

Improving Freight Movement in Delaware Central Business Districts



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November 2009



**Institute for Public Administration
College of Education & Public Policy
University of Delaware**

project funded by the
Delaware Department of Transportation

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Preface

As the director of the Institute for Public Administration (IPA) at the University of Delaware, I am pleased to provide this report, *Improving Freight Movement in Delaware Central Business Districts*. This project sheds light on a fairly common transportation problem that is often overlooked in small central business districts (CBDs)—efficient freight movement. While the on-time delivery of goods and services is critical to downtown businesses and restaurants, the transportation system also must safely accommodate needs of motorists, pedestrians, and other stakeholders. Many Delaware CBDs are constrained by historic buildings and infrastructure that cannot be easily retrofitted to accommodate loading/unloading needs of delivery vehicles. The lack of sufficiently designed and regulated commercial vehicle loading zones can cause public safety concerns, traffic congestion, and intermodal conflicts. To better understand and address issues of Delaware municipalities, the IPA research team conducted CBD site visits, photographed freight movement problems, and formed a working group to gain valuable input. A specific area of focus was goods movement and logistical needs of small package delivery businesses such as Federal Express (FedEx) and United Parcel Service (UPS).

I would like to take this opportunity to thank the individuals and entities that cooperated on this project. A total of 35 individuals, representing 20 stakeholder groups, attended the workshops and provided valuable input on ways to improve freight movement in Delaware CBDs. These individuals are recognized in the report Acknowledgements. Special thanks go to Policy Scientist Edward O'Donnell who served as Project Manager and Associate Policy Scientist Marcia Scott, who co-managed the project and wrote the report. Graduate Research Assistant Sebastian Anderka conducted the literature review, field study, and the PowerPoint presentations at both workshop meetings. Additional thanks go to Assistant Policy Scientist Mark Deshon who designed the report cover, provided editorial support, and managed production of the final report.

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The IPA project team gratefully acknowledges the individuals who agreed to serve on the working group and provided valuable insight, expertise, and first-hand knowledge of freight movement issues and needs in Delaware CBDs. It was especially helpful to gain an understanding of commercial vehicle drivers' needs related to last-mile logistics, on-time performance, and loading/unloading activity. While IPA appreciates all the valuable input that was captured in the "Proceedings" of each working group meeting, the project team would like to especially thank the working group members who represented UPS, FedEx, SYSCO, Coca-Cola, and Parcels, Inc.

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1 Executive Summary

Freight movement by trucks within a central business district (CBD) is often problematic for delivery drivers, pedestrians, automobile traffic, and downtown merchants. Freight pickup and delivery by trucks both contribute to and suffer from downtown traffic congestion. While the revitalization and economic sustainability of central business districts is paramount, the need for efficient freight movement, pedestrian access, traffic flow, and overall safety is equally important. This project is a follow-up to IPA's mobility-friendly design work as it relates to freight, as well as a continuing focus on freight issues in the Northeast Corridor. The goal of the project is to study issues and conflicts (automobile traffic, re-delivery, hauling, and loading) caused by freight movement in Delaware downtowns. A specific topic of concern is small-package delivery to CBD establishments by small package delivery businesses such as Federal Express (FedEx) and United Parcel Service (UPS).

A review of relevant literature on this topic reveals that, while timely freight and goods movement is critical to the economic viability and competitiveness of a CBD, there has been limited research on freight movement in small commercial districts. Successful best-practice strategies that may be adapted to small CBDs include regulatory, curb-management, market-priced parking, and enforcement policies that address competing needs, reduce double-parking, support multi-modal mobility, and promote parking turnover. Many cities are using advanced parking/loading zone-system technology to better manage on-street parking, improve loading-zone management and enforcement, and regulate price and time limits to reflect real-time demand for facilities.

A scan of federal, state, and local government freight-movement policies indicates that the regulatory focus has been primarily at the macro, rather than micro, level. Additional guidelines are needed to govern design and demarcation of downtown loading zones and facilities, development and enforcement of downtown loading zone/parking regulations, and development and placement of regulatory signage.

To observe freight-movement issues first hand, field visits were made to ten Delaware municipalities with active CBDs. Many of Delaware's small, historic CBDs are constrained by their physical environment and existing infrastructure that cannot be easily retrofitted for off-street loading bays or on-street loading zones. Issues observed in Delaware CBDs included design problems (lack and condition of loading-zone facilities), lack of or unclear on-street parking regulations, and public safety concerns (e.g., intermodal conflicts and illegal or unauthorized parking).

In order to gain perspectives on issues and possible solutions, IPA formed a working group consisting of representatives of UPS, FedEx, Parcels, Inc., Coca-Cola, SYSCO, Downtown Visions Wilmington, Main Street Wilmington, Wilmington Renaissance Corporation, Dover/Kent County MPO, Downtown Newark Partnership, Main Street Middletown, Downtown Milford, Downtown Dover Partnership, DelDOT, WILMAPCO, City of Newark, City of Wilmington, New Castle County, Town of Middletown, and New Castle County. The working group met on December 12, 2008, and April 16, 2009. At these meetings, freight-movement carriers shared their need to meet time-sensitive and perishable-delivery mandates, maximize safety through front-in and front-out loading-zone deliveries, and cater to businesses that operate on a cash or credit basis. Participants acknowledged delivery-practice differences in horizontal and vertical markets (like Wilmington) and that a diverse group of tactics is essential to improve downtown freight movement in both environments. The working group made several recommendations to improve freight movement within Delaware CBDs. For

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municipalities in Delaware with CBDs, these include the designation of a primary contact person to improve communications among stakeholders and formation of a working group (to include additional emergency-service representatives). Other suggestions included the need for municipalities to consistently enforce existing regulations and consider efficiency improvements, such as metered parking of loading zones and strategically placed package-drop boxes. The working group felt that DelDOT should provide additional guidelines for roadway development or retrofit projects within a downtown commercial district or “Main Street” land-use context.

2 Introduction

2.1 Problem Statement

Good traffic flow, safety, and mobility are paramount for a central business district (CBD) to function and thrive economically. While the most successful downtown commercial districts have a pedestrian—rather than automobile—orientation, multi-modal transportation needs cannot be overlooked. Freight is one of the essential modes of transportation in an urban environment that needs to be incorporated into the land use and transportation-planning process. Efficient freight movement is critically important to the economic viability of small CBDs. Small retail shops, restaurants, and service-oriented businesses that characterize CBD establishments need time-sensitive, just-in-time delivery of inventory and merchandise. Drivers of commercial vehicles face pressures to ensure that their services, goods, and/or perishable products reach their end destinations without costly problems or delays. Finally, public safety professionals need to respond to issues concerning personal safety, potential conflicts with vehicle traffic and pedestrian circulation, and enforcement of traffic/parking regulations.

In the freight movement world, “last-mile logistics” is the critical, final phase of supply-chain management where goods move from a supplier to a customer. The Council of Supply Chain Management Professionals estimates that as much as 28 percent of all transportation costs occur in the last mile (Goodman, 2005). The last mile of the freight delivery process within small, historic CBDs is particularly challenging. In this environment, changing traffic conditions, conflicts with roadway users, and unpredictable pedestrian and bicyclist behaviors present a serious threat to on-time deliveries (Thomas et al., 2007). To achieve efficient freight transportation and goods movement in core downtown areas, last-mile logistics need to be safe and cost-effective, and deliveries need to be expedient and time-sensitive.

The effective performance of the transportation system can impact the productivity and competitiveness of businesses within a CBD, as well as prices passed along to customers for services and goods. Freight movement and the delivery of small packages impact the surface transportation network and can cause a variety of problems in downtown environments. Problems range from traffic congestion, reduced mobility, and double-parking to concerns about pedestrian safety and increased risk of accidents. Traffic delays are costly both to motorists and truckers. A recent mobility report showed that the annual delay per traveler in small and medium-sized urban areas was 17 hours in 2005, causing a waste of 26 gallons of fuel annually per traveler. It was calculated that the additional average annual cost of congestion delays was \$316 per traveler and \$77 per hour of operation for the trucking industry (Chatterjee et al., 2008). Freight-movement problems that are not addressed can negatively impact the bottom line of commercial transporters and the economic viability of a CBD (NCFRP, Duin, 2006, and Walter, 2001).

From a transportation planner’s point of view, the transportation system and infrastructure of a CBD needs to accommodate multi-modal transportation access and mobility. The movement, parking, and loading/unloading of commercial vehicles, delivery trucks, and semi-trailers within high-density, high-activity areas can be a logistical nightmare. Small, historic downtowns are limited in their ability to reconfigure existing infrastructure, enhance transportation networks, or expand off-street and on-street parking areas, simply because there is limited usable space within the built environment. In dense and

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lively downtowns, service and delivery vehicles constantly compete for limited loading zones and docking space.

Commercial drivers and freight haulers are not the only ones facing challenges within CBDs. Research indicates that key users and stakeholders of CBDs face difficulties accessing the downtown commercial area, negotiating traffic congestion and thoroughfares dominated by vehicles, addressing safety concerns, achieving a pedestrian-friendly experience, managing growth, and providing a good transportation system. A primary challenge of CBDs is meeting diverse needs of downtown customers, merchants, and delivery-vehicle drivers. To succeed in a competitive business environment, a CBD needs to balance public demands for convenient parking, pedestrian safety needs, just-in-time inventory needs of retailers and businesses, and logistical requirements of freight-transportation providers. To address these needs, transportation-planning needs to move from a strict focus on infrastructure and policy to a comprehensive approach that comprises land-use planning, smart growth, economic development, public safety, environment, and livability principles.

2.2 Downtowns—The Lifeblood of Delaware’s Small Town Economy

Research indicates that a healthy and vibrant downtown is key to the economic health and quality of life in a small community. Specifically, dynamic downtowns provide jobs, incubate small businesses, reduce sprawl, protect property values, and increase the community’s options for goods and services. Moreover, downtowns serve as the social, cultural, and spiritual center of a community.

Unlike suburban shopping centers or malls, Delaware’s small, historic commercial districts are unique and reflect each community’s cultural heritage. Built on a human scale, historic Delaware downtowns are characterized by an efficient use of land and infrastructure, pedestrian-oriented streets designed in a grid-like pattern, mixed-use development, compact buildings, and proximity to other commercial spaces, business services, and residential areas.

According to July 1, 2009, census data, 52 of Delaware’s 57 municipalities (or 91 percent) have populations of less than 10,000 (U.S. Census Bureau, 2009). Delaware’s most populated cities include Wilmington (72,592), followed by Dover (36,107), Newark (29,882), Middletown (12,152), and Smyrna (8,603) (Population Division, U.S. Census Bureau, 2009). Delaware’s CBDs are, for the most part, characterized by a mix of independent retail shops, local convenience retailers, small franchises, service-oriented businesses, and restaurants. These businesses generally receive small quantities of goods, perishable foods, and packages from small- to medium-sized delivery trucks or parcel carriers such as FedEx and UPS. Like many American Main Street communities, most Delaware small towns have traditional commercial districts, historic structures built on a human scale, pedestrian activity, and mix of businesses.

Because Delaware downtowns have evolved over time and continue to change, there is a pattern of building and structure reuse. Many downtowns have been able to capitalize on their historic assets as part of a revitalization process. Yet, the transformation of a historic commercial district into a modern CBD inherently causes conflicts among pedestrians, motorists, the goods-movement community, and commercial vehicles. This rings true for Delaware downtowns that have undergone revitalization and streetscaping changes, and those that are being continuously regenerated. Delaware’s towns are small, and their historic CBDs are generally constrained by their physical environment and existing

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infrastructure. Many CBDs have limited or lack off-street parking facilities or loading docks. Streets that were designed in a by-gone era are often unable to accommodate current traffic volumes and pedestrian movement. Narrow streets are problematic for large commercial vehicles that need on-street parking for loading/unloading and require a large turning radii. Needs of commercial vehicles compete for space with pedestrians, motorists, and bicyclists that require safe places to park, walk/ride, and/or cross streets. Therefore, the need to achieve a balance of safe and efficient facilities for all modes in CBDs is vital.

Design of adequate on- and off-street loading zones/facilities in CBDs is especially important to last-mile logistics, or the final transportation destination of a downtown product delivery. However, a challenge to effective last-mile logistics in Delaware's small CBDs is competition for movement and parking among cars, large tractor-trailers, small delivery vehicles, and bus transit. To address last-mile logistic needs in Delaware's small, historic commercial districts, delivery-requirement needs should be considered for downtown businesses that are served by commercial- and small-package-delivery vehicles. For example, is the product to be delivered perishable, time-sensitive, or governed by a strict delivery schedule? Does the commercial district lack off-street loading areas and need on-street space for service vehicles and small-package deliveries? Can commercial vehicle- and parcel delivery-loading activity be restricted to minimize peak periods of traffic congestion, pedestrian activity, and shopping? Stakeholders of Delaware CBDs (e.g., planners, local officials, public safety and emergency-service personnel, commercial truck drivers, small-package-delivery services, downtown merchants and businesses, motorists, pedestrians, and customers) need to partner to develop an efficient transportation system that considers infrastructure, policy, and land-use planning needs to support all modes of downtown travel, including freight movement.

2.3 Planning for Livable Streets in CBDs

Cities nationwide are also striving to create CBDs that are vibrant, walkable, feature mixed-use development, offer transit options, and attract customers. The hallmarks of a healthy downtown include high-density development, a pedestrian-friendly environment, and strong sense of place. Urban streets serve multiple functions. In addition to serving as transportation routes, city streets provide connectivity and networks of multi-modal access, act as thoroughfares for moving freight and goods, function as linear parks, create pedestrian corridors, and establish the social fabric of a community. "Beyond simply acting as thoroughfares for motor vehicles, urban streets often double as public spaces. Urban streets are places where people walk, shop, meet, and generally engage in the diverse array of social and recreational activities that, for many, are what makes urban living enjoyable.... Pedestrian friendly urban streets have been increasingly linked to a host of highly desirable social outcomes, including economic growth and innovation, improvements in air quality, and increased physical fitness and health" (Dumbaugh, 2005, p. 283).

In his innovative dissertation, *Safe Streets, Livable Streets: A Positive Approach to Urban Roadside Design*, Eric Dumbaugh observes that most conventional urban roadway design is based on transportation-engineering guidelines that emphasize vehicle mobility and safety rather than the social, environmental, and economic contexts. His research, however, provides compelling evidence that livable streets, which "seek to enhance the pedestrian character of the street by both increasing its aesthetic appeal, as well as minimizing the negative impacts of automobile use on pedestrians," can actually enhance safety in an urban environment (Dumbaugh, 2005, pp. 3-4).

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Thus, the challenge for Delaware CBDs is to integrate a concept of smart transportation into land-use plans to ensure livable, urban streets. Smart transportation seeks to design the “transportation system in a manner that fosters development of sustainable and livable communities,” to engage stakeholders, and to consider financial, social, transportation, land use, and environmental aspects in a transportation solution (NJDOT and PennDOT, 2008). This project has taken a major step in tackling the problem of improving freight movement in CBDS through smart transportation techniques such as defining the transportation problem, understanding the issue and its context based on diverse perspectives, and gathering input on solutions from experts and stakeholders.

3 Literature Review

3.1 Scope and Limitations of Review

To become familiar with current issues, best-practice strategies, and policies and management practices impacting urban freight movement, a literature review was conducted. In conducting the review, the goal was to study the issues and conflicts caused by freight movement in downtown areas (automobile traffic, re-delivery, hauling, and loading). A specific topic of research was how other jurisdictions have dealt with problems of small-package delivery to CBD establishments by couriers such as UPS and FedEx.

While there have been numerous studies of urban freight movement, most are not germane to the research problem posed by this study. Many of the journal articles reviewed focused on freight movement in large urban environments, metropolitan areas, or on a regional basis. Freight-movement literature, for the most part, was categorized in one of two groups—a transportation-engineering perspective or a business-logistics viewpoint. Some bodies of work focus on operating facilities for the movement of goods, with a particular emphasis on intermodal transfers. Other literature provided an analysis of freight movement by modes, commodity flows, origin-destination, volumes, and offered strategies for improvement.

Technical reports such as the *WILMAPCO Regional Freight and Goods Movement Analysis* (Cambridge Systematics, 2007) and the *Delaware Freight and Goods Movement Plan* (Parsons, 2004) conveyed the importance of freight planning in Delaware and the larger region, provided an overview on freight transportation-system issues, and recommended a vision for freight-movement improvements. While these reports were informative, they were not particularly relevant, as they did not focus on freight movement and mobility issues within Delaware's small CBDs. A current study on downtown Wilmington circulation is currently being completed by WILMAPCO. Recommendations of this study will further inform as to how to address freight-movement issues in Delaware's largest city and provide relevant recommendations for achieving sustainable transportation improvements.

The results of a review of best practices proved to be the most informative for this study. While most of the best-practice examples have been implemented in large urban or metropolitan areas, many seem applicable or transferable to a small-CBD setting. Although there was a lack of research on freight movement in small downtowns, a new body of work is emerging that is relevant and demonstrates the need to better integrate land-use and transportation planning. This approach acknowledges that economic, social, land-use, and environmental perspectives should be incorporated into transportation-planning solutions.

Within the literature review, three major groups were identified—shippers, carriers, and service vehicles. Shippers are businesses that initiate delivery or the transport of goods. Some businesses, such as beverage companies or wholesale retailers, have a fleet of their own to deliver goods, but most companies hire carriers for shipping. Carriers are defined as contractors who charge a fee to pick up and deliver goods for the contracting company. Depending on the size of the company, carriers comprise a complex multi-modal network to transport items, and usually operate a fleet of commercial trucks or vans for the final step of delivery. Service vehicles are trucks or vans that are used by plumbers, electricians and others providing similar services. There is a major controversy as to whether or not

these service vehicles should be granted (by local law or ordinance) privileges to use off-street or curbside loading zones, because they tend to monopolize loading zones over a long period of time. (Chatterjee, 2004, Thomas et al., 2007). However, many of these journal articles failed to provide an understanding of the link between transportation and land-use planning and fail to take into account diverse perspectives of CBD stakeholders.

A number of themes emerged from the literature review that focused on 1) infrastructure design, including streetscape standards and loading zones, 2) public policies, including regulations governing curbside management, policies that promote pedestrian safety, and enforcement of regulations, 3) innovative technology, and 4) communication needs among stakeholders.

3.2 Summary of Literature Review Results

3-2-1. INFRASTRUCTURE DESIGN

INFRASTRUCTURE FACILITIES ASSESSMENTS

How can a jurisdiction determine if the existing transportation infrastructure is sufficient to handle the freight-movement, loading-zone, and transportation needs of stakeholders in a CBD? The municipality's comprehensive plan should include a transportation component that provides an inventory of the transportation system, identifies issues that need to be addressed, and makes recommendations for actions to ensure maximum mobility for all modes within the transportation network. Some larger cities, such as Seattle, Wash., designate a network of major truck streets within its comprehensive plan to illustrate primary routes for the movement of goods and services (City of Seattle DOT, n.d.). Good comprehensive plans link land-use-plan recommendations with transportation-planning needs. Transportation-related plan recommendations can help a local government preserve the character of its CBD, manage downtown growth and traffic volumes, promote economic development, ensure connectivity and access, and guide transportation investment and policy decisions that provide for safe, attractive, and efficient transportation options.

Specific transportation planning studies may be undertaken by a jurisdiction to assess how well the transportation network is functioning and develop a master plan for infrastructure improvements. One such study is a downtown-circulation plan, which seeks to make the downtown environment more livable and pedestrian-friendly by providing recommendations for built-environment and policy changes designed to improve multi-modal mobility and safety. The scope of downtown-circulation-plan studies generally includes a traffic volume and flow analysis, assessment of parking supply and demand, and an overview of circulation patterns of passenger vehicles, transit, pedestrians, and bicyclists. While intended to be comprehensive, many circulation plans overlook freight-movement needs and an assessment of how freight movement impacts the functioning of the transportation network both at peak and off-peak times.

Other jurisdictions have conducted downtown parking studies to assess parking needs and develop a transportation-management plan for a commercial district. Components of a parking study include a parking inventory and utilization/demand analysis; field surveys of infrastructure and buildings; survey

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of downtown stakeholders including the business community, carriers/shippers, and patrons; and a review of regulations that govern parking/loading-zone policies, signage, and enforcement. Central business district revitalization plan studies can also address transportation needs in a downtown in relation to economic development. These studies are intended to preserve the character of a downtown by providing design and revitalization guidelines and land-use plan recommendations, which may include strategies for streetscaping, traffic calming, and parking/loading zone facilities.

DOWNTOWN STREET DESIGN GUIDELINES

Off-Street Loading Facilities

Two main types of loading facilities can be identified—off-street loading bays or docks, and on-street loading zones. Limited on-street curbside space, the increased volume of delivery services, and need for public safety make it desirable to promote off-street facilities if possible (Muñuzuri et al., 2005). Most authors agree that the best way to reduce delivery traffic and congestion in downtown areas is to increase the number of off-street loading facilities. But an urban environment proves problematic in that it is already built and most existing buildings can't easily be retrofitted with an off-street loading dock. To remedy this situation as downtowns are redeveloped, researchers suggest amending existing building codes to impose off-street loading requirements in proportion to the floor area of every new or renovated building. To avoid designing and constructing an obsolete loading facility, possible types of future development should be kept in mind. Loading/unloading needs and demand can change over time, caused, for example, by a turnover of businesses occupying a building or space within a CBD (Chatterjee, 2004). For small buildings and companies, a shared loading dock or off-street parking facility may be optimal to create more loading capacity without demanding disproportionate investments (Pivo et al., 2002). It is costly and difficult for older buildings with substandard loading facilities to be upgraded. Incentives such as tax breaks or grants can be used to help a business offset costs of upgrading, retrofitting, or modernizing loading facilities (Morris et al., 2007).

When constructing new off-street loading bays, several minimum characteristics should be considered. First, the height of the dock should correspond to dimensions of the trucks expected to use the facility. If various-sized commercial vehicles serve the building, it may be necessary and beneficial to install a large loading bay for semi-trailers and an additional smaller bay for single-unit trucks (which are mostly used by small-package carriers like UPS and FedEx). There also should be ample space in front and adjacent to the dock to ensure that the trucks can safely maneuver when backing in (US DOT, 1995). Apron areas should be designed in a way that allows trucks to back in clockwise, as this ensures that the back of the truck is always visible to the driver (Walter, 2001). Improved and accurate signage is another way to ensure that truck drivers find their destinations quickly. When loading docks cannot be seen from the street, interactive signs can be installed to indicate the status of dock use. Real-time signage encourages safe movement of trucks and keeps truck drivers from getting stuck in tight, limited-access passageways (Morris et al., 2007, Pivo et al., 2002).

Loading bays in larger cities are often accessed via narrow one-way streets and back alleys. Most truck drivers are reluctant to use these streets, due to fear of being blocked in. Unexpected obstacles, trash containers, or other vehicles violating the one-way driving regulations often cost drivers time in their tight delivery schedules. For this reason, it is very important to strictly enforce one-way lane restrictions and no-parking regulations in back alleys. Optimal downtown design guidelines include construction of 20-foot road widths, pullouts for safe passing at certain intervals, and alcoves in the back walls of

buildings for dumpsters and other utilities. However, even with the best design, enforcement of regulations is needed. The enforcement in these areas has proven to be difficult because police and parking enforcement officers usually don't patrol alleys on a regular basis (Pivo et al., 2002, Thomas et al., 2007).

On-Street Loading Zones

Representatives of freight-carrier companies often complain about too few on-street loading zones. On-street loading zones that allow for front-in and front-out loading behavior are preferred by many commercial carriers due to safety, efficiency, and access considerations. If a commercial carrier can't find a sufficient on-street loading space, it may cause delays, double-parking behavior, and higher costs (if costs of tickets are built into the costs of doing business in a downtown setting). An inefficient system of loading facilities not only causes inconvenience to commercial-vehicle drivers and small-package carriers, but also has a direct economic impact on all businesses in the downtown (Chatterjee, 2004). On-street loading zones are best used in areas with few or no loading bays but high volumes of small-package delivery. Because reduced dwelling time and quick turnover of small-package-delivery vehicles is essential, it is important that on-street loading zones accommodate the needs of these vehicles over trucks delivering wholesale goods (US DOT, 1995).

Loading zones can be improved in a number of ways, but one of the most promising ones is the creation of on-street, curbside cut-outs. They minimize the interference with moving traffic, provide a safe area to load and unload a truck, and also prevent parked vehicles from being blocked by other cars. Cut-outs, however, require retrofitting infrastructure with wider streets and sidewalks, and therefore many not be practically and economically implemented in many downtown commercial districts (Chatterjee, 2004, Chatterjee et al., 2008). Several studies suggest that loading zones are best located at the end of blocks in the direction of travel (Pivo et al, 2002, Seattle DOT, 2008, Thomas et al., 2007). This keeps at least two sides of the truck free of other parked vehicles, and also allows the driver to enter and leave the loading zone in a forward motion. Alternatively, on-street loading zones can be situated at alley entrances, because this allows truck drivers to reach more buildings conveniently from their parking spot, including back doors in alleys. Each loading zone should be at least 30 feet long to safely accommodate parking and maneuvering single truck units (Pivo et al., 2002).

Studies suggest that the average minimum number of loading zones should be at least one usable loading zone per block (Volpe 2004). The U.S. Department of Transportation (US DOT) advises clear marking of all on-street loading zones with distinctive curbside signs and paint on the street—yellow line and 45-degree diagonal “zebra” striping (US DOT, 1995). Because these markings fade over time, they should be repainted at regular intervals (CPTMA, 2008). Finally, it should be noted that truck drivers usually use hand carts and dollies to transport packages from their trucks to the customers. Too high curbsides and obstacles on the sidewalk can hinder their operations and cause further delays, interferences with pedestrians, and increased parking times (US DOT, 1995).

Additional curb space for new loading zones can be freed by converting some of the parallel parking areas into angled parking without losing any parking capacity. Multi-space parking meters can be used to make parallel parking more efficient and flexible in streets too narrow to use angled parking. New, electronic meters are being used by many jurisdictions, which allow the implementation of variable-pricing policies to better manage the existing municipal parking (Chatterjee et al., 2008)

3-2-2. PUBLIC POLICIES

REGULATORY POLICIES

Many cities have ordinances that stipulate requirements and design guidelines for loading facilities to serve new development. Many large cities have adopted ordinances that set forth the number of off-street loading docks, berths, and the size of dock dimensions based on the proposed square footage and type of development (e.g., mixed use, industrial, retail, commercial) in a downtown area (Thomas et al., 2007). Smaller cities also regulate parking/loading requirements with respect to new land-use development, building use, and building size.

Some cities have developed innovative policies/regulatory strategies to provide for the loading/unloading of commercial vehicles within CBDs. The City of Dallas, Tex., requires new development within CBDs to provide off-street loading facilities or a payment in lieu of such a facility. The in-lieu-of payments may be used to finance common off-street facilities (e.g., underground truck terminals) that may be either managed by the municipality or a business-improvement district (BID). It should be noted that this strategy will not work in instances of adaptive re-use as there are space limitations in the redevelopment of historic buildings/properties (BRW, 2000).

CURB-MANAGEMENT POLICIES

On-Street Parking Management

Some municipalities have adopted on-street parking regulations to provide flexibility in the use of metered on-street parking spaces, while preventing the loss of parking revenue from metered spaces. The City of Madison, Wis., issues hangtag parking permits to contractors and repair persons who need to park in metered spaces to conduct work. Hangtags can be purchased in advance, used in any metered space, and enable the space to revert back to a metered space when the work is completed. Full-day hangtags permits cost \$15 and half-day permits are \$8 (City of Madison, n.d.).

Designated On-Street Loading Zones

On-street loading zones in downtown commercial districts can meet the needs of delivery vehicles, commercial trucks, and courier vans, provided that they are clearly marked, enforced, and maintained. The City of Madison, Wis., designates both 30-minute limited “freight loading zones” and “truck loading zones.” According to the city’s policy, freight-loading zones may be “used by anyone while actively engaged in loading or unloading,” while the truck-loading zone is reserved only for “vehicles with truck plates that are actively engaged in loading and unloading” (City of Madison, n.d.).

The City of Greensboro, N.C., has recognized the need to accommodate vehicles that make deliveries within the downtown commercial district. In 2008, the city proposed the adoption of a policy that reconfigured downtown parking spaces to maximize customer parking while designating two types of loading zones. A “truck only” loading zone was established to accommodate trucks that are 15,000 pounds or heavier and that have a commercial license. Truck-only loading zones would provide a 60-minute time limit and a length of 70 to 80 feet to allow the truck to pull in and out without backing up. A “delivery or drop off/pick up zone” was established to accommodate any vehicle that is loading or unloading in the commercial district. This zone would provide one or two 30-foot spaces on each block with a maximum 30-minute time limit (Greensboro Department of Transportation, 2008).

Curb-Marking of Loading Zones

The California Vehicle Code provides municipalities the authority to restrict on-street parking with the uniform marking of curbs. Parking restrictions are designated by the painting of a curb. A red curb means no stopping, standing, or parking at any time (except for buses). A yellow curb indicates stopping only for the purpose of loading or unloading passengers or freight for a time period that is specified by local ordinance. A green curb indicates time-limited parking as specified by local ordinance. A blue curb restricts parking to vehicles of persons or veterans with disabilities. A white curb allows for the loading or unloading of passengers or depositing of mail in an adjacent mailbox for a time period specified by local ordinance (California Vehicle Code, n.d.)

Curb-Marking and Loading-Zone Management

The City of Seattle, Wash., adopts on-street parking policies that reflect priorities established in the municipality's comprehensive plan and "regulates the use of curb space to address competing needs, to assist in moving people and goods more efficiently, to support the vitality of business districts, and to create livable neighborhoods." The City establishes curb-use priorities both in residential and commercial districts. In the city's business or commercial areas, including blocks with mixed-use buildings containing residential units, the priorities for curb space use are as follows (City of Seattle Department of Transportation, n.d.):

1. Transit use
2. Passenger- and commercial-vehicle loading zones
3. Short-term customer parking
4. Parking for shared vehicles
5. Vehicular capacity

In Seattle, loading zones are marked by four types of signs and corresponding curb colors. "Generic" loading zones are marked by a yellow curb, provide a 30-minute unmetered time limit, and allow for several loading/unloading activities including passenger, private vehicle, and commercial-delivery vehicle loading and unloading. "Truck Only" loading zones are also marked by a yellow curb, provide a 30-minute unmetered time limit, and are designated for vehicles licensed as trucks that are loading or unloading products, merchandise, or other objects. "Commercial Vehicle" loading zones are marked by a yellow curb, provide a 30-minute metered time limit, and are reserved for commercial service-delivery vehicles to conduct loading and unloading activities (such as trucks that deliver or pick up beverages, food supplies, large merchandise). "Passenger" loading zones are metered spaces marked by a white curb and provide for quick passenger drop-offs and pickups. Commercial vehicles are defined by Seattle law, must possess a commercial-vehicle loading-zone (CVLZ) permit, possess and carry a City of Seattle business license, and pay an annual commercial-loading-zone permit fee (City of Seattle DOT, n.d.).

The City of Houston, Tex., also classifies and issues four types of CVLZ permits at various costs. The most expensive, "Class A Permit," provides for a maximum of two hours of parking in a commercial-vehicle loading zone, or one to two metered parking spaces without payment of the usual meter fee as required (City of Houston, n.d.).

Commercial Curbside, Metered Loading Zones

The Washington, D.C., government implemented metered loading zones in 2007 as part of the Downtown Congestion Task Force's recommendation to reduce congestion, reduce double-parking, and

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create turnover of parking spaces in the District's downtown core. Drivers of commercial vehicles within specific, congested urban corridors are now required to deposit \$1 per hour, for a maximum of two hours, into existing parking meters. The solar-powered, smart meters accept credit cards, debit cards, and coin payments (Council of the District of Columbia, n.d.).

Following the adoption of the metered-loading-zone regulation, the Washington, D.C., government has proposed legislation to amend the current law. The proposed new legislation would enact rules to establish a pilot program for enhanced management and enforcement of commercial loading zones, which establish meter pricing, meter restrictions, enforcement, and fines. The proposed April 2009 legislation seeks to establish a 30-day pilot period within which commercial, curbside loading zones would be established and include (Council of the District of Columbia, n.d.):

- Loading-zone meter fees
- Minimum curbside-loading-zone requirements and duration
- Enforcement by District Department of Transportation (DDOT) traffic control officers
- Electronic payment cards for commercial-vehicle drivers
- Parking fines for curbside-loading-zone violations
- Variable parking meter rates and restrictions for commercial loading zones that vary by location, time of day, and day of the week

Other cities that have adopted loading-zone meters include Seattle, San Francisco, and New York City. In New York City, a graduated loading-zone pricing scheme has been imposed to encourage turnover of commercial vehicles. Commercial vehicles pay for use of "No Standing Loading and Unloading" parking spaces in certain areas in Manhattan during weekdays, between 7 a.m. and 6 p.m. The graduated, metered loading zones, which are controlled by "muni-meters," cost \$2 for the first hour and higher fees (\$5 for two hours, \$9 for three hours) for the privilege of an extended-length loading or unloading activity (New York City DOT, n.d.).

In addition, other municipalities recognize that on-street parking is a scarce resource and allow commercial/service vehicles to purchase a "meter bag" to allow use of a metered parking space. The City of Spokane, Wash., allows commercial/service vehicles, news-media vehicles, and vehicles of charitable/nonprofit organizations to purchase annual, monthly, or daily meter bags at various rates. These meter bags create temporary, short-term loading/unloading zones with a maximum time limit of 30 minutes (Downtown Spokane, 2002). The City of Houston, Tex., allows commercial vehicles to purchase a Class A CVLZ permit that provides the option of parking in one to two metered spaces at no additional cost (City of Houston, n.d.)

Off-Hour Delivery Policies

To reduce peak-hour congestion in downtown commercial districts, many jurisdictions restrict the time of deliveries to off-peak hours. The Fargo, N.D., Municipal Code designates 15-minute zones to facilitate quick loading and unloading of merchandise. The code prohibits loading/unloading between peak hours (7 a.m.-9 a.m. and 4 p.m.-6 p.m.). Any vehicles staying downtown more than 90 minutes are encouraged to use off-street parking facilities (City of Fargo, n.d.). In collaboration with partnering organizations, New York City DOT is currently researching policies that will encourage delivery drivers to shift activity to off-peak hours (7 p.m.-6 a.m.) (New York City DOT, n.d.).

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MARKET-PRICED PARKING POLICIES

In *The High Cost of Free Parking*, author Donald Shoup contends that municipal parking policies have contributed substantially to traffic congestion, transportation inefficiencies, and air-quality problems. In cities where there is an excess of or under-priced public parking, motorists tend to cruise until a parking spot becomes available. According to his research and analysis, about 30 percent of traffic congestion in cities is attributed to cruising for parking behavior. While Shoup is a professor of urban planning at UCLA, he advocates changes in parking policies rather than urban design to reduce traffic congestion and related problems. According to Shoup, market-priced parking should be implemented to create a balance between parking supply and demand and minimize congestion. In addition to market-based parking policies, Shoup also urges municipal officials to eliminate zoning requirements for off-street parking, abolish free parking, and establish variable-parking rates that reflect parking demand and maintain a 15 percent vacancy rate (Shoup, 2005).

Parking-Increment Financing

Shoup also encourages cities that adopt market-priced parking to consider parking-increment financing. He suggests depositing the existing level of parking meter revenue into a city's general fund, while using the excess revenue or increment above the existing level to fund improvements in the select commercial districts. Shoup explains that the parking-increment financing concept could be used to establish "parking-benefit districts," similar to business improvement districts. Increased parking revenue within parking-benefit districts could support added public services, parking enforcement, and parking improvements and amenities in a commercial area. Shoup contends, "the added public services paid for by increased parking revenue will promote business activity, and the increased demand for parking will further increase meter revenue" (Shoup, 2007).

Variable-Parking Pricing

Consistent with Shoup's market-priced parking philosophy, many municipalities are using public policy to regulate parking based on market forces and change parking behavior in congested, downtown areas. Variable-parking pricing is one such policy being adopted by cities to manage parking demand. An effective variable-parking-rate structure will adjust based on the time of day, day of week, duration of stay, and other conditions governing parking demand. During peak hours, parking rates would automatically increase to encourage parking turnover and maximize parking revenue. In 2008 the City of San Francisco adopted a pilot "SFPark" program that provides for variable-parking pricing, upgrades parking-meter technology to facilitate demand-responsive pricing, and improves parking practices to reduce congestion and promote a more pedestrian- and transit-oriented environment. San Francisco officials noted that variable-parking-pricing strategies are most effective in cities interested in capping the total parking available downtown, achieving a more equitable distribution of parking and traffic, and promoting multi-modal transportation options (Spinak et al., 2008).

ENFORCEMENT POLICIES

The goal of downtown parking-enforcement policies is to balance the competing needs for limited parking space, promote parking turnover, ensure the efficient and safe movement of traffic, and support the economic viability of a downtown. Parking-enforcement policies and on-site signage is needed to clearly communicate who may lawfully use loading zones, time limits of parking, and locations/demarcation of loading-zone spaces. Enforcement policies should be directed at vehicles that

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are illegally parking in loading-zone spaces and facilities and illegal parking practices of commercial vehicles.

Clear time limits for each loading zone should be defined to ensure turnover of commercial vehicles. Most communities in Delaware already apply a default time limit of 30 minutes in their codes. IPA's working group results show that public officials, as well as the freight carriers, agree that this is enough time to deliver small packages in all areas of the state. Another suggestion is to centralize package delivery and pickup. Shorter walking distances for the drivers result in shorter truck dwelling times and, therefore, more loading-facility turnover. Two possibilities for achieving this would be to place parcel drop-boxes throughout the city or to reinstate central mail rooms in mostly high-rise areas (Seattle DOT 2008). It is noted that most authors recommend restricting service vehicles from using designated loading zones, because their extended parking time hinders the needed turnover in dense urban areas with high demand (Chatterjee, 2004). Commercial license plates alone are not enough to identify delivery trucks, which are eligible to use designated loading zones. Ideally, commercial vehicles should also be defined by the maximum number of axles and tires as well as its delivery purpose. For example, commercial vehicles may be defined as "single truck units" with two axles and up to six tires, which carry goods for delivery and pick up (US DOT, 1995).

One study makes an interesting, but unusual, suggestion with regard to double-parking violations. Instead of eliminating it together, the study advocates permitting double-parking for up to 15 minutes as long as there are two or more lanes in each direction (to keep traffic moving) and no existing off-street alternatives (Muñuzuri et al., 2005). The suggested solution is not intended to ban double-parking but provide a reasonable solution to a common, yet often unavoidable situation. The City of Fargo, N.D., has successfully been applying this policy for a number of years, with an additional restriction that prohibits double-parking between 4:00 and 6:00 p.m. It should also be noted that Fargo doesn't designate any loading zones at all, because they were converted into general 15-minute parking spots years ago (Chatterjee et al., 2008).

Central Philadelphia's Transport Management Association (CPTMA) has developed another interesting concept. Tickets for illegal double-parking of up to \$25,000 a month have become usual for some freight operators in the city, and they are often accepted as typical business costs and passed on to customers. In 2007 alone, DHL, FedEx, and UPS together paid \$387,000 in illegal-parking fines (CPTMA, 2008). Thus, CPTMA has advocated leasing loading-zone spaces to carriers, which would be an overall lower cost than fines paid annually. This would create a win-win situation for the carriers and the city. The additional revenue, generated through the adoption of this policy, will be earmarked to hire additional enforcement officers who ensure that the leased loading zones are not blocked by ineligible users (CPTMA 2008, Thomas et al., 2007).

Off-peak-hour delivery is often advocated to take advantage of low-traffic volume late at night or during early morning hours (Muñuzuri et al., 2005). However, accepting off-hour deliveries is problematic to small business because it creates additional staffing and security costs. In small CBDs, businesses that operate on a cash basis are not able to accept deliveries when a business is neither open and nor staffed during the off hours. Residents also object to off-hour noise pollution caused by freight operations, which makes it a politically challenging policy option. Seattle and New York City incentivize off-peak deliveries by charging cargo-movement fees during peak hours. This can have a strong impact, but the

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logistics of implementing and enforcing such a policy may limit feasibility for larger cities (Seattle DOT, 2008).

As much as loading bays and docks are favored by transportation engineers, a consistent problem is that they often become partly or completely blocked by automobiles, commercial refuse containers, and other obstacles (Chatterjee, 2004). As previously stated, enforcement of loading-zone regulations on back streets and alleys is difficult. Part of this responsibility may rest with building managers, who have an interest in ensuring efficient freight operations (Thomas et al., 2007). Some municipalities adopt codes that require owners of private parking areas to be responsible for the towing of vehicles that violate posted parking and/or loading-zone regulations.

Even if costly, rigorous enforcement of local loading zones is important. Design and policy improvements only work if they are routinely monitored and strictly regulated (Volpe 2004, Chatterjee et al., 2008). If fines aren't enough to encourage lawful behavior, adoption of more stringent penalties may be necessary, which may include higher fees for repeat violators, a combination of towing and fees, and/or impounding of illegally-parked vehicles (Pivo et al., 2002).

Advanced technical solutions may also be used to support enforcement. Occupancy sensors and radio-frequency-identification (RFID) tags may be used to verify eligible users, record occupancy times, and identify unauthorized users (e.g., by displaying a red light when a vehicle is illegally parked in the loading zone) (Sonnabend, 2008).

3-2-3. INNOVATIVE TECHNOLOGY

PARKING-METER TECHNOLOGY

In addition to variable-parking pricing, technology is being used to better manage on-street parking and customer demand. Many cities are installing multi-space parking stations, which provide a single pay station for multiple parking spaces. Benefits of multi-space parking stations include more efficient parking enforcement and enhanced parking-meter revenue over coin-operated meters. As part of its multi-phased streetscape project, the City of Rehoboth Beach, Del., made substantial surface transportation improvements that helped to improve safety for delivery vehicles, motorists, pedestrians, and bicyclists. Streetscape improvements included the installation of multi-space parking meters, safer parking patterns, better signage, well-marked intersection crossings, and wider sidewalks.

SMART- PARKING SYSTEMS

Smart-parking technology is being implemented in municipal commercial districts to provide more efficient on-street parking systems, improve parking management and enforcement, and promote parking turnover. There are several advantages to new smart-parking systems. Many smart meters are solar powered, utilize modem communication technology, and provide better revenue recovery than traditional coin-operated meters. Smart-parking technology provides expanded payment options for customers that include cash, debit, or credit card payments. Some cashless parking systems use smart cards for validation systems and charge customers only for time being used at a parking space. Smart-parking technology, combined with a strategic parking-rate structure (like variable-parking pricing), can help a municipality more effectively manage on-street parking and turnover of parking

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spaces. Smart meters can be electronically programmed to regulate the price and time limits to reflect real-time demand for parking. Advanced technology systems, such as electronic parking meters with curb-pavement sensors enable customers to find, reserve, and pay for parking spaces via Internet-enabled devices and cell phones. Technology-driven parking enforcement enables remote monitoring, electronic surveillance, and enforcement of parking-space regulations, when linked by wireless networks (*USA Today*, 2009).

To focus on downtown customer needs and eliminate the need to cruise for parking, cities like Portland, Ore., Boulder, Colo., Seattle, Wash., and Manchester, N.H., have opted to replace electronic parking meters with solar-powered, wireless pay-and-display stations. Some smart parking systems provide real-time information about the availability of parking spaces. The Baltimore/Washington International Airport was the first airport in the nation to install a smart-parking system to manage parking lot inventory, convey availability of parking spaces to customers, and create a customer-friendly parking experience. Dynamic signage directs customers to parking lots with available spaces (Charette, 2007). Other airports, such as Jacksonville Fla. International, Boston's Logan International, and Dallas-Fort Worth, have also installed smart-parking systems.

In Portland, Ore., a smart-parking system conveys up-to-the-minute parking-inventory information for various municipal lots via the DowntownPortland.org website. Portland's Smart Park system provides real-time downtown parking space availability, map of locations, and information about city-owned public downtown parking garages (City of Portland, 2009).

3-2-4. COMMUNICATION IMPROVEMENTS

WORKING GROUPS

Better communication among all CBD stakeholders is a simple but effective way to improve the overall freight- and goods-movement process. As in the case with this study, the establishment of a working group, with a diverse group of stakeholders, was critical to understanding the scope of freight movement issues in CBDs, the needs of commercial delivery vehicles and their customers, and the potential impact of solutions on those directly affected. The interest and cooperation of all affected stakeholders is crucial for the success of freight planning, although it may be difficult to enlist involvement and build consensus. In particular, truck drivers can contribute valuable knowledge about the current state of freight movement in an area and also help find effective solutions for existing problems (Pivo et al. 2002, Sonnabend, 2008).

However, one problem noted is a high dropout rate of private-sector representatives. In some cases, private-sector stakeholders were disappointed by the lack of fast action, quick progress, and disillusioned by the time-consuming public planning process. It may be best to gain trust by addressing a number of smaller problems before starting to work on bigger projects (Chatterjee, 2004).

SINGLE POINT OF CONTACT

The literature, as well as IPA's own working group meetings, showed that in most cases there is simply no line of communication between commercial carriers and local governments. Establishing a single point of contact at the local government level for freight issues, questions, and suggestions is feasible to begin two-way communication. A single contact person is essential to clarify regulatory and

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enforcement policies, road closures or detours, and issuance of applicable permits. Over time, it would be beneficial to further institutionalize this exchange of ideas and views in order to tackle problems before they actually begin to cause serious congestion or safety risks. All findings from these discussions as well as from research on a particular issue should be compiled into a single source of information, then made accessible electronically on a website (Volpe 2004, Thomas et al., 2007).

SIGNAGE

Signage is the first line of communication about policies governing loading zones, parking, on-street curb management, and the downtown circulation system. Uniform, visible, and clearly understood signage is critical in managing the regulation of loading zones and parking spaces. California municipalities are mandated by state law to color-code curbs based on parking restriction and also posted signage. Signs should meet MUTCD highway specifications and clearly convey municipal statutes on parking/loading zone use, time-limit restrictions, effective days and hours, and consequences of violations. Good signage provides symbols and words to clarify parking/loading zone regulations.

PUBLIC INFORMATION TOOLS

Many local governments have developed parking-information websites to provide public information related to downtown-parking management, public policies that govern use of parking and loading-zone facilities, and general transportation updates. Notable municipal websites include that of the City of Atlanta, Ga., the City of Grand Rapids, Mich., and the City of Seattle, Wash. Atlanta's parking-information website was developed from data collected in a parking inventory and is geared toward downtown residents, employees, and visitors. The website consists of an interactive parking map of downtown parking facilities, regulatory information, and parking news. General transportation updates, transit options, and street-closure information are provided (City of Atlanta, n.d.).

The City of Grand Rapids, Mich., has a comprehensive parking-services website with information that is germane to downtown residents, employees, visitors, and commercial-vehicle drivers. For those who work, live, or visit downtown, the municipal website provides information on the downtown-area shuttle (DASH) service, a parking-facilities map, parking rates, and security services offered after normal transit operating hours. For commercial-vehicle operators, the website provides information and a map of downtown loading-zone locations. The map includes a summary of the loading zone ordinance, pinpoints specific loading-zone locations, and provides a corresponding list of the length of each loading-zone location (City of Grand Rapids, n.d.). When physical inventories are conducted of parking and loading zones, they should be ideally conducted with handheld GPS devices to easily allow the transfer of locations and dimensions into a GIS and possible future online map (Chatterjee et al., 2008).

The Seattle, Wash., Department of Transportation website provides a wealth of public information on transportation planning, freight mobility, and surface transportation programs and policies. Two notable features of the website is a map of major truck streets that serve as primary routes for the movement of goods and services as well as a listserve communications tool. Seattle DOT's Communications Office enables subscribers, presumably truck drivers, to sign up for e-mail alerts about changing conditions within the major truck street network. Listserv subscribers receive electronic notices of traffic issues,

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lane closures, and detours on those routes designated as Major Truck Streets in the Seattle Transportation Strategic Plan (City of Seattle, n.d.).

4 Policies and Practices Governing Freight Movement in CBDs

Public policies have generally been adopted to address problems as they arise. With regard to urban freight movement, several key factors can be cited for the implementation of policy measures, including traffic congestion, environmental issues, noise pollution, safety concerns, political considerations, lack of loading facilities, and the need to restore a balance among transportation modes (Lewis, 1997).

Policy measures related to urban freight movement may be classified by land use (e.g., zoning code ordinances or amendments), logistics operations (e.g., peak-hour deliveries, commercial-vehicle fees), roadway networks (e.g., truck routes), loading/unloading (e.g., facilities, curb-management policies, market-priced parking policies), and vehicles (parking regulations and enforcement policies). The policy framework runs the gamut from the national, regional, state, and local government levels. At each level, principles governing smart transportation should be considered “to manage capacity by better integrating land use and transportation planning” (NJDOT and PennDOT, 2008, p. 1). The concept of smart transportation encourages the development of transportation-planning and design solutions with respect to the financial, community, land-use, transportation, and environmental contexts of a planned project.

The point is that there is not one cookie-cutter approach to transportation planning. Policy and practices should promote the integration of land use with transportation planning, be consistent with state strategies and local comprehensive plans, and focus on mobility needs within the broader transportation network. To understand the context of policies and practices governing freight movement in Delaware CBDs, national, regional, and local design policies, guiding principles, and ordinances were reviewed and summarized in this section.

4.1 National Highway Design Policies & Standards

Policies and standards on the federal level mostly focus on the construction of highways and ways to increase the safety of roadside objects along highways. Most interestingly, even the *Manual on Uniform Traffic Control Devices* does not provide guidelines for demarcation of on-street loading zones.

4-1-1. AASHTO DESIGN POLICIES

The American Association of State Highway and Transportation Officials’ (AASHTO) Roadside Design Guide only addresses construction standards for highways in rural and urban areas, including barriers, signage, and curbsides. It does not speak to on-street or off-street loading facilities at any point.

- **Roadside Safety in Urban or Restricted Environments (Ch. 10)** – This chapter discusses design and construction standards for highways in suburban and urban settings, including ways to screen and protect pedestrians and bicyclists. As stopping or parking on highways for delivery purposes is not allowed, there are no loading-zone design standards or other regulations mentioned in the document.

In general, the Roadside Design Guide only covers highway roadsides in rural and urban contexts, focusing on barriers, curbs, signage, etc. It does not discuss parking or loading zones (AASHTO, 1989).

4-1-2. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

The Federal Highway Administration has issued a Manual on Uniform Traffic Control Devices (MUTCD) to define the standards used by transportation officials nationwide to install and maintain traffic-control devices on streets and highways. In terms of parking signage, MUTCD provides guidance for state departments of transportation (DOTs) as it relates to parking signage for state highways. Because many local governments or their parking authorities do not have transportation engineers on staff to interpret MUTCD guidelines, many of its fundamental concepts and principles may not be understood or applied at the local government level. Moreover, changes in parking technology (e.g., parking wayfinding signage, “pay and display” on-street-parking systems, and electronic signage displays of parking availability) have created new needs for parking signage that is consistent and uniform among communities.

- **Parking Space Markings (Section 3B.18)** – This is the only MUTCD chapter that indirectly mentions on-street markings for loading zones. It states that “marking of parking space boundaries encourages more orderly and efficient use of parking spaces” and will “prevent encroachment into loading zones.”
- MUTCD only describes how loading-zone *signs* should be designed, but not how loading-zone signage should be designed, marked, or standardized (U.S. DOT, 2003).

4.2 State of Delaware Design Policies

The state of Delaware recognizes the need to develop transportation facilities that fit the physical setting, maintains safety and mobility, and preserves a community’s scenic, aesthetic, historic, and environmental resources. The state has adopted guidelines and policies to promote street design and facilities that provide a safe integration of built infrastructure to accommodate both motorists and pedestrians. Delaware policy provides minimum standards for pedestrian facilities such as sidewalks, pathways, and crosswalks. In addition, the state’s context-sensitive design policy incorporates walkable design solutions into transportation improvement projects. State guidelines provide opportunities to create adapted solutions for environments with special loading needs or limited amounts of space. However, loading-zone design standards or minimum requirements are not provided within these policy guidelines, which would be helpful to local governments. A similar set of requirements for loading zones could probably be fitted into the existing regulatory framework (e.g., curb bulb-outs) without significant problems.

4-2-1. DELAWARE DEPARTMENT OF TRANSPORTATION (DELDOT) ROAD DESIGN MANUAL

- **Introduction (Road Design Manual Ch. 1, p. 1-2)** – There is a difference between the strict application of design standards found in the tables and charts versus providing consistency in design. The design should ensure a consistent application of the standards that allows the driver to react in a consistent and predictable manner when encountering similar roadway conditions.
- **Context-Sensitive Placement (Road Design Manual Ch. 2, p. 2-2)** – Design features should be selected that are in balance with the social context of the community and surrounding area. This is accomplished by gathering and including information from the public throughout the design process. A context-sensitive design advances the objectives of safety, mobility, enhancement of the natural environment, and preservation of community values. Projects that improve the

livability of the community or quality of the natural environment are considered context-sensitive.

- **Four General Classes of Traffic (Road Design Manual Ch. 2, p. 2-6)** – Where turning movements are involved, the geometric-design requirements are affected significantly by the types of vehicles using the facility. Four general classes of vehicles are identified: 1) passenger cars, 2) buses, 3) trucks, and 4) recreational vehicles. The truck class includes single-unit trucks, truck tractor/semi-trailer combinations, and trucks or truck tractors with semi-trailers in combination with full trailers.
- **Importance of Pedestrians (Road Design Manual Ch. 2, p. 2-11)** – Pedestrians are an important part of the roadway environment. Pedestrian needs are more prevalent and influential on design in urban areas, but their needs in rural areas should also be recognized. Pedestrian facilities include sidewalks, traffic-control features, refuge islands, curb cuts (depressed curbs and ramped sidewalks), and ramps for older walkers and persons with mobility impairments. Pedestrian facilities are also an important supporting component for transit operations.
- **Unpredictable Pedestrian Behavior (Road Design Manual Ch. 2, p. 2-11)** – Pedestrian actions are less predictable than those of the motorist. This makes it difficult to design a facility for safe and orderly movement of pedestrians. Pedestrians tend to walk in a path that represents the shortest distance between two points.

Later chapters in the manual discuss loading zones in the context of passenger loading (Ch. 10.11.5 - Chapter 10.11.9), such as for bus stops and park-and-ride or “kiss-and-ride” facilities. A discussion on the design of on-street loading zones for freight or package delivery would provide needed guidance to transportation and land-use planners focusing on the design of a CBD (Osiecki et al., 2004).

4-2-2. DELDOT TRAFFIC CALMING MANUAL

DelDOT developed and adopted the Traffic Calming Manual as a complement to the Road Design Manual. The intent of the Traffic Calming Manual is to offer administrative procedures to evaluate and implement traffic-calming measures, provide traffic-calming application guidelines, and present guidelines for geometric design and signage of traffic-calming measures. Options are offered for the development of subdivision streets and roads, which are classified no higher than arterial. This document doesn’t discuss loading activities, freight-delivery trucks, their needs, or potential problems (DelDOT, 2000).

4-2-3. DELAWARE FREIGHT AND GOODS MOVEMENT PLAN

This document sets forth a plan of action for DelDOT to implement the *Statewide Long-Range Transportation Plan*, which guides planning activities, investment decisions, and improvement priorities through 2020. It emphasizes the importance of efficient and effective freight transportation, trends impacting the future of freight movement in the region, and the need to implement priority improvement projects that are consistent with freight-plan strategies.

The section on motor-carrier freight improvements makes several points relevant to this study. First, the plan stresses the need for mutual cooperation among freight-industry stakeholders. “Partnerships must be forged with private-sector freight carriers, shippers, and industry, as well as local governments, in working toward the goal of improving the freight transportation system, which includes infrastructure, services and business practices. DelDOT policies and investments can help to leverage private

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investments and working relationships, thereby magnifying the positive contributions of state action” (Parsons, 2004, p. ES-5).

Second, the document acknowledges that truck and freight concerns are intertwined with road-building and -maintenance activities. To classify and define an expanded system of roadway improvements in Delaware, an inventory of the existing highway system/major truck corridors needs to be conducted, and physical factors and conditions that affect safe commercial-vehicle operations need to be identified. Third, the use of enhanced intelligent traffic-management systems (ITMS) is suggested to provide real-time data on traffic and roadway conditions to truckers and enable truckers to communicate via the use of in-vehicle information systems (IVIS) (Parsons, 2004).

Finally, it is emphasized that land-use planning decisions can affect the efficient distribution of goods and services. The state needs to direct strategic investments and policies to minimize sprawl, promote compact-development patterns, and direct growth to existing major corridors and urban centers. “DelDOT is in the key position of providing an essential statewide or ‘macro’ perspective to transportation and land use decisions to help ensure that system integrity and effectiveness are not unduly compromised by micro-level, local development proposals and decisions” (Parsons, 2004, pp. 2-18).

4-2-4. DELAWARE STATEWIDE PEDESTRIAN ACTION PLAN

This document sets forth the state of Delaware’s vision to promote safe and convenient pedestrian travel throughout the state. The action plan will lead to technical analysis of public policies and regulations to support changes and follow with implementation strategies. The document focuses on pedestrian activity from health, transportation-justice, and sustainability points of view. Context-sensitive design is discussed at length. The document notes that “urban circulation networks should accommodate pedestrians, bicycles, transit, freight and motor vehicles, with the allocation of right-of-way on individual streets determined through the context-sensitive solutions process” (Johnson, Mirmiran, and Thompson, 2007, p. 31) However, possible interactions and problems with sharing the sidewalk with other users, such as freight-delivery drivers, are not discussed.

4-2-5. DELAWARE CODE

With respect to freight movement, the Delaware Code focuses on the size, weight, and loads of trucks. Some provisions address the question of non-loading vehicles in designated loading zones.

- **Additional parking regulations; penalty** (Motor Vehicles, Sec. 4180 E) – “No person shall park a vehicle in any area owned by, leased by or under the control of a retail store and immediately adjacent to such retail store, when such area has been designated by the management of the retail store as a loading zone and is conspicuously marked as such.”
- **Size and weight of vehicles** (Motor Vehicles, Sec. 4502, B & C) – The provision specifies that vehicle width, height, and length shall not exceed 8 ft. 6 in., 13 ft. 6 in., and 40 ft., respectively. A combination of vehicles cannot be longer than 60 ft. Moreover, “[a] vehicle equipped with 2 axles, having each of the 2 axles equipped with 2 hubs, with a power brake on each hub, shall not exceed a total gross weight of 40,000 pounds” (Delaware Code).

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The Delaware Code also requires the construction of sidewalks during a roadway-improvement project, if appropriate. However, the regulations focus on the installation of sidewalks in conjunction with a DelDOT transportation project. Sidewalk installation within Delaware CBDs, for the most part, is regulated at the local government level.

- **General powers and duties** (HIGHWAYS, Sec. 132 F) – “Whenever the Department of Transportation widens, constructs or reconstructs any major arterial, minor arterial, collector road or proposed road in an urbanized area of this State, the Department shall incorporate within such plans, layout, widening, construction or reconstruction the construction of sidewalks, provided there is a need for sidewalks or that it can be reasonably anticipated that the need for sidewalks will exist. The Department shall have the responsibility for determining whether such need for sidewalks does or will exist for all or any part of any such project and, before arriving at a decision as to the need of such sidewalk construction, shall consult with the county department of planning, the State Planning Office, the Department of Education and the local school district in which the proposed new road construction or road widening construction is to take place” (Delaware Code).

4.3 Regional Metropolitan Planning Organizations (MPOs)

4-3-1. WILMINGTON AREA PLANNING COUNCIL (WILMAPCO)

WILMAPCO has been active in freight planning, and has exhibited a strong commitment to furthering freight-planning activities in the region. It recently released a Freight Analysis Report that primarily deals with regional freight and goods movement. However, some of the recommendations of the report are relevant to improving freight movement in downtown areas.

FINAL REPORT ON WILMAPCO REGIONAL FREIGHT AND GOODS MOVEMENT ANALYSIS

- The report notes that a recent study titled “Guidebook for Freight Policy, Planning, and Programming in Small- and Medium-Sized Metropolitan Areas” identifies a potential path for initiating a freight-planning program within an MPO (p. 4):
 - **Step 1:** Assign freight lead or point of contact (POC) to be the liaison between the MPO, the freight industry, the MPOs various transportation initiatives, and other stakeholders and agencies.
 - **Step 2:** Establish goals and objectives.
 - **Step 3:** Develop a regional freight profile (physical and operational characteristics of a region's freight system).
 - **Step 4:** Engage the private sector to give them the opportunity to contribute to the freight program development throughout the process.
 - **Step 5:** Define key issues based on review of results from step 3.
- The report also recommends the creation of a methodology to identify issues and disseminate information (p. 49). While the following recommendations are geared toward WILMAPCO and directed towards regional-transportation planning, these suggestions may also be relevant to transportation planning at the local government level for freight movement within CBDs:
 - **Recommendation 5** – Engage private-sector shippers and carriers and other key stakeholders in freight planning. Materials should be developed as part of an outreach effort to educate and involve shippers and operators in the freight planning process.

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- **Recommendation 7** – Disseminate vital information about goods movement to key decision-makers, stakeholders, and the general public to reinforce the concept of “freight as a good neighbor.” This should involve a multimedia approach using meetings, presentations, reports, press releases, radio interviews, and television broadcasts.
- **Recommendation 13** – Incorporate freight into their existing project-prioritization process. Using the improved freight-system performance data, freight should be better represented in WILMAPCO’s project-prioritization process. In the era of diminishing transportation funding, a concerted effort should be made to properly address the most critical sections of the network. Using the results of the gaps and conflicts analysis, these locations can be used to apply additional weight to potential projects.
- **Recommendation 21** – Support improved communication with the trucking industry to reduce the frequency of lost truck drivers. Initially this can involve development of a regional truck map that highlights primary truck routes and key truck destinations. Future efforts might involve Web-based or real-time communication with the drivers (Cambridge Systematics, 2007).

4-3-2. DOVER/KENT COUNTY MPO

Dover/Kent County MPO’s new Transportation Improvement Plan Update addresses freight movement on a regional level. It primarily focuses on semi-trailer traffic originating and arriving in the MPO area as well as the volume of freight traffic traveling through the area (Dover/Kent County MPO, 2009).

4.4 County Policies

The codes of New Castle, Kent, and Sussex Counties were searched for provisions that regulate the movement of goods in CBDs. Because many retail establishments are located within decentralized shopping centers, outside of a CBD, the county codes generally don’t address on-street loading regulations or facilities. Much attention is paid to the design, location, screening, and access to off-street-loading bays, mostly for shopping centers and strip malls; in some cases loading areas are explicitly defined as off-street facilities. County code regulations lack guidance as to how to create or designate on-street loading zones for small-package delivery.

4-4-1. NEW CASTLE COUNTY

New Castle County’s code is unique in that it addresses instructional signs to indicate loading and unloading zones. Moreover, the code has a provision about maintaining the visual attractiveness of commercial lots, which may require loading platforms to be screened if considered an unattractive facility.

- **Definition of “Loading space”** (Unified Development Code, Sec. 40.33.300) – “A durably paved, properly designed for drainage, off-street space used for the loading and unloading of vehicles, except passenger vehicles in connections with the use of the property on which such space is located.”
- **Loading standards** (Unified Development Code, Sec. 40.03.510) – This ordinance requires retail stores and restaurants to provide at least one loading bay for a building that is 3,500 - 8,000 square feet of gross floor area. It states that the bay should not be used for storing merchandise or motor vehicles and should not obstruct pedestrian circulation.

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- **Outdoor loading bay area standards** (Unified Development Code, Sec. 40.22.621) – This provision requires that outdoor bays should be at least 12 feet wide and 60 feet long, have a height of 14 feet if covered, provide constant access, and not interfere with emergency access. A truck using the outdoor bay should not block a public right-of-way and should have sufficient space to maneuver on the lot.
- **Unattractive facilities on lots** (Unified Development Code, Sec. 40.20.220, G) – This provision requires screening of loading platforms on commercial properties/subdivisions.
- **Permitted signs** (Unified Development Code, Sec. 40.06.040, A2) – This provision allows loading and no-loading instructional signs, but stipulates that they should not be more than four square feet in surface area and must be set back two feet from the street (*County of New Castle, Delaware Code*, n.d.).

4-4-2. KENT COUNTY

KENT COUNTY *COMPREHENSIVE PLAN*

Kent County's adopted *Comprehensive Plan* addresses issues related to the movement of goods in several chapters.

- “Land Use” – Outlines a growth-management strategy with an emphasis on directing development near existing cities and towns. Commercial development should include “design elements [that] serve both pedestrian and vehicular traffic [but] also with public transit opportunities in mind” (pp. 2-8). A “Neighborhood Commercial” development is envisioned as a center of intense urban use within a neighborhood that “create[s] a center that is well integrated to existing and planned neighborhood fabric, respects existing residences, and provides needed infrastructure” (pp. 2-8).
- “Community Design” – Stresses the need to integrate quality-design concepts in both residential and non-residential development. Site design characteristics that encourage traditional neighborhood design are encouraged. With respect to non-residential development, design elements that reduce the negative visual impact on an area are encouraged. “Parking for nonresidential uses should be placed behind the principal structure to the extent possible. Off-street parking areas and surface and parking structures should be located to the side and rear of buildings” (pp. 3-7). The chapter further suggests that “elements such as service bays, loading docks and platforms, rooftop utilities, satellite dishes, dumpsters, and storage areas should be screened from view” (pp. 3-8).
- “Transportation” – Acknowledges that transportation systems should encompass and accommodate a wide variety of modes. The chapter notes that when “road improvements for vehicular traffic are contemplated; multi-modal [aspects] for bike and pedestrian traffic should be included in the design” (pp. 5-12). It is recommended that traffic-impact studies for individual developments be replaced by traffic-improvement district (TID) master plans, to be financed by project developers (pp. 5-16). The overall Kent County transportation policy is to “create and maintain a transportation system... that is safe, supports economic development, allows easy access and mobility for people and goods to reach their destination and serves the public’s needs while reinforcing the unique character and quality of life...” (pp. 5-17). (*2007 Kent County Comprehensive Plan*, 2008).

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KENT COUNTY CODE

Kent County's Code addresses several topics relevant to freight movement:

- **Sec. 187-58 Street Layout** – Alleys may be provided in nonresidential subdivisions and sites for the purpose of providing secondary access to parking and loading areas. Alleys serving nonresidential subdivisions and site developments shall be established at a minimum right-of-way width of 20 feet, with a maximum paved width of 18 feet. Traffic flow in nonresidential alleys shall be limited to one-way and shall be planned and marked accordingly with standard signage and other means as applicable.
- **Sec. 187-63 Blocks C** – Blocks for business or industrial use shall be of such length and width as may be necessary to serve their prospective use, and shall include adequate provisions for off-street parking and for the loading and unloading of delivery vehicles.
- **Sec. 205** – This section contains the county's zoning regulations; therefore it includes topics such as setback requirements, general loading requirements, parking and loading requirements, etc. for various uses, but only for off-street facilities.
- **Sec. 205-221 A 2:** Each loading space shall be at least 15 feet wide by 35 feet long with 15 feet of vertical clearance.
- **Sec. 205-222 C:** Off-street loading spaces shall be provided in close proximity to the principal or accessory use served. The distance from a loading space to the closest point of the building entry or loading area shall be no more than 50 feet (*County of Kent County, Del. Code*, n.d.)

4-4-2. SUSSEX COUNTY

Sussex County Code provisions have specific requirements related to loading space and activities. It is not clear whether these provisions were developed with commercial shopping centers or strip malls in mind, or whether the provisions can be tailored or applicable to CBD environments.

- **Screening of Loading Areas (Sec. 115-170.1), Parts A and B** – These provisions require screening for new/existing loading areas and trash-dumpster areas. The screening for loading areas is intended to minimize the negative visual impact of such operations.
- **Off-Street loading - Design standards (Sec. 115-170), Part A - Minimum size** – For the purpose of these regulations, a loading space is a space within the main building or on the same lot providing for the standing, loading or unloading of trucks and having a minimum width of 12 feet and a minimum depth of 40 feet [and vertical clearance of at least 14 feet] (*County of Sussex County, Del. Code*, n.d.)

4.5 Municipal Codes

The municipal codes of Newark, Wilmington, Milford, Smyrna, and Dover were reviewed for regulatory provisions geared towards the efficient movement of freight and small-package delivery in downtown areas. Most municipal ordinances solely address off-street loading facilities, with the exception of Wilmington and Newark. These two municipalities regulate the use of on-street loading facilities and define legitimate users, timeframes, and purposes.

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4-5-1. CITY OF NEWARK

The City of Newark's code indicates how loading zones may be created; namely, either by a commercial establishment getting approval from the city building department or by the authority of the city manager.

- **Parcel pickup zone** (Motor Vehicles, Sec. 20-97.1) – This is defined as an area that is controlled by an adjacent retail store and has been designated as a loading zone, approved by the city building department, marked with a sign, and supplemented with painted curbs. It is restricted to parcel pickups only. The zone should not conflict with fire-lane restrictions.
- **Stopping for loading or unloading only** (Motor Vehicles, Sec. 20-223) – “The city manager is hereby authorized to determine the location of freight curb loading and unloading zones and shall place and maintain appropriate signs indicating the same and stating the hours during which the provisions of this section are applicable. No truck shall be loaded or unloaded unless curb parked in the zones authorized and determined by the city manager.”
- **Definition of “Loading space”** (Zoning, Sec. 32-4, A66) – “Paved accommodation off the street for loading and unloading of trucks, in the form of one or more truck berths located either within a building or in open space on the same lot. The area of each berth shall not be less than 600 square feet, and it shall have a minimum clear height, including access to it from the street, of 14 feet.”
- **Loading spaces** (Zoning, Sec. 32-46) – This ordinance, applicable to all districts, requires a certain number of loading spaces to be located on a lot depending on use. For example, a retail store of gross floor area of 5,000 to 8,000 square feet requires one berth (*Municipal Code, City of Newark, Del*, n.d.).

4-5-2. CITY OF WILMINGTON

Wilmington's city code, in a number of areas, is exemplary. First, there are provisions that aim at managing traffic on Market Street, the city's “Main Street.” These provisions clearly define commercial vehicles, impose time restrictions for commercial vehicle loading/unloading activity, and give public safety officials the authority to limit the number of commercial vehicles on Market Street mall at a given time. The code also allows alleys to be used for loading and unloading purposes. Finally, the zoning ordinance clearly and coherently discusses loading-berth requirements. The ordinance defines “loading berth,” then provides a table specifying the number of loading berths required for a particular use, and then regulates the dimensions of loading berths.

- **Definition of “Commercial vehicles”** (Motor Vehicles and Traffic, Sec. 37-1) – “[A]ny motor vehicles in use at the time for the principal purpose of carrying goods, wares, merchandise or tools, and which are identified, under state law, as being commercial vehicles by official markings on their license plates. Such official markings shall include, but are not limited to the marking ‘C,’ when such marking is in the first position on the license plate, and by the word ‘truck;’ however, the marking ‘P/C’ shall not be considered as identification of a commercial vehicle for purposes of this section.”
- **Definition of “Loading and unloading”** (Motor Vehicles and Traffic, Sec. 37-1) – “[T]he transfer of persons or property between a vehicle and the sidewalk or between a vehicle and one or more nearby buildings.”
- **Certain vehicles prohibited on portion of Market Street** (Motor Vehicles and Traffic, Sec. 37-194) – “It shall be unlawful for any person to drive any vehicle used for commercial purposes

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on Market Street between 7th and 9th Street unless he can prove that such movement is necessary for the purpose of loading and unloading merchandise in that district.”

- **Loading in alleys permitted** (Motor Vehicles and Traffic, Sec. 37-223, A14) – “A vehicle may park in any alley for the purpose of loading or unloading so long as it is for less than 15 minutes.”
- **Parking or loading in no stopping areas** (Motor Vehicles and Traffic, Sec. 37-224) – “It shall be unlawful for the driver of any vehicle to stop, stand, park or load on any street, or in front of any space on any street, where the stopping of vehicles has been prohibited by the department of public works and marked ‘No Stopping’ by authority of such department.” A \$35 fine is imposed for violations.
- **Parking oversized commercial vehicles** (Motor Vehicles and Traffic, Sec. 37-233) – “No person shall park an oversized commercial or recreational vehicle, classified as an 11,000 pound registered vehicle weight or more or 20 feet in length or more, nor any boat regardless of its weight or dimensions, on any day on any street in the city between the hours of 8:00 p.m. and 8:00 a.m. except during the time that such vehicle is actually loading or unloading or unless the driver has a lawful street storage permit issued by the department of licenses and inspections.” Graduated fines are imposed for first and subsequent offenses.
- **Parking on Market Street** (Streets, Sidewalks, and Other Public Places, Sec. 42-497, 3) – “Commercial delivery and trash collection vehicles with a maximum of two axles wishing to park on Market Street Mall from 7th to 9th Streets are subject to several conditions, including the time window of 5:00 a.m. to 11:00 a.m. and 2:00 p.m. to 6:00 p.m.” Public safety officials have “the authority to limit the number of vehicles on the mall at any one time.”
- **Definition of “Loading berth”** (Zoning, Sec. 48-2 – “[A]ccommodation off the street for loading and unloading of trucks, in the form of one or more truck berths located either within a building or in open space on the same lot.”
- **Loading and unloading spaces** (Zoning, Sec. 48-446) – A table specifies loading-berth requirements according to building use. For example, a retail establishment with 10,000 square feet or more of gross floor area must have one loading berth.
- **Size of loading berths** (Zoning, Sec. 48-447, B) – This ordinance regulates the depth, width, height clearance, and loading-platform dimensions of loading berths. For example, all loading berths should be at least 12 ft. wide and have a 14 ft. clearance (*City of Wilmington, Del. Code*. n.d.).

4-5-3. CITY OF MILFORD

The City of Milford’s code addresses loading spaces and signage for loading zones.

- **Definition of “Berth (loading)”** (Zoning, Sec. 230-4) – “A space for an automotive vehicle or truck to load or unload its cargo.”
- **Loading spaces** (Zoning, Sec. 230-21, C) – This provision requires certain building uses to have loading berths on the premises for accommodating trucks. For example, a retail store of 5,000-7,999 square ft. of floor area must provide one berth.
- **Permitted signs** (Zoning, Sec. 230-24, A3) – Under this provision loading zones signs are permitted, but they cannot exceed 2.5 square ft. in area and should be non-illuminated (*City of Milford, Del. Code*, n.d.).

4-5-4. TOWN OF SMYRNA

There are two sections of the City of Smyrna's code related to freight movement and loading/unloading activities.

- **Parking of trucks and other heavy equipment** (Traffic and Vehicles, Sec. 66-106.5, B) – This section allows for temporary parking of trucks to load/unloading.
- **Loading requirements** (Zoning, Sec. 6-1, C) – This provision requires an off-street loading space for all hospital, institution, commercial, or manufacturing uses/buildings erected on areas of 2,500 or more. For each 10,000-square-foot lot (or fraction above 2,500 square feet), a loading space is required that is 12 feet wide and 50 feet in length (*Town of Smyrna, Del. Code*, n.d.)

4-5-5. CITY OF DOVER

Dover's code primarily addresses the location, dimensions, and screening of off-street loading facilities. Additionally, it imposes a time maximum of 25 minutes for all loading and unloading purposes. It does not address the location, necessity, or design of on-street loading.

- **Appendix B - Article 3 - Section 27.67 (f) Screening** – Service bays and loading docks and platforms are required to be screened to minimize visibility from the roadway, adjacent properties and other public areas.
- **Appendix B - Article 6 - Section 2. Permitted accessory loading berths** – This provision permits off-street loading berths as an accessory to any use, except one- to two-family residences. Off-street loading berths are not allowed in front yards.
- **Appendix B - Article 6 - Section 4 Required off-street loading berths:**
 - An off-street loading berth is required to be 12 feet wide and 60 feet long. If more than one loading berth is required, subsequent berths may have minimum dimensions of 12 feet wide and 40 feet long. Trucks and vans are not allowed to extend into a public thoroughfare or right-of-way while the truck or van is being loaded or unloaded. If the outdoor loading area is covered, but not totally enclosed, the minimum height is 14 feet.
 - This provision requires land to be reserved for at least one standard-sized loading berth that meets all requirements of this ordinance. This provision also recognizes that off-street loading needs may change in the event of downtown redevelopment. It allows the city planner to require that an [additional] loading berth be constructed if a change in use warrants the need.
- **Chapter 106 - Article 3 Stopping, Standing and Parking - Sec. 106-122** – This provision imposes a 25-minute-parking time limit when loading or discharging freight (*City of Dover, Del. Code*, n.d.).

4.6 Summary of Policies/Practices Governing Freight Movement

4-6-1. DELAWARE LOCAL POLICIES

In summary, existing Delaware local government codes focus mostly on three areas:

- Design, number, and use of off-street facilities
- Use of on-street facilities
- Regional freight traffic

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Most Delaware local government regulations lack attention to design standards for on-street loading zones. This observation was confirmed by the municipal stakeholders during the second working group meeting. If an increased use of on-street zones is desired, there has to be more guidance at the state level.

WILMAPCO's studies and reports support the general observations made during the working-group meetings and emphasize the necessity of improved communication and an increased role of intra-urban freight delivery in the policy-making process.

4-6-2. PUBLIC POLICY TOOLS

As the official policy of a local government, a comprehensive plan should provide a vision that guides decisions regarding development—including the design or redesign of a CBD as a hub for business and economic development. A comprehensive plan should address multi-modal movement within the downtown core, and stress the value of creating a balance between traffic movement and pedestrian activity. The comprehensive plan should provide development principles, design guidelines, and make recommendations for ordinance amendments that will achieve a jurisdiction's vision to strengthen or redevelop a downtown area.

Integrated land-use and transportation planning is one of the essential principles of smart growth that can be conveyed within a comprehensive plan, supporting planning documents, and regulatory policies. Development principles and supportive land uses should strive for a balanced portfolio of motorized and non-motorized transportation facilities that integrate and results in an attractive downtown streetscape setting. Implementation tools should provide design guidelines and policy recommendations to accommodate and manage traffic flow, pedestrian access, and parking demand.

According to the Smart Growth Network, “parking—its provision, pricing, and distribution—plays an important role in creating a balanced transportation system” (ICMA, 2002, p. 65). While the lack of parking can negatively impact a CBD, the oversupply of parking can drive up the cost of development and promote auto usage. Unfortunately, as dependency on the automobile has grown, local policies have been skewed to reinforce the car culture. Rather than addressing parking supply-and-demand through design guidelines and management strategies, local jurisdictions opt to overly rely on local ordinances to regulate parking and loading zones. Many municipalities institute parking-ratio ordinances, which establish the minimum number of parking and loading-zone spaces a development project must provide for a given land use and project size. In many instances, these traditional approaches to regulating parking and loading activity have led to either underutilized or a glut of parking spaces, which discourage mixed land uses, dense patterns of development, walkability, and a pedestrian-friendly environment. To address these concerns, local jurisdictions should focus on developing/amending policies to better manage parking and truck loading/unloading needs. Strategies that may be adopted through local zoning-code amendments may include reduced minimum-parking requirements, parking maximums, area-wide parking caps, shared parking, and parking districts. All parking/loading-zone policies should be consistent with local public policy documents (e.g., a comprehensive plan, downtown circulation plan, CBD revitalization plan) to ensure that an overall vision is secured for an attractive, pedestrian-friendly, and transit-oriented downtown.

5 Observed Issues in Delaware CBDs

The literature review provided a framework for conducting the research, an overview of regional and urban freight- and goods-movement issues, a synopsis of best management practices, and general recommendations. However, the research team concluded that context of the available research was geared toward larger urban areas and often lacked relevance to freight movement realities within smaller cities and towns. Unlike cities in other freight movement studies, Delaware's CBDs are small—52 of Delaware's 57 municipalities or 91 percent have populations under 10,000 (U.S. Census Bureau).

5.1 Field Visits

To observe freight-movement issues first hand in Delaware CBDs, ten field visits were made to downtown areas of local jurisdictions in New Castle, Kent, and Sussex Counties. Criteria for the selection of field-visit locations was based on the population of the cities and towns, the presence of an active CBD, and the extent to which the jurisdiction serves a year-round business community (beach towns, with seasonal tourism and business activity were excluded). The table below lists the jurisdictions selected for field-study observations, location within a county, and date of field visit.

Field Visits to Delaware Central Business Districts			
Municipality	Estimated Population*	County	Date
City of Newark	29,886	New Castle	September 26, 2008
City of Dover	36,107	Kent	October 6, 2008
City of Harrington	3,435	Kent	October 6, 2008
Town of Smyrna	8,603	Kent	October 6, 2008
City of Milford	8,511	Kent/Sussex	October 6, 2008
Town of Elsmere	5,688	New Castle	October 7, 2008
City of New Castle	4,977	New Castle	October 7, 2008
Town of Newport	1,106	New Castle	October 7, 2008
Town of Middletown	12,152	New Castle	October 9, 2008
City of Wilmington	72,592	New Castle	October 17, 2008

**Source: Population Division, U.S. Census Bureau, Release Date: July 1, 2009*

The population of each of the jurisdictions visited varied—from Wilmington, Delaware's largest city (72,592), to the smaller town of Newport (1,106), which is more comparable in size to many of Delaware's small towns. Of Delaware's 57 incorporated municipalities, 42 or 74 percent have populations under 2,500 (U.S. Census Bureau, 2009). Each of Delaware's municipalities is unique and showcases Delaware's rich history and cultural heritage. The physical organization of Delaware's towns is defined along major transportation and marketing routes and reflects the continued importance of CBDs as centers of commerce, business, cultural, and social activity.

Several of the towns visited during the field visits—including Dover, Milford, Newark, and Wilmington—are also members of Downtown Delaware. This program is modeled after the National Trust's Main Street program, which is designed to revitalize downtown business districts through a comprehensive strategy that focuses on organization, promotion, design, and economic restructuring. A core principle of downtown design is a focus on quality of place. To compete economically, CBDs need

to have a strong visual appeal and inviting atmosphere but also provide adequate infrastructure (such as streets, sidewalks, and parking) to promote adequate circulation of vehicular and pedestrian traffic. According to a recent IPA report, sidewalks and shared-use paths should be designed and maintained to create a safe environment, minimize user conflicts between vehicles and pedestrians, and provide accessibility and interconnectivity (O'Donnell and Knab, 2007). For this reason, it is critical that municipal comprehensive, land-use (i.e., adaptive reuse), and transportation plans (e.g., downtown circulation, downtown parking studies) consider and integrate community goals for historic preservation, economic development, public safety, and multi-modal mobility.

5.2 Observed Issues

The IPA research team attempted to observe freight-movement issues within the select Delaware CBDs from the perspectives of each of the identified downtown stakeholder groups, which include public safety officials, planners, the business community (delivery recipients), and commercial-vehicle drivers (i.e., shippers and haulers). It is noted that some of the observed issues may have varying degrees of significance or apply to only certain stakeholder groups. Nonetheless, the researchers were able to observe and categorize several issues as design problems (lack and condition of loading-zone facilities), lack of or unclear regulations, and public safety concerns (e.g., intermodal conflicts and illegal or unauthorized parking). These findings should thus be interpreted as illustrative of the range of issues faced by stakeholders within Delaware CBDs, rather than a definitive or exhaustive list. The issues, by category, are described below.

5-2-1. DESIGN PROBLEMS

It was observed that many Delaware CBDs lack appropriate off-street loading facilities, on-street loading zones, and parking spaces. This problem has several aspects. First, because historic commercial districts have been subject to reuse and redevelopment, many buildings lack off-street loading areas that meet the needs of current tenants. Many older buildings, which have been restored for commercial or retail use, simply do not have off-street facilities and rely on on-street parking for service, product, and small-package delivery. In many cases it is either unfeasible or cost-prohibitive to provide off-street loading facilities for adaptive re-use projects involving historic properties in commercial districts. If an off-street loading area is available, it may be difficult to access, be insufficiently sized, and/or share space with other trucks concurrently serving the buildings.

Second, the design of many off-street parking facilities may be outdated and no longer safely meet truck loading/unloading needs. A commercial-vehicle driver may simply opt to avoid an outdated, off-street loading facility if there is insufficient access, inadequate turn-around space, parking congestion, or a chance of getting blocked by another vehicle.

Third, off-street loading facilities may not meet on-time delivery requirements of a business. Property owners and business managers are principally concerned with preserving their ability to have reliable, timely delivery of office supplies, perishable goods, mail and parcel packages, legal documents, and other retail shipments. Often, delivery times are dictated by customer requirements or business operating hours. Because on-time delivery requirements impose additional pressures to small-package carriers and delivery-truck drivers, they may avoid an off-street loading facility in favor of on-street parking.

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Fourth, if an off-street loading area is available, the state of the facility is often problematic. The IPA research team observed a number of problems that rendered an off-street space useless or undesirable. For example, off-street loading areas were sometimes blocked by a commercial trash container, subject to illegal parking, or not clearly delineated as loading zones.

Finally, CBDs often lack designated on-street loading zones for commercial vehicles. The lack of on-street loading zones may not be an intentional design oversight but reflects the small size of CBDs and a limit in the overall number of on-street parking spaces. In these cases, on-street parking is scarce and subject to competition among cars, buses, service vehicles, commercial-delivery trucks, and parcel carriers. This issue is related to the next category of observed issues—unclear or lack of regulations.

5-2-2. LACK OF ON-STREET PARKING REGULATIONS

A lack of on-street parking regulations in Delaware CBDs was observed during the field visits to jurisdictions. The research team noted that while the reuse of historic structures has contributed to an overall lack of off-street loading facilities in Delaware CBDs, there also seems to be a lack of designated on-street loading zones for commercial and delivery vehicles. As redevelopment occurs in downtown areas, the demand for on-street, curbside parking spaces has increased and in many vibrant CBDs the demand for goods delivery has exceeded the supply of curbside spaces. This supply-demand issue forces commercial and delivery vehicles to either park in metered spaces that are generally designed for passenger-vehicle use or, if there is a lack of curbside spaces, double park in traffic lanes.

Where on-street loading zones exist, regulations governing commercial loading zone activity were lacking or were unclear. For example, the City of Dover and Town of Middletown did not provide any signage or curbside marking that indicated the presence of a commercial loading zone. It was unclear as to whether these jurisdictions did or did not have on-street loading zones. In other jurisdictions with designated on-street loading zones, signage was inconsistent or did not convey regulations/policies concerning use of loading zones, turn-over requirements, or zone enforcement. It was also observed that while some jurisdictions painted curbs yellow to delineate loading-zone areas, many of these painted curbs were weathered or lacked corresponding signage to indicate the meaning of the painted curbs.

Many commercial vehicles share on-street parking spaces in Delaware CBDs with passenger vehicles. Trucks and delivery vehicles were observed parking or taking up several metered spaces that were designed for use by passenger vehicles. It was not clear whether regulatory policies exempt commercial vehicles from meter regulations, or whether delivery drivers assume they are excused from meter policies and enforcement provisions.

Like many urban areas nationwide, it is evident that Delaware local governments wrestle with the dilemma of sensible curb-management policies within CBDs. Local governments struggle to balance the parking needs of patrons versus the loading/unloading needs of commercial trucks, service vehicles, and small-package-delivery vehicles. On the one hand, delivery trucks need to be accommodated to provide services to downtown businesses. On the other hand, creation of on-street loading zones can take away parking spaces for customers, the lifeblood of a commercial district. A single on-street parking space may provide an opportunity for continuous turn-over of delivery trucks or accommodate a single parked car for a lengthy period of time or all day. If a jurisdiction decides there is a need for an

Improving Freight Movement in Delaware Central Business Districts

on-street loading zone, officials need to develop policies to determine how many zones are needed, where they should be located, and how to manage the turnover of loading-zone spaces.

5-2-3. PUBLIC SAFETY CONCERNS

Several public safety concerns were observed, including traffic congestion, intermodal conflicts, and lack of commercial-loading-zone regulation enforcement. One problem is that small-package and freight deliveries are made during peak periods of activity in a commercial district. Often, a business owner or staff needs to be available to accept delivery of a product during working hours. This forces deliveries to be made during other peak periods of downtown activity for patrons, commuters, and employees. On-street loading in itself can compound traffic volume and congestion. Moreover, if there is a lack of off-street or on-street parking, commercial vehicles may be forced to double park in a main lane of traffic, which poses a risk to pedestrians, motorists, and bicyclists. Double-parking of large trucks in traffic lanes may also prevent public safety vehicles (fire trucks, ambulances, and police vehicles) from efficiently responding to an emergency.

In addition to traffic congestion issues, intermodal conflicts were observed in many Delaware commercial districts. Specific intermodal conflicts involved trucks blocking pedestrian crosswalks, driveways, parking-lot entrances, and/or intersections, which created line-of-sight problems for pedestrians, motorists, and bicyclists. Intermodal conflicts were also caused by the actual on-street unloading activity itself—unloading goods from the truck in traffic, loading goods onto a dolly, and maneuvering goods across crowded streets and sidewalks. When double-parked, the act of unloading increases the chance of intermodal conflicts.

Another public safety concern is illegal or unauthorized parking in designated loading-zone areas. In several jurisdictions, service vehicles or passenger cars were observed occupying a designated loading-zone space. Non-delivery vehicles and cars were also observed parking in alleys, which could block a commercial vehicle making a delivery. The lack of enforcement of a designated loading-zone area leads to a shortage of supply and often results in commercial vehicles making several passes to wait for the loading-zone space to open. If loading-zone spaces are illegally used or unavailable, then commercial vehicle operators are in turn forced to illegally double-park, or park in a metered space that is designed for passenger cars.

The issue of parking enforcement is complicated, and local officials should consider implications of enforcement of loading zone policies in order to reach an achievable balance that benefits all downtown stakeholders. On the one hand, strict enforcement of loading-zone provisions is favorable because it ensures that space is reserved for commercial-loading activity. However, if there is strict enforcement of illegally or double-parked commercial vehicles, the cost of doing business downtown increases as fines are passed along to businesses and patrons. On the other hand, lax enforcement is problematic. It can lead to traffic congestion, public safety problems, and encourage car drivers to illegally park in loading zones and truck drivers to illegally park in metered spaces or traffic lanes. Delays experienced by commercial carriers can also add to the costs of doing business in a downtown commercial district. The costs borne by shippers and receivers are ultimately passed along to the consumer—so all stakeholders pay for an inefficient freight-delivery system.

6 Working Group

The establishment of a working group was critical to the success of this project. While the literature review provided a framework for conducting research on freight movement and the field visits helped to identify issues relevant to Delaware's commercial districts, the working group brought together participants representing the interests and views of stakeholders from Delaware CBDs. The purpose of the working group was threefold. First, it brought together experts and stakeholders to engage in an interactive discussion on freight-movement issues in Delaware CBDs. Second, meetings of the working group provided a forum for sharing perspectives, communicating ideas, and building consensus on ways to improve freight movement in Delaware CBDs. Third, the IPA research team was able to bounce ideas off working-group members during meetings in order to gain valuable insight and reactions to preliminary research findings and issues observed in Delaware.

IPA formed a working group of local government planners, the business community, public safety officials, and small-package shippers and haulers. A total of 35 individuals participated in the two working-group meetings, held on December 12, 2008, and April 16, 2009, in the University of Delaware Center for Composites Materials conference room. Working-group members included representatives of UPS, FedEx, Downtown Visions Wilmington, Main Street Wilmington, Wilmington Renaissance Corporation, Dover/Kent County MPO, Downtown Newark Partnership, Main Street Middletown, Downtown Milford, Downtown Dover Partnership, the Delaware Department of Transportation (DelDOT), WILMAPCO, City of Newark, City of Wilmington, New Castle County, Town of Middletown, New Castle County, Parcels, Inc., Coca-Cola, and SYSCO (Appendix A). The original intent of the project was to focus on needs of small-package-delivery businesses like FedEx and UPS. However, at the suggestion of the working-group members, the scope of the study was broadened to include delivery needs of large tractor-trailers in CBDs.

6.1 Outcomes of the December 12, 2008, Working-Group Meeting

The first meeting was held on Friday, December 12, 2008, and was attended by 24 individuals. At this meeting a PowerPoint presentation titled "Improving Freight Movement in Delaware CBDs" conveyed the purpose of the study, displayed issues observed in downtown areas, and provided an overview of the literature review (Appendix B). A group discussion followed and focused on questions posed during the presentation. Proceedings of the group discussion, which tracks the discussion by participant, are provided in this report (Appendix C). This section will highlight the primary topics of discussion.

6-1-1. PRINCIPLE GOVERNING COMMERCIAL-LOADING-ZONE (LZ) ACTIVITY

ON-TIME DELIVERY

- FedEx and UPS provide a money-back guarantee on package delivery.
- Delivery time pressures often force commercial carriers to illegally park.
- Tickets are often factored into the cost of doing business.
- Small-package-delivery model is set up for morning service to businesses and commercial districts, evening service to residential locations.

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SAFETY

- Drivers are taught not to back up.
- Goal is to achieve a front-in, front-out delivery.
- Drivers avoid alleys and narrow areas where they may be blocked.
- Drivers will repeat attempts to make on-time delivery.

INCREASED “AT STOP” TIME

- Security needs (sign-ins at businesses) have increased since 9-11.

6-1-2. IMPROVEMENT STRATEGIES

OPTIONS TO IMPROVE LZ MANAGEMENT

- Consider fees to convert parking spaces to LZs.
- Establish policies to restrict deliveries to non-peak hours (noted that this works for towns that are not a major commuter destination).
- Install multi-space “smart”-card-operated electronic meters that can be used for on-street parking for cars or trucks.
- Establish a central drop off location/delivery.
 - For a building with multiple businesses: drive up, drop off, then building manager (or designee) makes internal deliveries.
 - For a block of businesses: drop off goods at one location, and “walker” can deliver package to each store.
 - This option is more suited for downtowns in vertical markets or businesses with a centralized mailroom.

COMMUNICATIONS

- Initiate better communication among stakeholders at the local government level.
- Have each jurisdiction or commercial district designate a single point of contact to provide communications and outreach on LZ and parking issues.
- Form a freight-movement working group within each jurisdiction.

INFRASTRUCTURE CHANGES

- Establish more LZs.
 - Determine the feasibility of converting some metered on-street parking spaces to short-term, on-street LZs and/or establish new designated on-street LZs to provide more options and opportunities for deliveries. On-street LZs must provide front-in, front-out delivery.
 - LZs must not block the sight line of pedestrians.
 - Consider Rehoboth Beach streetscape project as study of land economics. Weigh the need for LZ space against the need for customer parking spots.
- Determine the feasibility of establishing new curb bulb-outs.

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- If feasible, design and construct bulb-out areas during a streetscape project; establish policies to regulate use.

TECHNOLOGY

- Gather delivery logistics information to build spatial-information technology (e.g., geographic information systems - GIS) databases to help private carriers plan for last-mile logistics.
- Use technology to better manage freight movement and LZs.
 - Use transponders for delivery vehicles using LZs.
 - Install smart meters that assess variable fees or limit occupancy time for shared parking spaces.
 - Share GIS/automatic vehicle locator (AVL) information to improve freight delivery logistics.
 - Use new parking technology to manage various aspects of on-street parking.

ENFORCEMENT

- Adopt, regulate, and strictly enforce LZ ordinances. It is useless to convert spaces or provide more LZs if enforcement is absent.
- Conduct direct enforcement activity both at illegally parked private vehicles and trucks.
- Consider whether ordinances should prohibit parking of service vehicles in commercial LZs.

STRATEGIES FOR VERTICAL VS. HORIZONTAL MARKETS

The consensus of the working group was to identify improvement strategies that may be more suited for larger CBDs in vertical markets (like Wilmington) or smaller CBDs that are more characteristic of smaller Delaware business districts. Based on the literature review, fieldwork, and input from working-group members at the December 12, 2008, meeting, strategies for vertical vs. horizontal markets may be illustrated per the graphic below.

Adapted Recommendations for Small and Large Central Business Districts

Small CDBs	Large CDBs
<p><i>Communication</i></p> <ul style="list-style-type: none"> • Establish central contact person. • Institute regular exchange of ideas and problems. • Compile single comprehensive-information document. • Create physical inventory of all facilities. <p><i>Enforcement</i></p> <ul style="list-style-type: none"> • Enforcement of existing regulations. • Adhere to minimum design standards for loading facilities. <p><i>Efficiency improvements</i></p> <ul style="list-style-type: none"> • Introduce metered parking (loading zones as well as private parking). • Strategically place package-drop boxes. 	
<p><i>Shared use</i></p> <ul style="list-style-type: none"> • Share use of curbside. • Emphasize use of smaller vehicles. 	<p><i>Improve turnover</i></p> <ul style="list-style-type: none"> • Utilize central delivery points and walkers. • Consolidate freight traffic. <p><i>Create additional facilities</i></p> <ul style="list-style-type: none"> • Strongly focus on off-street loading. • Redesign on-street loading zones. • Add on-street loading zones.

6.2 Outcomes of April 16, 2009, Working-Group Meeting

The second working-group meeting was held on Thursday, April 16, 2009, and was attended by 18 members and four guests. At this meeting, a PowerPoint presentation was made to recap previous suggestions, introduce new literature-review findings, highlight feedback obtained from freight carriers, and obtain input on a proposed process for municipal-loading-zone management (Appendix E). At the previous working-group meeting, it had been suggested that the group be expanded to include representatives from Parcels, Inc., Coca-Cola, SYSCO, and Dunbar Armored Corporation. Representatives from those companies, with the exception of the armored-truck company, were present to share their perspectives on issues concerning freight movement in Delaware CBDs. Proceedings of the group discussion, which highlights primary topics of discussion, are provided in this report (Appendix F).

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6-2-1. FEEDBACK FROM SMALL-PACKAGE CARRIERS (UPS AND FEDEX)

Prior to the April 16 meeting, feedback was solicited from UPS and FedEx on two questions posed by working-group members. The questions and responses, detailed below (and Appendix D), were provided to working-group members at the April 16 meeting.

1. *What are specific downtown delivery needs of drivers (both in vertical markets like Wilmington and smaller CBDs)? What do drivers feel are necessary conditions for optimal delivery and pickup?*
 - It is critical to provide loading-zone spaces that allow front-in and front-out deliveries.
 - Loading-zone spaces should be located where the largest quantity and size of packages are delivered.
 - Interesting concepts used in other cities include temporary freight passes (Midvale, Utah) and color-coding curbs to designate open parking spaces, fire zones, and truck-only loading zones (San Francisco, Calif.).
 - Enforcement of existing regulations was identified as most important.
2. *Can drivers identify chronic problems impacting delivery in CBDs (such as service vehicles parking in designated loading zones)? This feedback would help alert public safety officials to the need for greater enforcement action.*
 - Drivers are most in tune with local circumstances that may impact efficient deliveries through their daily contacts (e.g., the impact of Vice Presidential candidate Joe Biden's visit to Newark in fall 2008).
 - Drivers need to be alerted (other than by word of mouth) to any changing local conditions that may impact delivery schedules.
 - Open communication is essential.

6-2-2. PERSPECTIVES FROM NEW WORKING-GROUP MEMBERS

IPA facilitators reiterated the purpose of the study and provided an overview of the first working-group meeting. New working-group members were introduced and provided insight as to how they move freight and deliver products within Delaware CBDs. Representatives from SYSCO, Coca-Cola, and Parcels, Inc., informed the group about successful freight-delivery models used by their companies or optimal conditions for efficient freight movement in Delaware CBDs.

OFF-HOUR DELIVERIES

- Achievable if the business provides access with a key and operates on a credit basis
- Ideal for restaurants that need uninterrupted refrigeration of perishable food
- Do not work for commercial carriers that operate on a cash basis—the customer must be present to accept and pay for the product

DELIVERY-LOGISTICS SAFETY

- LZ spaces that enable front-in, front-out deliveries are optimal.

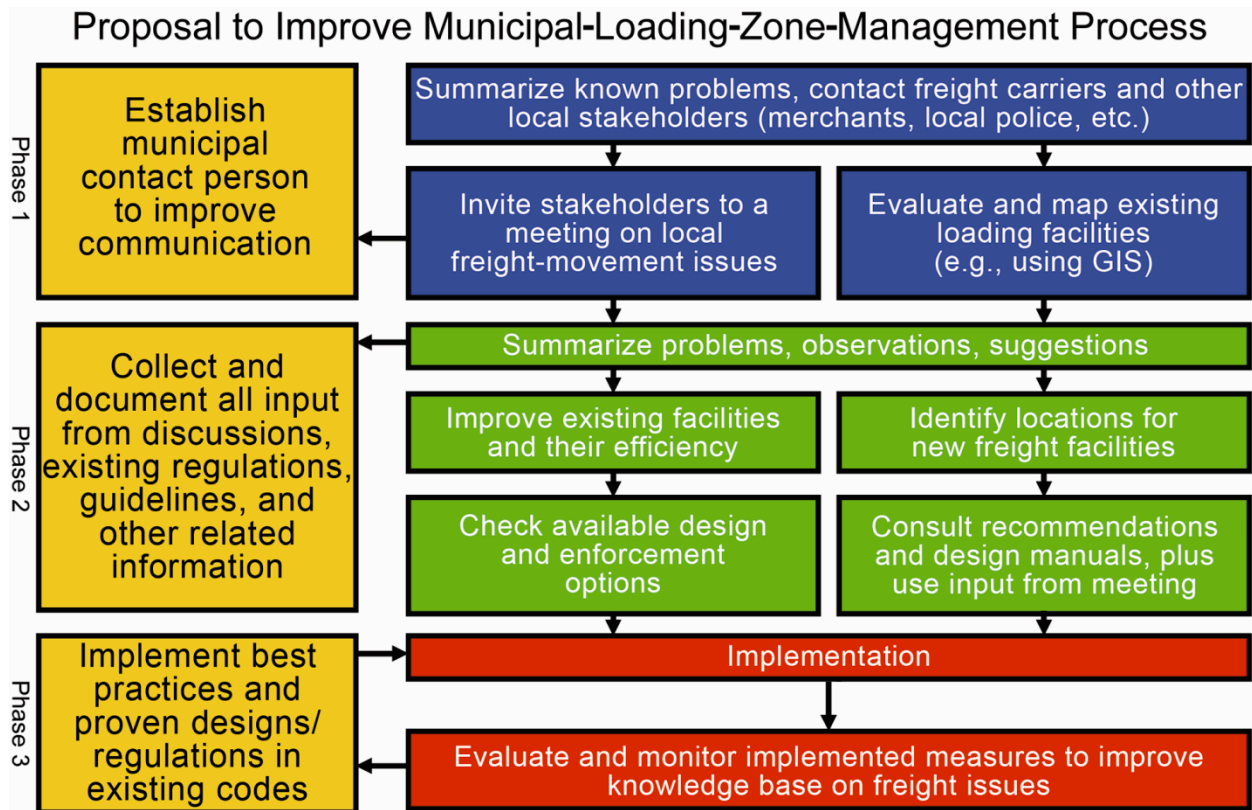
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ON-TIME DELIVERIES

- Delivery of perishable food requires on-time delivery. A centralized delivery point will not work for carriers of perishable food because it would “break the cold chain.” Whoever receives the delivery is responsible for the continued quality of the product.
- For Parcels Inc., which caters to the law firms in Wilmington, the primary challenge is timely pickups and deliveries for “Priority 1” service (within 15 minutes). Short-term parking for delivery vehicles is critical but often unattainable.

6-2-3. PROPOSAL TO IMPROVE MUNICIPAL- LOADING-ZONE-MANAGEMENT PROCESS

The IPA research team presented a proposal to improve the municipal-loading-zone-management process. The intended outcomes of this process are to bring all stakeholders of a jurisdiction together to discuss downtown freight-movement problems; brainstorm on possible policy, loading-facility location and design, and enforcement/public safety solutions; and implement recommendations through changes to existing policies, regulations, and parking/loading-zone regulations. The graphic below illustrates the three-phased approach to improving the municipal-loading-zone-management process.



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PHASES OF PROPOSED PROCESS

Phase 1: Analysis

At the local government level, stakeholders should form a local working group to identify the local needs, problems and opportunities for improving freight-movement issues in a CBD. In addition to local government planners, the business community, small-package shippers and haulers, and police officers, other public safety officials from fire stations and ambulance services should be represented.

The analysis phase should include

- Designation of a contact person to oversee the process, convene stakeholders, and facilitate ongoing communication.
- Process to begin regular meetings.
- An inventory and evaluation of 1) existing on-street and off-street LZ facilities using GIS technology, 2) policies and existing regulations, 3) effectiveness of enforcement activities, and 4) communication tools and strategies.

Phase 2: Implementation

In this phase, the findings of the inventory of facilities, analysis, and input from working-group meeting(s) should be summarized and documented as a first step towards creating a comprehensive municipal-loading-zone-management process. Implementation strategies should include the development of additional guidelines to govern design and demarcation of downtown loading zones and facilities, development and enforcement of downtown loading zone/parking regulations, development and placement of regulatory signage, and possible communication improvements via a local government website.

Phase 3: Monitoring and Evaluation

As a circular process, the implementation of strategies should be continually monitored. In addition, the working group should continue to provide feedback on ways to further optimize freight movement and regulatory practices that balance the need for safe traffic flow, delivery of goods downtown, and pedestrian mobility.

7 Key Recommendations

When designing the transportation context of a roadway, the land-use context (e.g., small CBD or core business center) to which it will be applied should be considered. Many roadway-design guidelines do not consider special planning needs associated with transportation corridors that serve as the major thoroughfare through small, historic CBDs and are constrained by existing buildings and infrastructure. An efficient transportation system serving a small CBD needs to consider infrastructure, policy, and land-use planning needs to support all modes of downtown travel, including freight movement. Variables to consider when balancing the land-use and transportation context of a CBD include last-mile freight-movement logistics, traffic volume, demand for parking vs. loading-zone spaces, and the nature of and delivery needs of commercial businesses (e.g., cash vs. credit delivery requirements, perishable goods).

The following recommendations that are based on the literature review, fieldwork, and working-group input may not be applicable in every context. Each town or city is a unique place with its own set of characteristics and challenges. However, this study provides key recommendations that can be further assessed by DelDOT and local jurisdictions to determine how smart transportation concepts can be integrated into land-use plans to foster the development of sustainable and livable communities. The recommendations are grouped into the following categories of infrastructure modification, planning and management, and policies and practices.

7.1 Infrastructure Modification

The *DelDOT Road Design Manual* recognizes that the design of each roadway project needs to be context-sensitive. Roadway design needs to encompass the functional classification of a roadway, specific design controls (e.g., anticipated level of service/design speed), geometric design, physical elements, and design environment. The manual emphasizes the need to consider, within the project development process, “existing and expected land-use patterns, growth areas, and generators of pedestrian movement” (DelDOT, pp. 10-29). However, additional guidance should be provided on how to apply context-sensitive design solutions for a downtown redevelopment, retrofit, streetscape, or revitalization project.

DelDOT should provide design strategies that reduce the aesthetic and environmental impacts of parking/loading-zone facilities, including on-street parking, surface parking lots, parking structures, and off-street loading bays and on-street loading spaces. Moreover, design standards should consider the special logistical needs that were identified by stakeholders within the working group, including the following:

- Front-in, front-out deliveries
- Avoidance of use of alleys or spaces that restrict vehicle turn-arounds
- Need for on-time deliveries, delivery of perishable goods, and need for short delivery-vehicle dwelling times
- Various delivery needs within vertical vs. horizontal markets (e.g., establish a central drop-off location for delivery/pick-up in vertical markets like Wilmington, Del.)
- Inability for small businesses, or those that operate on a cash basis, to accept off-peak deliveries

There are several topics that should be addressed either within the *DelDOT Road Design Manual* or the *DelDOT MUTCD* that can provide additional guidance to local government planners, downtown

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developers, or design professionals. For each of these topics, a comprehensive checklist should be developed to include within project plans. The checklist can serve to bring uniformity to project designs and the project-review process. Topics to address within DelDOT design manuals include

- Design guidelines for downtown building retrofit/redevelopment/revitalization projects.
 - Provide design guidelines/standards for off-street loading docks in CBDs.
 - Provide design guidelines/standards for instances when shared off-street loading facilities are warranted.
 - Provide guidelines for the use of the local site-plan-review process to ensure that development plans address loading-zone needs and design considerations.
- Design guidelines for location, design, and demarcation of on-street loading zones.
 - Provide guidelines as to where on-street loading zones should be located.
 - Provide guidelines on criteria for designing the appropriate number of on-street loading zones.
 - Provide guidelines for uniform signage and curb markings. Consider adopting a system of uniform color-coded curbs, similar to the system legislated by the California Vehicle Code, that can be further tailored by municipal regulations to meet local conditions/needs.
- Consider guidance on parking signage within *DelDOT MUTCD*.
 - Because the Manual of Uniform Traffic Control Devices (MUTCD) provides limited guidance on parking signage, and with the advent of new parking technology, there are new opportunities to manage on-street parking. DelDOT can use this opportunity to establish guidelines for parking signs that are uniform and consistent between communities (e.g., parking signs for wayfinding, pay and display stations, regulatory and restriction signs).

7.2 Planning and Management

A jurisdiction's comprehensive plan should set forth the overall vision of a vibrant and active CBD at the heart of a community that is pedestrian-oriented, accessible by many modes of transportation, and recognizes the often competing needs of various stakeholders. To develop transportation solutions that consider the specialized CBD land-use context, a local jurisdiction may need and should be encouraged to undertake a specialized planning study such as a downtown-circulation plan, downtown-parking study, a streetscape plan, or a CBD revitalization plan.

Several recommendations were made by the working group to address freight-movement issues and plan for solutions at the local level. These recommendations include

- Convene a freight-movement group(s) at the municipal level. Stakeholder participants should include local government planners, the business community, public safety officials (including police, fire, and emergency medical technicians), and small-package shippers and haulers (i.e., FedEx and UPS).
- Improve the municipal-loading-zone-management process (proposed process on p. 41).
- Establish a single point of contact at the municipal level.
- Conduct a pilot program to gather delivery-logistics information to build GIS databases to help private carriers plan for last-mile logistics (suggested jurisdiction is Wilmington, Del.).
- Develop public information tools, including the following:

- Parking Information Website—posting of parking and loading-zone regulations, information on parking/loading-zone permits, schedule of fees, and map of general parking and loading zone locations
- Information on signage/demarcation of loading-zone facilities

7.3 Policies and Practices

The concept of smart growth recognizes the need to plan for more sustainable and environmentally sound patterns of development. Smart transportation goes a step further to ensure that transportation systems are designed to reflect the character of a community and tailored to a specific land-use context (NJ DOT and PennDOT, 2008). To better manage parking and balance parking with truck loading/unloading needs, local jurisdictions should consider developing/amending policies that may include reduced minimum-parking requirements, parking maximums, area-wide parking caps, shared parking and parking districts. Two primary ways that local jurisdictions can control the supply of parking is by 1) revising local zoning ordinances to reflect local parking demand and circumstances and 2) tailor parking requirements to reflect project-specific conditions and parking/loading-zone needs.

There were several curb-management policies, identified within best practice examples of larger cities, which may be applied to Delaware municipalities:

- Sale of commercial-vehicle hangtags for use of metered parking spaces
- Designation of time-restricted “freight loading zones,” “truck only loading zones,” and/or “delivery or drop off/pick up zones”
- Color-coded curb marking of loading zones
- Curb-use priority zones within residential and commercial districts
- Commercial curbside, metered loading zones
- Variable-parking-rate structure to manage parking demand
- Consistent local enforcement of designated parking areas and loading-zone spaces
- Use of new parking technology to manage variable aspects of on-street parking and enforcement activities

8 Appendices

A. Working-Group Members

Affiliation/Interest Represented	Name and Title
Town of Middletown	
• Police Department	Lt. Edward Murray, Patrol Commander
• Planning Department	Tim De Schepper, Planning Director
Main Street Middletown	Tracy Skrobot, Main Street Manager
City of Milford	
• Planning Department	Gary Norris, City Planner
• Police Department	Sgt. Edward Huey
Downtown Milford, Inc.	Beth Durham, Executive Director
City of Newark	
• Planning Department	Maureen Feeney Roser, Assistant Planning Director
• Police Department	Lt. George Stanko, Traffic Division Commander
Downtown Newark Partnership	Joe Charma, member of Board of Directors, Chair of Design Committee
City of Wilmington	
• Department of Public Safety	Cpl. Maurice Thompson, Dept. of Public Safety
• Planning Department	Peter Besecker, Planning Department Director
• Department of Transportation	Dave Blankenship, Director of Transportation
Wilmington Renaissance Corporation	Carrie Gray, Managing Director
Main Street Wilmington	Clarence Wright, Director
Downtown Visions (Wilmington)	
• Administration	Martin Hageman, Executive Director
• Safety	Michael Maggitti, Director of Safety
• Management	George Koumpias, Manager
New Castle County	
• Planning Department	John Janowski, Planner
• Planning Department	Owen Robatino, Planner
• Planning Department	Mike Bennett, Land Use Planner
• Police Department	Captain Watson, Patrol Commander
DelDOT	Bobbi Geier, Planning Department
WILMAPCO	Dave Gula, Planner
	Dan Blevins, Planner
Kent County MPO	Jim Galvin, AICP
FedEx	Tony Conca
	Jim LaFrance
UPS	Joe Burns
	Allen Klaschus
City of Dover	
• Department of Public Safety	Lt. Steven Getek, Patrol Unit

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Affiliation/Interest Represented	Name and Title
Downtown Dover Partnership	Bill Neaton, Executive Director
City of Smyrna, Police Department	Norman Wood
Dunbar Armored Corporation	Kris Stankiewicz
SYSCO	Brian Dean
Coca-Cola	Kevin Looney
Parcels, Inc.	Sean Kennedy

Improving Freight Movement in Delaware Central Business Districts

B. December 12, 2008, Working-Group Meeting Presentation



Improving Freight Movement in Delaware CBDs

1st Working Group Meeting


Sebastian Anderka
Jason Eckley

106 Composites Manufacturing Science Laboratory
December 12, 2008

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Purpose of Study


- **Overall Aim:** formulate policy to meet future infrastructure needs of Delaware
- **Specific Project:** study issues and conflicts caused by freight movement in CBDs.
- **Project Goal:** improve freight movement within CBDs to enhance:
 - Economic sustainability
 - Pedestrian access
 - Traffic flow
 - Overall safety
- **Project Focus:** design and policy improvements

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Overview

- I. Perspectives
- II. Observed Issues
 1. Design Problems
 2. Unclear Regulations
 3. Public Safety Concerns
- III. Literature Review
 1. Design
 2. Regulations
 3. Public Safety
- IV. Discussion




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I. Perspectives

Stakeholders:
Public safety officials, planners, business community, shippers, and haulers

Questions to consider:

1. Is this a freight movement issue?
2. Does this issue directly impact me?
3. If yes, why?

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II. Observed Issues

1. Design Problems
 - a. Lack of Loading Facilities



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II. Observed Issues

1. Design Problems
 - b. State of Facilities



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II. Observed Issues

2. Unclear or No Regulations



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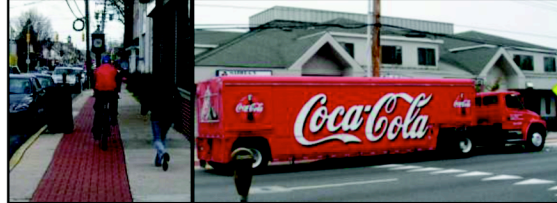
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II. Observed Issues

3. Public Safety Concerns

a. Intermodal Conflicts – Pedestrians and Bicyclists



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II. Observed Issues

3. Public Safety Concerns

a. Intermodal Conflicts – Automobiles



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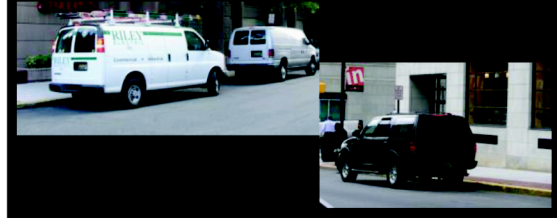
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II. Observed Issues

3. Public Safety Concerns

b. Illegal and Unauthorized Parking



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II. Observed Issues

3. Public Safety Concerns

b. Parking Issues

- Illegal double parking
- Non-delivery vehicles in alleys



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III. Literature Review

1. Design

a. Streetscape Design

- Roadway Design
- Alley Design
- Parking Spaces



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III. Literature Review

1. Design

b. Loading Facilities

- **Loading Bays**
 - Min. dimensions
 - Consider compatibility
 - Offer two sizes
 - Provide enough facilities



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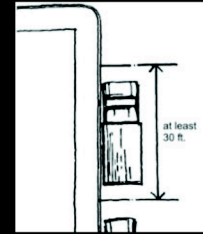
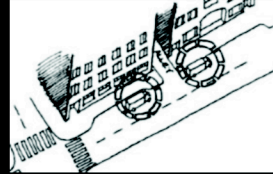


III. Literature Review

1. Design

b. Loading Facilities (cont.)

- **Loading Zones**



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III. Literature Review

2. Regulations

a. Curbside Management Strategies

- **Improve turnover**
 - Meters
 - Time restrictions
- **Optimize use**
 - Shared use of loading zones
 - Parking spaces
- **Off-peak-hour delivery**

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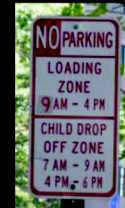
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III. Literature Review

2. Regulations

Time restrictions to improve turnover



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III. Literature Review

2. Regulations

b. Improve Signage

- **Visibility of signs and street markings**
- **Number of signs**
- **Show status of internal loading bays**



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III. Literature Review

2. Regulations

c. Policies

- **Comprehensive approach**
 - Update zoning codes
 - Require off-street loading facilities for new buildings in CBDs
 - Designate a contact person
 - Publicize single information source
 - Use GIS to map facilities

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III. Literature Review

2. Regulations

c. Policies (cont.)

- Use of fees
 - Off-peak hours incentives
 - Introduce graduated system of fee
 - Use new funds to further improve loading facilities

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III. Literature Review

3. Public Safety

a. Enforcement

- In alleys, enforce:
 - One-way use
 - No parking
- In loading zones:
 - Limit use to delivery
 - Enforce time limits



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III. Literature Review

3. Public Safety

b. Pedestrian Safety

- Convenient connections
- Accessibility
- Open lines-of-sight
- Clear signage

→ Perception of safety has influence on pedestrian and therefore business activities



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IV. Discussion

Questions?

Recommendations?

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IV. Discussion

- What are the important freight delivery issues in Delaware?
- How do you evaluate the current situation in Delaware?
- How can the differences between main streets and a larger CBD like Wilmington's be considered adequately?
- Which of the presented recommendations could be applied in Delaware?

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References

- Chatterjee, A. (2003). Planning for Urban Freight Movement. Talking Freight 19/11/03. Retrieved November 3, 2008 from http://www.ftbaa.del.gov/download/bpofrigh/planning/talkingfright11_19_03ac.pdf
- Chatterjee, A., Varma, A., Fischer, A., & Swenson, J. (2008). Curbside Delivery of Freight by Trucks in Downtowns of Small- and Medium-Sized Urban Areas. ITE JOURNAL, 78 (1), 32-42.
- District Department of Transportation, Volpe National Transportation Systems Center (2004). District of Columbia Motor Carrier Management and Threat Assessment Study, Final Report. Retrieved September 16, 2008 from <http://pdf.dco.gov/dot/cv/view/a.1240.q.029850.asp>
- Duin, J. H. R. van (2006). Chaos in urban freight policies? A comparison between Dutch cities. Retrieved November 7, 2008 from <http://www.motrans.org/multidocuments/vanDuijn.pdf> (Motrans Transportation Center, Long Beach, CA)
- Morris, A., Kornhauser, A., Kay, M. (2007). Getting the Goods Delivered in Dense Urban Areas: A Snapshot of the Last Link of the Supply Chain. Transport Research Record, 1653/1999, 34-41.

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References (cont.)

Munuzuri, J., et al. (2005). Solutions applicable by local administrations for urban logistics improvement. In: *Cities*, 22(1), 15-18.

Parsons (2004). Delaware Freight and Goods Movement Plan Technical Report. Retrieved October 16, 2008 from www.delddot.gov/information/pubs_forms/freight_plan/pdf/technical_report.pdf

Pivo, G., Carlson, D., Kitchen, M., & Bilen, D. (2002). Learning from truck drivers: Truck drivers' views on the planning and design of urban and suburban centers. In: *Journal of Architectural and Planning Research*, 19(1), 12-29.

Sonnabend, P. (2006). Logistics Innovation for the Urban Domain. BESTUFS-II Final Conference, Athens 11-13 June 2006. Retrieved September 25, 2008 from http://bestufs.net/download/conferences/Athens_June06/BESTUFS_Athens_080612_DPLsonnabend_final.pdf

San Francisco Department of Parking and Traffic (2005). San Francisco Downtown Pick-Up and Delivery. Retrieved November 7, 2008 from http://www.thwa.ida.gov/download/Doc/Free/2005ParkingStudy_10c002-16-05u.pdf

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References (cont.)

Seattle Department of Transportation (2008). 10 Best Practices in Freight Movement. 10A Freight Mobility. Seattle Urban Mobility Plan. Retrieved September 5, 2008 from

<http://www.seattle.gov/transportation/docs/ump/10%20SEATTLE%20Best%20Practices%20in%20freight%20Movement.pdf>

Thomas, D., O'Laughlin, R., Rinnan, M. (2007). Chicago Downtown Freight Study. THB 2008 Annual Meeting Paper #08-2465.

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C. Proceedings of December 12, 2008, Working-Group Meeting

Attendance

Working-Group Members: Dave Blankenship, Dan Blevins, Joe Burns, Joe Charma, Tony Conca, Tim De Schepper, Jim Galvin, Bobbi Geier, Carrie Gray, Dave Gula, Martin Hageman, Gwinneth Kaminsky, Jim LaFrance, Michael Maggitti, Lt. Edward Murray, Josh Puett, Maureen Feeney Roser, Tracy Skrobot, Cpl. Maurice Thompson, Clarence Wright

During the group working session, Ed O'Donnell provided a background on the project, introduced project team, and welcomed participants. Working group members introduced themselves and the entity that they represent. A PowerPoint presentation, "Improving Freight Movement in Delaware CBDs" was conducted by Sebastian Anderka and Jason Eckley. The group discussion followed and focused on questions posed during the PowerPoint presentation. The following is an edited summary which captures the essence of the discussion.

Cpl. Maurice Thompson (City of Wilmington, Department of Public Safety) – The human factor is a big issue with regard to parking and loading. There is the problem that driver's don't follow or adhere to signs, generally because the lack of time during the delivery; this leads to double parking. Getting operators of vehicles to adhere to rules is difficult when decisions are based on convenience.

O'Donnell – The question is whether public safety [officials] impact the issue with the carrot or stick approach.

Dave Blankenship (Director of Transportation, City of Wilmington) – We feel that we have adequate loading zones. We need to talk to carriers to understand how we can better manage use and accommodate their needs. Would the carriers be willing to adjust their practices to meet variable needs of other users? Could carriers manage their businesses in such a way to use managed loading zones? Maybe a zone could be designated to a carrier if that helps them do their business. Perhaps loading zone time windows could be auctioned off to freight carriers.

Jim LaFrance (FedEx) – City officials have to understand that we're dealing with a money-back guarantee on package delivery. There is not an option to fit our delivery times into a scheduled slot [managed by a city official] or come back at a later time to deliver. We need to satisfy customer needs and meet the guaranteed delivery time. More loading zones would provide more options and opportunities for deliveries. At certain times of the day, loading zone options are limited.

Dan Blevins (WILMAPCO) – A study was just released that provided recommendations on reducing congestion in Center City Philadelphia (see: www.planphilly.com/files/ccd%20congestion%20FINAL.pdf). It was mentioned that many private carriers factor in tickets [for illegal or double parking] as the cost of doing business downtown. One recommendation is to convert current parking lanes to "delivery only" areas and charge a fee to companies that lease the use of these parking spaces because leasing a zone might be cheaper than tickets.

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Blankenship – We need to obtain input from the freight delivery companies as to whether certain designated loading zone spaces would be used. I understand that some freight delivery vehicles don't use certain spaces (or avoid like the plague) those spaces that may lead them to be trapped or "parked in."

Joe Burns (UPS) – A safety-wise practice that we teach is for drivers not to back up because it is too unsafe due to unclear or blocked line of sight. Drivers (20 in Wilmington and 7 in Newark) are responsible for 13 – 17 stops per hour in a downtown environment. Drivers look for spaces where they can drive in frontwards and drive out frontwards. Having a user-friendly loading zone location and design that allows the driver to achieve a front-in, front-out delivery is a plus. There are many variables that come into play during a downtown delivery situation, but safety is our first concern. If our drivers can't make a delivery on their first run through, the vehicle traffic flow may be impacted if they have to attempt a second delivery in a congested area. Also, locating loading zones on corners is a problem because it forces drivers to back into an intersection.

Blankenship – Is UPS or FedEx aware of any "model cities," where innovative or best practices have been implemented that are ideal for private carriers and address congestion/public safety issues? UPS and FedEx both should post internal bulletins asking for good transportation solutions in other regions.

Tony Conca (FedEx) – We're not aware of any model cities where best practices have been implemented.

Blankenship – Enforcement of illegal parking in Wilmington has been a key to managing deliveries downtown. In Wilmington, officers ticket and give points to ensure compliance in areas where illegal or double parking is prevalent. We would prefer if we don't have to go there, but it's one way to manage problem areas. The idea is that delivery truck drivers care more about their driver's license than about tickets.

Carrie Gray (Wilmington Renaissance Corporation) – We should point out that enforcement actions are just not directed at private carriers. There are other vehicles that are illegally parked or that are impeding the flow of traffic that result in enforcement action.

Joe Charma (Downtown Newark Partnership- DNP) – As the urban environment is already built out, there may be a need to sacrifice parking spaces to create short-term loading zone areas for private carriers and others making deliveries. Something has to go.

O'Donnell – We've acknowledged that there are two different package movement activities and two different size vehicles to achieve downtown deliveries. Private, small package delivery companies like FedEx and UPS use small trucks. Delivery of goods is also being made by companies that use large tractor trailers. In Newark, Sysco regularly pulls up at 6:30 a.m. the wrong way on Main Street to unload its tractor trailer. They seem to have the delivery time and method down to a science.

Maureen Feeney Roser (City of Newark and DNP) – In Newark there are 65 restaurants that have similar food delivery needs. To get these restaurants to use the same produce companies instead of different carriers would be the ideal, but it just doesn't work that way.

Improving Freight Movement in Delaware Central Business Districts

Tim DeShepper (Town of Middletown) – Marking or de-marking “drop zones” within a Geographic Information System (GIS) layer may help meet the information needs of private carriers, like information regarding traffic and pedestrian activity. Spatial information technologies can be used by private carriers to plan for logistical needs of operations.

Burns – UPS currently uses Automatic Vehicle Locators (AVLs). [Note: AVLs can provide a vehicle’s dispatchers with immediate and up-to-date information as to the exact location of the vehicle at periodic points along the vehicle’s route.

This data is used by dispatch to evaluate the vehicle’s on-time status and make modifications to existing schedules when needed].

Dave Gula (WILMAPCO) – Parking enforcement is still a key. If there is not a dedicated effort to enforce existing loading zone restrictions, providing more loading zones or de-marking loading zone locations is useless. There needs to be enforcement of private vehicles; otherwise, trucks will not worry about parking illegally themselves.

Blevins – In Philadelphia, the plan for revenue generated by the conversion of parking spaces to leased loading zone spaces is to pay for more traffic police and parking enforcement officers.

Blankenship – One observation is that large delivery trucks park and block the line of sight of pedestrians. It is important that location of loading zones consider impact on pedestrian. It is frustrating to plan these loading zone locations and see that the line of sight and crosswalks are blocked. Is there driver safety training or do opportunistic parking spots motivate decisions by drivers?

Burns – Drivers are motivated by the fact that they must have efficient pick up and delivery of goods. To react to the Center City Philadelphia plan to ease congestion – if carriers have to lease or buy a loading zone space, the cost will be passed on to the customers. That’s the reality of doing business.

Bobbi Geier (Delaware Department of Transportation) – The recent streetscape and infrastructure work in the City of Rehoboth Beach is a study in the economics of land use. When parking spaces were being redesigned, merchants appealed for more parking spaces for customers. In many cases, when the need for loading space is weighted against metered customer parking, city officials and merchants don’t want to lose customer parking spots. The trade off is when more parking spaces are provided, there is less loading zone space. Also configured in the streetscape design was the need for crosswalks, wider walkways to meet ADA requirements, and the need to put a lot of infrastructure into a constrained area.

Blankenship – In Wilmington, there is pressure to have parking spaces in the main area of a street and loading zones at the end of the street.

O’Donnell – What about the bulb-out or cut-out design that allows a delivery truck to pull in and pull out with ease?

Burns – It’s a beautiful idea but is it physically possible in areas that are already developed and infrastructure is already in place?

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Blankenship – We’ve heard that a concern is for trucks getting parked into a cut-out space by double-parked vehicles.

Burns – I don’t believe that’s a concern for UPS drivers.

Blankenship – It’s frustrating to see a 40-ft. loading zone empty and a delivery vehicle unload right next to the empty space.

Thompson – Again, convenience seems to be the key motivator for many drivers. As long as it takes more time and effort to park in a loading zone, people will double park.

Roser – Drivers seem to be willing to gamble on whether an enforcement action will be taken against them. They’re willing to take the chance that a parking enforcement officer (PEO) will not get there in time to issue a ticket. It’s difficult for a PEO to take enforcement action when the vehicle is parked illegally only for a brief period of time.

O’Donnell – Do the small freight carriers have a sense for what percent of deliveries are late or impacted by loading zone problems?

Burns – The problem is defined in terms of costs in excess mileage and fuel wasted. It’s a matter of economics. Circling blocks is a waste of gas and mileage, and it adds to congestion and delay. It’s optimal if we can deliver on the first sweep rather than make a second attempt. We do, however, want to know if there are currently safety issues [in Delaware] downtowns. Our delivery systems were designed without knowing specific problems. We could make adjustments if we are aware of these delivery issues.

Conca – It’s in everyone’s interest to accommodate delivery vehicles. Problems related to pickups and deliveries are costly to the carriers, customers, and other downtown businesses.

Blankenship – What if there was a central drop off location and an entity (such as Downtown Visions) acted as an intermediary to make final deliveries?

LaFrance – Since the advent of 9-11, the “at stop” time has increased. Traffic and deliveries aren’t moving at the same pace as in the past. Sometimes it is necessary to sign in to have access to certain places and floors. I don’t feel that customer/tenant will buy into a centralized mail room within a particular building. If there is buy-in to this idea, the “at stop” time could be cut in half. It would be great if we could figure out a better way for carriers to do business downtown and reduce the “at stop” time. We don’t want to hear from municipalities daily, but we do want to be aware of chronic problems and expedite the delivery process. Two-way communications is essential.

Conca – I like the central drop off location/delivery idea. However, the “sell” to the client is important. It is necessary that central delivery points are sold as a measure that benefits the town and its merchants, not only FedEx/UPS.

Burns – We could use Bank of America (BoA) as a model for the central delivery idea. After 9-11, Bank of America assumed responsibility of internal distribution of goods delivered by private carriers.

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We now drop off and BoA makes internal deliveries. In Philadelphia, “walkers/helpers” are used. We drive up, drop off, then goods are hand delivered.

O'Donnell – What is the possibility of applying these concepts to small main streets.

Tracy Skrobot (Main Street Middletown) – It would be hard to apply the latter concept to a main street community. Small business owners with limited staff would have a hard time leaving their individual businesses to pick up deliveries at a central location. It would also be difficult to pick up a large volume of packages and bring it back to a store at another location.

Lt. Edward Murray (Town of Middletown) – As far as enforcement goes, having one location for delivery of goods would be ideal. If drop offs could be made at one location, and “walkers” could deliver the packages to each store, then enforcement would focus on only one location. The question is whether having a centralized drop off location and walkers is a viable concept.

Burns – This is a viable concept in Philly. For example, UPS unloads at Children’s Hospital and walkers make deliveries within CHOP all day. When a town conducts a redesign during a revitalization process, they should plan for loading zone design considerations.

Michael Maggitti (Downtown Visions) – Can you define the term “walker?”

Burns – Our walkers are UPS employees, not the employee of a business or central business district.

Blankenship – If private carriers arrange to have a business firm make all internal deliveries, is there discount in service costs? In other words, if an entity like Downtown Visions takes responsibility for making the final delivery, what is the value to private carriers for lowering the cost of doing business?

Gwinneth Kaminsky (City of Wilmington) – A related question is whether the private carrier may hand off responsibility for final delivery to an intermediary.

Marcia Scott (IPA) Also, is there an issue with the chain of custody for delivery of goods?

LaFrance – This could be a win-win situation for both the downtown businesses and private carriers. However, I think this would be most ideally suited for downtowns with vertical markets for a centralized mailroom.

O'Donnell – We also need to consider issues regarding pick up of goods.

Burns – In commercial districts, most pickups occur in the evening. There are less pickups than deliveries.

Martin Hageman (Downtown Visions) – If an intermediary party is used, they would be required to have insurance. I’m trying to understand the needs of carriers. In downtown Wilmington do most buildings have mailrooms?

Conca – Some have central mailrooms, but many handle mail delivery by floor.

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Roser – Are there any guidelines regarding the optimum number of loading zones in a central business district? Is there a formula to figure out how many we need if parking spaces are replaced by loading zones? Also, do private carriers have standards that govern optimal delivery distances from parking or loading zone areas?

Burns – In Newark, deliveries within an entire block can be achieved from one parking position. In Wilmington, we park on one block and go vertical with the use of handcars.

LaFrance – Generally, 30 minutes provides enough time unless there is a large volume of pick ups. We also use hand trucks for deliveries at vertical locations.

Maggitti – In a large city, such as Manhattan, do private carriers have a central location to off-load deliveries?

Burns – No, and we are not able to unload and make deliveries from the independent UPS stores.

Conca – There are more foot carriers in larger cities.

O'Donnell – In the recommendations that were discussed, which have the most merit to pursue (e.g. design, regulations, enforcement)? What's the practical difficulty in dealing with downtown deliveries to multiple businesses vs. one vertical business?

Conca – I think that there needs to be a diverse group of tactics to improve freight movement in downtowns. For vertical businesses, a central delivery point could work. There is also a need for communication among all stakeholders.

Charma – We need to better understand the needs of carriers and conditions for optimal delivery.

UPS & FedEx representatives concur that they will seek input on specific needs from their drivers.

Roser – The reality is that there is a difference in delivery needs among communities. In Newark, for example, morning deliveries work because the city is not a major commuter destination.

Burns – Our business model is set up for morning service to businesses and commercial districts and evening service to residential locations. The optimum objective to achieve is a design or design standards that promotes delivery vehicles to get in and out efficiently.

Roser – Was Sysco invited?

O'Donnell – The intent of the project was to focus on needs of small package delivery businesses like FedEx and UPS. We could perhaps expand the group to include businesses that make deliveries via tractor trailers.

Burns – In most downtowns, deliveries via tractor trailers are not an everyday occurrence – not the norm.

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Maggitti – The soda company trucks also impede the flow of traffic. In addition to Sysco, should we invite Coke?

Blankenship – How about armored car companies?

LaFrance – Another idea to consider is locating drop boxes (for pick ups) to loading zone areas. This could reduce the number of trips and length of “at stop” times.

Scott – Is there a need to address problems of commercial or service vehicles parked in designated loading zones?

Thompson – Chronic problems would need to be reported so that enforcement could occur.

Gray – This should be a responsibility of building owners to inform drivers of service vehicles that parking is prohibited in loading zones.

Murray – There should be disincentives for service vehicles to park in loading zone areas.

Thompson – A lot of times, this is not seen as an issue with small businesses that are anxious for the scheduled service to occur and minimize disruptions to their business.

Gula – I think that communications are important. Each community or commercial district needs to have a single point of contact/information source to provide communications and outreach on loading zone and parking issues.

A discussion ensued on technology to better manage freight movement and loading zones in downtown areas. Suggestions included the use of transponders for delivery vehicles using loading zones (similar to the EZ-Pass concept), “smart meters” that assess variable fees or limit occupancy times for shared parking spaces, gathering delivery logistics information to build GIS databases, and sharing GIS/AVL information to improve freight delivery logistics.

As a follow up to the meeting, a request was made to circulate contact information (names, affiliation, e-mail addresses, and phone numbers) of those participating. Scott informed the group that the contact information will be circulated along with a summary of meeting proceedings.

D. Feedback from UPS and FedEx on Two Follow-Up Questions

From:
Josh Puett
IE Supervisor, UPS
Hunt Valley, MD 21152
(410) 472-7108

Here are some answers to the questions posed:

1. *What are specific downtown delivery needs of drivers (both in vertical markets like Wilmington and smaller CBDs)? What do drivers feel are necessary conditions for optimal delivery and pickup?*

Our service providers require space on all 6 sides of the vehicle. So, the loading/unloading zone would have to be large enough to accommodate the package car without backing or being a target for a hit while parked. The service providers are also required to use the shortest and safest distance to the point of delivery or pickup. So, the loading/unloading zone would have to be placed in a location where the largest quantity and size of packages are being delivered. The optimal conditions for the service providers to make safe and efficient deliveries and pickups in super urban zones and CBD's would be a controlled flow of traffic and loading/unloading zones that give the service provider the best chance at making the safest and most efficient delivery as possible.

2. *Can drivers identify chronic problems impacting delivery in CBDs (such as service vehicles parked in designated loading zones)? This feedback would help alert public safety officials of the need for greater enforcement action.*

Joe would probably better suited to answer this question and provide feedback. However, I know that most service providers are very knowledgeable about their areas because they have so much experience delivering and picking up everyday. Our Service providers do provide us with feedback when traffic conditions change because it typically lengthens their day until adjustments can be made from a dispatch level. However, there are some traffic conditions that the service providers become accustomed to. When service providers have set routines based on their daily habits, not much feedback is provided in these areas unless an issue is raised from the management side.

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From:

Tony Conca, FedEx
ajconca@fedex.com

Marcia, I asked my peers across the country for some info on this subject. Below is what I received:
Hope it helps.

Midvale, Utah

Tony you probably have this in place, but the cities I am familiar with have designated freight load/unload zone by time. These are generally close to the shipping/receiving areas and are designed for quick in and out, reducing downtown traffic and potential pedestrian hazards. A second option is a temporary freight pass that resides with the truck for a designated time and date time frame. This reduces designated parking areas, allowing for greater stopping places - even just off the main street.

San Francisco

I left San Francisco in 2001, but back then they had truck only loading and unloading zones. Naturally we couldn't do anything if a car chose to park in it, but 60-70% of the time it would be open for delivery or pick up.

They identified them by color-coding the curb. Example: Red was a fire zone, Green was an open zone, and yellow was truck loading/unloading.

Phoenix, Ariz.

The only special arrangements would be at the airport and city buildings. There is a designated parking area for all delivery vehicles.

Houston, Tex.

We do have parts of some downtown Houston streets that are designated parking for pickup and delivery trucks only

Improving Freight Movement in Delaware Central Business Districts

E. April 16, 2009, Working-Group Meeting



Improving Freight Movement in Delaware CBDs

2nd Working Group Meeting


Marcia Scott
Edward O'Donnell
Sebastian Anderka

106 Composites Manufacturing Science Laboratory
April 16, 2009

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Meeting Agenda

- I. New Group Members
- II. Feedback from Freight Carriers
- III. Recap of previous Suggestions
- IV. Other Suggestions from Literature Review
- V. Proposed Process for Municipal Loading Zone Management
- VI. Applicability of Process

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New Group Members


- Kris Stankiewicz, Dunbar Armored Corporation
- Brian Dean, SYSCO
- Coca-Cola, Kevin Looney
- Parcels, Inc., Sean Kennedy

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Questions for Freight Carriers

Questions Posed:


1. What are specific downtown delivery needs of drivers (both in vertical markets like Wilmington and smaller CBDs)? What do drivers feel are necessary conditions for optimal delivery and pickup?
2. Can drivers identify chronic problems impacting delivery in CBDs?

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Feedback from UPS

Response to Question 1


- Space on 6 sides of vehicle
- Zone large enough to accommodate
- Use of shortest & safest distance to point of delivery or pickup
- Loading zone(s) located where largest quantity & size of packages are delivered
- Optimal conditions:
 - Controlled flow of traffic
 - Safe loading/unloading zones

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Feedback from UPS

Response to Question 2

- Service providers do provide feedback when traffic conditions change because it typically lengthens their day until adjustments can be made from a dispatch level
- However, there are some traffic conditions that service providers become accustomed to.
- Routines are set on a daily basis. Not much feedback provided unless an issue arises from the management side.

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Improving Freight Movement in Delaware Central Business Districts

Feedback from FedEx

Response to Question 1

- **Midvale, UT** – 1) Designated freight load/unload zone by time. 2) Temporary freight pass that resides with the truck for a designated time and date time frame.
- **San Francisco** – Truck only loading and unloading zones identified by color coding the curb. Example: **Red** was a fire zone, **Green** was an open zone, and **Yellow** was truck loading/unloading.

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Feedback from FedEx

Response to Question 1 (cont.)

- **Phoenix, AZ** – Special arrangements would be at the airport and city buildings. There is a designated parking area for all delivery vehicles.
- **Houston, TX** – Some downtown Houston streets have designated parking for pickup and delivery trucks only.

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Recap of previous Suggestions

Four important topics from first working group meeting:

1. Communication Improvements
2. Loading zones
3. Enforcement
4. Adapted strategies for large and small CBDs

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Communication Improvements

- Single contact person
- Freight delivery information document
- Regular exchange of information
- Mapping of loading zones

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Loading zones

- Universal design standards
- Time limits
- More loading zones
- Better loading zone management
- Technological improvements

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Enforcement

- Service vehicles in loading zones
- General Parking regulation enforcement
- Optimize enforcement

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Improving Freight Movement in Delaware Central Business Districts

Adapted Strategies

- Large urban areas (i.e. Wilmington)
 - Central delivery / mailroom
 - Walkers / intermediary delivery partners
 - drop boxes for package pickup
- Smaller Downtowns
 - drop boxes for package pickup

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Additional thoughts

Smaller Towns	Larger Cities
Shared use <ul style="list-style-type: none"> • Shared use of curbside • Emphasize use of smaller vehicles 	Improve turnover <ul style="list-style-type: none"> • Central delivery points and walkers • Consolidation of freight traffic Create additional facilities <ul style="list-style-type: none"> • Stronger focus on off-street loading • Redesign on-street loading zones • Add on-street loading zones

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Other Suggestions – Lit. Review

- Use tax breaks or mitigation fees as incentives to make deliveries at night or in the early morning more attractive
- Introduce multi-space meters to use curbside parking spots more efficiently after opening up some for a loading zone (also allows variable pricing)

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Multi-Space Parking Meters



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Process proposal

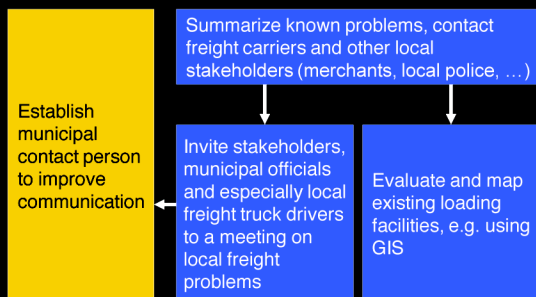
How do we design a better municipal loading zone management process?

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Step 1 - Analysis

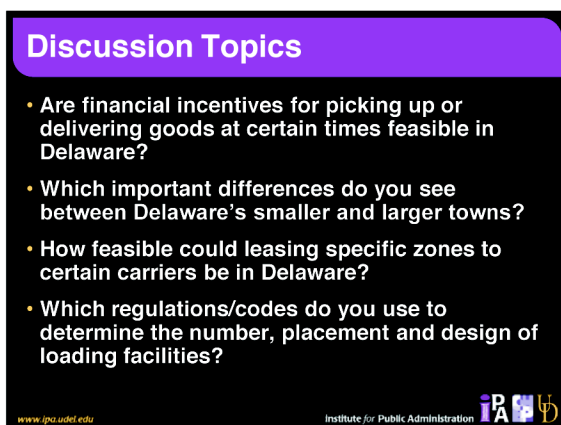
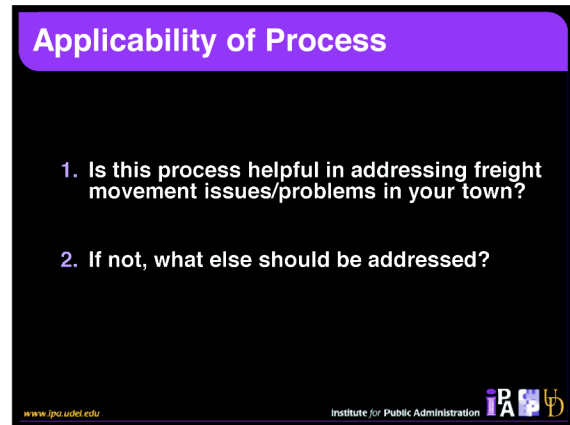
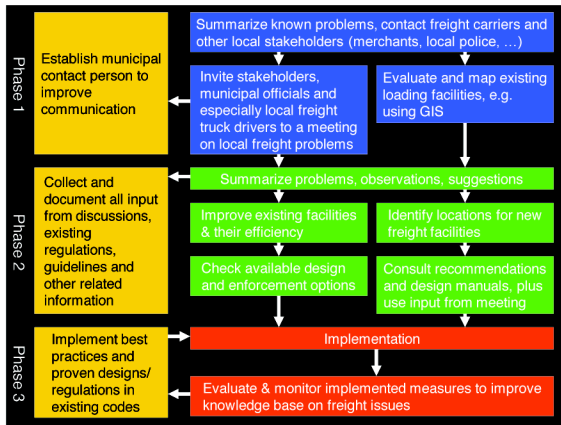
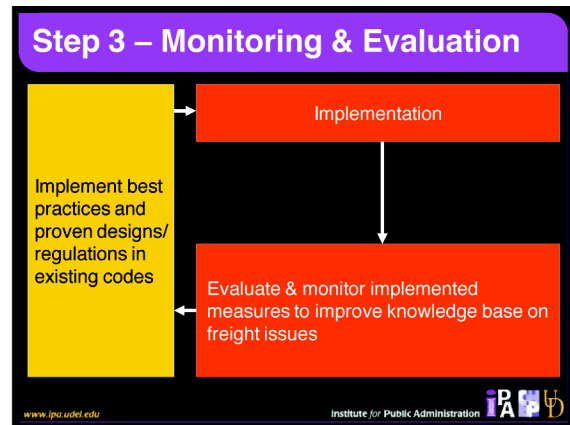
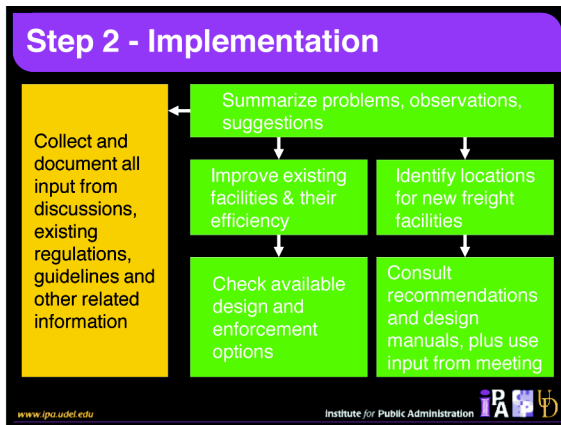


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F. Proceedings of April 16, 2009 Working Group Meeting

Attendance:

Working Group Members: Peter Besecker, Dave Blankenship, Joe Burns, Joe Charma, Tony Conca, Brian Dean, Tim DeSchepper, Maureen Feeney Roser, Jim Galvin, Bobbi Geier, Carrie Gray, Dave Gula, Sean Kennedy, George Koumpias, Kevin Looney, Bill Neaton, Owen Robatino, George Stanko
Others in Attendance: Sherri Tull (Wilmington Police Department), Elvin White (SYSCO), Brian Vincent (UPS), and Martin Wollaston (UD IPA)

Welcome and Re- Introductions – Edward O'Donnell, AICP and Policy Scientist, IPA

1. Perspectives of New Working Group Members – O'Donnell

O'Donnell first provided an overview of the project then explained what has transpired since the first working group meeting on December 12, 2008. New working group members introduced themselves and share the following perspectives related to freight movement in Delaware central business districts. The following is an edited summary, which captures the essence of the discussion.

Kris Stankiewicz, Dunbar Armored Corporation: Unable to attend due to a last minute conflict.

Brian Dean, SYSCO: One freight delivery model that is successfully being utilized by SYSCO is off-hour deliveries. For deliveries to businesses that operate on a credit basis, obtaining a key from those businesses to make off-hour deliveries has proven to be a win-win situation. Customers can have fresh products delivered prior to the business day and it is easier for SYSCO to make deliveries during off hours. Dean stated that the idea about centralized delivery points in downtowns would not work for SYSCO because it would “break the cold chain” for perishable products that are being delivered to restaurants and that need immediate refrigeration such as oysters, clams, and seafood products. Whoever receives the delivery must take responsibility for the continued quality of the product.

Kevin Looney, Coca-Cola: Ideally, Coca-Cola delivery truck drivers look for loading zone locations/spaces where they can achieve a front-in, front-out delivery. About 70% of reported accidents involving Coca-Cola trucks occur from backing up during a product delivery. Safety is the most important aspect of delivery logistics. Coca-Cola operates on a cash basis—the customer must be present at the business to accept delivery and pay for the product [therefore, the centralized delivery point idea would apply to businesses that operate on a credit basis rather than cash basis for non-perishable products]. In Delaware, two central business districts that provide the greatest challenges are Main Street, Newark and Market Street, Wilmington. Hi-rise areas have not proven to be a great concern.

Q – Is there any flexibility with regard to the size of delivery vehicles? Can Coca-Cola still preserve the efficiencies of deliveries using smaller vehicles?

Dean: Smaller trucks are being used in some delivery areas. SYSCO has made a transition to smaller (half-size) vehicles in some instances.

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Looney: Coca-Cola primarily uses tractor trailers that are specially-designed for product delivery needs.

Sean Kennedy, Parcels, Inc.: The primary challenge for our business is timely pickups from and deliveries to law firms in Wilmington. “Priority 1” service requires that the pick up and delivery is made within 15 minutes. For “Priority 1” service, we use small vans and vehicles and have no time to drive around to find a vacant parking space. Tickets are part of the cost of doing business and unfortunately, this cost is passed along to the customer.

Q – Are bike deliveries viable for your business?

Kennedy: We have 15 bikes on the streets in Wilmington. However, oversized materials, multiple materials, and high-priority materials like court documents still require our business to rely on vehicles to expedite service.

2. Feedback from Private Carriers – Marcia Scott, Associate Policy Scientist, IPA

As a follow up to the December 12, 2008 meeting, two questions were posed to UPS and FedEx:

- 1) What are specific downtown delivery needs of drivers (both in vertical markets like Wilmington and smaller CBDs)? What do drivers feel are necessary conditions for optimal delivery and pick up?
- 2) Can drivers identify chronic problems impacting delivery in CBDs?

Scott read the responses from Josh Puett of UPS and Tony Conca of FedEx, who had asked peers on the national level to respond. A copy of the feedback from UPS and FedEx was provided to attendees. The following points were stressed by UPS and FedEx:

- It is critical to provide loading zone spaces that allow front-in and front-out deliveries.
- Loading zone spaces should be located where the largest quantity and size of packages are delivered.
- Drivers are most in tune with local circumstances that may impact efficient deliveries (e.g. example of impact of VP-candidate Biden’s visit to Newark). Drivers need to be alerted (other than by word of mouth) to any changing local conditions that may impact delivery schedules. Open communications are essential.
- Interesting concepts used in other cities include temporary freight passes (Midvale, Utah) and color-coding curbs to designate open parking spaces, fire zones, and truck-only loading zones (San Francisco, Cal.)

3. Recap of Previous Suggestions – Sebastian Anderka, Graduate Research Assistant

- Communication improvements
- Loading zones
- Enforcement
- Adapted strategies for large and small CBDs

Anderka: Is leasing out loading zone spaces (i.e. Philadelphia, Pa.) a viable idea?

Dave Blankenship (City of Wilmington): Does leasing out these spaces result in less tickets?

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Dean: UPS, FedEx, Coke, Pepsi are not leasing out spaces in Philadelphia. First, the program has not been sufficiently communicated to attract our interest. Second, there don't seem to be a sufficient number of spaces to address the need.

O'Donnell: This underscores the need for someone at the municipal level to communicate with delivery companies that do business in their cities and towns. A new program can't be effective unless it's been communicated.

Blankenship: Wilmington is using Automated Vehicle Locator (AVL) technology called Nav-Trac to keep track of the movement of city vehicles/trucks. The Nav-Trac technology can be loaned to delivery companies to place in delivery trucks to obtain "bread crumbs" or a sense of truck movement within Wilmington.

Joe Burns (UPS): We presently use in-vehicle systems that are linked to a main network, to enhance delivery efficiencies.

Dean: Coke uses similar technology.

Dave Gula (WILMAPCO): In addition to providing "bread crumbs," the AVL system could provide a valuable record of when and where primary deliveries are made. This could help optimize policy decisions on locations and time restrictions for loading zones.

Blankenship: Logistics software enables an analysis of re-occurring vs. non re-occurring circumstances. It would be great if I could have a contact person(s) who would be interested in working with Wilmington on this.

Jim Galvin (Dover/Kent MPO): Is this information trackable through parking tickets?

Blankenship: That would be a time-consuming exercise. We could also go to Downtown Visions to see camera recordings of specific loading zone incidents, but that would be tedious. It's easier to analyze software data.

Gula: Enforcement seems to be the key to everything. How quickly can vehicles be towed? If loading zones are in place, violators need to be cleared quickly. In Wilmington, "booting" doesn't seem to solve the problem – the vehicle is still in place.

Blankenship: The booting program can be made more user-friendly. A code can be obtained to release the boot and clear the car from the loading zone space.

Gula: That is if the owner of the car is willing to pay to have the boot released.

Lt. George Stanko (Newark Police Department): The daytime response in Newark is 15 minutes and the nighttime response is 20 minutes. The towing company is awarded a contract by the City of Newark through a competitive bidding process every three years. The company is obligated, under the contract, to tow a vehicle to clear a driveway or blocked area. While enforcement is heavy, towing occurs only if the blocked area is deemed a public hazard.

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Dean: If one of our drivers parks in a fire zone, they are personally required to pay the fine. This helps curb the behavior and forces the driver to find another alternative (even if it means double parking).

4. Proposed Process for Municipal Loading Zone Management – Anderka

Anderka introduced a proposed municipal loading zone management process. The proposed process consists of three steps—analysis, implementation, and monitoring and evaluation. After reviewing the process, he asked the group: 1) Is this process helpful in addressing freight movement issues/problems in your town? 2) If not, what else should be addressed?

Stanko: Design and engineering of loading zone areas and spaces is an issue. For example there are some areas in Newark that are ideal for rear delivery in municipal parking lots. However, the entrances to these lots are not designed for large-vehicle delivery. A second issue is that if these large vehicles could enter these lots and make back-door deliveries, there is not enough space within the lots to accommodate turning and backing up.

O'Donnell: So issues include initial design of loading zone spaces/facilities, viability of retrofitting what's in place, or possibly using smaller vehicles to fit the space (although not possible with SYSCO or Coca-Cola). There would still need to be a dedicated loading zone space if a municipal lot was used for back-door deliveries.

Carrie Gray (Wilmington Renaissance Corporation): Before any loading zone changes are made, it would be a good idea to talk with business owners to ensure that changes don't impose any additional challenges to their operations.

O'Donnell: A first step may be to survey the need of business owners.

Peter Besecker (City of Wilmington): A single point of contact should be designated by each municipality or jurisdiction. In Wilmington, a council person formed a parking study group to review and address issues related to downtown parking. I think that some of our discussion could carry over to this group to ensure that all needs are being met.

Tim DeSchepper (Town of Middletown): We'll be looking at these same issues in Middletown. How should we begin the process to designate the number and location of loading zones?

O'Donnell: Make sure you bring both the Planning Commission and Town Council into the discussion. The key is to match the needs of the businesses with the physical needs required by delivery drivers.

Owen Robatino (New Castle County): Issues of jurisdiction over roadways may come into play for many local governments.

Bobbi Geier (DelDOT): It would be critical then to involve DelDOT in the discussion. Chronic delivery problems or loading zone issues should be identified. There needs to be cooperation and discussion among land use agencies, local governments, the law enforcement community, businesses, and the entity that has jurisdiction over the roads in that area. Carriers should be contacted and brought into the discussion to convey where they are having problems. A working group at the local level, similar to this working group, would be ideal.

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Gula: Getting a municipal working group together for a specific town will help to facilitate points of view and an understanding of delivery/business requirements. One working group meeting up front many eliminate for future meetings down the road.

O'Donnell: An ideal follow up to this working group meeting is to recommend that individual municipalities form similar work groups and hold a meeting. Individuals that need to be included are representatives of the business community, law enforcement officials, planners, transportation officials, and DelDOT if the state has jurisdiction over the roadway with freight movement issues.

Gray: I would assume that there needs to be some level of trust among businesses and freight delivery companies that make deliveries after hours and have keyed access.

Dean: To make that arrangement work there needs to be trust, a credit-paid basis for deliveries, and the delivery of non-perishable goods. The carriers need to be careful of night deliveries in certain areas.

Looney: Coca-Cola tends not to have night deliveries in urban areas due to safety concerns for drivers and the fact that we operate on a cash basis.

Maureen Feeney Roser (City of Newark): Are there financial incentives for freight carriers or businesses?

Burns: UPS charges more to businesses that require deliveries within a specific window of time. For example, Game Stop will pay more for to have time-sensitive deliveries of new, popular video games.

Roser: Are pedestrians more of an issue in vertical markets vs. smaller CBDs?

Looney: We're talking about a different delivery dynamic in Newark vs. Middletown – we're sensitive to the different delivery environments in all cities and towns.

O'Donnell: If more back door deliveries were possible, would that eliminate some of the potential conflict among pedestrians and trucks?

Burns: Many smaller business operations don't want back door deliveries because it draws them away from the front of the store. We need to identify and address chronic problems first before we make a blanket assumption that everyone wants back door deliveries.

5. Other Suggestions

- **Idea of Leased Loading-Zone Spaces**

Conca: For FedEx, the idea of leased loading zone spaces depends on cost. We'd have to balance out the costs of driver time, parking tickets, wasted fuel costs to assess whether the cost is worth the expense.

Burns: An industrial engineering study would need to be conducted to weight the costs and benefits.

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Roser: I would imagine that a leased loading zone would be difficult to police and enforce.

Anderka: One problem that we found during the course of our research that there are no guidelines for on-street loading zones. There is no information in codes about what size, placement, and number of on-street loading zones relative to the size of a commercial district.

Galvin: Should the size of an off-street loading zone be determined by city code? There are standards for new construction, but what about existing buildings?

Gula: That's an interesting point. Do businesses consult with carriers on loading zone requirements when their facility is being designed?

SYSCO, UPS, FedEx, and Coca-Cola were not aware of any pre-construction consultation on loading zones.

6. Path Forward

- Distribute summary notes of meeting to all working group members.
- Prepare a working paper to include results of the literature review and input from both working group meetings. The working paper will be disseminated on IPA's website and the link to the publication will be sent in a letter to all working group members.
- One important result from this process that will be conveyed is the need for follow up at the municipal level, including the designation of a municipal contact person.

G. References

- American Association of State Highway and Transportation Officials. (1989). *Roadside Design Guide*. Washington, D.C.: American Association of State Highway and Transportation Officials. FHWA.
- BRW. (2000). "Downtown San Antonio On-Street Management Plan. Retrieved April 29, 2009 from www.sametroplan.org/pages/Studies_Projects/Completed/DowntownSan%20Antonio_Space_Management/Downtown%20San%20Antonio.pdf
- California Vehicle Code. Section 21458. "Curb Markings." Retrieved May 27, 2009 from www.dmv.ca.gov/pubs/vctop/dl1/vc21458.htm
- Cambridge Systematics. (September 2007). *WILMAPCO Regional Freight and Goods Movement*. Retrieved October 8, 2008 from www.wilmapco.org/freight/Freight_Analysis_Final07.pdf
- Central Philadelphia Transportation Management Association (2008). *Managing Success in Center City: Reducing Congestion, Enhancing Public Spaces*
- Charette, Robert. (October 2007). "Smart Parking Systems Make it Easier to Find a Parking Space." *IEEE Spectrum*.
- Chatterjee, A., et al. (2008). Curbside Delivery of Freight by Trucks in Downtowns of Small and Medium-Sized Urban Areas. *ITE JOURNAL*, 78(1), 32-42.
- Chatterjee, A. (2004). Freight Transportation Planning for Urban Areas. *ITE Journal*, 74(12), 20-25.
- Chatterjee, A. (2003). Planning for Urban Freight Movement. *Talking Freight* 19/11/03. Retrieved November 3, 2008 from www.fhwa.dot.gov/download/hep/freightplanning/talkingfreight11_19_03ac.ppt
- Chatterjee, A. (2001). Incorporating Safety and Security Issues in Urban Transportation Planning. *Transportation Research Record*, (1777), 75-83.
- City of Atlanta. (n.d.) "Get Around Atlanta." www.atlantadowntown.com/get-around
- City of Dover, Del. Code*. (n.d.) Retrieved October 21, 2008 from www.municode.com/resources/gateway.asp?pid=13910&sid=8
- City of Grand Rapids. (n.d.) "Parking Services." Retrieved May 16, 2009 from www.grand-rapids.mi.us/index.pl?page_id=406
- City of Fargo. (n.d.) "Downtown Time Zones." Retrieved June 3, 2009 from www.cityoffargo.com/CityInfo/Parking/TimeZones/

Improving Freight Movement in Delaware Central Business Districts

City of Houston Parking Management. (n.d.) “Commercial Vehicle Loading/Unloading Zone (CVLZ) FAQs.” (n.d.) Retrieved June 3, 2009 from www.houstontx.gov/parking/cvlz.pdf

City of Madison Parking Utility. “Contractor Hangtags.” Retrieved June 4, 2009 from www.cityofmadison.com/parking/On-street.html

City of Milford, Del. Code (n.d.) Retrieved October 9, 2008 from www.ecode360.com/?custId=MI1458

City of Portland. (n.d.) “Smart Park.” Retrieved June 9, 2009 from www.portlandonline.com/smartpark/index.cfm?c=35272

City of Seattle. (n.d.) “Seattle Major Truck Streets Notification List.” Retrieved June 4, 2009 from www.cityofseattle.net/transportation/freightlist.htm

City of Seattle Department of Transportation. (n.d.) “Load Zones.” Retrieved June 4, 2009 from www.cityofseattle.net/transportation/parking/parkingload.htm

City of Wilmington, Del. Code (n.d.) Retrieved November 1, 2008 from www.municode.com/resources/gateway.asp?pid=11715&sid=8

Council of District of Columbia. (n.d.) “A Bill to Amend the Performance Parking Pilot Zone Act of 2008.” Retrieved May 26, 2009 from www.dccouncil.us/images/00001/20090220114019.pdf

County of Kent County, Delaware Code. (n.d.) Retrieved October 8, 2008 from www.ecode360.com/?custId=KE1751

County of New Castle, Delaware Code (n.d.) Retrieved October 8, 2008 from www.municode.com/Resources/gateway.asp?pid=11287&sid=8

County of Sussex County, Delaware Code (n.d.) Retrieved October 8, 2008 from www.ecode360.com/?custId=SU1223

Delaware Code (n.d.) Retrieved October 7, 2008 from <http://delcode.delaware.gov/>

DelDOT (2000). *Traffic Calming Design Manual*. Retrieved September 30, 2008 from www.deldot.gov/information/pubs_forms/manuals/traffic_calming/pdf/deldotfinal.pdf

Dover/Kent County MPO. *Dover/Kent County MPO Transportation Improvement Program, Fiscal Years 2010-2013*. Retrieved April 29, 2009 from www.doverkentmpo.org/indexmpo.html

Downtown Spokane. (November 18, 2002) “Commercial Loading Zone Decals.” Retrieved May 19, 2009 from www.downtownspokane.org/uploads/documents/parking/clzs%20and%20meter%20bags.pdf

Improving Freight Movement in Delaware Central Business Districts

- Duin, J. H. R van (2006). Chaos in Urban Freight policies? A Comparison between Dutch Cities. Retrieved November 7, 2008 from www.metrans.org/nuf/documents/vanDuin.pdf (Mettrans Transportation Center, Long Beach, CA)
- Dumbaugh, Eric. (Summer 2005). "Safe Streets, Livable Streets." *Journal of the American Planning Association*, Vol. 71, No. 3.
- Dumbaugh Eric. (August 8, 2005). *Safe Streets, Livable Streets: A Positive Approach to Urban Roadside Design*. Dissertation Presented to Georgia Institute of Technology. http://smartech.gatech.edu/bitstream/1853/7456/1/dumbaugh_eric_w_200512_phd.pdf
- Goodman, Russell. (December 1, 2005). "Whatever You Call It, Just Don't Think of Last-Mile Logistics, Last." www.supplychainbrain.com/content/headline-news/single-article/article/whatever-you-call-it-just-dont-think-of-last-mile-logistics-last
- Greensboro Department of Transportation. "Loading Zone Proposal." (August 13, 2008). www.greensboro-nc.gov/departments/GDOT/divisions/business_parking/parking/downtownparkingchanges.htm
- ICMA (2002). *Getting to Smart Growth: 100 Policies for Implementation*.
- Johnson, Mirmiran, & Thompson (July 2007). *Delaware Statewide Pedestrian Action Plan*. Retrieved October 27, 2008 from www.deldot.gov/information/projects/bike_and_ped/delaware_ped/pdfs/DE_Ped_Action_Plan.pdf
- 2007Kent County Comprehensive Plan (October 7, 2008). Retrieved November 17, 2008 from www.co.kent.de.us/Departments/Planning/Zoning/documents/AdoptedCompPlan-Full.pdf
- Lewis, A. (1997). *Alternative Urban Freight Strategies, Synthesis Report: Alternative Strategies for Urban Freight Transport Management*, Oxfordshire (UK).
- Morris, A. G., Kay, M. J., & Kornhauser, A. L. (1999). Getting the goods delivered in dense urban areas: A snapshot of the last link of the supply chain. *Transportation Research Record*, no. 1653, 1999, p. 34-41,
- Municipal Code City of Newark, Del.* (n.d.) Retrieved November 8, 2008 from www.municode.com/Resources/gateway.asp?pid=10128&sid=8
- Muñuzuri, J. S., Larrañeta, J., Onieva, L., & Cortes, P. (2005). Solutions applicable by local administrations for urban logistics improvement. *Cities*, 22(1), 15-28.
- NJ DOT and PennDOT. (March 2008). *Smart Transportation Guidebook*. www.smart-transportation.com/assets/download/Smart%20Transportation%20Guidebook.pdf
- New York City DOT. (n.d.) "Motorist: Parking a Truck or Commercial Vehicle." Retrieved June 2,

Improving Freight Movement in Delaware Central Business Districts

2009 from www.nyc.gov/html/dot/html/motorist/parktruck.shtml

Osiecki, Canning, and Scarborough (2004). *DelDOT Road Design Manual*. Retrieved October 21 from www.deldot.gov/information/pubs_forms/manuals/road_design/index.shtml

Parsons. (June 2004). *Delaware Freight and Goods Movement Plan Technical Report*. Prepared for DelDOT. Retrieved May 12, 2009 from www.deldot.gov/information/pubs_forms/freight_plan/pdf/technical_report.pdf

Pivo, Gary, Daniel Carlson, Matthew Kitchen, et al. (2002). Learning from truckers: Truck drivers' views on the planning and design of urban and suburban centers. *Journal of Planning Literature*, 17(1), 85-168.

Seattle Department of Transportation (2008). 10 Best Practices in Freight Movement, 10A Freight Mobility. Seattle Urban Mobility Plan. Retrieved September 5, 2008 from www.seattle.gov/transportation/docs/ump/10%20SEATTLE%20Best%20Practices%20in%20Freight%20Movement.pdf

Shoup, Donald. (2007). "Cruising for Parking." *Access* 30 (2007): 16-22. Retrieved March 5, 2009 from www.uctc.net/access/30/Access%2030%20-%2004%20-%20Crusing%20for%20Parking.pdf

Shoup, Donald. (2005). *The High Cost of Free Parking*. American Planning Association.

" 'Smart' Parking Meters Catching on Across U.S." (February 23, 2009). USA Today. Retrieved February 26, 2009 from www.usatoday.com/tech/news/techinnovations/2009-02-23-smartmeters_N.htm.

Spinak, Chiu, Casalegno. (July 2008). "Sustainable Innovation Inventory." Retrieved October 20, 2008 from www.connectedurbandevelopment.org/pdf/sust_ii/sfparking.pdf

Sonnabend, P. (2008). Logistics Innovation for the Urban Domain. BESTUFS-II Final Conference, Athens 11-13 June 2008. Retrieved September 25, 2008 from http://bestufs.net/download/conferences/Athens_June08/BESTUFS_Athens_080612_DHLsonnabend_final.pdf.

Thomas, D., O'Laughlin, R., Rinnan, M. (2007). Chicago Downtown Freight Study. TRB 2008 Annual Meeting Paper #08-2465.

Town of Smyrna, Del. Code (n.d.) Retrieved October 30, 2008 from www.municode.com/resources/gateway.asp?pid=12853&sid=8

US DOT (1995). Characteristics of Urban Freight Systems, Report #DOT-T-96-22

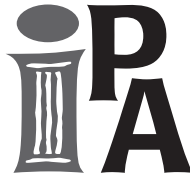
US DOT (2003). *Manual on Traffic Control Devices*. Retrieved October 20, 2008 from http://mutcd.fhwa.dot.gov/pdfs/2003r1r2/pdf_index.htm

Improving Freight Movement in Delaware Central Business Districts

Visser, Binsbergen, and Nemoto (July 1999). "Urban Freight Transport Policy and Planning." Paper for First International Symposium on City Logistics.

Volpe National Transportation Systems Center, District Department of Transportation (2004). *District of Columbia Motor Carrier Management and Threat Assessment Study, Final Report*. Retrieved September 16, 2008 from <http://ddot.dc.gov/ddot/cwp/view,a,1249,q,609850.asp>

Walter (2001). Commercial Developments Need Loading Spaces – But How Many? What size? *ITE Journal*, 71(5), 46-51.

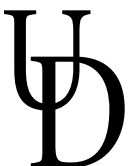


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