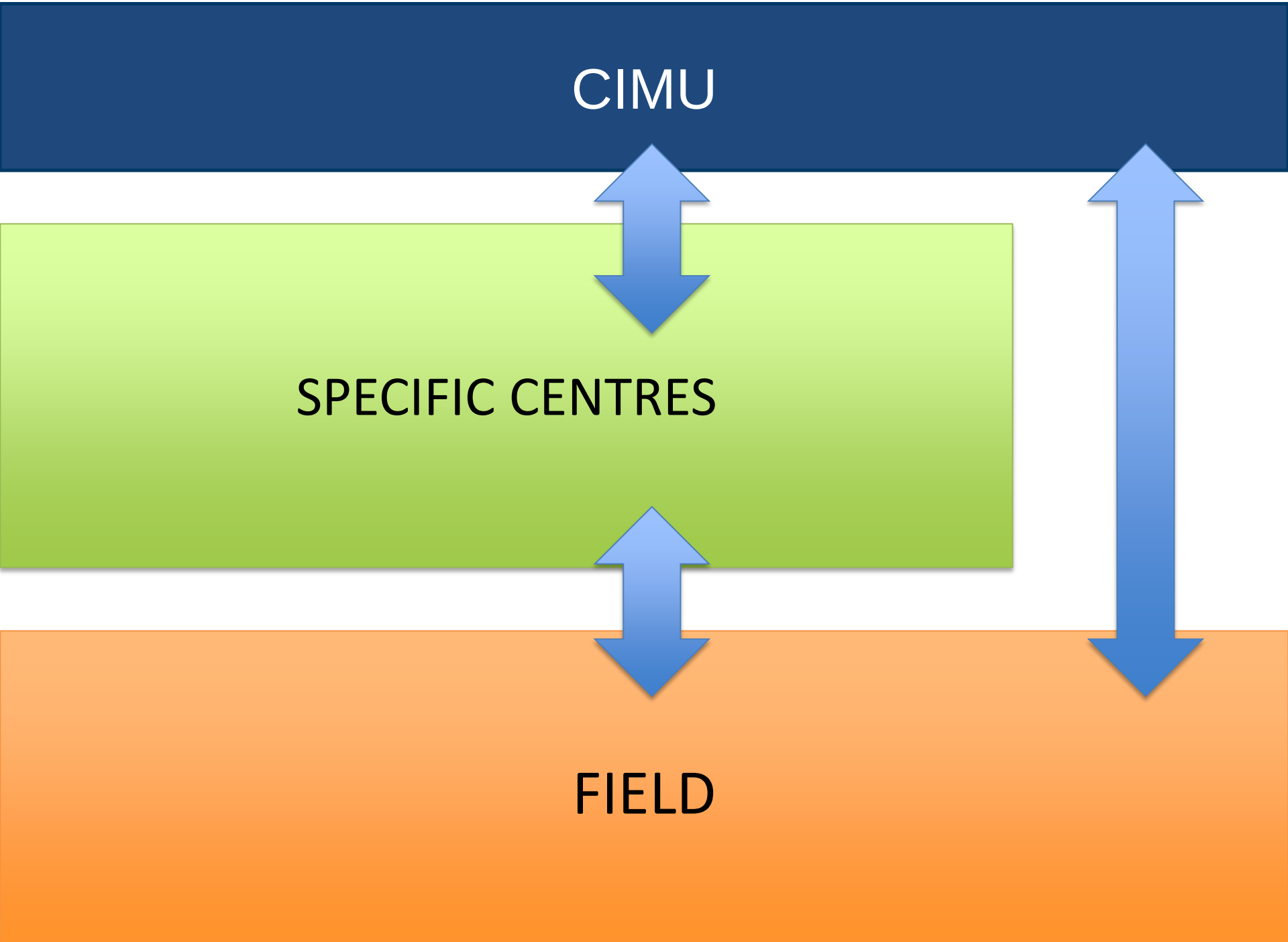
> control **< envir. damage** **> information** **> predictability**

Aims of CIMU

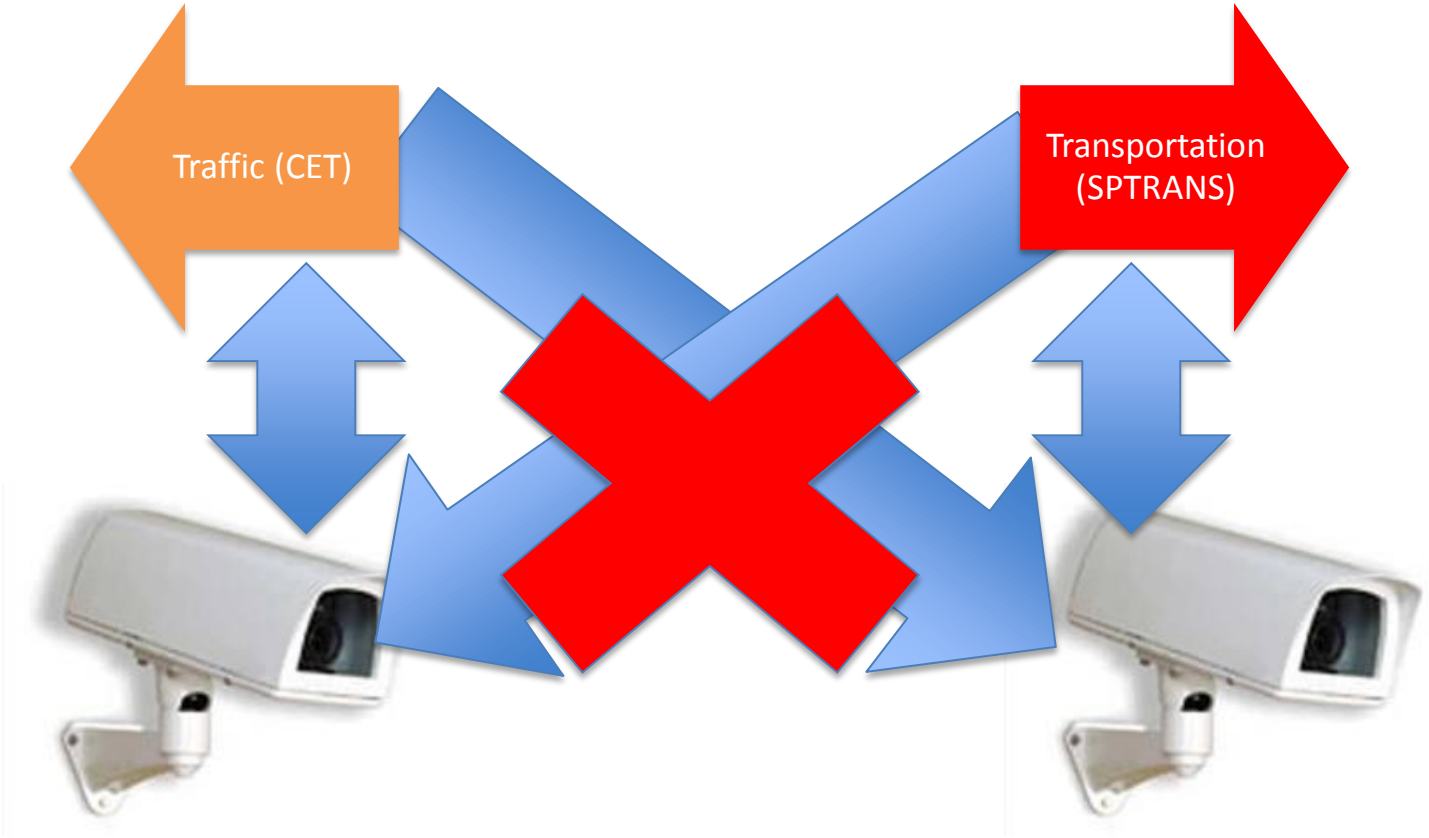
- Visualize, on a global/meta level, the information about all the ITS elements and infstracture components to foster strategic decisions
- Automation of processes
- Deployment of new functionalities
- Provide information to the end users
- Share resources
- Lower operational costs

How CIMU will operate?

- Field data captured in real time
- Transmission of data from the field to specific coordination and control centres
- Copy of data from the specific centres to CIMU
- Generate strategic information for decision making
- Share resources among the specific centres
- Act in certain cases


CIMU
SPECIFIC CENTRES
FIELD

Example of CCTV



CIMU

Traffic
CET

Transportation
SPTRANS

FIELD

CENTRO INTEGRADO DE MOBILIDADE URBANA - CIMU

SPECIFIC CENTERS

TRAFFIC LIGHTS | GPS | TICKETING | CCTV | VMS | ECD/DAI | Height detection | Tunnels

Data Network

FIELD

Fig. 5

Fig. 11

Fig. 8

Fig. 9

CENTRO INTEGRADO DE MOBILIDADE URBANA - CIMU

SPECIFIC CENTERS

TRAFFIC LIGHTS | GPS | TICKETING | CCTV | VMS | ECD/DAI | Height detection | Tunnels

UTMC | NTCIP

Data network

UTMC | NTCIP

FIELD

ADAPTOR

PROPR. | CTLS EXISTENT

UTMC 2 | CTLS NEW

Fig. 5

Fig. 11

Fig. 8

Fig. 9

CIMU

BUS PRIORITIZATION

SPECIFIC CENTERS

NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR

TRAFFIC LIGHTS | GPS | TICKETING | CCTV | VMS | ECD/DAI | Height detection | Tunnels

UTMC — NTCIP

Data network

UTMC — NTCIP

FIELD

ADAPTOR

PROPR. — CTLS EXISTENT

UTMC 2 — CTLS NOVOS

Fig. 5

Fig. 11

Fig. 8

Fig. 9

CIMU

TRAVEL TIME

WEB

SPECIFIC CENTERS

NTCIP ADAPTOR

NTCIP ADAPTOR

NTCIP ADAPTOR

NTCIP ADAPTOR

NTCIP ADAPTOR

NTCIP ADAPTOR

NTCIP ADAPTOR

NTCIP ADAPTOR

TRAFFIC LIGHTS

GPS

TICKETING

CCTV

VMS

ECD/DAI

Height detection

Tunnels

UTMC

NTCIP

Data network

UTMC

NTCIP

FIELD

ADAPTOR

PROPR.

CTLS EXISTENT

UTMC 2

CTLS NOVOS

Fig. 5

Fig. 11

Fig. 8

Fig. 9

CIMU

ORIGIN-DESTINATION RESEARCH

MANAGEMENT

SPECIFIC CENTERS

NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR

TRAFFIC LIGHTS | GPS | TICKETING | CCTV | VMS | ECD/DAI | Height detection | Tunnels

UTMC

NTCIP

Data network

UTMC

NTCIP

FIELD

ADAPTOR

PROPR.

CTLS EXISTENT

UTMC 2

CTLS NOVOS

Fig. 5

Fig. 11

Fig. 8

Fig. 9

CIMU

PROCESS AUTOMATION

SPECIFIC CENTERS

NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR | NTCIP ADAPTOR

TRAFFIC LIGHTS | GPS | TICKETING | CCTV | VMS | ECD/DAI | Height detection | Tunnels

UTMC — NTCIP

Data network

UTMC — NTCIP

FIELD

ADAPTOR

PROPR. — CTLS EXISTENT

UTMC 2 — CTLS NOVOS

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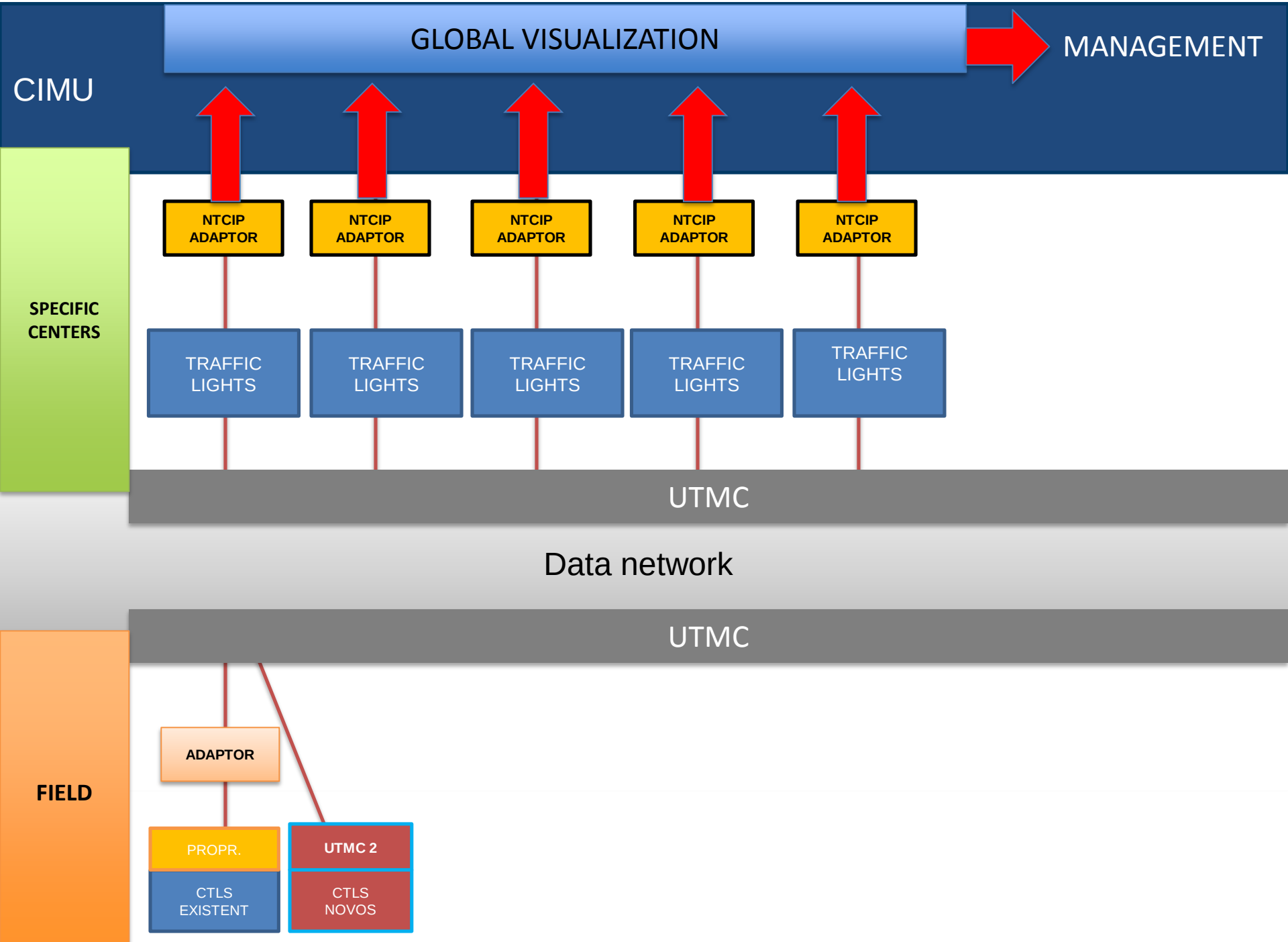
CIMU
GLOBAL VISUALIZATION
MANAGEMENT
SPECIFIC CENTERS
NTCIP ADAPTOR
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TRAFFIC LIGHTS
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CIMU

GLOBAL VISUALIZATION

MANAGEMENT

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NTCIP ADAPTOR

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UTMC

NTCIP

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UTMC

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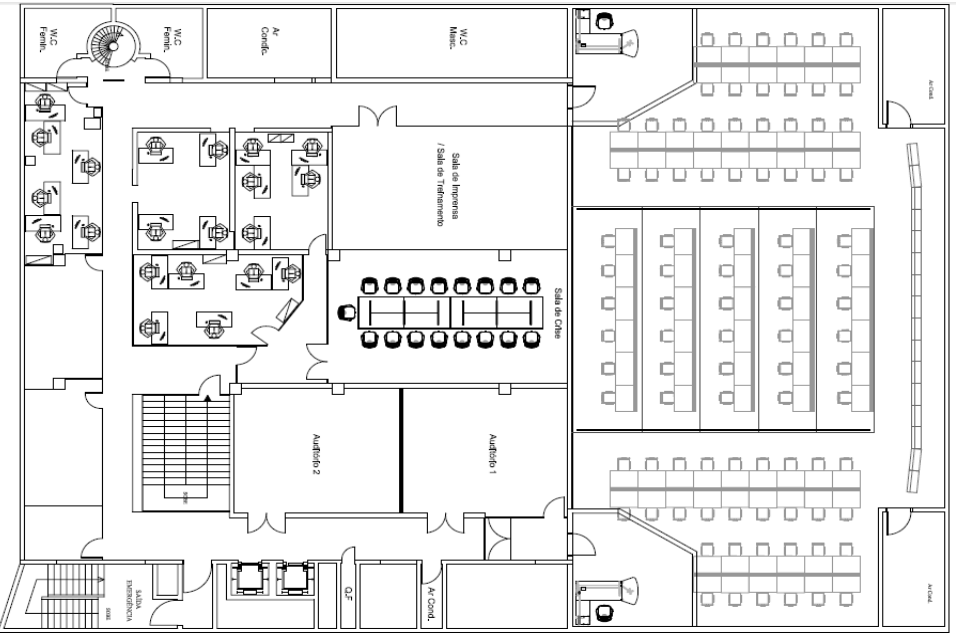
CIMU in numbers

Fiber network	**1100 km**
Real time traffic lights	**3000**
Fixed time traffic lights	**3200**
PTZ Cameras	**970**
Fixed Cameras	**710**
Incident Detection	**405**
VMS	**150**
Height Detectors	**30**
CIMU	**1**



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Further possibilities:

- Parking management
- Emergency vehicles monitoring
- Hazardous cargo monitoring
- Metro/Train integration
- Metropolitan area integration

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TRANSPORTES

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THANK YOU

USP

GAESI

GESTÃO EM AUTOMAÇÃO E T.I.

Electric Energy and Automation Engineering Department

of the Polytechnic School

of the University of São Paulo

Cidades inteligentes
(Smart cities projects)

- Integration of traffic lights in Sao Paulo
- Maintenance of urban infrastructure/ furniture in Sao Paulo
- MOG-LAB Laboratory of logistics, urban mobility and environmental implications - Santos
- TAX management automation – SP state

Rastreabilidade
(track and trace projects)

- Pilot system of equipment and access control on restricted areas
- Traceability applied to the supply chain ABEC/ACAV/SINDICARE-SC/SINDUSFARMA
- Secure supply chain - FINEP

LOGISTICS

- Management, control, financial and operational systems for ports authorities
- Automation of electronics scales
- Yard and port cargo management process (for Port Santos and Macae)
- Ports security (for Sao Paulo state dock company)
- Retroporto system
- Dashboard for logistic activates for Petrobras
- Electronic superhighway (Docks companies of Santos and Rio de Janeiro)