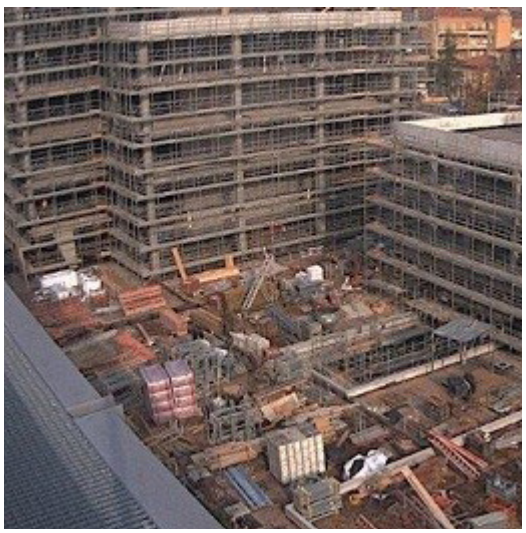
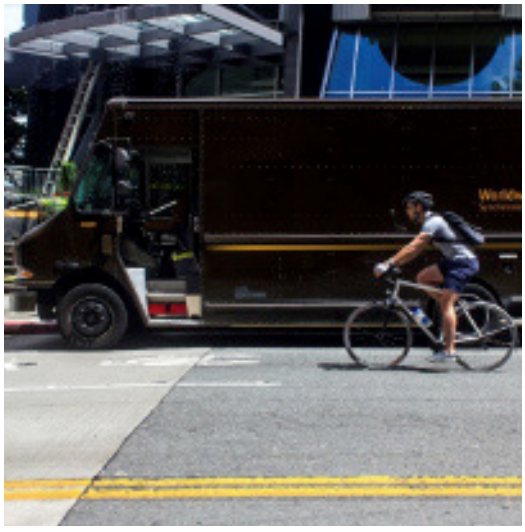
September 2017

United States-European Commission Urban Freight Twinning Initiative: Compendium of Project Summaries

Overview of Second Annual Urban Freight Roundtable at 2017 Transportation Research Board Annual Meeting



U.S. Department of Transportation
Federal Highway Administration

European Commission

Foreword

Freight transportation systems are undergoing significant, transformative changes. New technologies such as autonomous vehicles and unmanned aerial vehicles (i.e., drones) could dramatically change how and where goods move. In response to consumers' growing demand for faster deliveries of products, new business models and services are competing with traditional shipping methods. Furthermore, changes to the industry are occurring due to the rise of "big data"—the capture, management, and analysis of very large and diverse volumes of data. There are a number of opportunities on the horizon to use new data sources and analytical techniques to improve the condition and operation of freight transportation networks.

Despite these changes, some fundamental truths about our society remain. First, cities cannot survive without well-functioning systems for goods movement. As home to more than 80 percent of the U.S. population[1], urban areas require a constant flow of food, fuel, and other essentials. Second, cities will continue to act as key centers of economic activity, serving as critical gateways for interregional and international trade. It is through cities that U.S. goods are delivered to the world market, and where international goods arrive from around the world. Freight movement into, out of, and through cities is critical to ensure that these places remain vibrant centers to work, live, and play.

The Federal Highway Administration (FHWA) understands the critical importance of safe, efficient, and reliable urban goods movement and is committed to helping States, metropolitan planning organizations (MPOs), cities, and other stakeholders improve the management of urban freight flows. FHWA is currently developing resources in several areas to assist partners with improved freight mobility. Some of these areas include guidance and best practices in truck parking, performance measures, off-hours delivery, freight data, and in facilitating partnerships for collaboration and sharing of innovative strategies.

This compendium of urban freight initiatives is a product of FHWA's ongoing coordination with the European Commission (EC). The initiatives illustrate a range of strategies to improve urban goods movement both in the U.S. and internationally. These initiatives offer ideas for consideration and discussion with your partners including in freight planning and project delivery innovations. If you are interested in learning more about a particular initiative, we encourage you to contact the expert staff identified at the end of each summary.

Martin Knopp
Associate Administrator for Operations
Federal Highway Administration
U.S. Department of Transportation

Herald Ruijters
Director of Investment, Innovative & Sustainable Transport
Directorate-General for Mobility and Transport
European Commission

[1] United States Census Bureau (2010). 2010 Census Urban Area Facts. Retrieved from: https://www.census.gov/geo/reference/ua/uafacts.html.

Notice

This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in this document.

The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this report only because they are considered essential to the objective of the document.

Quality Assurance Statement

The Federal Highway Administration (FHWA) provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

Cover Photos (Clockwise from Top-Left)
Freight Delivery. Source: Alison Conway, The City College of New York.
Heavy Truck Delivery. Source: Anne Goodchild, University of Washington.
Curbside Delivery. Source: Chris Eaves, Seattle Department of Transportation.
Urban Delivery. Source: Tom Cherrett, University of Southampton.
SUCCESS Pilot Site. Source: Francesco Ferrero, Luxembourg Institute of Science and Technology.
Freight in Complete Streets. Source: Anne Goodchild, University of Washington.

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. FHWA-HOP-17-029	2. Government Accession No.	3. Recipient's Catalogue No.	
4. Title and Subtitle United States-European Commission Urban Freight Twinning Initiative: Compendium of Project Summaries Overview of Second Annual Urban Freight Roundtable at 2017 TRB Annual Meeting		5. Report Date September 2017 6. Performing Organization Code OST-R V-322	
7. Author(s) John A. Volpe National Transportation Systems Center		8. Performing Organization Report No.	
9. Performing Organization Name and Address U.S. Department of Transportation John A. Volpe National Transportation Systems Center 55 Broadway Cambridge, MA 02142-1093		10. Work Unit No. (TRAIS) 11. Contract or Grant No. DTFH6114V00029	
12. Sponsoring Agency Name and Address U.S. Department of Transportation Federal Highway Administration 1200 New Jersey Ave SE Washington, DC 20590		13. Type of Report and Period Research Project Compendium 14. Sponsoring Agency Code DOT-VNTSC-FHWA-17-12	
15. Supplementary Notes FHWA COR - Tamiko Burnell			
16. Abstract This compendium is comprised of 33 brief summaries of urban freight initiatives that include research projects, plans, pilot demonstrations, and other efforts. These initiatives were presented at a roundtable discussion that was part of the 2017 Annual Meeting of the Transportation Research Board. The roundtable was sponsored by the Federal Highway Administration (FHWA) in cooperation with the European Commission (EC), and attracted nearly 40 participants from around the world. The event was the second annual in a series and is part of an ongoing research coordination (or "twinning") effort between FHWA and the EC on the topic of urban freight. Freight practitioners may consider incorporating the strategies documented in this compendium as part planning, programming, and project delivery activities, to improve freight mobility and goods movement in urban areas.			
17. Key Words Urban Freight, last-mile/first-mile goods distribution, freight logistics, freight research and development, freight project delivery	18. Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA 22161		
19. Security Classif.(of this report) Unclassified	20. Security Classif.(of this page) Unclassified	21. No. of Pages 43	22. Price N/A

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

TABLE OF CONTENTS

INTRODUCTION

The efficient movement of goods to, from, and through our Nation's cities is essential to our economy. Current economic and demographic trends suggest urban goods movement will become even more important in the future, presenting both challenges and opportunities. By 2045, the U.S. economy is expected to double in size, and the nation's population is projected to increase by roughly 70 million people.[1] In tandem with this projected growth in population and economic output, freight movements across all modes are expected to grow by roughly 40 percent by 2045.[2]

This growth in overall freight demand will put increased pressure on infrastructure throughout the country, particularly in cities. The expected strain on urban transportation infrastructure will occur in part because most of the projected population growth in the coming decades is expected to occur in urban areas. In addition, the country's 100 largest metropolitan areas drive national goods trade, with more than 80 percent of all goods either starting or ending in these areas. In total, $16.2 trillion in domestic and international goods flow annually through the largest metropolitan areas.[3]

Many of the country's gateways for international trade are located in or near our cities. In 2015, 14 of the top 25 international trade gateways were located in the country's 25 most populous metropolitan areas (e.g., New York, Los Angeles/Long Beach, Houston).[4] Transportation agencies in urban areas must work with their constituents, as well as with partners at all levels of government and in the private sector, to plan for and address landside freight flows to and from these gateways.

This compendium includes summaries of ongoing or recently completed initiatives from around the globe that were shared during the 2017 Urban Freight Roundtable. The roundtable is an annual event held as a follow-on to the Annual Meeting of the Transportation Research Board (TRB), sponsored by FHWA, in cooperation with the EC. A wide variety of strategies are presented in this compendium ranging from research and planning projects to pilot demonstrations and policy efforts to address the challenges and opportunities posed by the growing demand for urban freight.

The annual roundtables are part of an ongoing research coordination (or "twinning") effort between FHWA and the EC on the topic of urban freight. In addition to the roundtables, FHWA and the EC are collaborating to offer

Federal Highway Administration (FHWA) – European Commission (EC) Twinning Effort

The FHWA-EC twinning effort promotes coordination and information-exchange on areas of urban freight research and innovation that are of mutual interest and benefit.

This effort is highlighting four urban logistics projects funded by the EC and three research projects sponsored by FHWA. Many of these projects are included in this compendium.

EC projects are part of Horizon 2020, the EC's latest research and development program. Horizon 2020 project leads are large public-private consortia that work on research and deployment of urban logistics initiatives. The projects involve pilot testing of urban freight strategies in as many as 20 European cities.

FHWA projects, currently in development, include two primers and a guidebook. The primers will identify a range of strategies that practitioners can incorporate into transportation planning and project delivery for improved urban freight mobility. The guidebook will focus on context-sensitive design that includes considerations for freight. Collectively, FHWA projects seek to define major challenges facing freight transport in U.S. cities and highlight innovative practices to address those challenges.

[1] U.S. DOT, Beyond Traffic 2045, pp. 4, 51.
[2] U.S. DOT, National Freight Strategic Plan, draft for public comment, October 2015, p. 5.
[3] Brookings Institution, Mapping Freight: The Highly Concentrated Nature of Goods Trade in the United States, Nov. 2014.
[4] Bureau of Transportation Statistics, 2015 Freight Facts and Figures, Figure 2-7. Gateways ranked by value of shipments. Population of U.S. metropolitan areas from Census Bureau.

additional opportunities for researchers and practitioners to share innovations in the management of urban freight flows.

The initiative summaries presented in this compendium were developed by the lead agency or organization responsible for implementing each project, or by agencies and organizations that funded the projects. FHWA compiled the summaries with the overall goal of encouraging an information-exchange within the global urban freight community.

GUIDE TO USING THIS COMPENDIUM

This compendium is comprised of 33 brief summaries describing urban freight initiatives that include research projects, freight plans, and pilot demonstrations, among other types of efforts. Each summary details how stakeholders are working together to implement strategies that lead to freight planning, project delivery, and mobility improvements, both in the U.S. and abroad. The summaries present the key challenges addressed by each initiative, the expected or realized outcomes, and stakeholder(s) involved in planning or implementing the initiative. Each summary also includes contact information. The reader is encouraged to reach out to the identified contacts with questions or requests for additional information. Through these connections, transportation professionals can begin building an urban freight community of practice that spans not only the nation, but also reaches across the globe.

These summaries can assist freight practitioners at all levels of government in working collaboratively with their private sector partners, the research/academic community, and other stakeholders to advance the state of urban freight mobility.

Freight practitioners may consider incorporating the strategies documented in this compendium in transportation planning, programming, and project delivery activities. For example, freight practitioners in State Departments of Transportation or MPOs may wish to share these strategies as part of ongoing discussions with their freight advisory committees to identify mutually beneficial solutions to improve urban freight mobility. Practitioners could also use these strategies to engage agency leadership in decisionmaking around freight needs and solutions. Finally, practitioners could consider these strategies when developing key planning documents such as a statewide or regional freight plan.

Readers can use any of the following aids to identify urban freight initiatives of interest and learn more about them:

- **Project Summary Table**: the project summary table on the next page, *Guide to Project Summaries Included in this Compendium*, helps readers easily identify projects of interest, categorized by type of effort, location (e.g., United States, Europe, other international), and general topic area(s) addressed.
- **Tabs:** Colored tabs located on the top-right corners of each summary indicate the project's type of effort and its location; the tab colors match the color-coding used in the Project Summary Table.
- **Links:** Most of the summaries in this compendium provide links to presentations, reports, and peer-reviewed journal articles where readers can find additional information about a project.
- **Contact Information:** The summaries include contact information to help the reader reach out directly to project leads to exchange information or ask questions about a specific project.

GUIDE TO PROJECT SUMMARIES INCLUDED IN THIS COMPENDIUM

Page #	PROJECT LEAD	PROJECT NAME	PROJECT TYPE				LOCATION			TOPIC AREA															
			Pilot	Policy	Metropolitan/Regional Plan	Research	United States	European Union	Other International	Air Quality/Environment	Building/Road Design	Curbside Delivery & Parkin	Economic Competitiveness	Energy Consumption	Innovative Finance	Land Use Interaction	Last Mile Delivery	Livability/Quality of Life	Logistics/Distribution	Mobility/Congestion	Modeling	Off-Hours Delivery	Safety	Supply Chains	Other
9	Metropolitan Washington Council of Governments	**Local and Regional Food Distribution Working Group**	●				●																	●	●
10	Rensselaer Polytechnic Institute	**Engaging Large Retailers in Off-Hour Delivery Programs**	●				●					●								●		●	●		
11	Rensselaer Polytechnic Institute	**Off-hour Delivery Trusted Vendor Program**	●				●					●									●	●	●		
12	Cross River Partnership / Westminster City Council	**Freight Electric Vehicles in Urban Europe (FREVUE)**	●	●				●		●									●	●					
13	Institute of Transportation Economics and the University of Southampton	**CITYLAB – City Logistics in Living Laboratories**	●			●		●		●							●	●	●				●		
14	MemEx Italy	**CIVITAS DESTINATIONS**	●			●		●		●				●			●	●		●			●		
15	University of Southampton	**Freight Traffic Control 2050**	●			●		●						●			●	●	●						
16	Royal Institute of Technology, Integrated Transport Research Lab	**Off-peak City Logistics – A Case Study in Stockholm**	●	●				●										●		●		●			
17	Rensselaer Polytechnic Institute	**Impacts of Policy-Induced Freight Modal Shifts**		●			●										●		●		●			●	
18	MIT Megacities Lab	**Design, Capacity, and Location of Urban Freight Infrastructure in an Integrated Mobility Plan for Santiago de Chile**		●					●			●						●			●				●
19	Singapore University of Technology and Design	**Singapore Urban Freight Study**		●					●							●			●	●					

Page #	PROJECT LEAD	PROJECT NAME	Pilot	Policy	Metropolitan/Regional Plan	Research	United States	European Union	Other International	Air Quality/Environment	Building/Road Design	Curbside Delivery & Parking	Economic Competitiveness	Energy Consumption	Innovative Finance	Land Use Interaction	Last Mile Delivery	Livability/Quality of Life	Logistics	Mobility/Congestion	Modeling	Off-Hours Delivery	Safety	Supply Chains	Other
20	Atlanta Regional Commission	**Atlanta Regional Freight Mobility Plan Update**			●		●			●			●			●		●		●	●				
21	Memphis Metropolitan Planning Organization	**Regional Freight Plan for Memphis, TN**		●	●		●			●			●			●		●		●	●				
22	New York City Department of Transportation	**NYC Smart Truck (Freight) Management Plan**		●	●		●			●		●				●				●	●		●		
23	The City College of New York	**Accommodating Freight and Commercial Vehicles in Complete Streets**				●	●				●	●											●		
24	Texas A&M Transportation Institute	**Freight Fluidity**				●	●													●				●	●
25	SUNY Maritime College	**Developing a Freight Advisory Committee to Guide Future Freight Transportation Infrastructure Development in the Greater New York City Region**				●	●					●	●				●								●
26	The City College of New York and Hofstra University	**Decomposing the Home-based Delivery Supply Chain**				●	●					●									●			●	
27	University of Washington and Seattle DOT	**The Final 50 Feet of Urban Goods Delivery**				●	●				●	●					●			●					
28	MIT Megacities Lab	**Design of Distribution Network for Business-to-Business Delivery in Congested Urban Areas**				●	●												●		●				●
29	MIT Megacities Lab	**Distribution Network Design for E-Commerce in High-Density Urban Areas**				●	●										●		●		●				●

Page #	PROJECT LEAD	PROJECT NAME	Pilot	Policy	Metropolitan/Regional Plan	Research	United States	European Union	Other International	Air Quality/Environment	Building/Road Design	Curbside Delivery & Parking	Economic Competitiveness	Energy Consumption	Innovative Finance	Land Use Interaction	Last Mile Delivery	Livability/Quality of Life	Logistics	Mobility/Congestion	Modeling	Off-Hours Delivery	Safety	Supply Chains	Other
30	Rensselaer Polytechnic Institute	**Effective Decision-making Methods for Freight-efficient Land Use**				●	●			●						●		●		●					
31	MIT Megacities Lab	**Interactive Simulation of Last-Mile Distribution Network Design and Performance Using Tactile Visual Interfaces**				●	●										●		●		●				●
32	Texas A&M Transportation Institute, University of South Florida	**Metropolitan Freight Transportation: Implementing Effective Strategies (NCHRP 08-106)**				●	●																		●
33	Rensselaer Polytechnic Institute	**Using Commodity Flow Survey Microdata and Other Established Data to Estimate the Generation of Freight, Freight Trips, and Service Trips**				●	●									●					●				
34	FHWA Office of Freight Management and Operations	**Primer on Collaboration, Coordination, and Communication (3C) Strategies for Urban Freight Mobility**				●	●										●								●
35	FHWA Office of Freight Management and Operations	**Primer on Operations, Logistics, and Technology (OLT) Strategies for Urban Freight Mobility**				●	●			●		●					●			●		●	●		●
36	Hellenic Institute of Transport (HIT)	**NOVELOG – New Cooperative Business Models and Guidance for Sustainable City Logistics**				●		●		●									●	●	●				●

Page #	PROJECT LEAD	PROJECT NAME	Pilot	Policy	Metropolitan/Regional Plan	Research	United States	European Union	Other International	Air Quality/Environment	Building/Road Design	Curbside Delivery & Parking	Economic Competitiveness	Energy Consumption	Innovative Finance	Land Use Interaction	Last Mile Delivery	Livability/Quality of Life	Logistics	Mobility/Congestion	Modeling	Off-Hours Delivery	Safety	Supply Chains	Other
37	Luxembourg Institute of Science and Technology (LIST)	**Sustainable Urban Consolidation CentrES for conStruction (SUCCESS)**				●		●										●						●	●
38	Cranfield School of Management	**U-TURN**				●		●		●								●	●		●				●
39	University of São Paulo	**Integrated Management at the Operations Center in Rio de Janeiro During the 2016 Olympic Games**				●			●												●				●
40	University of São Paulo	**Operational and Environmental Impacts of Off-Hours Deliveries in the City of São Paulo, Brazil**				●			●	●											●	●			●
41	University of São Paulo	**Truck GPS Data for In-Depth Characterization of Urban Logistics in the City of São Paulo, Brazil**				●			●										●						●

The LRFD Working Group is helping to enhance food chain supply logistics in the Washington, D.C. region. Source: Lindsay Smith, MWCOG.

LOCAL AND REGIONAL FOOD DISTRIBUTION WORKING GROUP

The Metropolitan Washington Council of Governments (MWCOG) has established a Local and Regional Food Distribution (LRFD) Working Group to help enhance local food supply chains that connect rural and suburban farmers to urban-based marketplaces in the Washington, DC metro region. Many producers and businesses in this region (and in other regions) struggle to connect with scale-appropriate infrastructure for product aggregation and distribution. This project is currently supported by local philanthropic contributions and by a U.S. Department of Agriculture program called Leveraging Investment for Network Coordination (Food LINC). As part of the FoodLINC initiative, MWCOG hired a full-time Regional Food Systems Value Chain Coordinator to work with the LRFD Working Group and other regional stakeholders.

Project Type
Pilot Project

Period of Performance
Beginning March 2017

Project Site(s)
Washington, D.C. metro region

Website
https://www.mwcog.org/environment/planning-areas/agriculture-and-forestry/regional-agriculture-initiative/

Contacts
Lindsay Smith, AICP
Regional Food Systems Value Chain Coordinator
Metropolitan Washington Council of Governments
(202) 962-3307
lsmith@mwcog.org

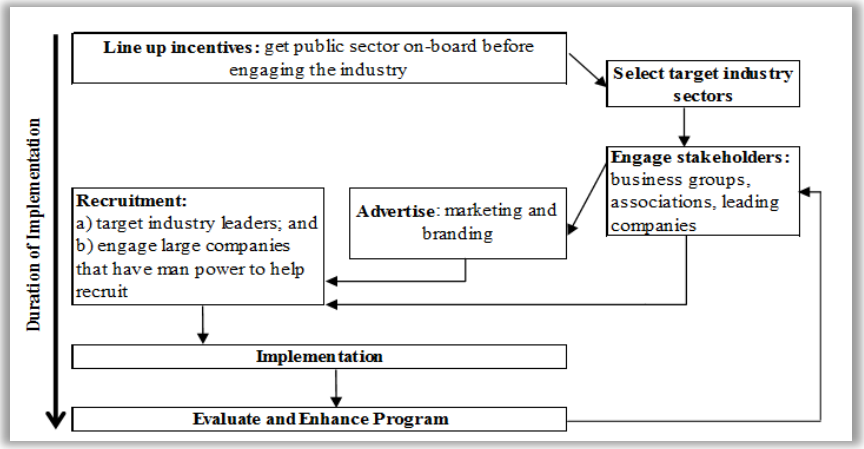
Jon Schermann
Transportation Planner IV
Metropolitan Washington Council of Governments
(202) 962-3317
jschermann@mwcog.org

Challenges Addressed
- Urban market accessibility for regional and local food products

Expected Outcomes
As a strategic convener of food-system stakeholders, the LRFD Working Group is expected to strengthen local and regional farm businesses and increase access to healthy, sustainable, local food for regional consumers.

The LRFD Working Group will:
- Identify infrastructure gaps and underutilized capacity for aggregation, cross-docking, etc. of local produce, meat, seafood, and dairy products.
- Be a forum for discussing logistics challenges and exploring potential policy and programmatic solutions.
- Foster business connections among producers, distributors, and customers in the Washington, DC metro region.
- Communicate resource, research, policy, and programmatic needs to MWCOG member jurisdictions.
- Develop metrics and goals for increasing local and regional food distribution efficiencies.

Stakeholder Involvement
MWCOG staff interviewed a range of food system stakeholders working in different areas of the supply chain to develop a work plan and identify potential participants. Stakeholders interviewed include nonprofits, farmers, local government staff, institutions, distributors, and grocers.



Stages for Implementing Off-Hour Deliveries. Source: Jeffrey Wojtowicz.

ENGAGING LARGE RETAILERS IN OFF-HOUR DELIVERY PROGRAMS

The main goal of this project is to advance the transportation community's knowledge on how to best foster off-hour delivery programs in urban areas nationwide. This will be accomplished by providing materials that offer guidance to large retailers and public-sector officials regarding all aspects that are necessary to implement and maintain off-hour delivery as a traffic demand management strategy. To this end, the Rensselaer Polytechnic Institute (RPI) team will engage larger retailers and food companies regionally and nationwide with the intent of designing and possibly pilot-testing a series of novel approaches—tailored to the needs and expectations of large retailers—that could make it easier for them to conduct off-hour deliveries across the nation.

Project Type
Pilot

Period of Performance
September 2015–August 2017

Project Site(s)
Primarily New York City, though also other U.S. locations

Website
None

Contact
Jeffrey Wojtowicz
Rensselaer Polytechnic Institute
518-276-2759
wojtoj@rpi.edu

Challenges Addressed
- Congestion
- Parking
- Safety

Expected Outcomes
The final deliverable will be a guidebook that entails a comprehensive approach to implementing and maintaining off-hour deliveries with a focus on large retailers.

Stakeholder Involvement
The project will seek involvement from private industries, public agencies, and trade organizations for input and feedback to create the guide materials.

OFF-HOUR DELIVERY TRUSTED VENDOR PROGRAM

The main goal of this project is to develop and implement a self-sustainable Trusted Vendor Program (TVP) to help foster off-hour deliveries in urban areas. It is believed that a TVP endorsed by trustworthy organizations can increase participation in off-hour delivery by helping vendors earn trust from receivers. This program is intended to provide information to customers about shippers and carriers who fulfill the conditions that will make them "trusted" to receivers, in a way that is both community-friendly and that does not put the receiving establishment at risk.

The project contemplated four main tasks: Market Assessment and Marketing Plan, Identification of Trusted Vendor Qualifications and Evaluation Criteria, Implementation Design, and Implementation of TVP. The methodology included a review of existing programs (similar to TVP), followed by a preliminary design of the program that is discussed with partners. Private industries were further engaged using a focus group format, principally receiver and vendor establishments to gain an understanding of the key attributes that matter for them within the program. For this purpose, a survey was designed to facilitate discussions in each focus group to obtain key insights of the businesses' needs related to the program. The final design is refined at this stage. The implementation stage of the project includes a pilot of the TVP.

Project Type
Pilot

Period of Performance
January 2015–December 2017

Project Site(s)
New York City

Website
None

Contact
Jeffrey Wojtowicz
Rensselaer Polytechnic Institute
518-276-2759
wojtoj@rpi.edu

Challenges Addressed
- Congestion
- Parking
- Safety

Expected Outcomes
The final deliverable will be a final report that will describe the results of the development and implementation of the TVP.

Stakeholder Involvement
The project will seek involvement from private industries, principally receiver and vendor establishments, as they are directly involved in focus groups and the pilot study. This is done in collaboration with the New York City Department of Transportation, Trucking Association of New York, and the Grand Central Partnership.

A service station attendant charging an electric vehicle. Source: FREVUE.

FREIGHT ELECTRIC VEHICLES IN URBAN EUROPE (FREVUE)

The FREVUE project is exposing more than 80 fully electric freight vehicles to the day-to-day rigors of the urban logistics environment. In doing so, the project aims to prove that the current generation of electric vans and trucks can offer a viable alternative to diesel vehicles,particularly when combined with state-of-the-art urban logistics applications, innovative logistics management software, and well-designed local policy.

As part of the FREVUE project, eight of Europe's largest cities, including six capitals, are assessing whether electric vehicles conducting "last-mile" freight movements in urban centers can offer significant and achievable de-carbonization of the European transport system.

The demonstrations have been designed to ensure that FREVUE covers the breadth of urban freight applications that are common across Europe, including goods deliveries, novel logistics systems, vehicle types, climates, and political/regulatory frameworks.

Project Type
Demonstration

Period of Performance
March 2013–September 2017

Project Site(s)
Amsterdam, Lisbon, London, Madrid, Milan, Oslo, Rotterdam, and Stockholm

Website
www.frevue.eu

Contact
Tanja Dalle-Muenchmeyer
FREVUE Coordinator
Cross River Partnership/Westminster City Council
+44 (0)20 7641 1693
tdmuenchmeyer@westminster.gov.uk

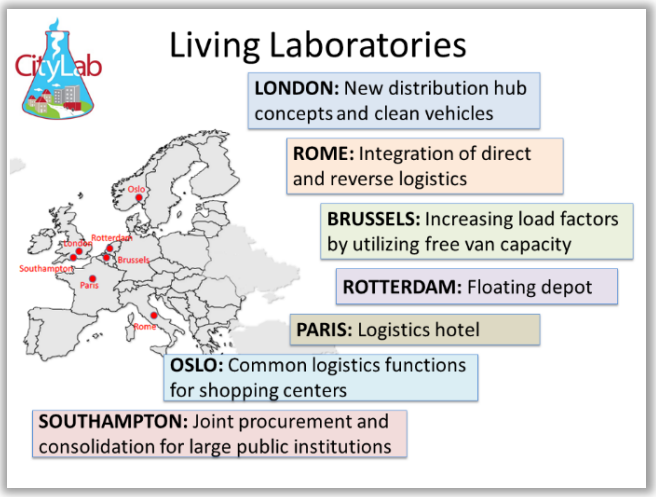
Challenges Addressed
- Air quality and congestion

Expected Outcomes
Data from the demonstrations will be analyzed, and relevant conclusions for the logistics industry and policymakers will be drawn, including:

- Technical suitability of electric freight vehicles.
- Economics of electric freight vehicles.
- Environmental performance of the demonstrations (e.g., carbon-dioxide emissions), and analysis of impacts of wider-scale deployment (for air quality, congestion, and the electricity grid).
- Social impact of the electric-vehicle logistics applications and policies (e.g., curfew extensions).
- Impact of the range of policies on the economic case for logistics operators to deploy electric vehicles.

Based on this information, partners will produce clear guidelines and recommendations for the key focus groups of this project: freight operators and fleet managers; public authorities at the local and regional level; energy network operators; Information & Communications Technology and service providers and vehicle manufacturers.

Stakeholder Involvement
The public-private partnership of FREVUE brings together 17 industry partners, 9 public-sector bodies, and 6 research and networking organizations.



CITYLAB Living Laboratories Across Europe. Source: Dr. Tom Cherrett.

CITYLAB–CITY LOGISTICS IN LIVING LABORATORIES

Funded by the European Commission's Horizon 2020 research program, the CITYLAB project aims to improve basic knowledge and understanding about the impacts of freight distribution and service trips in urban areas. It aims to test and implement seven innovative urban freight management solutions that could positively influence business profitability; reduce traffic and emissions; and have wider potential for roll-out in the logistics sector, and provide a platform for replicating and disseminating the supported solutions. The project focuses on four aspects of urban freight transportation that call for improvement and intervention:

1. Highly fragmented last-mile deliveries in city centers
2. Inefficient deliveries to large freight attractors and public administrations.
3. Urban waste, return trips, and recycling.
4. Logistics sprawl.

The project supports cities that are working to improve sustainability and livability, as well as private companies that are developing new services and business models for improved sustainability and profitability of their logistics activities. This support is embodied in Living Laboratories (Living Labs), where promising solutions are being tested with the involvement of all stakeholders and from which roll-outs over the whole of Europe will be targeted. A group of 18 follower cities has been established. Among those cities, a more limited set of transfer cities will be selected. The transfer cities will receive targeted guidance for transferring specific CITYLAB solutions as well as the Living Lab approach.

Project Type
Research and Pilots

Period of Performance
May 2015 – April 2018

Project Sites
Brussels, London, Oslo, Paris, Rome, Amsterdam, and Southampton

Website
www.citylab-project.eu

Contacts
Jardar Anderson
Project Coordinator
Institute of Transport Economics
+47 997 00 804
jan@toi.no

Tom Cherrett
Dissemination Manager
University of Southampton
+44 23 80 59 46 57
T.J.Cherrett@soton.ac.uk

Challenges Addressed
- Mobility and Efficiency
- Environment and Air Quality

Expected Outcomes
The outputs from the Living Labs will include best-practice guidance on innovative approaches and how to replicate them. CITYLAB will lay the groundwork for transfer of cost-effective policies and implementations that lead to increased load factors and reduced movements of freight and service vehicles in urban areas. Increased load factors and reduced vehicle trips will contribute to the European Commission's goal of achieving essentially carbon-free city logistics in major urban centers by 2030.

Stakeholder Involvement
The project involves local authorities and industry partners in each of the Living Labs. In addition, the Polis network of European cities and regions is assisting with reaching additional cities across Europe. The CITYLAB project uses Living Labs as its approach to fostering the deployment of innovations. The concept of Living Labs, which is new in city logistics, creates an experiential environment in which stakeholders such as citizens, governments, industry, and researchers collaborate to achieve a shared long-term goal. The pursuit of a shared goal is intended to reduce conflicting interests and speed up real-life developments and the deployment of innovations.

Civitas DESTINATIONS pilot locations in Europe. Source: Civitas DESTINATIONS.

CIVITAS DESTINATIONS

Civitas DESTINATIONS is one of the three biggest projects on sustainable mobility recently funded by the European Union. The project involves 30 partners from 10 European countries and 4 cities in China. The main objective is to achieve sustainable mobility for residents and tourists by working toward measures and innovative solutions in the following sectors: car-independent lifestyle; clean fuels and vehicles, collective and flexible public transport; demand management; integrated sustainable mobility plan; innovative crowd-sourcing and public involvement tools; intelligent transport systems for access control and criteria; and urban freight distribution and city logistics.

Project Type

Research, Pilot, Policy

Period of Performance

September 2016–September 2020

Project Site(s)

Five popular European tourist destinations: Madeira, Portugal; Crete, Greece; Gran Canarias, Spain; Cyprus; and Elba, Italy

Websites

www.civitas.eu/destinations

www.enclose.eu

Contact

Giorgio Ambrosino
DESTINATIONS Innovation and ITS Lead; Elba Site Manager
MemEx, Italy
+39 0586 211646
giorgio.ambrosino@memexitaly.it

Challenges Addressed

- Urban Quality.
- Cost-effectiveness and integration of last-mile logistics services.
- Reduction of emissions and energy consumption.
- Traffic congestion in urban areas.
- Safety and public use of urban spaces.

Expected Outcomes

Each of the six Civitas DESTINATIONS cities will develop an integrated Sustainable Urban Logistics Plan (SULP) and a general Mobility Plan (SUMP-Sustainable Urban Mobility Plan) following a common methodology set up at the EU level (IEE-ENCLOSE project) to address the various aspects of urban freight distribution. Additionally, these cities will begin to utilize different measures/services concerning last and first miles, delivery with Enhanced Environmentally Friendly vehicles (i.e., vehicles that comply with the most stringent exhaust emissions standard), special services (hotel laundry services), and new access regulations set by the local authorities in favor of low-carbon delivery schemes.

Stakeholder Involvement

Local and regional authorities and chambers of commerce are directly involved in the project. They are responsible for all the site measures implementation and evaluation. Additional partners include university and research institutes (focusing on innovative solutions) and transport operators and consultancy companies (focusing on the implementation of specific services for last-mile delivery and schemes at site level). The local authority will serve as the facilitator for the various transport operators and shop keeper associations in order to:

- Set urban freight regulation scenario (time/space), incentives for "green delivery vehicles" and for access in relation to load factor/ unloading time window/vehicle typology.
- Set enforcement schemes making existing infrastructure available (Information & Communication Technology included).
- Set agreement among the shopkeepers for selecting a common goods provider, reducing the own account transport and evaluating the role of urban distribution center as final delivery destination.
- Design a specific plan devoted to city logistics solutions.

Goods delivery and service vehicles on a London street
Source: FTC2050

Freight Traffic Control 2050 (FTC2050)

Freight transport currently makes up about 16 percent of all road vehicle activity in our cities; by 2030, the European Union would like to see largely carbon-free logistics systems operating in its urban centers. With van traffic predicted to increase by 20 percent in London by 2030, and the slow uptake of alternatively fueled and electric goods vehicles, more radical strategies are needed to reduce the numbers and impacts of freight vehicles in cities.

Working with some major parcel carriers in London, this project is examining the potential for closer operational collaboration among carriers to reduce urban traffic and energy demand while maintaining customer service levels.

Project Type
Research

Period of Performance
April 2016–March 2019

Project Site(s)
London, UK

Website
www.ftc2050.com

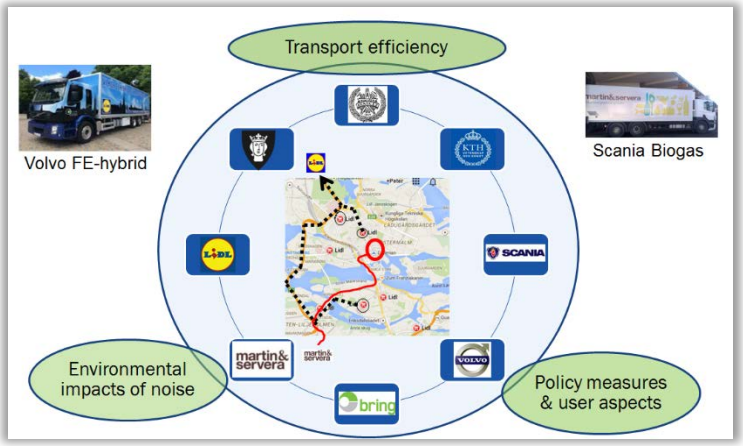
Contact
Professor Tom Cherrett
Principal Investigator
University of Southampton
023 80594657
T.J.Cherrett@soton.ac.uk

Challenges Addressed
- Energy consuption of last-mile frieght distribution in urban centers
- Load consolidation/trip reduction

Expected Outcomes
The key research objectives are to:

- Investigate the collective transport and energy impacts of current parcel carrier activities.
- Create a database to gather and interrogate collection and delivery schedules supplied by different carriers.
- Use the data with a series of optimization algorithms to investigate the potential transport and energy benefits if carriers were to share deliveries and collections more equitably among them and develop tools to help visualize those benefits.
- Evaluate what business models would be needed to enable carriers to collaborate in this way.
- Investigate the role that a third-party “Freight Traffic Controller” could play in stimulating collaboration among carriers to reduce energy demand and vehicle impacts across a city.
- Identify the key legal and privacy issues associated with the receipt, processing, and visualization of such collaborative schedules.

Stakeholder Involvement
This research involves a multidisciplinary collaboration, led by the University of Southampton’s Faculty of Engineering and the Environment, and involving the Southampton Business School, Lancaster University’s School of Computing and Communications and Data Science Institute, the University of Westminster’s Faculty of Architecture and the Built Environment, and University College London’s Bartlett Centre for Advanced Spatial Analysis. Two major carriers (TNT and Gnewt Cargo) have agreed to participate in the research along with Transport for London (TfL). TfL has a primary interest in how carrier operations affect street performance in urban areas and how urban space could be better used to accommodate last-mile delivery.



A visual summary of the off-peak delivery project. Source: Anastasios Koutoulas.

OFF-PEAK CITY LOGISTICS– A CASE STUDY IN STOCKHOLM

Stockholm's need for better organization of urban freight transport and reduction of traffic congestion was what prompted the city to initiate an off-peak delivery pilot project in 2014. The goal was to make deliveries more flexible; to urge transport companies to invest in new, silent, environmentally friendly trucks; and to use the infrastructure in a more efficient way for all modes of transport. The objective is to improve the safety and livability of the city for its inhabitants. From 2015 to 2016, the project tested nighttime distribution in the city center of Stockholm using one hybrid and one biogas vehicle for delivering goods to three retail establishments, and to a variety of hotels and restaurants. The outcomes were analyzed for four different aspects: transport efficiency, environmental impacts of noise, policy measures, and stakeholders' perceptions.

Project Type
Pilot Project/Research/Policy

Period of Performance
January 2015–December 2016

Project Site(s)
Stockholm, Sweden

Website
https://www.itrl.kth.se/research/projects/off-peak/off-peak-city-distribution-1.632601

Contact
Anastasios Koutoulas
Ph.D. Candidate
Royal Institute of Technology (KTH), School of Architecture and the Built Environment (ABE), Department of Transport Science
+46 8 790 6833
anastasios.koutoulas@abe.kth.se

Challenges Addressed
- Mobility/transport efficiency
- Noise

Key Findings

Transport Efficiency:
- Off-peak deliveries in general have better performance regarding driving efficiency, delivery reliability, and energy efficiency.
- 31 percent higher driving speed on the delivery route (dedicated deliveries) and 59 percent higher driving speed in the entire urban network in off-peak than in the afternoon peak (consolidated deliveries).
- Off-peak deliveries have better energy and efficiency compared to regular-hour deliveries.
- The average fuel consumption is higher during all daytime intervals compared to the off-peak hours because of the congestion.

Environmental impacts of noise:
- Important background noise levels. In areas with busy streets, the added effects of deliveries is negligible, whereas the impact is more significant in quiet, residential areas.
- Nighttime deliveries are unproblematic in noisy areas, while more efforts are needed in quiet areas.

Stakeholder Involvement
The municipality of Stockholm found companies, organizations, and entities interested in off-peak deliveries, and organized their actions in a way that it would not generate new problems or inefficiencies for citizens. Major producers of heavy trucks provided two state-of-the-art, environmentally friendly distribution trucks. A company expert in silent systems for distribution (e.g., rolling cages) provided the necessary equipment. From the carriers' side, two of the biggest logistics companies in Sweden participated by delivering goods during nighttime hours to their customers.

IMPACTS OF POLICY-INDUCED FREIGHT MODAL SHIFTS

The increased recognition of the environmental and human impacts of supply chain activities, such as air emissions, energy consumption, noise, and congestion, has led to public pressure for action. This includes calls for public policy actions to encourage shifting freight shipping to more sustainable modes (e.g., highway to rail).

Freight mode choice is one of the most complex decision processes in transportation, due to a multiplicity of factors. Three economic agents influence freight mode choice: shippers, carriers, and receivers. An effective implementation of a desired modal shift requires a thorough understanding of how these agents respond to various transportation policies. The objective of this research is to develop a handbook for public practitioners that describes the factors shippers and carriers consider when choosing freight modes. It also provides an analytical methodology for public practitioners to quantify the probability and outcomes of policy-induced modal shifts.

The major tasks involved in this research effort include:

1. Studying the factors influencing the current modal shares of freight traffic.
2. Conducting interviews with freight agents (i.e., shippers, carriers, receivers) regarding their decisionmaking for supply chains, mode choices, and recommendations on what the public sector could do to foster the use of sustainable modes.
3. Estimating freight mode choice models using the Commodity Flow Survey's 2012 microdata, combined with Longitudinal Business Database (LBD), modal attribute data comprising of costs and travel times of various modes.
4. Quantifying the public impacts of freight modal shifts.
5. Applying models developed to case studies.

This project is funded by the National Cooperative Freight Research Program (NCFRP) of the Transportation Research Board (TRB), and is being conducted by the Rensselaer Polytechnic Institute (RPI), partnered with Jack Faucett and Associates.

Project Type

Research

Period of Performance

October 2013—June 2017

Project Site(s)

Any geographic scale (national, State, or regional)

Website

http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3534

Contact

José Holguín-Veras, Ph.D., P.E., F.ASCE
William H. Hart Professor,
Department of Civil and Environmental Engineering
Rensselaer Polytechnic Institute
518-276-6221
jhv@rpi.edu

Challenges Addressed

- Modeling.
- Policy.
- Last-mile deliveries.
- Logistics.

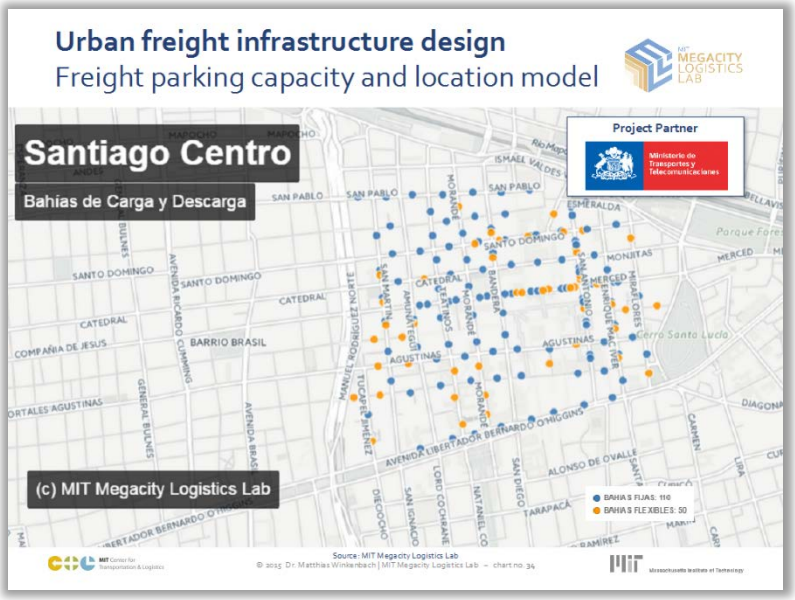
Expected Outcomes

The project will result in a handbook that explains the factors shippers and carriers consider when choosing freight mode, and that provides a modeling framework that practitioners can use to quantify the probability and outcomes of policy-induced modal shifts.

Stakeholder Involvement

There are many stakeholders from public and private industry involved in this study:

- Public agencies: NCFRP, Federal Railroad Administration (FRA), U.S. Census Bureau.
- Private agencies: JFA, Caliper Corporation, a lot of private firms participated in the in-depth interviews.



Optimal locations of fixed and flexible, dedicated freight parking bays in downtown Santiago de Chile. Source: MIT Megacity Logistics Lab

DESIGN, CAPACITY, AND LOCATION OF URBAN FREIGHT INFRASTRUCTURE IN AN INTEGRATED MOBILITY PLAN FOR SANTIAGO DE CHILE

MIT supported a remodeling plan for downtown Santiago de Chile by providing a data-driven freight perspective to the government's integrated mobility plan for the remodeling effort. The goal of the remodeling plan is to make the downtown a more livable, safe, healthy, and less congested neighborhood.

MIT developed a novel approach to using spatial queuing theory in infrastructure planning and design to inform public decisionmaking regarding:

- The capacity, type, and location of freight-specific parking infrastructure to be created.
- The design of local freight regulations (e.g., time-, vehicle-type- and location-based access restrictions) to support the efficient use of such infrastructure.

This effort was informed by delivery-intensity data collected through surveys and observation, as well as vehicle Global Positioning System (GPS) data from several vendors.

Project Type
Research

Period of Performance
August 2015 –December 2016

Project Site(s)
Santiago, Chile

Website
www.megacitylab.mit.edu

Contact
Matthias Winkenbach
Director
MIT Megacity Logistics Lab
Center for Transportation & Logistics
857-253-1639
mwinkenb@mit.edu

Challenges Addressed
- Urban freight parking infrastructure
- Logistics
- Regulation

Key Outcomes
The research provided local researchers and government officials with the necessary quantitative tools to accomplish two objectives:

1. Assess the need for freight-dedicated parking infrastructure in downtown Santiago de Chile.
2. Develop a corresponding plan for the creation of such infrastructure to serve as an important input for the government's integrated mobility plan for the neighborhood.

This plan will align with other regional freight and modal transportation planning efforts. It will also provide a framework to measure progress and identify trade-offs for the region.

Stakeholder Involvement
This project was part of a joint research effort with the Chilean Ministry of Transport and Telecommunication and the Pontificia Universidad Católica de Chile.

SINGAPORE URBAN FREIGHT STUDY

The research team is developing an integrated framework for (i) data collection, (ii) modelling, and (iii) decisionmaking to facilitate the design and evaluation of policies related to urban freight and logistics. This project uses sensing technologies in freight surveys (i.e., commodity flows, vehicle and driver surveys), and data will be used to develop agent-based behavioral simulation models.

Policy case studies include freight consolidation, centralized receiving stations at retail malls, provision of heavy vehicle parking in the city, and predicting freight trips with future land-use changes.

Project Type
Research and pilots

Period of Performance
2016–2019

Project Site(s)
Singapore

Website
http://mobility.sutd.edu.sg/loadingbays

Contact
Lynette Cheah
Assistant Professor,
Singapore University of
Technology and Design
+65 6499-4740
lynette@sutd.edu.sg

Challenges Addressed
- Freight traffic congestion in dense city centers
- Land and freight infrastructure planning

Expected Outcomes
Contribution to freight survey methods and local freight policy recommendations.

Stakeholder Involvement
The project is carried out by researchers from the Singapore University of Technology and Design, Massachusetts Institute of Technology's Intelligent Transportation Systems Laboratory, the Singapore-MIT Alliance for Research and Technology (SMART) Future Mobility group, and the University of Napoli Frederico II.

Partnering government agencies include the Singapore Urban Redevelopment Authority, Land Transport Authority, JTC, and the Infocomm and Media Development Authority.

A rail freight yard in northwestern Atlanta.
Source: Atlanta Regional Commission.

ATLANTA REGIONAL FREIGHT MOBILITY PLAN UPDATE

The Atlanta Regional Comission (ARC) developed the Atlanta Regional Freight Mobility Plan, which was adopted in 2008. It has provided direction for freight planning and implementation throughout the Atlanta region. The Atlanta Regional Freight Mobility Plan Update was adopted in June 2016, and is an update of the original plan. Its primary purpose is to identify and prioritize freight infrastructure projects needed in the Atlanta region, incorporate those projects into other regional plans, analyze locations with the most freight activity, evaluate freight performance in the region, and identify other freight planning needs.

Project Type
MPO Policy Document

Period of Performance
Ongoing

Project Site(s)
Atlanta Metropolitan Planning Organization's planning area

Website
https://atlantaregional.org/freight-transportation/

Contact
Daniel Studdard
Atlanta Regional Commission
470-378-1593
dstuddard@atlantaregional.org

Challenges Addressed
- Mobility
- Infrastructure project identification
- Commodities analysis
- Freight land use

Expected Outcomes
This plan update identified major infrastructure projects needed in the Atlanta region, while also analyzing other regional freight issues. Truck parking was identified as an issue having an impact nationally as well as within the Atlanta region:

- ARC is finalizing procurement of a consultant team to conduct the Atlanta Regional Truck Parking Assessment Study in 2017.
- This study will focus on both overnight parking and truck staging needs near warehouses/distribution centers and major manufacturing facilities.
- The study will develop an inventory of existing truck parking in the region, conduct surveys with the trucking industry, analyze truck volumes on major roadways, and evaluate other data to identify where additional truck parking spaces may be needed.
- Recommendations will potentially include general locations where more truck parking is needed, additional communications technology that can assist drivers, and other potential ways to address this problem.

Stakeholder Involvement
Stakeholder involvement included local, State, and Federal transportation staff, elected officials, and private industry. This was done through ARC standing committee meetings, the ARC Freight Advisory Task Force, stakeholder interviews, and an online questionnaire.

Memphis metropolitan area showing the Class 1 rail network, Interstate highways, and arterial connectors. Source: Memphis MPO.

REGIONAL FREIGHT PLAN FOR MEMPHIS, TENNESSEE

The Memphis metropolitan area is a major transportation and logistics center, hosting the world's second largest air cargo airport, five Class I railroads, an inland water port, and hundreds of trucking terminals. The region is covered by two metropolitan planning organizations (MPOs): the West Memphis MPO covers one county in Arkansas; and the Memphis Urban Area MPO (Memphis MPO) covers two counties in Tennessee and two counties in Mississippi.

The Memphis MPO is developing a regional freight plan that will enhance the mobility of people and goods, while addressing the unique characteristics of the region and encouraging economic development.

Project Type

Metropolitan Plan

Period of Performance

June 2016–August 2017

Project Site(s)

Memphis Metropolitan Planning Organization's planning area

Website

http://memphismpo.org/project/regional-freight-plan

Contact

Pragati Srivastava
Director, Memphis Metropolitan Planning Organization
901-576-7190
pragati.srivastava@memphistn.gov

Challenges Addressed

- Road design (in relation to freight)
- Traffic modeling
- Parking
- Land use
- Innovative finance
- Economic competitiveness

Expected Outcomes

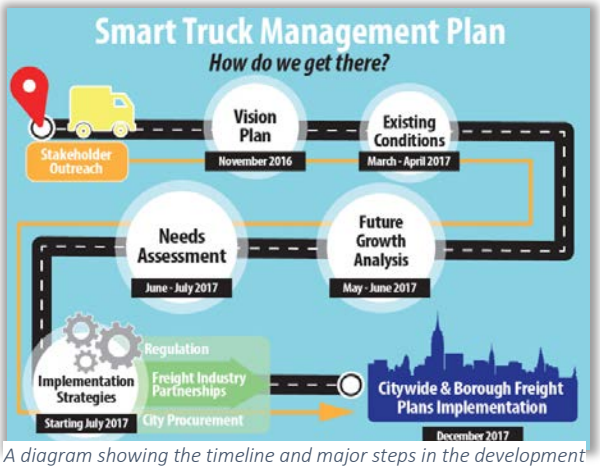
The regional freight plan will:

- Identify freight routes with poor curb/road geometries and create a priority list of projects to improve intersections and lane widths.
- Assess the future traffic impacts of various land development patterns.
- Examine the current and future supply and demand for truck parking areas.
- Analyze the supply and demand for industrial land over the next 20 to 30 years.
- Identify investment needs for the regional freight transportation system.
- Analyze future threats to the economic competitiveness of freight in the region.

This plan will align with other regional freight and modal transportation planning efforts. It will also provide a framework to measure progress and identify tradeoffs for the region.

Stakeholder Involvement

Numerous meetings will be held with various stakeholders from the region's public and private sectors to gather feedback on freight movement, operations, and transportation infrastructure.



A diagram showing the timeline and major steps in the development of the Smart Truck Management Plan. Source: NYCDOT.

NEW YORK CITY SMART TRUCK MANAGEMENT PLAN

This study seeks to develop a comprehensive freight strategy that leverages innovative technologies and sustainable urban freight programs to promote off-hour deliveries, reduce air and noise pollution by implementing these innovations, foster a culture of compliance, and mitigate adverse impacts of freight transportation on communities while supporting the city's business and economic development goals.

Project Type

Comprehensive study to inform the regional freight plan

Period of Performance

November 2016–December 2017

Project Site(s)

New York City, New York

Websites

NYCDOT Truck & Commercial Vehicle Information: http://www.nyc.gov/html/dot/html/motorist/trucks.shtml#urbanfreight

NYCDOT 2016 Strategic Freight Plan http://www.nycdotplan.nyc/freight-movement

Contact

Diniece Peters
Program Manager
New York City Department of Transportation
212-839-6670
dpeters@dot.nyc.gov;
freightplan@dot.nyc.gov

Challenges Addressed

- Congestion
- Curbside managment
- Efficient freight deliveries
- Freight trip generation
- Land-use interaction
- Environmental sustainability
- Truck safety
- Commercial vehicle compliance
- Freight flow operation regulation and enforcement

Expected Outcomes

City-wide and borough freight plans; development of recommendations for truck route improvements, land-use and freight policy improvements, regulatory measures, and new approaches to truck and other freight-related data collection, system performance/compliance monitoring, reporting, and enforcement.

Stakeholder Involvement

Stakeholder involvement ranges from one-on-one meetings with businesses/stakeholders, meetings with city agencies, various community workshops, and advisory committee meetings with stakeholders from local (city) agencies, private truck industry, MPO, regional planning agencies, labor unions, non-government organizations, community organizations, academia, etc.

A home-based delivery on a residential street.
Source: Dr. Alison Conway, The City College of New York.

ACCOMMODATING FREIGHT AND COMMERCIAL VEHICLES IN COMPLETE STREETS

The goal of this project is to develop an illustrated guidebook that can be used by urban street design professionals to identify common challenges for goods movement and emergency vehicle operations in complete streets environments, and identify solution alternatives to address or mitigate these challenges. An international review of academic and practical literature was conducted to identify challenges and best practices. A web-based survey was also conducted to gather input and experience from large and medium-sized U.S. cities.

Project Type
Research

Period of Performance
April 2016–March 2017

Project Site(s)
New York City

Website
When completed, the guidebook and educational module will be made available at: https://www.metrans.org/metrofreight-education

Contact
Dr. Alison Conway
Assistant Professor, Department of Civil Engineering
Organization: The City College of New York
212-650-5372
aconway@ccny.cuny.edu

Challenges Addressed
- Street design
- Parking
- Bicycle/pedestrian safety

Expected Outcomes
The final products of this effort will be a published guidebook and an education module suitable for use by practitioners in academic courses, and in professional development programs.

Stakeholder Involvement
This project is being conducted by a team of researchers from the Grove School of Engineering and the Spitzer School of Architecture at the City College of New York with support from the New York City Department of Transportation (NYCDOT). The project is funded by the New York State Energy Research Development Authority (NYSERDA) with in-kind support from NYCDOT. The National Association of City Transportation Officials assisted with survey distribution. Surveys were completed by nine additional city agencies, including: District DOT; Boston Transportation Department; City of Seattle DOT; Northeast Ohio Areawide Coordinating Agency (NOACA); Louisville Metro Government; Charlotte DOT; City of Portland, Bureau of Transportation; City of Austin Transportation Department; and City of Pittsburgh City Planning. The final products will be distributed by the Metrofreight Center, a Volvo Research and Educational Foundations Center of Excellence.

FREIGHT FLUIDITY

"Freight fluidity" is a broad term referring to the characteristics of a multimodal freight network in a geographic area of interest, where any number of specific modal data elements and performance measures are used to describe the network performance (including costs and resiliency) and quantity of freight moved (including commodity value) to inform decisionmaking.

The Texas A&M Transportation Institute is conducting the following activities related to freight fluidity:

- Demonstrating and implementing the freight fluidity concept in Texas (statewide and border fluidity) and Maryland using key activity centers and corridors with high truck volumes.
- Providing technical assistance (as part of a consultant team) for the development of FHWA's National Freight Fluidity Monitoring Program Implementation, including identifying appropriate supply chains, data sourcing, and regional implementation.
- Developing and implementing a freight fluidity performance management framework for U.S. ports for the U.S. Army Corps of Engineers (USACE) (performing Mobile, Alabama, port demonstration).

Project Type
Research

Period of Performance
Varies by activity/sponsor

Project Site(s)
Various locations and geographic scales, including: Texas (statewide); Maryland (statewide);and Mobile, Alabama (port)

Website
https://cattworks.org/projects/freight-fluidity/

Contact
Bill Eisele
Principal Investigator, Texas A&M University
979-845-8550
bill-eisele@tamu.edu

Challenges Addressed
- Freight mobility
- Resilence/reliability of supply chains
- Performance measures of freight networks and supply chains.

Expected Outcomes
Frameworks and implementation/demonstration of freight fluidity concepts at the regional (local) and statewide levels with an eye toward national/international supply chain implementation.

Stakeholder Involvement
Texas Department of Transportation (statewide/border), Maryland State Highway Administration, FHWA, and USACE.

The New York Tri-state Area. Source: Regional Plan Association.

DEVELOPING A FREIGHT ADVISORY COMMITTEE TO GUIDE FUTURE FREIGHT TRANSPORTATION INFRASTRUCTURE DEVELOPMENT IN THE GREATER NEW YORK CITY REGION

The purpose of this initiative is to assemble a group of representatives of public agencies and private-sector freight stakeholders to help prioritize the needs for improvements to the freight transportation network in the New York City (NYC) region. This group will highlight freight transportation infrastructure needs, but will also focus on the needs of sustainability, service, and safety. It will consolidate and synthesize existing transportation plans already under consideration by existing public agencies, providing private-sector input and articulating needed steps for implementation of existing plan priorities. It will also address funding concerns, develop funding alternatives, and respond to demand for particular improvements related to freight.

Project Type
Research/Policy Implementation

Period of Performance
April 2016—ongoing

Project Site(s)
Greater New York City, including areas of New York, Connecticut, New Jersey, and Pennsylvania

Website
Under development

Contact
Christopher Clott, Ph.D.
ABS Chair of Marine Transportation and Logistics
SUNY Maritime College
347-842-1611
cclott@sunymaritime.edu

Challenges Addressed
- Last-mile (especially related to traffic to and from Port of New York/New Jersey)
- Port-to-door delivery
- Congestion “pinch points”
- Multimodal transportation
- Short sea shipping potential

Expected Outcomes
A prioritized list of freight transportation infrastructure needs—drawing from each of the various plans for the NYC region—through expert consensus. A description of how to champion these needs to policymakers, private funding bodies, and the public.

Stakeholder Involvement
All freight planning agencies in the region, including local, State, and Federal levels; freight trade associations; real-estate interests; and private firms involved in infrastructure finance and development.

An example of home-based delivery in New York City.
Source: Dr. Alison Conway, The City College of New York.

DECOMPOSING THE HOME-BASED DELIVERY SUPPLY CHAIN

This project aims to explore the characteristics of freight demand and delivery behavior at large residential buildings in the New York City (NYC) region. The project includes multiple case studies employing both building delivery records and direct field observation to identify delivery trends. Variables examined include, but are not limited to: overall package and vehicle demands; shipment sizes; time-of-day, day-of-week, and annual trends; shipper and carrier types; vehicle types; parking behavior for delivery and pickup; and curbside logistics models.

Project Type
Research

Period of Performance
June 2015–June 2017

Project Site(s)
Manhattan, Brooklyn, Queens, and Bronx boroughs of New York City; Fort Lee, NJ

Website
https://www.metrans.org/research/decomposing-home-based-delivery-supply-chain

Contacts
Dr. Alison Conway
Assistant Professor,
Department of Civil Engineering,
The City College of New York
212-650-5372
aconway@ccny.cuny.edu

Dr. Jean-Paul Rodrigue
Professor; Van Horne Researcher in Transportation and Logistics,
Hofstra University
Jean-paul.rodrigue@hofstra.edu

Dr. Camille Kamga
Director
University Transportation Research Center, The City College of New York
ckamga@utrcs2.org

Challenges Addressed
- E-commerce
- Freight demand
- Parking behavior

Expected Outcomes
The project is expected to produce a final report detailing delivery characteristics and trends identified for residential delivery activity in the NYC region. The report will also discuss the benefits and challenges of the data collection methods employed. Results from this study will also be compared with related studies ongoing in Metrofreight partner cities of Paris and Seoul.

Stakeholder Involvement
This project is being conducted by researchers at the University Transportation Research Center (UTRC) from Hofstra University and the City College of New York. The project is being funded by the Volvo Research and Educational Foundations through the Metrofreight Center.

The final 50 feet of a downtown delivery.
Source: Chris Eaves, Seattle Department of Transportation.

THE FINAL 50 FEET OF URBAN GOODS DELIVERY

The University of Washington and the Seattle Department of Transportation are gathering data on delivery assets (i.e., loading zones, alleys, and building loading bays) to determine how best to design the "final 50 feet of delivery." This term refers to the movement of a freight shipment from a delivery vehicle to the recipient. The University of Washington will perform concentrated analysis on specific building types to generate scalable "archetypical" buildings that illustrate urban freight needs, and that can inform the requirements for freight facilities for large-scale developments.

Project Type

Research and data gathering

Project Site(s)

Highly developed urban centers

Websites

http://www.seattle.gov/transportation/thefinal50feet.htm

https://depts.washington.edu/sctlctr/members/urban-freight-lab

Contacts

Barb Ivanov
Chief Operating Officer
University of Washington Supply Chain & Logistics Center
206-468-2201
ivanov@uw.edu

Chris Eaves
Senior Civil Engineering Specialist
Seattle Department of Transportation
206-684-4524
Christopher.eaves@seattle.gov

Jude Willcher
Strategic Advisor, Capital Programming
Seattle Department of Transportation
206-684-4059
jude.willcher@seattle.gov

Challenges Addressed

- Goods delivery in highly developed urban environments
- Parking
- Access
- Congestion
- Building design

Expected Outcomes

This work is designed to pilot and evaluate operational improvements in highly developed urban environments such as urban centers, central business districts, and urban villages. The project will also inform policy and permitting on current development needs.

Stakeholder Involvement

- Public agency (Seattle Department of Transportation)
- Higher education (University of Washington's Urban Freight Lab)
- Private industry (UPS, USPS, Nordstrom, FedEx, Costco)

DESIGN OF DISTRIBUTION NETWORK FOR BUSINESS-TO-BUSINESS DELIVERY IN CONGESTED URBAN AREAS

This project will formulate a large-scale numerical optimization model for the design and planning of urban distribution networks serving small retail customers (e.g., convenience stores, bars, supermarkets) in densely populated and congested urban markets. The model will address the following:

- The number, capacity, type, and location of urban distribution facilities
- The degree of consolidation and deconsolidation of urban shipments (i.e., direct shipment from a distribution center vs. indirect, multi-tier shipment via local satellite facilities)
- The allocation of service areas to these facilities
- The location-specific choice of the vehicle types and delivery models to be used to serve various kinds of urban customers

To depict urban complexities as accurately as possible, the model will be designed to incorporate various sources of relevant (big) data from sources such as company order and delivery data, high-resolution Global Positioning System (GPS) traces from the current delivery fleet, publicly available data such as travel times and distances from Google Maps, geo-referenced information on real-estate cost and crime incidents.

Project Type
Research

Period of Performance
October 2016–August 2017

Project Site(s)
Bogotá, Colombia

Website
www.megacitylab.mit.edu

Contact
Matthias Winkenbach
Director
MIT Megacity Logistics Lab
Center for Transportation & Logistics
857-253-1639
mwinkenb@mit.edu

Challenges Addressed
- Road design (in relation to freight)
- Traffic modeling
- Parking

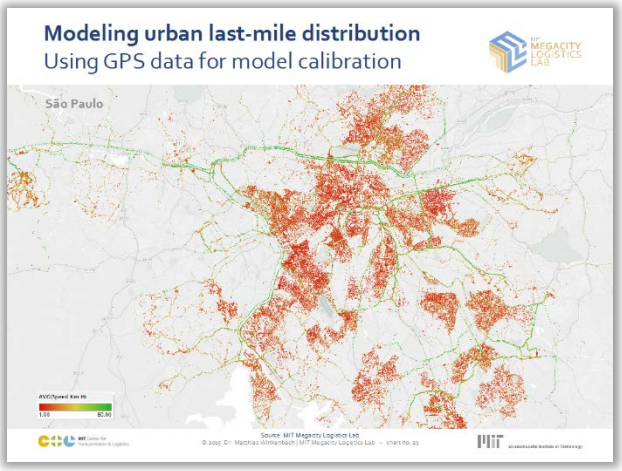
Expected Outcomes
MIT will produce a data-driven network design tool to be used by Coca-Cola Femsa in its strategic design and operational planning of urban last-mile distribution to consumers in major Latin American and Asian cities. The tool will allow Femsa to operate:

- At lower operational cost.
- With reduced impacts on the environment.
- At a higher service level to the customer.
- With a better alignment of the company's corporate objectives (e.g., market share, profit, sustainability) with the direct and indirect incentives of its delivery crews.

MIT develops novel methods of incorporating large amounts of high-resolution data from various sources into improved, large-scale, mathematical optimization models for the design and planning of distribution networks. In particular, MIT uses the following data sources to better inform models of numerical network optimization and geometric probability methods for route length and cost estimation:

- Corporate transactional data.
- Fleet GPS data.
- Google Maps application program interface (API) data.

Stakeholder Involvement
Private-sector research partner: Coca-Cola Femsa, the largest global bottler of Coca-Cola.



High-resolution GPS traces to inform model parameters for travel speeds, traffic patterns, stop locations, and durations. Source: MIT Megacities Logistics Lab.

DISTRIBUTION NETWORK DESIGN FOR E-COMMERCE IN HIGH-DENSITY URBAN AREAS

The purpose of the project was to create a large-scale, numerical optimization model for the design of urban distribution networks for major consumer markets of our collaboration partner, B2W Digital of Brazil. The model addresses:

- The optimal number, capacity, type, and location of B2W Digital's urban distribution facilities.
- The optimal allocation of service areas to these facilities.
- The location-specific optimal choice of the vehicle type and delivery model to be used to serve the customer.

To depict urban complexities as accurately as possible, the model was designed to incorporate various sources of relevant (big) data such as: company order and delivery data; high-resolution GPS traces from the current delivery fleet (in photo above); publicly available data such as travel times and distances from Google Maps; and geo-referenced information on real-estate cost and crime incidents.

Project Type
Research

Period of Performance
February 2016 –January 2017

Project Site(s)
São Paulo, Brazil

Website
www.megacitylab.mit.edu

Contact
Matthias Winkenbach
Director
MIT Megacity Logistics Lab
857-253-1639
mwinkenb@mit.edu

Challenges Addressed
- Efficient urban distribution of e-commerce deliveries.
- Design and planning of distribution network.
- Use of public and commercial data to improve last-mile efficiency.

Key Accomplishments

MIT produced a data-driven network design tool to be used by B2W Digital in its strategic design and operational planning of urban last-mile distribution to consumers in major Latin American cities. The tool allows B2W Digital to operate:

- At lower operational cost.
- With reduced impact on the environment.
- At a higher service level to the customer.
- With reduced risk exposure (i.e., likelihood of robbery attempts) for employees.

MIT developed novel methods of incorporating large amounts of high-resolution data from various sources into improved, large-scale, mathematical optimization models for the design and planning of distribution networks. In particular, MIT used the following data sources to better inform models of numerical network optimization and geometric probability methods for route length and cost estimation:

- Corporate transactional data.
- Fleet GPS data.
- Google Maps application program interface (API) data.
- Geo-referenced datasets of safety incidents and real estate cost.

Stakeholder Involvement
Private-sector research partner: B2W Digital, a major Brazilian e-commerce company.

EFFECTIVE DECISIONMAKING METHODS FOR FREIGHT-EFFICIENT LAND USE

Freight traffic is growing faster than car traffic. Research on land-use strategies has traditionally been focused on reducing the vehicle-miles traveled (VMT) of passenger vehicles and has generally ignored the movement of commercial vehicles. There are many other factors influencing land use such as population growth, gentrification, and new supply chain management approaches. Among these new approaches are freight villages, freight hubs, and inland ports. Furthermore, pollution from diesel engines has emerged as a top health concern. To plan for an environmentally sustainable and livable future, we have to understand and consider the dynamics between freight and land-use.

This research project is funded by the National Cooperative Highway Research Program (NCHRP) of the Transportation Research Board (TRB). The research team is led by the Rensselaer Polytechnic Institute (RPI); research partners include SRF Consulting Group, University at Albany-State University of New York, American Transportation Research Institute, and Emprata.

Project Type

Research

Period of Performance

Ongoing

Project Site(s)

End products are intended to be used at all scales (city, region, State)

Website

http://apps.trb.org/cmsfeed/trbnetprojectdisplay.asp?projectid=4187

Contact

José Holguín-Veras, Ph.D., P.E., F.ASCE
William H. Hart Professor,
Department of Civil and Environmental Engineering
Rensselaer Polytechnic Institute
518-276-6221
jhv@rpi.edu

Challenges Addressed

- Land use
- Mobility
- Air quality
- Livability
- Environmental sustainability

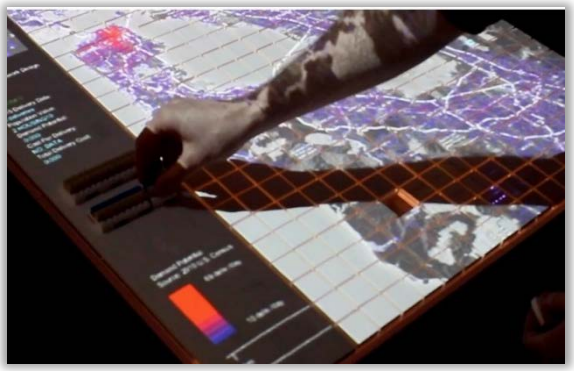
Expected Outcomes

The project will result in:

- A guide to quantify and evaluate the impact of land-use practices and policies to support efficient movement of all modes of freight
- Decision-support tools to assist local, regional, and State land-use and transportation decisionmakers to support efficient movement of freight.

Stakeholder Involvement

Potential stakeholders include land-use planners, local and State-elected officials, locally appointed officials (planning commissions and board of zoning appeals), remonstrators, constituents, courts, developers, and economic development officials.



Tactile user interfaces enable researchers and decisionmakers to explore and analyze complex data and models intuitively. Source: MIT Megacity Logistics Lab

INTERACTIVE SIMULATION OF LAST-MILE DISTRIBUTION NETWORK DESIGN AND PERFORMANCE USING TACTILE VISUAL INTERFACES

The purpose of the project was to create a large-scale, interactive simulation model to assess the performance of a last-mile distribution network for online grocery deliveries. The research team used a tactile and visual user interface initially developed by the Media Lab at the Massachusetts Institute of Technology (MIT), which allows the user to design interactively an urban distribution infrastructure that would serve as a basis for a high-resolution simulation of distribution performance in terms of coverage area, cost of delivery, on-time delivery, and traffic and emission footprint. Model results are fed back to the user through the visual interface in close-to-real-time, creating a fast-paced environment for collaborative, cross-functional, and highly data-driven urban logistics decisionmaking for design and planning.

To depict urban complexities as accurately as possible, the model was designed to incorporate various sources of relevant (big) data such as: historic company order and delivery data; fleet GPS traces; and real-time traffic and travel distance data.

Project Type
Research

Period of Performance
February 2016 –January 2017

Project Site(s)
San Jose/San Francisco, CA, and Denver, CO

Website
www.megacitylab.mit.edu

Contact
Matthias Winkenbach
Director
MIT Megacity Logistics Lab
Center for Transportation & Logistics
857-253-1639
mwinkenb@mit.edu

Challenges Addressed
- Goods distribution
- Efficiency and responsiveness of last-mile distribution

Key Accomplishments
MIT produced a data-driven, high-performance simulation model of urban last-mile distribution performance to be used by Walmart.com in their network design and operational planning of online grocery distribution.

MIT combined methodological advances for the fast-paced, large-scale simulation of urban distribution networks with novel methods of visualizing model inputs and outputs, and making mathematical modeling intuitively accessible to decisionmakers and researchers through interactive visualization.

Stakeholder Involvement
Private-sector research partner: Walmart.com

METROPOLITAN FREIGHT TRANSPORTATION: IMPLEMENTING EFFECTIVE STRATEGIES (NCHRP 08-106)

Although information about innovations and best practices in urban freight is now widely available, research has not addressed the question of why some urban freight strategies succeed and others do not. With a better understanding of when particular strategies are most appropriate, freight professionals could much better tailor strategies to the specific circumstances they find in their local areas. The research team is developing a tool and guidance to help practitioners identify critical factors, barriers, and possible characteristics that can accelerate successful implementation of urban freight strategies. Researchers have developed a "problem-driven" Excel matrix of strategy solutions based upon literature and experience (domestic and international). It will be updated with the results of a recently completed survey.

This research is funded by the National Cooperative Highway Research Program (NCHRP) of the Transportation Research Board and is labeled as NCHRP Project 08-106.

Project Type
Research

Period of Performance
May 2016–May 2018

Project Site(s)
Metropolitan Regions

Website
http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4034

Contacts
Bill Eisele
Co-Principal Investigator, Texas A&M University
979-845-8550
bill-eisele@tamu.edu

Seckin Ozkul
Co-Principal Investigator,
University of South Florida
813-974-3120
sozkul@cutr.usf.edu

Challenges Addressed
- Mobility
- Regulations
- Design
- Implementation

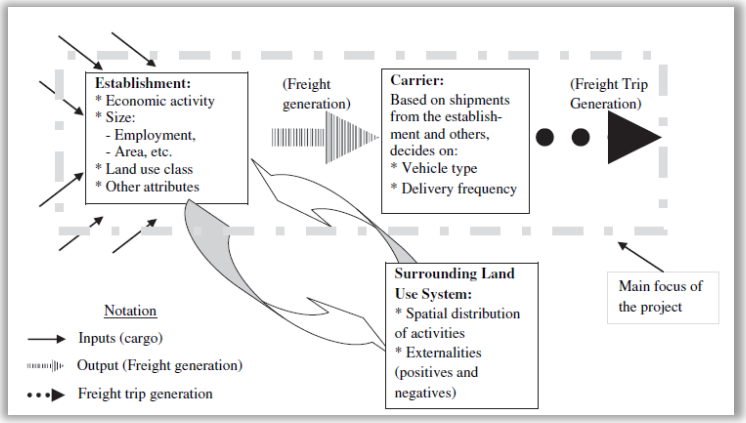
Expected Outcomes
The objective of this research is to develop guidance for transportation practitioners that identifies and evaluates:

1. Critical factors impacting the implementation of effective approaches to improve urban freight transportation.
2. Barriers to the implementation of effective approaches.
3. Strategies, processes, and relationships that could accelerate the adoption of effective practices and technologies.

Specific project deliverables will include: Strategy resource matrix (Excel), urban freight implementation tool (UFIT), UFIT user's guide, documented pilot studies to implement urban freight strategies (for future implementation).

Stakeholder Involvement
The research team recently completed an online survey to help determine:

- Why some metropolitan freight transportation strategies succeed in implementation and others do not.
- How various strategies may impact different freight stakeholder groups.



Schematic of connections between freight and land use. Source: José Holguín-Veras.

USING COMMODITY FLOW SURVEY MICRODATA AND OTHER ESTABLISHMENT DATA TO ESTIMATE THE GENERATION OF FREIGHT, FREIGHT TRIPS, AND SERVICE TIPS

The objective of the research was to estimate freight generation (FG) models using Commodity Flow Survey (CFS) microdata as a function of establishment characteristics (e.g., establishment size, economic activity performed). The research team estimated models at different levels of geography by industry segment to capture the role of geography and economic activity in freight generation patterns.

This project was undertaken by Rensselaer Polytechnic Institute (RPI), in partnership with the State University of New York at Albany. The project was funded by the National Cooperative Freight Research Program (NCFRP) of the Transportation Research Board (TRB).

This project, numbered by TRB as NCFRP Project 25(01), is an extension of NCFRP Project 25 (Freight Generation and Land Use), in which the research team utilized CFS microdata and other establishment data to estimate the generation of freight, and freight and service trips. For the follow-on project, the research team conducted an additional freight generation survey and incorporated new models into the electronic database of freight trip generation models that was created for the NCFRP 25 project.

Project Type
Research

Period of Performance
October 2012–December 2015

Project Site(s)
End products are broadly applicable

Websites
NCFRP Research Report 37

NCFRP Report 19

Contact
José Holguín-Veras, Ph.D., P.E., F.ASCE
William H. Hart Professor,
Department of Civil and Environmental Engineering
Rensselaer Polytechnic Institute
518-276-6221
jhv@rpi.edu

Challenges Addressed
- Freight-land use interaction.
- Freight data collection.
- Last-mile deliveries.
- Freight parking.
- Establishment of freight trip production.

Key Accomplishments
A guidebook (labeled as NCFRP Research Report 37) was produced that provides improved freight trip generation rates (or equivalent metrics) for different land-use characteristics related to freight facilities and commercial operations. These improved rates can be used to better inform State and local decisionmaking.

Stakeholder Involvement
Numerous meetings will be held with various stakeholders from the region's public and private sectors to gather feedback on freight movement, operations, and transportation infrastructure.

PRIMER ON COLLABORATION, COORDINATION, AND COMMUNICATION (3C) STRATEGIES FOR URBAN FREIGHT MOBILITY

The 3C Primer will document strategies and offer "how to" guidance on fostering collaboration, coordination, and communication among actors involved in urban freight movements. Moving freight involves a wide range of stakeholders in both the public and private sectors, each of whom has limited decisionmaking authority or responsibility. Therefore, collaboration, communication, and coordination strategies are vital for ensuring the safe, reliable, and efficient delivery of goods in and through urban areas. However, there are inherent challenges for coordinating among freight stakeholders, such as the proprietary nature of much information collected by the private freight industry, and the sheer number and different types of actors involved in moving goods—each of whom may represent different sectors, disciplines, and/or interests.

Project Type
Reference Guide/Research

Period of Performance
Expected publication in mid-2017

Project Site(s)
Includes noteworthy practices from the U.S. and other countries

Website
https://ops.fhwa.dot.gov/freight/fpd/index.htm

Contacts
Tamiko Burnell
Transportation Specialist
FHWA Office of Freight Management and Operations
202-366-1200
tamiko.burnell@dot.gov

Alisa Fine
Community Planner
U.S. DOT Volpe Center
617-494-2310
alisa.fine@dot.gov

Challenges Addressed
- Government and Partner Collaboration, Coordination, and Communication.
- First-and Last-Mile Freight Movements in Cities.

Expected Outcomes
The 3C Primer is expected to be an important resource for practitioners involved in transportation/freight planning at the State and local levels, including transportation engineers and planners, land use planners, urban designers, and landscape architects; elected officials at the State and local levels; private-sector freight stakeholders; as well as community leaders. Specific expected outcomes include improving stakeholders' abilities to identify:

- Implementation steps and resources needed to incorporate 3C strategies into public-sector freight planning, programming, and decisionmaking processes.
- Strategies, tactics, and innovative solutions that support State DOTs in developing FAST Act-compliant freight plans.
- Noteworthy practices from around the country and internationally, helping to foster an urban freight community of practice.

Stakeholder Involvement
The 3C Primer will reflect input provided by a technical review panel comprised of Federal/State/local government agency representatives and private-sector stakeholders.

PRIMER ON OPERATIONS, LOGISTICS, AND TECHNOLOGY (OLT) STRATEGIES FOR URBAN FREIGHT MOBILITY

This primer will document a range of operations, logistics, and technology strategies for implementation by the public and private sectors to improve urban freight mobility. Many of the challenges to the efficient flow of goods arise in cities, where freight movements must compete with other uses of urban roadways and curb space. As demand for freight transportation continues to rise at a disproportionate rate to freight system capacity, public-sector transportation practitioners, in coordination with private-sector freight shippers and carriers, must plan for and implement innovative solutions to ensure safe, efficient, reliable, and cost-effective delivery of goods.

Project Type

Reference Guide/Research

Period of Performance

Exepected publication by mid-2017

Project Sites

Includes noteworthy practices from the U.S. and other countries

Website

http://ops.fhwa.dot.gov/freight/fpd/index.htm

Contacts

Tamiko Burnell
Transportation Specialist
FHWA Office of Freight Management and Operations
202-366-1200
tamiko.burnell@dot.gov

Alisa Fine
Community Planner
U.S. DOT Volpe Center
617-494-2310
alisa.fine@dot.gov

Challenges Addressed

- First- and last-mile freight movement
- Emissions reductions
- Off-hours delivery
- Traffic control and lane management
- Management of curbside truck loading and parking areas
- Real-time information systems
- Safety-oriented technologies

Expected Outcomes

The OLT Primer is expected to be an important resource for public-sector planners and engineers at the local, regional, and State levels, as well as for private-sector freight stakeholders, researchers, and academics. Specific expected outcomes include improving stakeholders' abilities to identify:

- Implementation steps and resources needed to incorporate OLT strategies into public-sector freight planning, programming, and decisionmaking processes.
- Strategies, tactics, and innovative solutions that support State DOTs in developing FAST Act-compliant freight plans.
- Noteworthy practices from around the country and internationally, helping foster an urban freight community of practice.

Stakeholder Involvement

The OLT Primer will reflect input provided by a technical review panel comprised of Federal/State/local government agency representatives and private-sector stakeholders.

NOVELOG–NEW COOPERATIVE BUSINESS MODELS AND GUIDANCE FOR SUSTAINABLE CITY LOGISTICS

The mission of the NOVELOG project is to improve the understanding of urban freight distribution and service trips so that cities can both implement effective and sustainable policies and measures, and facilitate stakeholder collaboration for sustainable city logistics.

The project will produce four tools to strengthen the capacity of local authorities and stakeholders:

NOVELOG.
Source: Dr. Georgia Ayfantopoulou

1. Understanding Cities: A city-level platform for building a common view among stakeholders on the urban freight environment and for reaching consensus on the current and future state of the urban freight transport (UFT) environment.
2. Evaluation: A multi-criteria, multi-stakeholder evaluation tool composed of 5 assessment modules and 140 indicators that are grouped into 7 impact areas of a life cycle-based sustainability framework.
3. Toolkit: A tool that enables cities to identify potential logistics strategies or measures and their impacts based on a set of city parameters.
4. Guidance: A guidance framework to support cities to incorporate UFT solutions in their Sustainable Urban Mobility Plans (SUMPs), enabling collaborative schemes among private and public sector stakeholders, participating in the decisionmaking and operation of UFT policies and measures.

Project Type
Research

Period of Performance
June 2015–May 2018

Project Site(s)
Six Pilots: Athens, Barcelona, Graz, Mechelen, Rome, Turin

Six Case Studies: Copenhagen, Emilia Romagna Region (Italy), Gothenburg, London Boroughs of Barking & Dagenham, Pisa, Venice

Website
www.novelog.eu

Contact
Dr. Georgia Ayfantopoulou
Project Coordinator
Hellenic Institute of Transport (HIT), Centre for Research and Technology Hellas (CERTH)
+30 2310498451
gea@certh.gr,
novelogoffice@certh.gr

Challenges Addressed
- Environmental sustainability
- Traffic congestion

Expected Outcomes
The main outcomes of the project will be the NOVELOG tools (Understanding Cities, Evaluation, Toolkit, Guidance), which are intended to help cities make decisions regarding urban freight. However, the project also has additional outcomes such as:

- A data collection framework.
- An evaluation framework.
- The development of multi-stakeholder platforms (or freight quality partnerships) in the NOVELOG cities.
- The development of urban freight roadmaps and strategies.

Stakeholder Involvement
The NOVELOG project involves partners from a variety of experts in the field of urban freight transport, ensuring the knowledge of the academic sector, the experience of cities, the expertise of consultants, and the multiplier effect of European networks.

SUCCESS pilot site in Verona, Italy. Source: SUCCESS.

SUSTAINABLE URBAN CONSOLIDATION CENTRES FOR CONSTRUCTION (SUCCESS)

SUCCESS is one of the few research projects addressing freight transportation for the construction sector, with a specific focus on:

Construction Supply Chain: Collecting real data from four pilot construction sites and analyzing them to measure the potential advantages of the adoption of collaborative tools, decision-support systems, and new practices.

Consolidation Centers: Measuring the potential impact of construction consolidation centers (CCCs) and finding a viable business model for their replication in other contexts.

Project Type
Research and Innovative Action

Period of Performance
May 2016–April 2018

Project Site(s)
Luxembourg City; Paris, France; Valencia, Spain; Verona, Italy

Website
http://www.success-urbanlogistics.eu/

Contact
Francesco Ferrero
Lead Partnership Officer - Mobility, Logistics, and Smart Cities
Luxembourg Institute of Science and Technology (LIST)
+352 275 888 2227
francesco.ferrero@list.lu

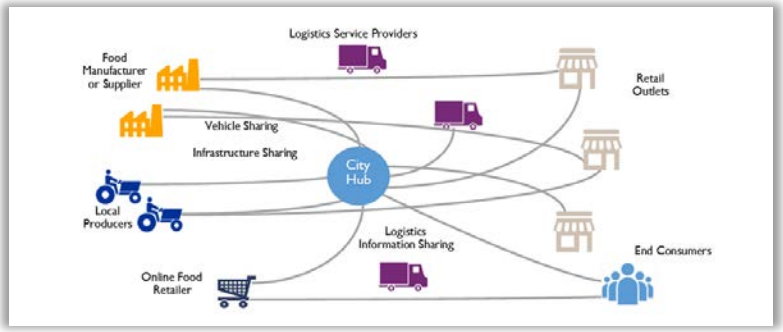
Challenge(s) Addressed
- Congestion
- Air pollution
- Noise
- Accidents

Expected Outcomes

With reference to CCCs, the short-term impacts generated by SUCCESS focuses on the mainstreaming of the CCC business, operational solutions, and related regulatory frameworks into the investment decisions of companies and the policy plans of cities.

The main long-term impacts of SUCCESS will be:
- The reduction of construction traffic and the related reduction of congestion, pollution, noise, etc.
- Just-in-time deliveries and smoother material flows by better synchronizing supply chain activities.
- The reduction of construction waste by integrating reverse logistics processes into the construction supply chain.
- Improvement of the working environment at construction sites by reducing the presence of waste.
- The diffusion of CCC schemes by identifying new business models that deliver added-value services to their users.
- Improved productivity of construction sites.
- A reduction of the conflicts between construction sites and other actors in the urban environment.

Stakeholder Involvement
All of the main stakeholders in the construction sector's supply chain are involved: construction and transportation companies; other subcontractors; public administrations; and research organizations.



This diagram shows the different movements of food shipments that are the subject of the U-TURN project. Shipments originate with local producers, online food retailers, and food manufacturers or suppliers. Some shipments are taken directly to retail outlets or end consumers. Others travel first to a distribution center or "city hub." Source: U-TURN.

U-TURN

The traditional methods of food logistics are being challenged by population growth, urban congestion, and environmental damage, as well as by the increased use of convenience stores and the home delivery of online grocery purchases. The U-TURN project is investigating new models for transporting food in urban areas that can bring about environmental and societal benefits. The goal of the project is to identify opportunities for consolidating freight flows and to define collaboration practices and alternative logistics pooling strategies.

Project Type
Research

Period of Performance
January 2016–May 2018

Project Site(s)
Athens, Greece; Milan, Italy; London, UK

Website
http://www.u-turn-project.eu/

Contact
Dr. Dimitris Zissis
Senior Research Fellow in Supply Chain Modelling
Cranfield School of Management
Dimitris.Zissis@cranfield.ac.uk

Challenges Addressed
- Urban distribution (focusing on food logistics)

Expected Outcomes
U-TURN will analyze existing flows of food shipments in urban areas and will suggest innovative collaboration practices and tools for achieving more efficient operations from both an environmental and a cost perspective. The project will assess the logistics-sharing and collaboration strategies in three ways: 1) through comparative analysis based on actual market data, 2) through simulation experimentation; and 3) via pilot execution in three different countries: UK, Italy, and Greece.

The UK pilot is focused on the home-delivery market for food and grocery products in London. The Italian pilot is assessing the distribution of fresh food from local producers into the city of Milan. The Greek pilot is identifying opportunities to share loads and reduce vehicle trips in Athens.

U-TURN will further contribute to the adoption of logistics-sharing strategies for urban freight transport through managerial assessment, quantifiable benefits, and the provision of tools, including a "smart" transport matching tool, a collaboration platform, a simulation tool, and an economic assessment model.

Stakeholder Involvement
Manufacturers, farmers, and food retailers

The Rio Operations Center. Source: Dr. Hugo Yoshizaki.

INTEGRATED MANAGEMENT AT THE OPERATIONS CENTER IN RIO DE JANEIRO DURING THE 2016 OLYMPIC GAMES

During the 2016 Summer Olympics in Rio de Janeiro, the city created an Integrated Urban Mobility Center (CIMU) as part of its Operations Center. The Operations Center integrates the data and monitoring functions of about 30 municipal and state agencies and corresponding utilities. The creation of the CIMU was the first time that representatives of all transport concessionaires and public agencies that work with urban mobility in Rio de Janeiro were put together. The CIMU had three key tasks:

1. Monitor the flows of tourists and the Olympic athletes and staff.
2. Respond with integrated actions to the operational problems of transport modes and implement appropriate contingency plans.
3. Manage information in real-time and decide whether to inform the operational teams and managers and whether to share information with the public (i.e., citizens and Olympic spectators).

The success of the CIMU may be one of the main legacies from the Olympic Games to the city. This project was partially funded by the Brazilian Ministry of Science and Technology.

Project Type
Research

Period of Performance
2016

Project Site(s)
Rio de Janeiro, Brazil

Website
None

Contact
Hugo Yoshizaki
Associate Professor
University of São Paulo
55 (11) 5525-8745
hugo@usp.br

Challenges Addressed
- Mobility

Expected Outcomes
Influencing the City of Rio de Janeiro to maintain the experience as a legacy.

Stakeholder Involvement
Rio de Janeiro Operations Center, other agencies from city of Rio's Municipality, State of Rio de Janeiro, Rio de Janeiro International Airport, and representatives of bus service providers.

OPERATIONAL AND ENVIRONMENTAL IMPACTS OF OFF-HOURS DELIVERIES IN THE CITY OF SÃO PAULO, BRAZIL

This project will evaluate the economic and environmental (i.e., air emissions) impacts of off-hour deliveries using a continuous approximation model. Parameters come from primary data of GPS traces from two large retail chains (grocery, pharmacy) and a food/beverage manufacturer. Cost data come from actual market values. Using sensitivity analysis, the researchers will explore different distances from distribution centers to delivery regions inside the metropolitan area, delivery densities, and drop sizes. Preliminary results were presented at the Volvo Research and Educational Foundation's 2016 Conference on Urban Freight. This project was partially funded by the Brazilian Ministry of Science and Technology.

Project Type
Research

Period of Performance
2016–2018

Project Site(s)
São Paulo, Brazil

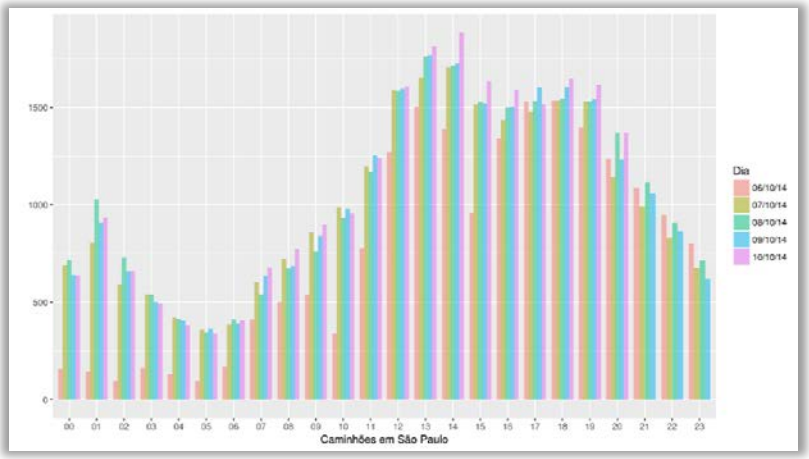
Website
None

Contact
Hugo Yoshizaki
Associate Professor
University of São Paulo
55 (11) 5525-8745
hugo@usp.br

Challenges Addressed
- Off-hours deliveries
- Policy Implementation

Expected Outcomes
Better understanding of the trade-offs between regular and off-hour deliveries for different stakeholders in the same supply chain.

Stakeholder Involvement
Private shippers and carriers.



Number of trucks traveling in São Paulo by hour of the day on five different days (10th day of the month from June–October 2014). Source: Dr. Hugo Yoshizaki.

TRUCK GPS DATA FOR IN-DEPTH CHARACTERIZATION OF URBAN LOGISTICS IN THE CITY OF SÃO PAULO, BRAZIL

This project explores actual truck Global Positioning System (GPS) traces from different shippers and carriers, as well as from an Internet traffic service provider, to better understand truck logistics behavior and traffic around the city. Data collection started during the São Paulo Off-Hour Deliveries pilot in October 2014. Some results were presented at the 2016 World Conference on Transport Research. This research is partially funded by the World Bank and the Brazilian Ministry of Science and Technology.

Project Type
Research

Period of Performance
2015–2018

Project Site(s)
São Paulo Metropolitan Region, Brazil

Website
None

Contact
Hugo Yoshizaki
Associate Professor
University of São Paulo
55 (11) 5525-8745
hugo@usp.br

Challenges Addressed
- Truck traffic
- Speeds
- Stops (parking/unloading)

Expected Outcomes
Characterization of truck behavior in the metropolitan region will help evaluate different policies regarding urban logistics from the standpoint of both the public and private sectors.

Stakeholder Involvement
Private shippers/carriers, Internet traffic service providers

ACKNOWLEDGMENTS

The Federal Highway Administration's (FHWA) Office of Freight Management and Operations (HOFM) would like to thank the various authors who contributed their time and effort to this compendium. This document is the combined work of more than 20 different project team leaders who have volunteered their efforts to make this compendium a reality.

FHWA's Office of International Programs provided important support that made possible FHWA's coordination with the European Commission (EC) on urban freight research and development activities ("twinning" initiative).

U.S. Department of Transportation
Federal Highway Administration
Office of Operations
1200 New Jersey Avenue, SE
Washington, DC 20590

Office of Operations Web Site:
https://ops.fhwa.dot.gov/

European Commission
Directorate General for Mobility and Transport
B - 1049 Brussels

DG for Mobility and Transport Web Site:
https://ec.europa.eu/transport/about-us_en

September 2017
FHWA-HOP-17-029