



POLIS Environment & Health WG

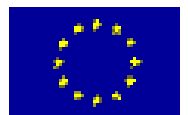
Noise Abatement: Quiet Night Deliveries in Barcelona

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1. Noise Maps & Decision Support Systems (DSS)
2. Short history of Quiet Night Delivery (QND) experimentations in Barcelona:
 - 1.1 Context, & interests of the food sector
 - 1.2 Operators, trials in MIRACLES, SILENCE projects
 - 1.3 Who, what, when & where?
 - 1.4 Results, conclusions
3. Experimentation continues. FIDEUS...

- **MES*** (Strategic Noise Map) is conceived as a **tool** to permit the global evaluation of environmental noise city-wide
- It comprises a graphic representation in electronic format of various types of information arising from municipal management
- Prior to MES, no DSS existed (maps for 1990, 1997, centralised system of noise complaints...)

- Noise Map

- Street sections →
- Programs for sound-level estimates
- Timetable: daytime, evening night →

Current situation

Define Objectives

- Map of acoustic capacity

- Street sections
- Districts
- Timetable: daytime, evening night

Conflicts maps

- Maps of levels exceeding thresholds

- Measures for Reducing Noise →

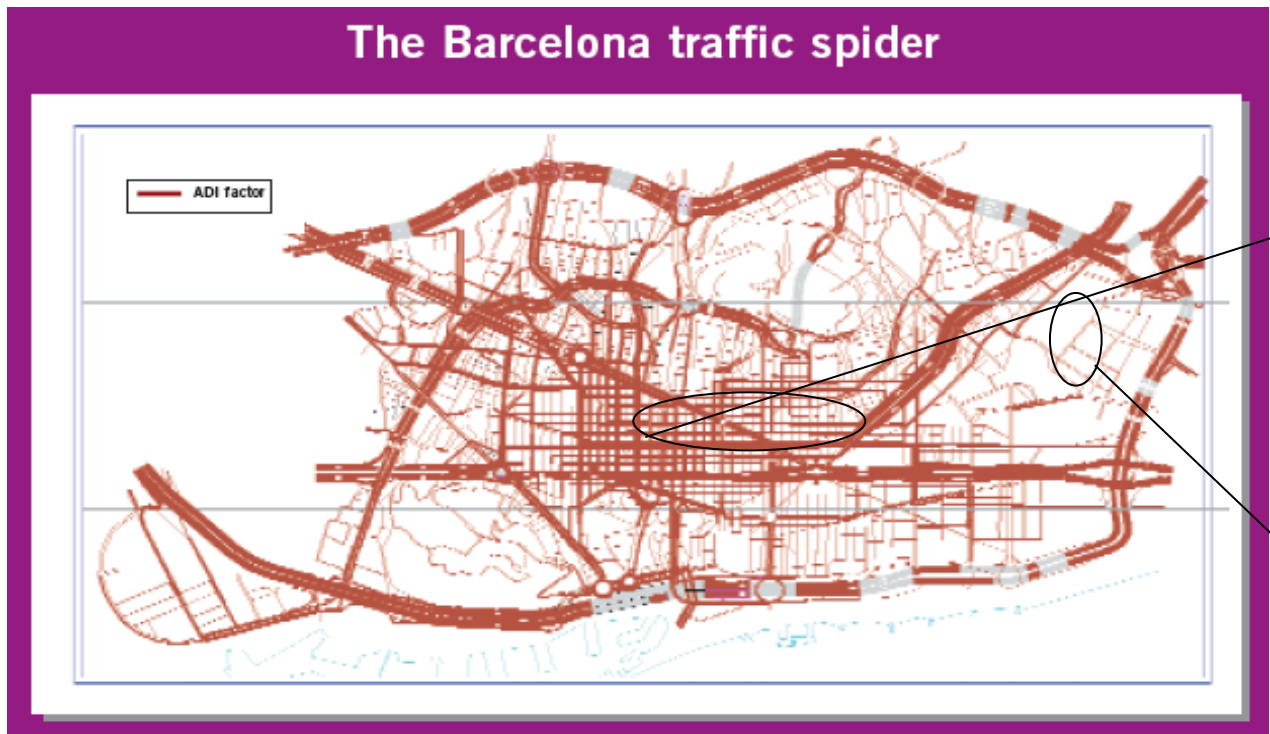
Action Plans

- MES is designed as an integral management tool, shared between different sectorial city managers:
 - Mobility / traffic
 - Housing, town planning...
 - Activities managers
- Under development by the Municipal Informatics Institute (IMI), the application aims to handle public consultation via the web

- Different noise sources:
 - Road traffic
 - Industrial activities
 - Night-time leisure activities
 - Shopping Malls
 - Total daytime noise
 - Total evening noise
 - Total night-time noise

- Completion of measurements / simulations (end 06):
 - 5 districts based on measurement technique (1360 measurements)
 - 5 based on simulation* (with 800+ validation measurements)
- Internal operation of application (Spring 07)
- Elaboration of Action Plans: July 2008
- Updating of data & application

- Importance of traffic
 - Filtering (levels of 15000 vpd.). Stark differences



Red in Noise Map – little to be achieved by signalling strategies

Green in Noise Map

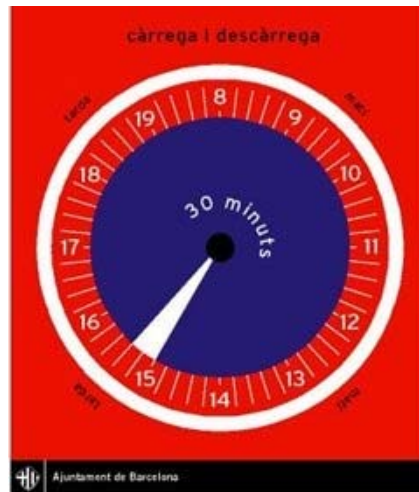
2 Quiet night deliveries

- The majority of the city's 47,000 commercial premises have no off-street loading facilities and it estimated that each day, some 100,000 goods deliveries are realised from the kerbside (*Robusté*, 2003).
- A similar situation is found in other cities (for example, 49% of Dublin's deliveries are made from the street*).

* Finlay, POLIS Annual conference, Toulouse, 2007

General traffic regulation

- Some 10,000 on-street spaces are reserved for un/loading between the hours of 08.00 and 20.00. Goods operators are provided with a disc to facilitate the identification of illegal occupation of the spaces, and to detect vehicles over-staying the 30-minute limit.



Food sector's interests

- Supermarket operators have a special interest in supplying fresh foodstuffs ready for when the stores open.
- They use refrigerated trucks, coming from transshipment centres, located outside the city.
- Within the Barcelona Mobility Pact, these operators initiated a process of night-delivery trials.

- The first night-time quiet delivery trial was made by operator Mercadona in 2003, with an adapted 40T truck (MIRACLES project)
- The Municipality introduced experimental exemption (6 months) to the noise regulations*.
- Traffic police collaborated to measure noise levels in residences close to the supermarket sites.

* Residential/commercial mixed: 22.00 – 07.00: 60dB(A)

Mercadona, c. Valencia



- electric lift,
- insulating carpet
- kerb adaptations for access using fork lift
- staff trained to unload minimising verbal communication

Results

- Unloading realised with negligible increase in ambient noise levels (0.3 dB(A))
- Trip consolidation (7 day trips with medium trucks -> 2 large truck trips / week at night)
- Reduced journey times
- Return on investment in 3 years
- Extension to 115 outlets across Spain

Operator Condis

- Having smaller stores, with less refrigerated capacity, trials were proposed using medium 16T truck
- New trials coordinated within SILENCE project; this time with Municipality's Noise Unit as responsible for formally measuring noise levels



- Plastified roll-containers, soundproofing, wedges controlling roll-tainer movement
- Adapted refrigeration equipment
- Kerb adaptations for access
- Staff training to minimise verbal communication

Results

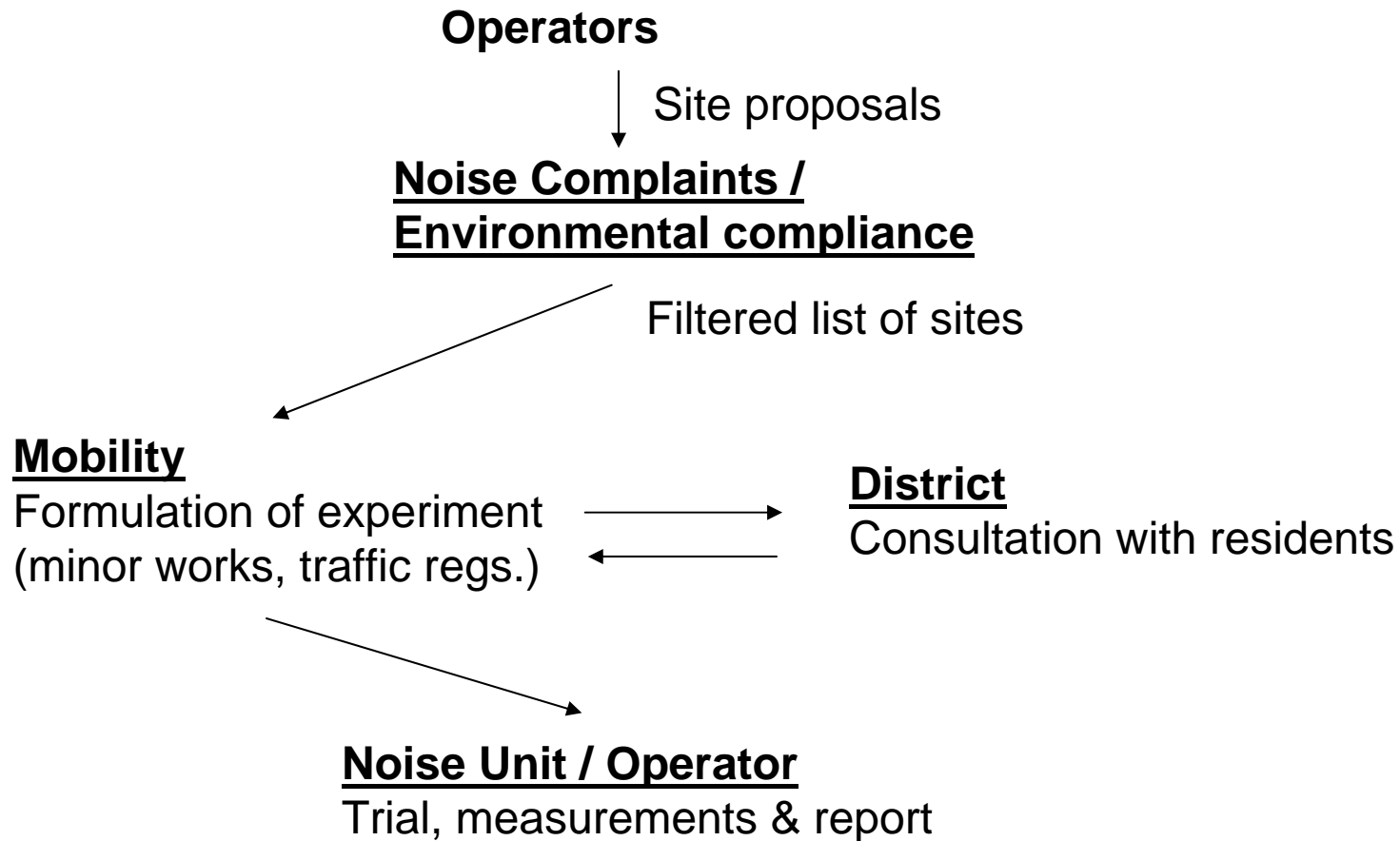
- Noise readings show the moment of truck arrival (IVECO Eurocargo) exceeding the level during the unloading operation.
- Rate of return: 15 months



Building the QND programme

- Receipt of Operator's proposed locations (Noise Unit)
- Coordination with Traffic Dept & Districts (citizens in the neighbourhood)
- Programme of measurements: Noise Unit
- Sept 2007:
 - **14** measurements at **11** sites assessed, in **5** different districts
 - Responding to petitions from **3** supermarkets operators

Procedure overview



Noise measurements: what?

Noisemeter readings of the unloading operation at the locations proposed by operators, together with measures of ambient noise levels without unloading.

Measures of: L_{Aeq} & L_{Amax} .

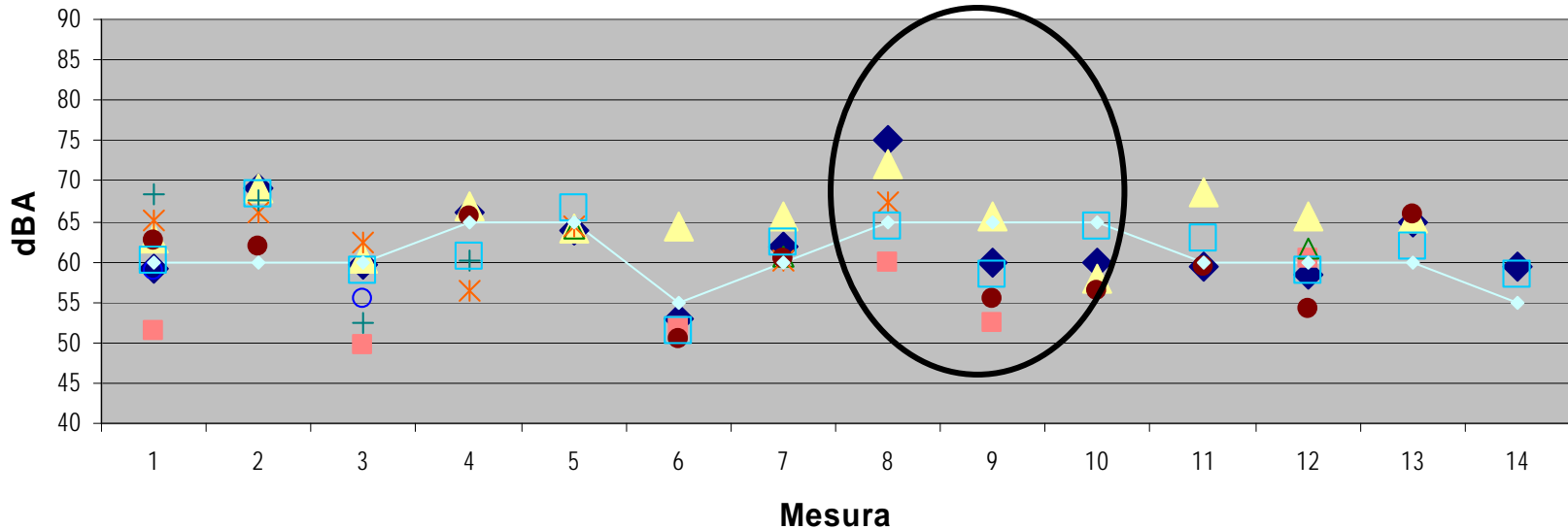
Identification of the sources of maximum sound levels

Comparison of L_{Aeq} values with the ambient levels and the reference level of the location.

Noise measurements: who, where, when?

Titular	Establiment	Districte	Núm. mesura	Data
Condis	Bruc, 166	Eixample	1	10/04/07
	Roger de Llúria, 47	Eixample	2	11/04/07
	Bailen, 56	Eixample	3	11/04/07
	Aragó, 520	Eixample	4	08/03/06
			5	18/04/07
Mercadona	c/Bilbao-Pl.Unió	Sant Martí	6	16/04/07
	Sant Pere de Abanto,4-12	Sants-Montjuïc	7	17/04/07
	València,531	Eixample	8-9	01-02/03/06
			10	18/04/07
	Calàbria, 129	Eixample	11	17/04/07
	Ausias Marc, 101	Eixample	12	23/04/07
	Pl.Bonanova-c/St.Gervasi Cassoles 104	Sarrià-St.Gervasi	13	25/04/07
LID'L	Pg. Valldaura, 122	Nou Barris	14	29/03/06

Nivells sonors equivalents (Leq)



- | | | |
|-----------------------------|--------------------------------------|-----------------------------|
| ◆ Nivell sonor de fons | ■ Senyalització del carril | ▲ Arribada del camió |
| △ Maniobres del camió | ✕ Portes del magatzem | ● Portes del camió |
| + Moviment de la plataforma | ○ Col·locació combis a la plataforma | □ Descàrrega de mercaderies |
| ◆ Nivell guia | | |

- Cases 8, 9 & 10: C. Valencia
- 2006 measurements (8 & 9) by police, 2007 reading (10) acc. to Ordenanza.

Review of main findings

- In 45% of cases, unloading actions cause noise levels above ambient level
- In 55% of cases noise levels exceed reference guideline levels
- The actions within the unloading operation that cause most noise are:
 - Truck arrival (62% of cases)
 - Goods unloading (15% of cases)
- Maximum noise levels generally exceed ambient and reference levels (due to engine / braking noise: 40%, and doors of supermarket: 23%)

Conclusions

- Supermarket Operators & Truck Manufacturers are willing to make invest, participate
- Innovation requires the coordinated action of various Municipal actors
- Proposals are best received (filtered) by Unit(s) handling:
 - noise complaints
 - environmental certification of commercial licences

Check on Actors

- What regulations currently govern legal ability to make trials?
- Who runs the Mobility Pact / has access to operators?
- Who handles noise complaints?
- Who makes formal noise measurements?
- Who consults with residents?

3 Experimentation continues

- Renault 12T Midlum truck – next candidate for testing (FIDEUS project). “Dual mode” approach to engine configuration meeting noise and pollutant emissions restrictions in cities; connected vehicle knows when to change driving mode.
- Trials to be made in collaboration with CONDIS:
 - night-time delivery (noise tests) at Roger de Lluria outlet
 - Day-time deliveries at Sant Andreu outlet



Fideus – trials in 3 cities*; with 3 vehicles, by 2 shippers**



FIDEUS Forum: Lyon 9th April

TRA: Ljubiana 21 -24th April

www.impacts.org/projects/fideus/fideus.html

* Hannover & Lyon

** DHL & Condis



Experimentation - next steps

- Web-based version of QND procedures
- Further collaborations between operators & vehicle / equipment suppliers (sensors & refrigeration equipment)
- ... possibly at EU level!



Thanks for your attention!
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