

04 (future 02+03)

Present and Future Mobility Management

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- Imagine how traffic/mobility (vehicle and people flows) can/will be managed in the future

Present Traffic Management

- **Sensors**
 - Inductive loops, video cameras with image processing, or controlled by human operators
- **Actuators**
 - Traffic lights, variable signals
- **Communications**
 - Mostly wired network
- **Control**
 - One owner
 - Centralized control with some forms of local management
 - Good quality (but probably poor) data (ex. accurate vehicle counters)

Inductive loop detectors

- Most common vehicle sensor
- Detects the inductance change when a vehicle passes over a coil
- Several physical configurations are able to support diverse applications
 - Counting
 - Speed measurement
 - Vehicle classification

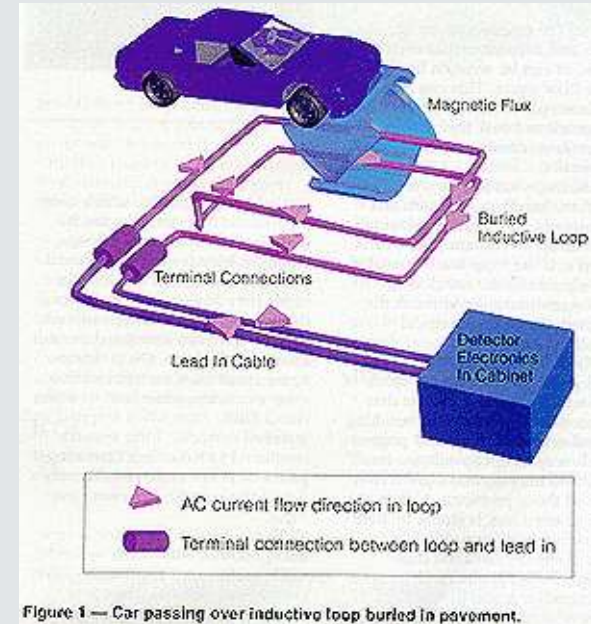
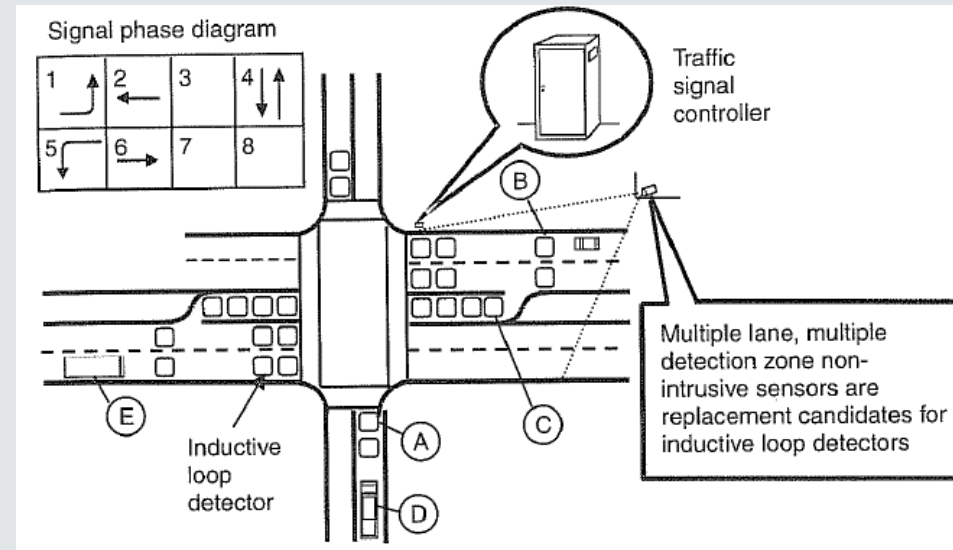


Figure 1 — Car passing over inductive loop buried in pavement.

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Intersections

- Fixed time intervals
- Variable time intervals depending on traffic conditions
 - Priority to emergency vehicles



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Traffic management

Captura e funde os dados dos vários sensores e comanda os semáforos à escala global

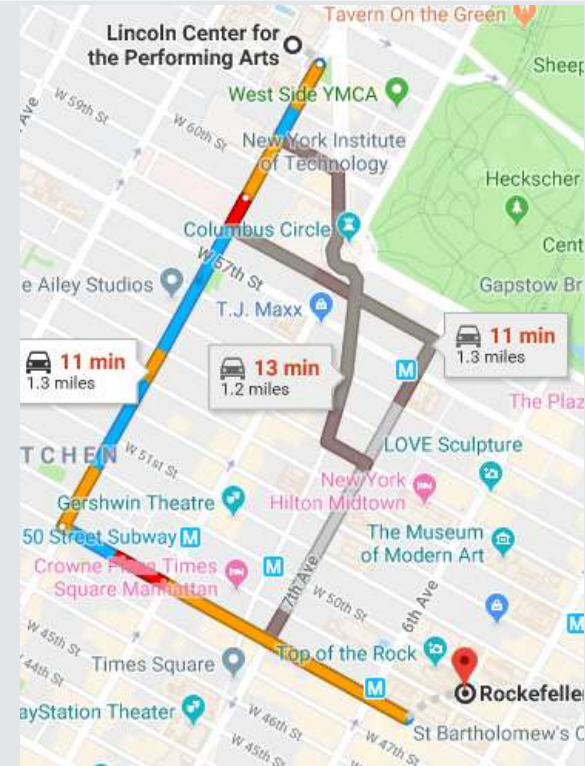
Lisbon Gertrude (*Gestion Electronique de Régulation en Temps Réel pour L'Urbanisme, les Déplacements et l'Environnement*)



Future Traffic Management

(incremental engineers view)

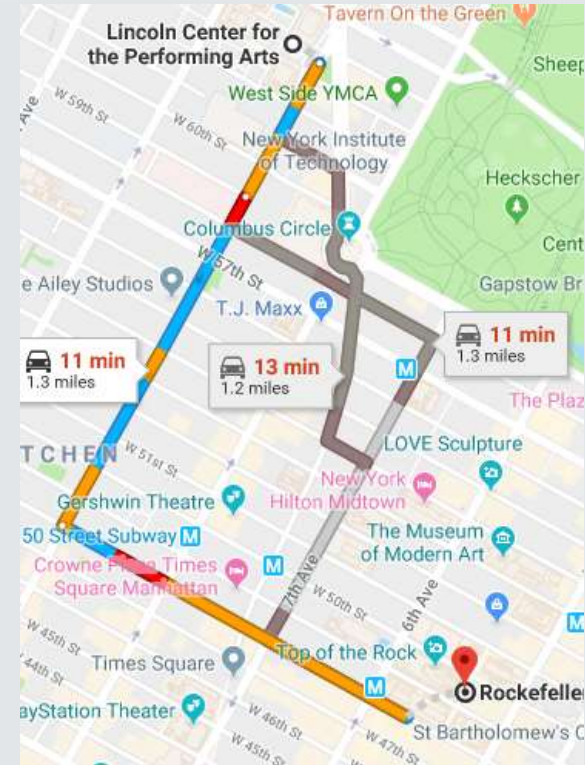
- **Sensors**
 - Automatic vehicle location (GPS, beacons), and
 - Detection (video cameras, electronic license plates)
 - Crowd-sourced
- **Actuators**
 - Automatic control of autonomous vehicles, traffic lights, variable signals
- **Communications**
 - Vehicular networks, WiFi, celular (fixed and wireless or celular networks)
- **Control**
 - Cooperatively distributed
 - Rich data from several sources/owners (ex. Google Maps)
 - Variable data quality (lots of information – number and types of vehicles, vehicle IDs, driver profiles and behavior patterns, etc.)



Future Traffic Management

(“Google-like” view)

- Sensors
 - Pre-installed onboard or smartphone, video cameras
 - Crowd-sourced + tagged humans
- Actuators
 - Automatic control of autonomous vehicles
 - Biopulses
- Communications
 - Vehicular networks, WiFi, celular (fixed and wireless or celular networks)
- Control
 - We will do it



Future Traffic Management

(“Google-like” view)

