Freight and Emergency Vehicles on Complete Streets

- Dangerous collisions
  - Large vehicles
  - High speeds
- Traffic congestion
- Lane obstructions
- Infrastructure damage
- Pollution
  - Air
  - Noise

Or alternatively ...

- Narrow lanes, short crossing distances impede emergency access

Guidebook Development

- Preliminary MetroFreight/VREF research examining truck-bike interactions
- Survey – 10 participating cities
  - Freight experts
  - Street design experts
- Preliminary content presentations
  - MPO Freight Advisory groups: DVRPC, LVPC, NJTPA
  - VREF Urban Freight Conference
- Agency review
Potential Areas of Application

- Urban centers
- Suburban/exurban areas with warehousing/industrial development
- Suburban/small town main streets
- Industrial/commercial campuses

Operator Motivations

**Freight**
- Meet customer demands
  - On-time
  - Maintain quality of goods
- Minimize costs
- Provide reliable service
- Meet regulatory requirements

**Emergency Services**
- Provide service
- Minimize response time
- Meet expected performance standards

7 Common Challenges

- Selecting an appropriate design vehicle
- Vehicle navigation challenges
  - Providing adequate space for large vehicle turns
  - Reducing conflicts with vulnerable roadway users
  - Safely reducing speeds
  - Providing network connectivity and redundancy
- Curbside challenges
  - Providing adequate space for parking, loading, and emergency response operations
  - Providing curb and building access

Large Vehicle Turns

Design Solutions
Regulatory Solution: Vehicle Size Restrictions

- Fixed
- Time-based
- Safety benefits of size restrictions must be carefully weighed against related impacts
  - VMT and congestion
  - Operator costs and industry participation

Operational Solution: Dedicated Signal Phases

Design Solutions: Bike Infrastructure, Clear Identification of Conflict Zones

Operational Solutions: Dedicated Signal Phases and Roadside Mirrors

Vehicle-Based Solutions

- Mirrors
- Fresnel safety lenses
- Cameras
- Direct vision
- Side guards
Education

- Drivers
- Non-motorized travelers
- General public

Demand Management Strategies

- Change the volume, spatial, or temporal distribution of demands
- May require policy change, infrastructure investment, and/or behavior change by multiple stakeholders
- Will only be implemented if costs are acceptable to decision-makers

Freight
- Off-hour Deliveries
- Consolidation Centers
- Lockers and Pick-Up Points

Emergency Vehicles
- Secondary Referrals
- Fireproofing

Acknowledgements

- NYSERDA
- NYC DOT
- Volvo Research and Education Foundations
- City College
  - Civil Engineering
  - Quanquan Chen
  - Linette Prasad
  - Architecture
  - June Williamson
  - Marija Gjorgjievska
  - Crystal Xing