



# Traffic Engineering Company



April/12





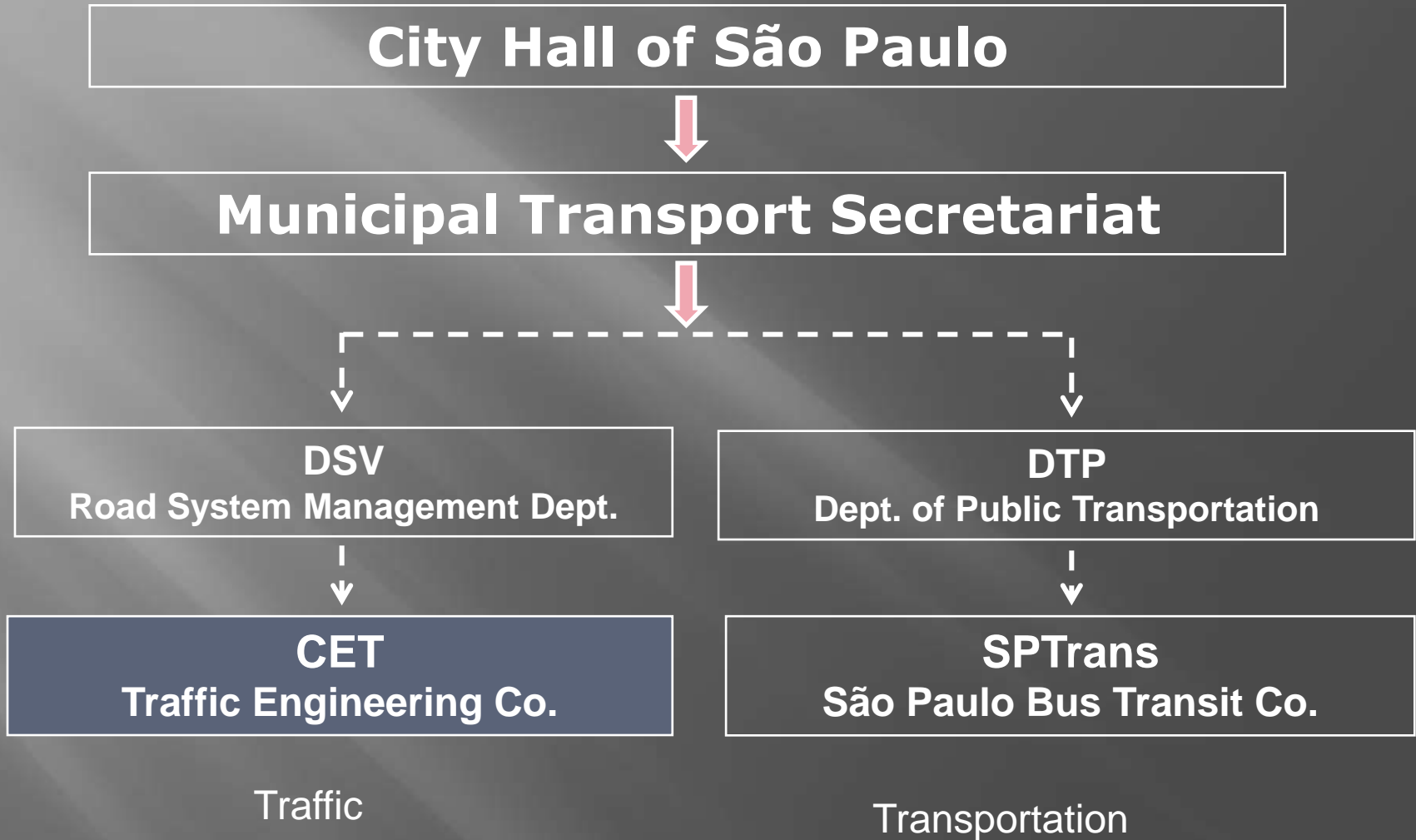
# Traffic Engineering Company

Mixed Economy Society created in 1976 with the following objectives:

- Plan and Implement road system operation to ensure safety and mobility;
- Promote the economical exploitation of urban equipments in order to benefit traffic and transportation
- Provide services and works to improve traffic flows



# CET IN THE MUNICIPAL GOVERNMENT



# CET - GOAL

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PROVIDE SAFE MOBILITY IN TRAFFIC,  
CONTRIBUTING TO CITIZENSHIP AND  
QUALITY OF LIFE.

# WORKING SECTORS

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**Traffic Engineering Management**

**Enforcement**

**Project / Planning**

**Road Signaling**

**Traffic Safety**

4.707  
Employees

**Education**



# CET: THE CHALLENGE



**11.3 million people** (IBGE/2010)  
**7.2 million registered vehicles** (November/2011)  
**17.000 Km of roads**  
**21.6 million motorized trips**  
**7.1 million walking trips**  
**138.000 bicycle trips**

} (Research S/D 2007)



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# **DATA AND STATISTICS**



# CET: DATA AND STATISTICS

## HUMAN RESOURCES

**1.900** TRAFFIC AGENTS ON THE STREETS / DAY

**340** MONITORING AGENTS

## MATERIALS RESOURCES

**872** PATROL CARS, MOTORCYCLES AND TOW-TRUCKS

**347** CAMERA (CCTV)

**24** VARIABLE MESSAGE PANELS / SIGNS (VMP)

**647** MOBILE RADIO ( VEHICLE MOUNTED)

**27** FIXED RADIO Transmitters and Receivers (for dispatching activities)

**515** MOBILE PHONES

**1.245** HANDHELD DEVICE (PORTABLE DATA TERMINALS)







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# **TRAFFIC ENGINEERING MANAGEMENT**



# TRAFFIC ENGINEERING MANAGEMENT (GETs)



**Operation Control Center**

- 8 Traffic Engineering Management Departments (GETs)
- 1 Operation Control Center
- 6 Traffic Signal Operation Centers (DCSs)
- 5 Tunnel Control Centers



# Traffic Operation and Enforcement



**1.900** Agents  
(Operation / Parking control / works)



# Daily Activities

**178 rush hour shift watching (1.670 Km of streets)**



**21 Reversible lanes (36 km length)**

**410 Operating points on / day**



**105 car Accident  
(30 with injuries)**



# Daily Activities

## 3 Special Trucking Accidents

tumbling, falling load, dangerous productos e over high measure)

260 broken vehicles  
44 broken busses  
59 broken trucks



## 23 Towned cars

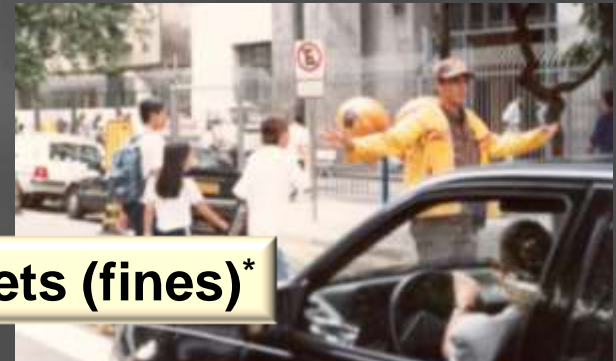
Average response time: 27 minutes

19.100 tickets (fines)\*

14 Operation school continues and  
46 Periodic operation (average – some days and times)

Ref. Feb and Mar/11 – SCO

\* Daily average of ticketing 2010 – includes staff, equipm. and Police)



# Special Planned Events



**Civic Dates**



**Shows**



**Sports**



**Carnival**

**44.600** events atended in 2010  
**R\$ 20 million** of income in 2010



**Works**



**Religious**



**Car Racing**

# Unforeseen Events

## Demonstrations - strikes



## Accidentes



## Emergencial Works





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# **OPERATIONAL CONTROL CENTER**





# OPERATION CONTROL CENTER - Activities

24 hour operation and communication management

- Traffic Agent Management;
- Registering and dispatching of occurrences;
- Interface with internal departments;
- Interface with related agencies;
- Road Network Monitoring (PAC, Tunnels and Cameras);
- Starting Tow-trucks;
- Traffic Related Information – Phone line 1188;
- Twitter
- Variable Message Panels / Signs (VMP).



# OC - DATA AND STATISTICS

- **140 thousand** REGISTERED INCIDENTS AND ACTIVITIES PER MONTH
- **92.511** PHONE CALLS RECEIVED THROUGH THE TRAFFIC HOT LINE 1188;
  - ✓ 48% provided traffic related information by URA and attendants
  - ✓ 52% provided information plus dispatching activities related to additional traffic operations required (traffic lights with problems, enforcement, crashes or traffic incidents)
- **123 thousand** incoming phone calls from field-operation agents;
- **1.5 thousand** radio contacts with field-operation agents;
- **4.7 thousand** calls from various municipalities, media, police department, transit company, and others;
- **2.4 thousand** followers, 2.000 messages/month by Twitter;
- **1.246** emails/month received by Falecom (Talk to CET); and
- **7,5 million** accesses/month to the website.

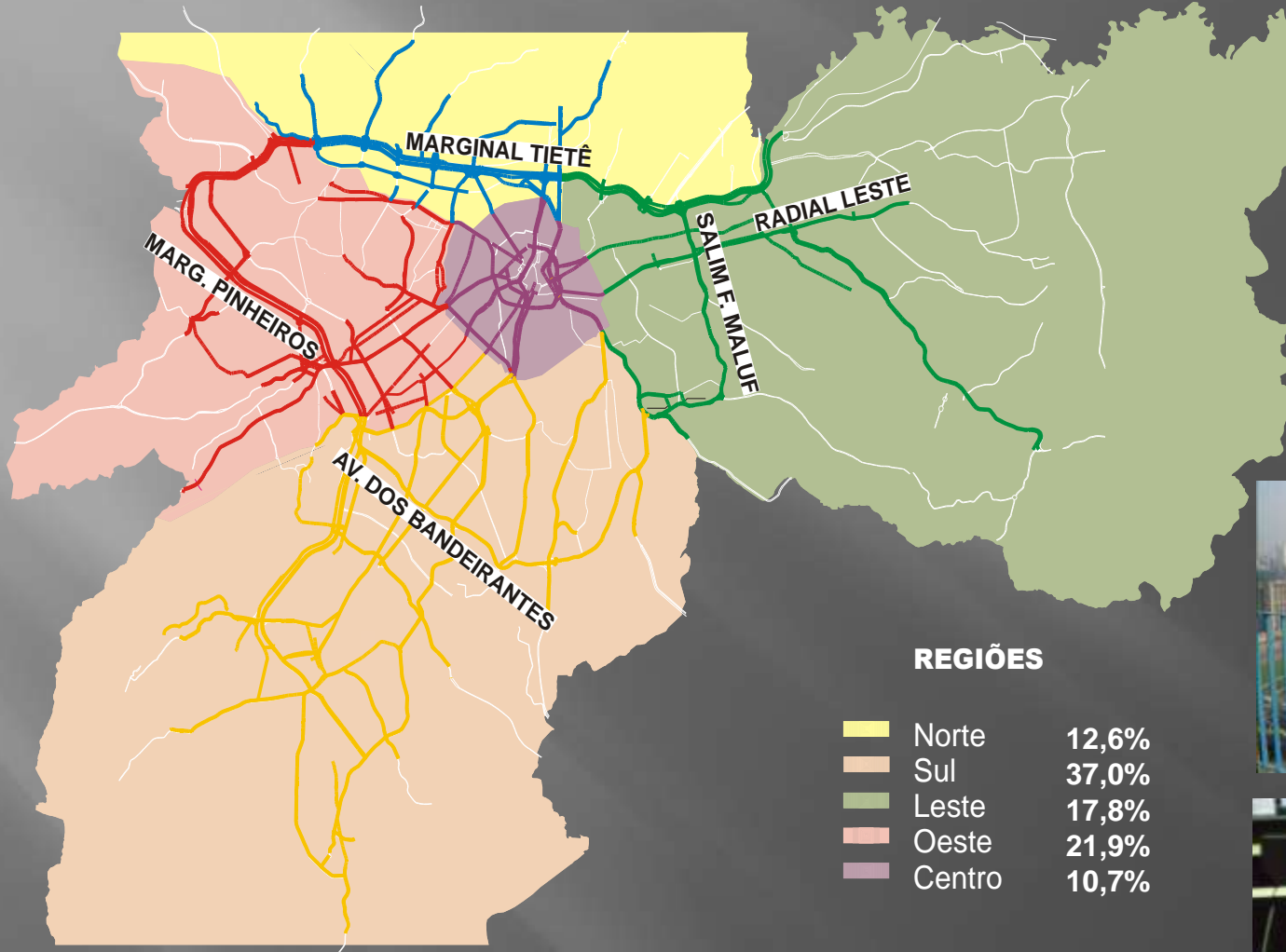


Road System  
1.509 Km<sup>2</sup> of area  
17.000 Km of streets

# Road Monitoring

868 Km monitored streets

46% PAC  
(Advanced Field Monitoring)  
20% Cameras  
34% Routes



CFTV Cameras  
347 (Tunnels, DCSs)  
April/10

# RESOURCES, SYSTEMS and PRODUCTS



PAC: Building-top Monitoring Places



Monitoring Camera



Traffic Agents



handheld



radio



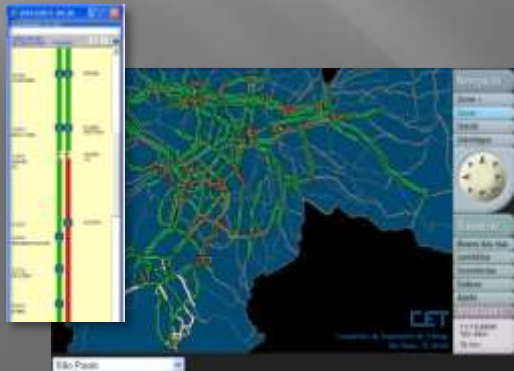
Line 1188 / Twitter



**I-CAD**

**VOICE TELEPHONY**

**RADIO**



Traffic Congestion Map



Variable Message Panels / Signs (VMP)



Internet / Media



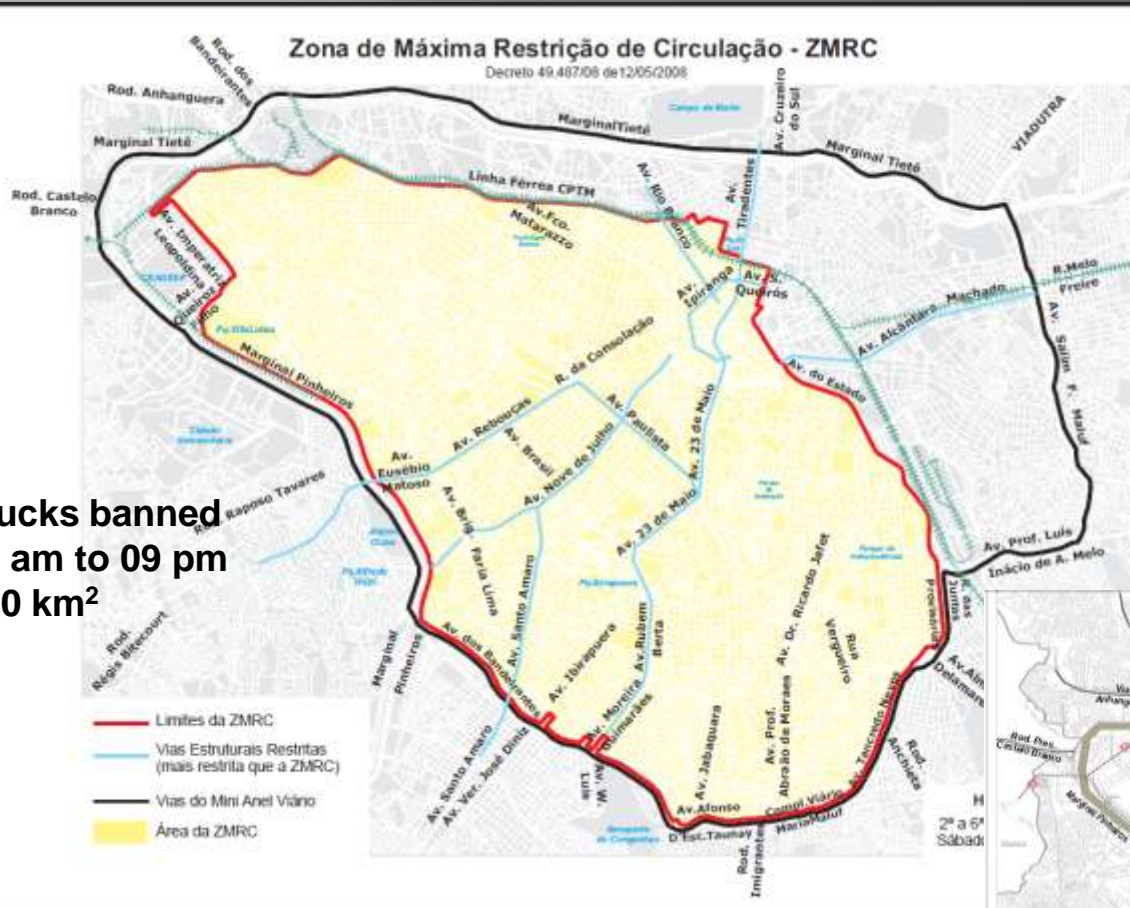
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# **PROJETCS AND PLANNING**



# Project and Planning

## Trucks Circulation Restrictions



Trucks banned  
05 am to 09 pm  
100 km<sup>2</sup>



Restrictions on Movement  
of Chartered Buses

# Leisure Bikelanes



# Informative Traffic Signs



# Bottleneck treatment



# Safety projects





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# **EDUCATION and SAFETY**





# Traffic Education and Safety



**56.400 people trained / oriented in Transit Education in 2010**



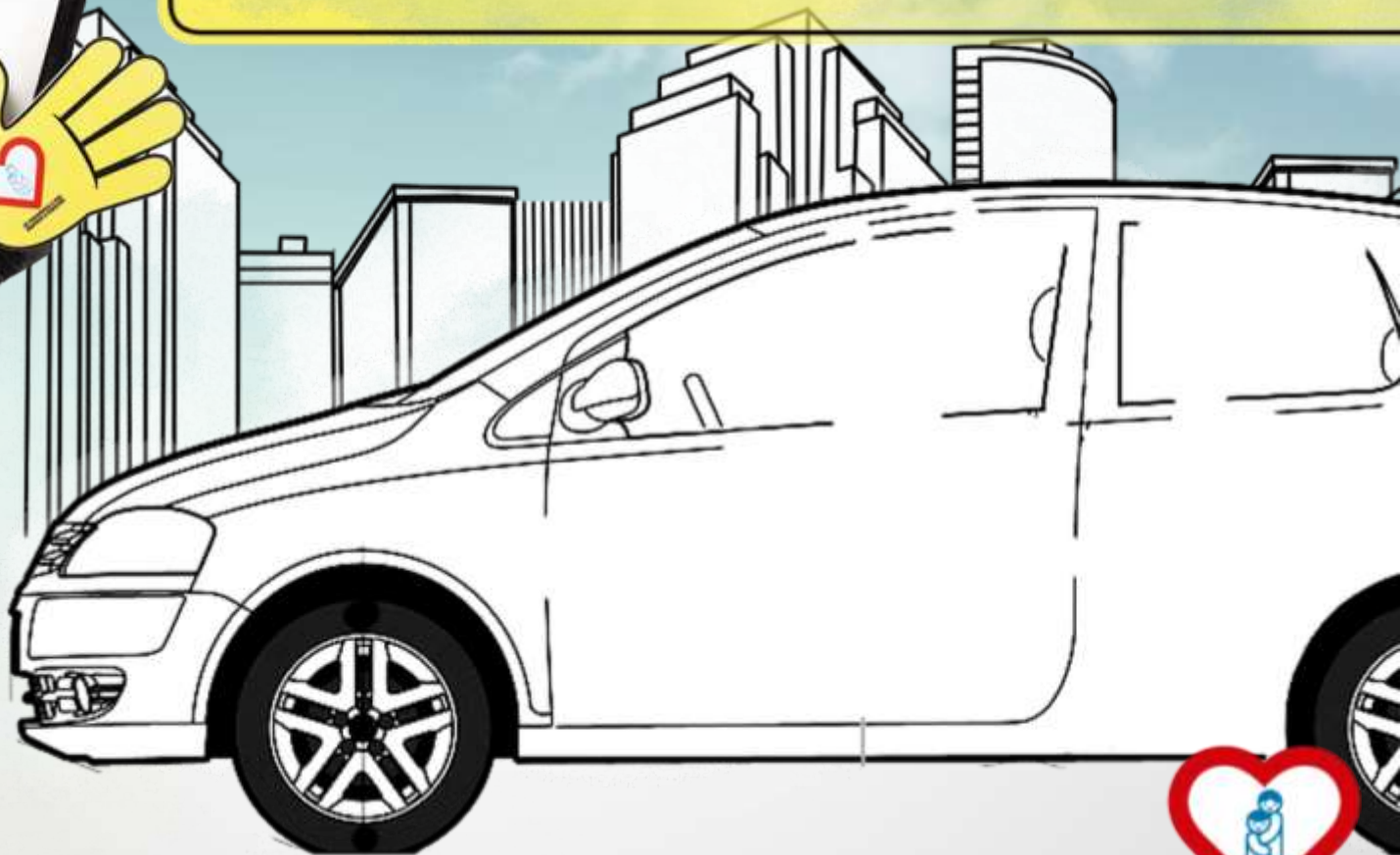
# Traffic Educational and Safety

384 enlightened pedestrian crossing - 2010



125km of streets with standard speed

# PEDESTRIAN SAFETY PROGRAM





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# **TRAFFIC SIGNALS**



# Signaling

2.4 million square meters (road makings)



401.000 traffic signals



6.134 traffic lights



# Signaling

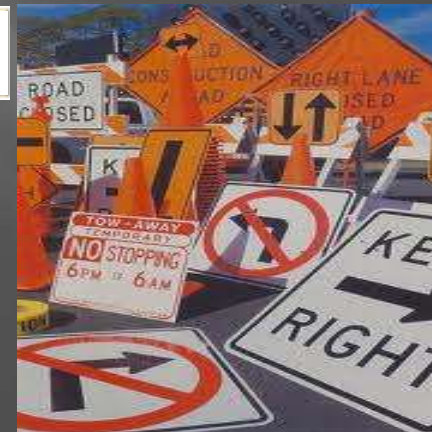
## Traffic Controller's maintenance



Road Works



## Traffic signs manufactory



Loop detectors





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# **TRAFFIC CONTROL**



# Departments for Traffic Signal Control

GET 2 – DCS 2



GET 3 –DCS 3



GET1 - DCS 1



GET 6 Monitoring

GET 5 – DCS 5



GET 4 – DCS 4





# MAIN ACTIVITIES

## FLOW SURVEYS



## PROGRAMMING

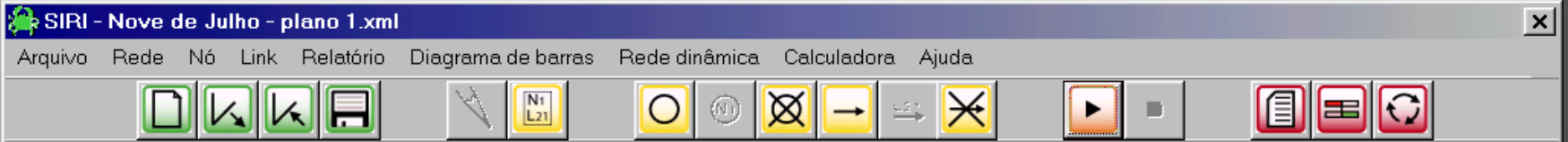


## PROJECTS

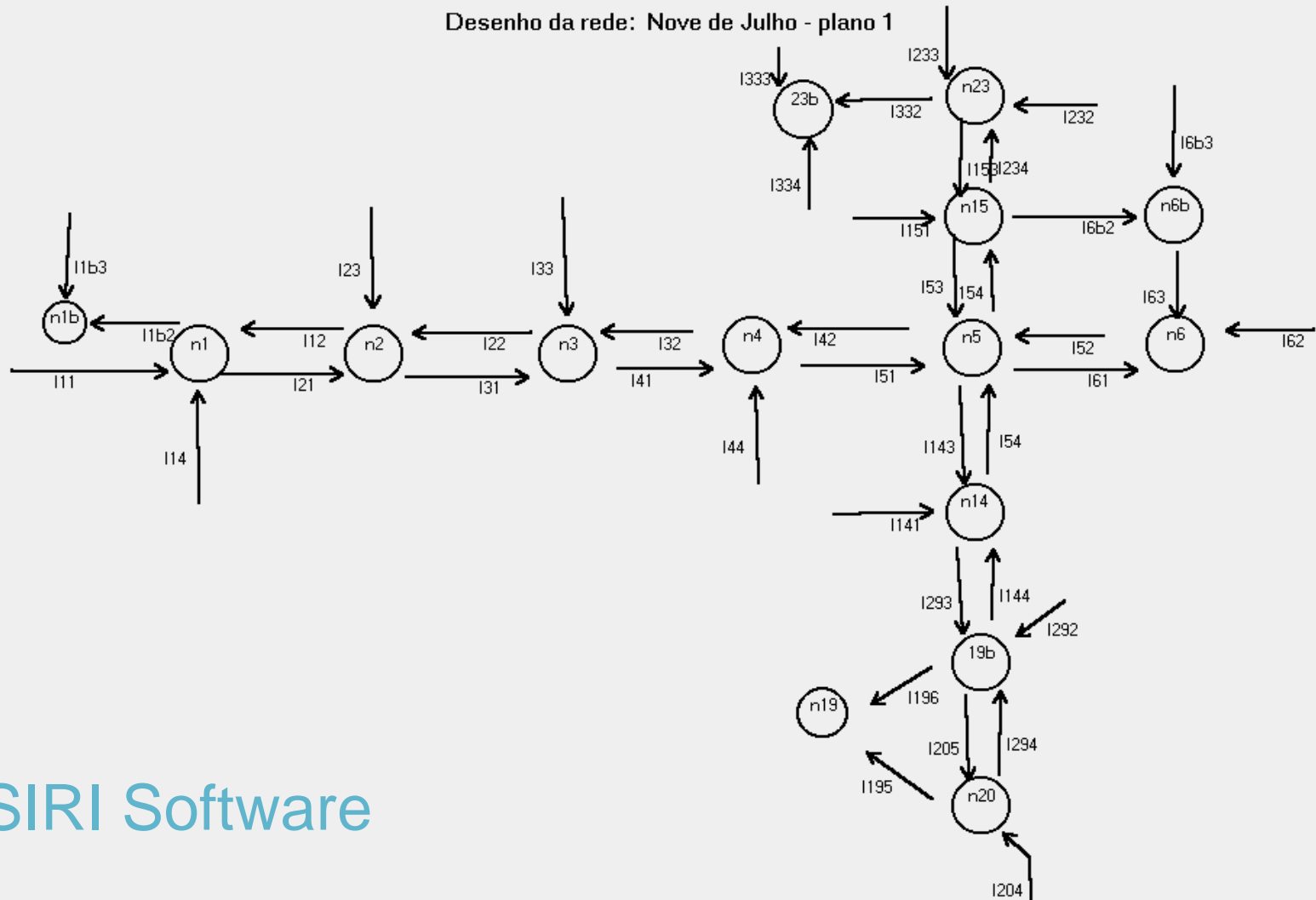


## MEASUREMENTS

# TRAFFIC MODELING



Desenho da rede: Nove de Julho - plano 1



SIRI Software

# MAIN ACTIVITIES

## MONITORING



## TRAFFIC SYSTEM OPERATION



# TECHNOLOGY

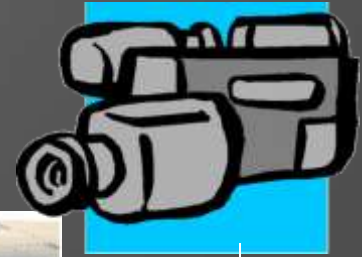
## Centralized traffic control

CTA 1 (2012)

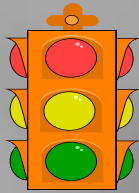


# SOFTWARE SCOOT

CAMERAS



CONTROL CENTER



TRAFFIC LIGHTS



LOOP DETECTORS



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# **EFORCEMENT TECHNOLOGY**



# ENFORCEMENT TECHNOLOGY

## Cameras with loop detectors and OCR

(optical character reader)

Câmera with OCR and data processing

AXS0007



Data transmission



Data Center to process images



Loop detectors

# PERMANENT RADAR

Light

Camera

Control cabinet





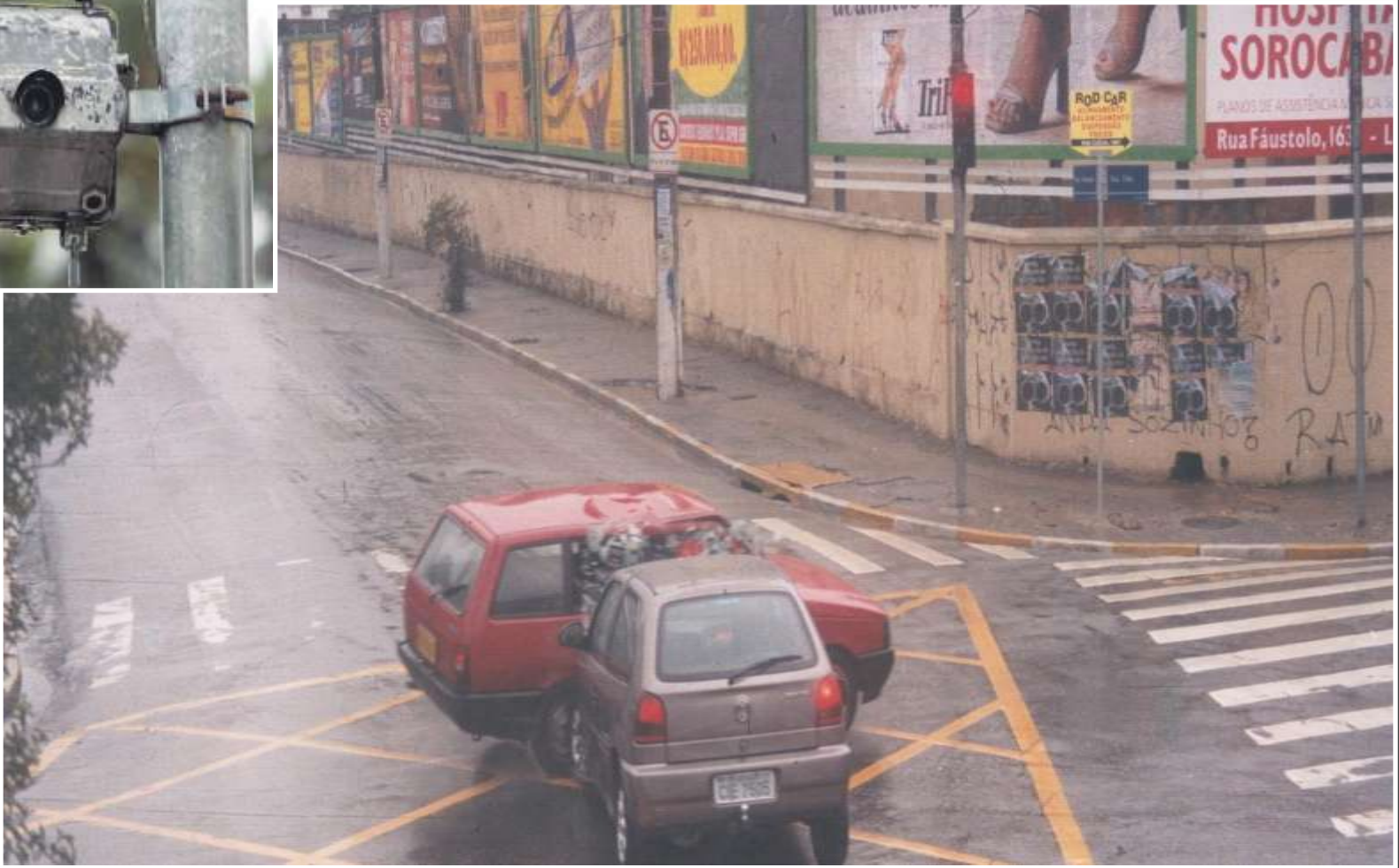
# ELETRONIC BARRIER



SPEED  
INDICATOR



# RED LIGHT ENFORCEMENT CAMERA



# PORTABLE SPEED RADAR



# RADAR GUN





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# **OTHER TECHNOLOGY**



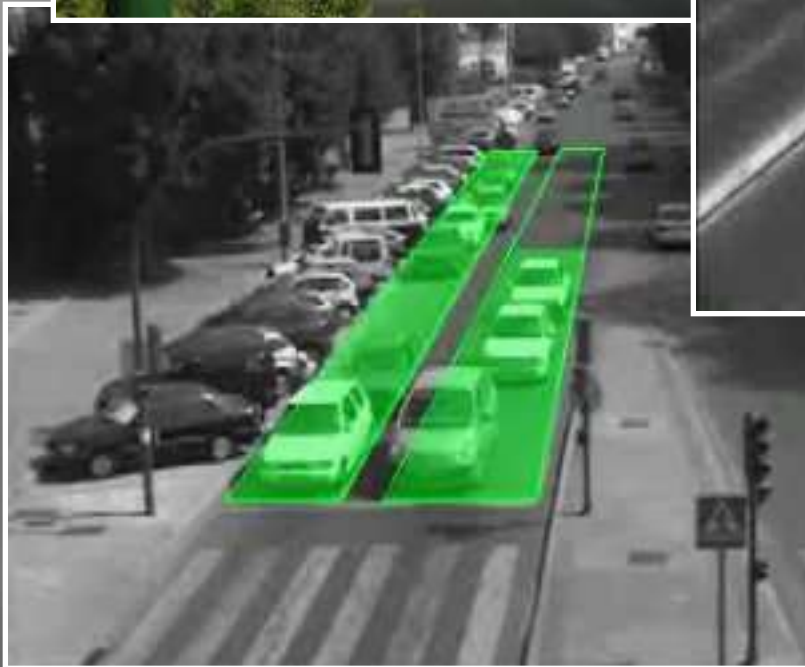
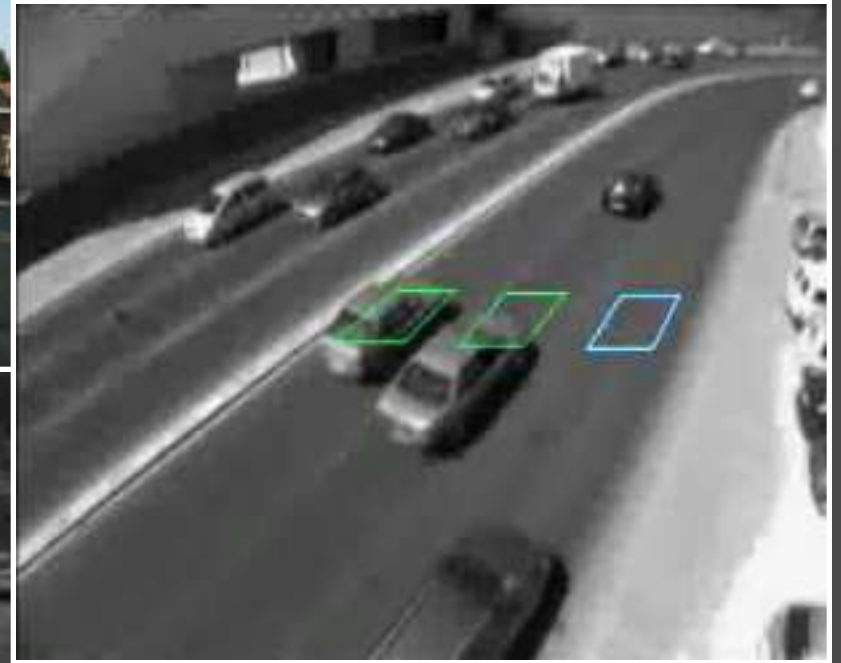
# BATTERY OPERATED TRAFFIC LIGHTS



# SOLAR ENLIGHTENED ZEBRA CROSSING



# VIDEO DETECTION (test)





# INCIDENT AUTOMATIC DETECTION (test)



# Traffic Engineering Company

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