Noise: One of the Barriers to Implementing Off-Hour Deliveries in Urban Areas

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TRB ADC40 Mid-Summer Meeting

Asheville, NC
July 23, 2012

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Off-Hour Delivery Background

- Deliveries made between 7PM and 6AM
- Purpose:
  - Reduce congestion
  - Improve safety
  - Improve reliability of deliveries
  - Reduce costs
- USDOT / RPI / NYCDOT led a pilot test on OHD in 2007-2010
- RPI-NYCDOT is leading the implementation phase of OHD, which started in January 2011

Key Players

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United States Department of Transportation

Noise Related Study

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Regular vs. Off-Hour Deliveries

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Regular vs. Off-Hour Deliveries

OHD Advantages / Disadvantages

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- **ADVANTAGES**
  - Increased reliability of deliveries
  - Significant environmental impacts
  - Travel time savings: 3-5 minutes per trip for **all highway users**
  - Carrier travel time savings: ~48 minutes per delivery tour
  - Savings in service times (per tour): 1-3 hours
  - Carrier cost savings: increased efficiency, fewer tolls & fines
  - **Between $100 and $200 million/year in travel time savings and pollution reduction**

- **DISADVANTAGES**
  - Additional cost to receivers (i.e. staff or equipment)
  - Potential noise impacts to the community

Need for Noise Reduction Technologies

- Concerns over Noise
  - Vehicle movements are often constrained during night-time and / or weekend periods by local “curfew” to avoid noise impacts.
  - Noise concerns from:
    - Local residence,
    - Businesses worried about upsetting nearby customers

- For **Off-Hour Deliveries** to be successful it will be necessary to **minimize noise pollution**.

Project Objectives

- Gain a thorough understanding of citizen's concerns regarding noise.
- Assess impacts of truck noise on communities.
- Identify appropriate commercial vehicle noise reduction technologies and strategies.

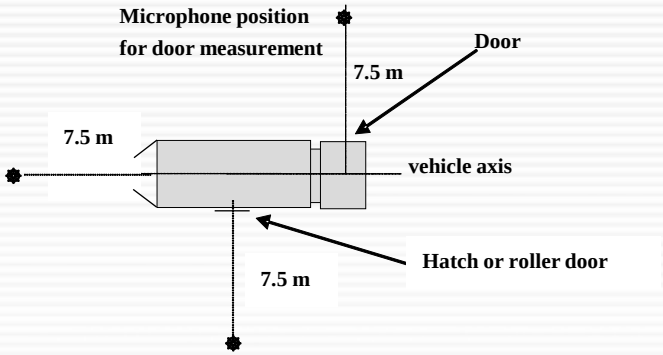
Existing Noise Levels

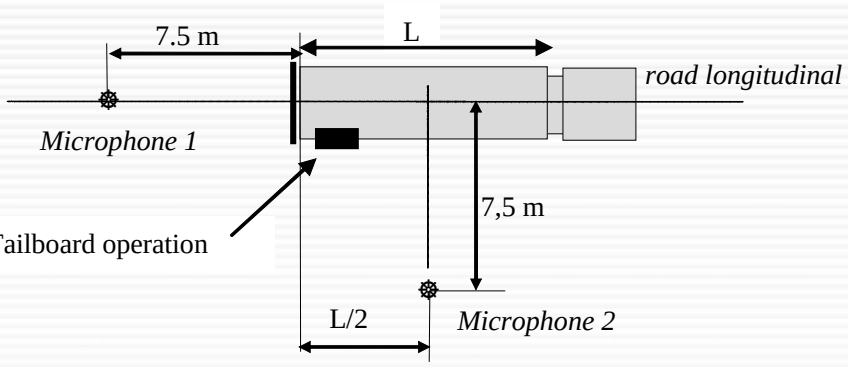
- Standard diesel engine - 80 dB(A)
- Truck is not only source of noise irritations
  - **Without low noise technologies** some typical sounds that occur in the delivery process measured at a distance of 25' away:

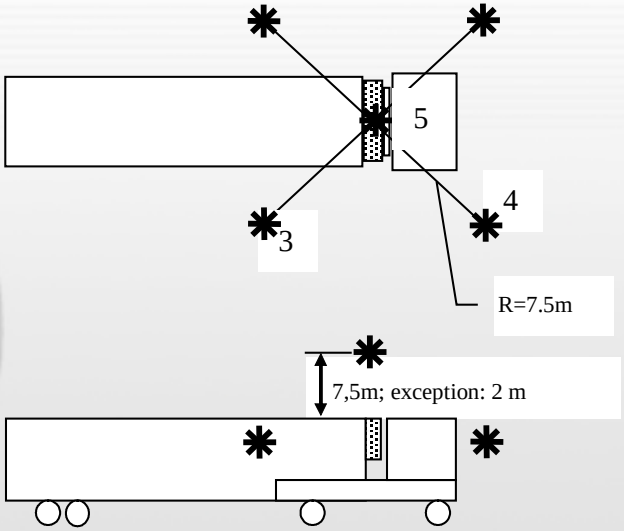
Action	Noise Measurement dB(A)
Slamming doors	74
Driving up/away	67-83
Cargo access	65-92
Containers over load floor	74-85
Refrigeration kicking on	70-78
Removing onboard forklift	77-82
Moving carts / dollies	53-77

  - Another major culprit – **Driver Behavior**

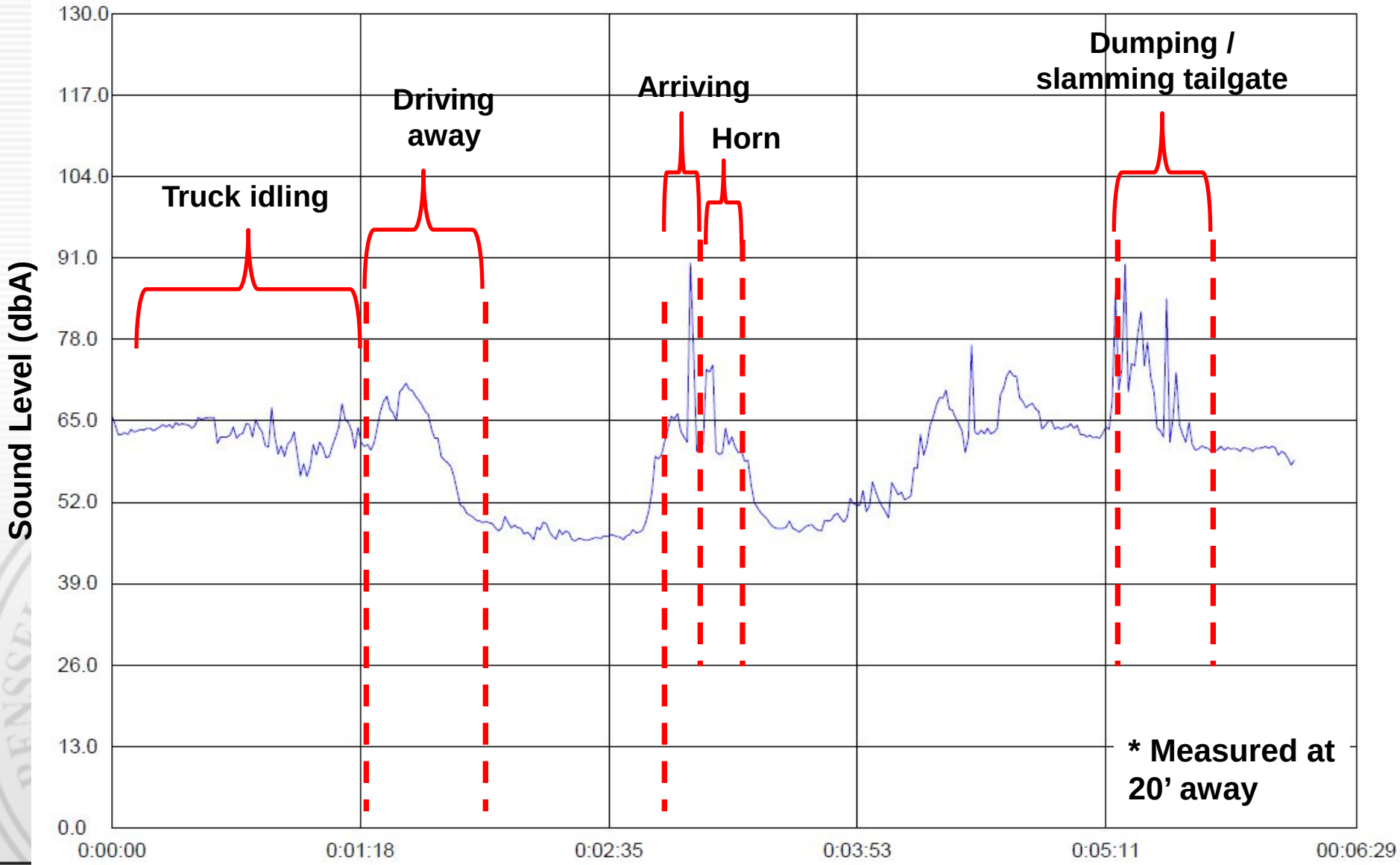
Noise Data Collection







Noise Profile of a Dump Truck



Noise Profile of a Delivery Truck

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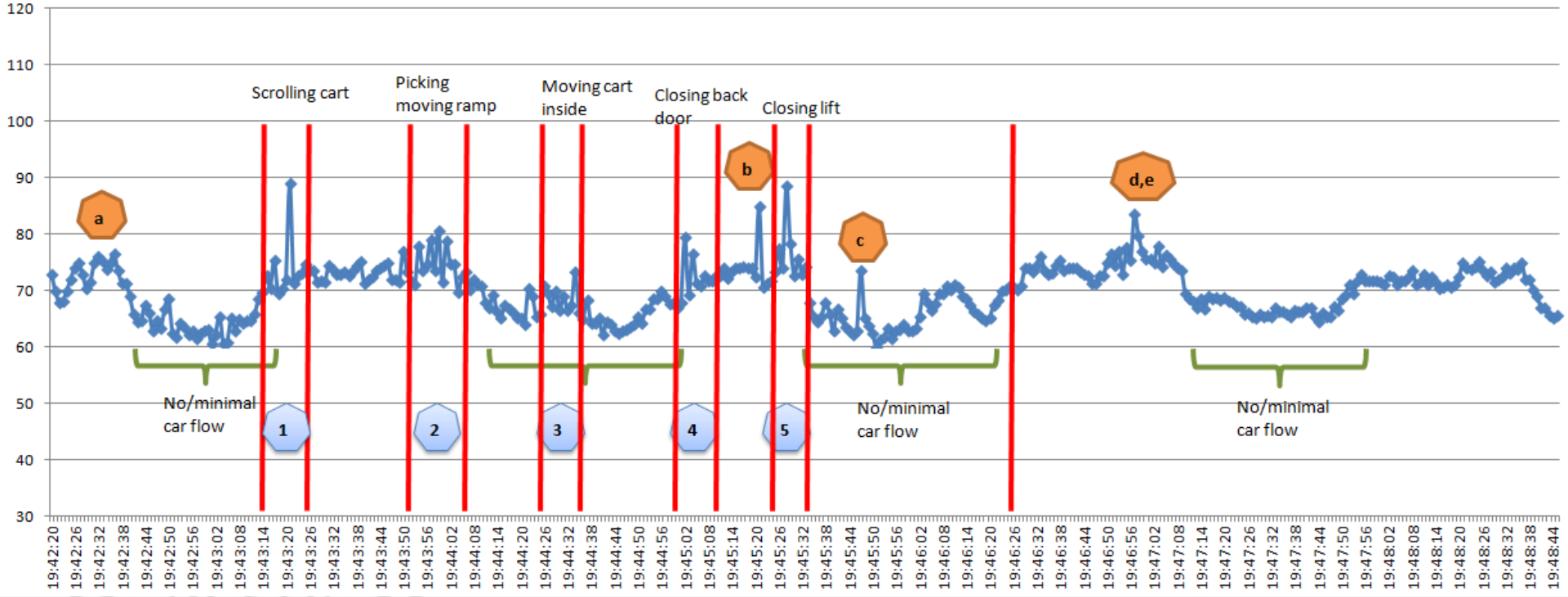

Sample Low Noise Solutions

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Trucks:

- Engines
  - LNG/CNG
  - Electric
  - Refrigeration units
- Body
  - Design
  - Sound dampening
- Lift gates
- Tires

Sample Low Noise Solutions

Cargo Handling Equipment:

- Forklifts
- Hand pallet trucks
- Push cart / dollies
- Other cargo handling equipment

Sample Low Noise Solutions

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Physical Changes to Delivery Locations

Source: www.advanced.edu

Training Drivers on Noise Abatement

Next Steps

- Reach out to community boards and industry
  - CITE.RPI.EDU/OFF-HOUR-DELIVERIES-NOISE/
  - **CAN ADC40 HELP WITH ISSUING AN RFI FOR LOW COST NOISE REDUCING TECHNOLOGIES FOR TRUCKS & DELIVERIES?**

Next Steps

- Survey residents and shippers/carriers
  - Document noise concerns of NYC citizens
  - Develop preliminary noise control standards
  - Shippers willingness to install low noise equipment to offer OHD
- Noise monitoring
  - Monitor noise in various locations for trucks with different low noise equipment installed
- Cost / Benefit analysis

Sample Benefit

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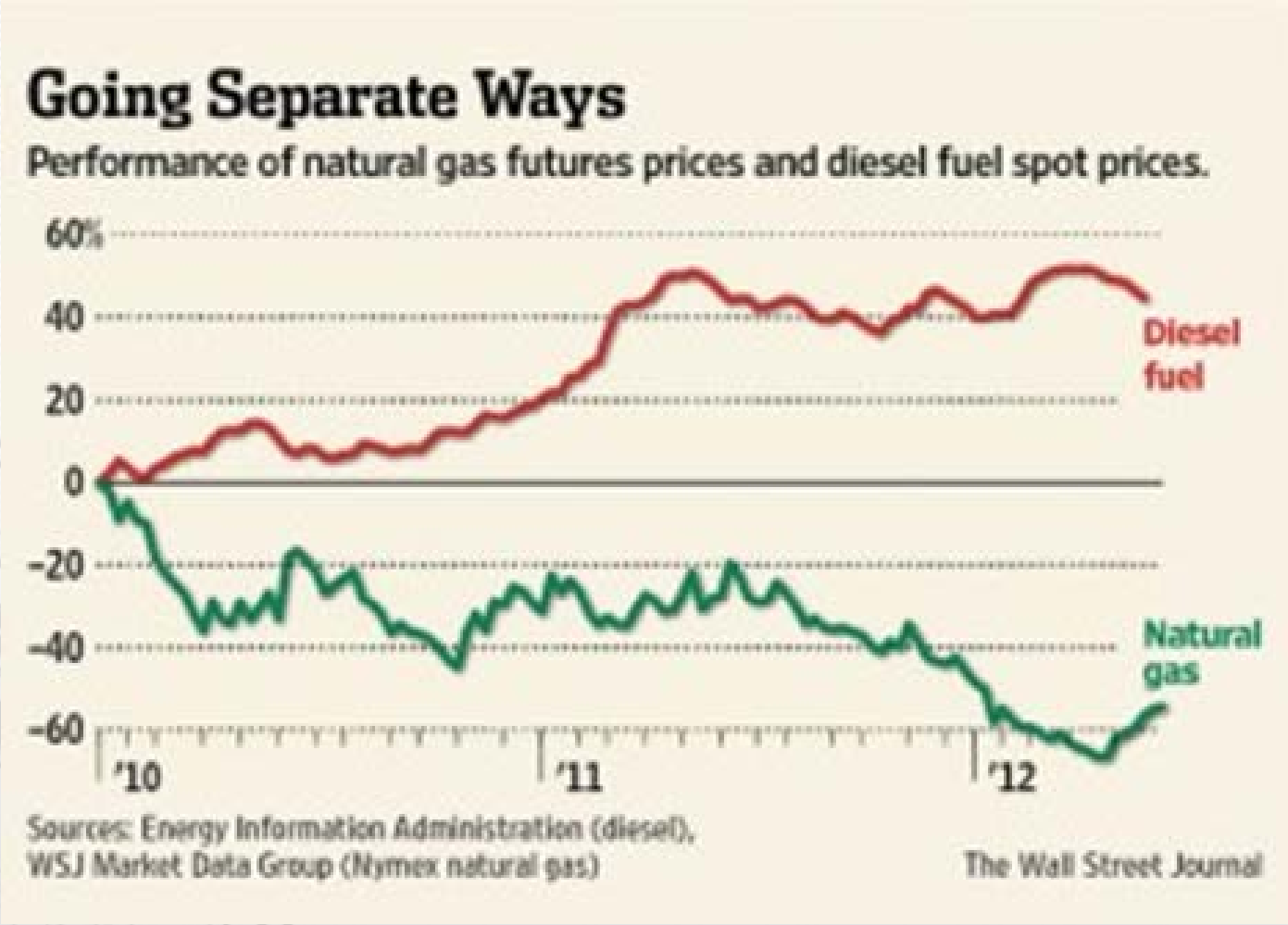
Fuel savings for changing engine types



Questions??

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Acknowledgements:

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