

## Combined Notes from Roundtable Transcript, Roundtable Chat Comments and then run through ChatGPT (which added content)

### Sandra

Sandra Rothbard, founder of Freight Matters in Atlanta, is an urban planning expert with extensive experience in NYC's freight and waste management sectors. She has worked on NYC cargo bike projects and contributed to the Augusta, Georgia Regional Transportation Study. Her career began in the Mayor's Office of Long-Term Planning and Sustainability, where she focused on the solid waste section of PlaNYC, sparking her interest in freight and waste management as vital to business, the environment, housing, and safety.

PlaNYC, launched by Mayor Bloomberg in 2007, aimed to prepare NYC for population growth, economic resilience, and climate action. Covering ten key areas—including Housing, Transportation, Energy, and Solid Waste—it provided a framework for sustainability. Rothbard views it as a major step forward and stresses the importance of documenting goals for measurable progress.

Currently, Rothbard collaborates with nonprofits, municipalities, and private companies to address last-mile delivery challenges. She emphasizes that while private funding is valuable, public-sector involvement is crucial since city governments regulate curbs and industrial zones, directly influencing freight operations.

With over 90% of U.S. trucking fleets consisting of small businesses with fewer than five trucks, she highlights the need for public funding to help them transition to cleaner, more efficient vehicles. Public-private collaboration remains key to solving urban freight challenges sustainably.

### Participants who commented, including in chat.

Justin Ryder, Clare Mifflin, Robyn Marquis, Haggai Davis, Catherine Elliot, Catherine Ponte, Jacob Kenney.

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## Launch of Citi Bike and SBS: Lessons for Future Initiatives

New transportation projects like Citi Bike and Select Bus Service (SBS) require overcoming logistical, public, and political challenges.

### Citi Bike Launch

- **Operational Challenges:** Delayed due to software issues and Hurricane Sandy damage.
- **Public Opposition:** Concerns over lost parking led to adjustments in station placements.

## SBS Implementation

- **Community Resistance:** Pushback over traffic changes and parking loss required ongoing dialogue.
- **Operational Adjustments:** Dedicated bus lanes and optimized stop locations had to balance rider and business needs.

## Key Takeaways for Future Projects

- **Comprehensive Planning & Flexibility:** Expect setbacks and adapt as needed.
- **Stakeholder Engagement:** Proactive communication and involvement ease implementation.
- **Infrastructure & Maintenance:** Durable equipment, maintenance schedules, and responsive service ensure long-term success.

By applying these lessons, future transportation projects can better navigate urban complexities.

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## FiDi: Reimagining a Historic District

The Financial District (FiDi), founded as New Amsterdam in 1624, has evolved into a mixed-use neighborhood. With rising office vacancies, efforts focus on revitalization—creating cargo micro-hubs, expanding bike-share infrastructure, and enhancing waterways. The goal: transform FiDi into a modern, sustainable "city of the future" while preserving its history.

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## Urban Freight Funding Challenges

NYC's freight sector faces funding uncertainty due to potential federal cuts. The MTA has already slashed \$16.5 billion from its capital plan due to congestion pricing delays.

- The city's Federal Infrastructure Funding Task Force secured \$2.3 billion in grants, but inflation has eroded \$4.4 billion of state spending power, impacting the \$33 billion DOT Capital Plan.
- With 90% of U.S. trucking fleets being small businesses, public funding is crucial to support clean vehicle transitions.
- NYC DOT's Urban Freight Lab, backed by a \$5.6M USDOT RAISE grant, is developing zero-emission freight solutions.
- The MTA's \$68.4B capital plan request has sparked funding debates, underscoring the need for state-federal collaboration.

Public-private partnerships remain essential for sustainable freight solutions.

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## Congestion Pricing: Uncertain Future

NYC's congestion pricing program, launched on January 5, 2025, was expected to generate \$1B annually for MTA improvements via a \$9 toll below 60th Street. However, the Trump administration withdrew federal approval, citing financial burdens on working-class Americans and small businesses.

- Governor Hochul met with President Trump to defend the program, citing a 9% traffic reduction in Manhattan.
- Without congestion pricing, the MTA faces a \$16.5B shortfall, delaying subway expansions and essential upgrades.
- Alternative funding options—state reallocations, tax hikes, or federal aid—may face political resistance.

## Freight

### General

Urban freight in NYC faces challenges as major companies prefer proprietary delivery services for brand control. Third-party logistics providers (3PLs) help optimize last-mile deliveries through shipment consolidation and specialized packaging.

Incentive zoning allows developers to receive benefits like increased building density in exchange for public amenities. NYC, for example, grants additional floor area to developers who incorporate public spaces. However, many new buildings still lack adequate facilities, leading to overwhelmed mailrooms—highlighting the need for better design standards to accommodate growing delivery volumes.

Collaboration between the public and private sectors is essential. While personal vehicle charging infrastructure receives significant attention, similar support is needed for greening freight fleets. Over 90% of U.S. trucking fleets are small businesses with fewer than five trucks, yet funding for clean vehicle transitions is limited. Programs like the **New York Truck Voucher Incentive Program (NYTVIP)** provide financial assistance for adopting zero-emission trucks.

Municipalities play a key role in freight operations through truck route regulations and industrial business zones. Increased public funding and policy initiatives are necessary to advance sustainable urban freight management.

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## Expanding Capacity

### Blue Highway & Rail Integration

Spain is testing freight deliveries via trains and metros during off-peak hours—an approach that could work in NYC with MTA buy-in. The challenge lies in efficiently bridging the gap between train stops and final delivery destinations.

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## Truck Parking & Delivery

Truck freight is a critical part of NYC's logistics, involving multiple steps:

- **Shipment Preparation:** Cargo is assessed for dimensions, weight, and compliance.
- **Shipping Methods:**
  - **Full Truckload (FTL):** Direct, large-volume shipments.
  - **Less Than Truckload (LTL):** Cost-efficient consolidation of smaller shipments.
- **Transportation Phases:**
  - **Pickup & Delivery:** Goods are collected and delivered.
  - **Line Haul:** Long-distance transport.
  - **Unloading & Inspection:** Final checks upon arrival.

Advancements in technology are improving efficiency. Companies like **Gatik** are developing autonomous trucks for medium-distance deliveries, aiming to enhance safety and reduce costs.

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## Off-Hour Deliveries

The **NYC DOT Off-Hour Deliveries program** encourages businesses to shift deliveries between **7 p.m. and 6 a.m.** to reduce congestion and double-parking. Financial incentives support businesses in making this transition, including installing **keyless entry systems** for secure nighttime deliveries.

*Robyn Marquis: Sandra and I worked on the original off-hour delivery pilot! It was such a 'sexy' topic that I focused my dissertation on truck parking behavior, later cited in a Ph.D. dissertation by Haggai Davis of Arcadis.*

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## Cleaner Trucks & Cargo Bikes

- **NYC Clean Trucks Program:** Supports adoption of zero-emission freight vehicles.
- **International Models:** Positive responses to clean truck programs align with global trends.
- **Micro Cargo Bikes:** Growing in NYC but may face resistance from the existing bike community.

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## Last-Mile Challenges

The last mile is the most expensive segment due to labor costs, parking fees, and fines. Some companies absorb these fines as part of doing business, making it crucial to implement cost-effective alternatives.

## DOT Micro Cargo Hubs

The **NYC Department of Transportation (NYC DOT)** is developing a microhub system to improve urban freight logistics. These hubs serve as localized distribution centers where large delivery vehicles transfer goods to **smaller, eco-friendly transport** modes like cargo bikes and electric vans, enhancing last-mile efficiency.

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### NYC DOT's Microhub Pilot Program

- **Phase 1 (Summer/Fall 2023):** Up to **20 pilot microhub sites** launched across NYC, testing curbside and off-street locations.
  - **Phase 2 (Summer/Fall 2024):** Expansion with additional amenities and regulatory adjustments to **support sustainable deliveries**.
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### Collaborative Efforts & Design Innovations

The **American Institute of Architects New York Chapter (AIANY)** released *Delivering the Goods: NYC Urban Freight in the Age of E-Commerce*, outlining **design and policy solutions** for integrating microhubs into the city's infrastructure.

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### Multi-Use Microhubs: Expanding Potential

Beyond freight, microhubs could incorporate:

- **Waste Management:** Streamlining sanitation services.
- **Shared Mobility:** Docking stations for bikes and scooters.
- **Public Amenities:** Seating areas, restrooms, and community spaces.

Implementing multi-use hubs requires strategic planning and **public-private collaboration** to address spatial and operational constraints.

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### Private Sector Participation

Private-sector involvement is crucial. **Utilizing private properties** for microhubs can **reduce pressure on public space** while enabling innovative solutions tailored to

neighborhood needs. Collaborations with businesses can **support cargo bike-sharing programs**, making last-mile deliveries more efficient without significant capital investment.

**NYC DOT's microhub system represents a forward-thinking approach to urban freight.** With multi-functional designs and public-private partnerships, these hubs could **significantly improve NYC's delivery infrastructure.**

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## Lockers: Enhancing Urban Delivery Efficiency

Launching new urban initiatives—like **bike-sharing and smart lockers**—requires overcoming **logistical hurdles, public engagement, and unexpected challenges.**

- **Citi Bike & SBS Rollouts:** Required citywide staff coordination, underscoring the need for **cross-departmental collaboration.**
- **Parcel Pending Lockers:** NYC DOT's **LockerNYC program** aims to **reduce package theft and delivery congestion** through smart locker installations.

Unforeseen events, such as Hurricane Sandy disrupting Citi Bike's launch, highlight the importance of **contingency planning in urban infrastructure projects.**

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## Air Quality & Policy Engagement

*Robyn Marquis: "For anyone local who may want to testify in person or submit comments, here's info on a hearing for NYC's Indirect Source Rule."*

[!\[\]\(e1d6102fe77919492c04879c8450f1f5\_img.jpg\) NYC Indirect Source Rule Hearing](#)

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## Global Innovations in Urban Freight

### NYC: Microhubs & Cargo Bikes

NYC DOT is partnering with companies like **DutchX**, using electric cargo bikes for **zero-emission deliveries**, reducing congestion and emissions.

### Switzerland: Carvelo & Smargo

- **Carvelo: E-cargo bike-sharing in 100+ cities**, allowing hourly rentals for transporting goods up to 100 kg.
- **Smargo: Electric micro-vans** for short-distance transport, supporting businesses with **event logistics and waste disposal.**

## Madrid: Freight via Metro

The *Última Milla* pilot program integrates freight transport into Madrid's **metro system**, using off-peak hours to deliver parcels. This initiative **reduces road congestion and emissions**, eliminating up to **5,000 daily surface deliveries**.

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## Rethinking Last-Mile Logistics

- **Decentralized Delivery Models:** A logistics system where multiple companies handle packages within their respective delivery regions could **empower small cargo bike operators** and reduce reliance on major delivery firms.
- **Cost Considerations:** The last mile is the **most expensive segment** due to **parking fees, labor costs, and fines**, which many companies **accept as a cost of doing business**.

Reworking urban freight logistics can shift delivery costs and efficiency in favor of smaller, more sustainable operators.

## Critical Mass of Uses / Urban Uses

Urban micro-hubs are emerging as a key strategy for addressing **last-mile delivery challenges** in dense cities. These localized logistics centers consolidate goods and **dispatch them via cargo bikes and electric vehicles**, reducing congestion and emissions.

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## European Initiatives in Micro-Hubs

- **Barcelona:** Identified **1,000+ potential sites** for parcel delivery, integrating hubs into **public transport stations, markets, and shopping centers**.
  - **Copenhagen:** Uses **shared transport facilities** as micro-hubs, employing **real-time logistics data** to optimize deliveries.
  - **London:** Repurposing **underutilized commercial spaces** into urban logistics hubs for efficient parcel sorting and delivery.
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## Challenges & Considerations

While micro-hubs offer **logistical and environmental benefits**, urban planners must **balance innovation with livability**, addressing concerns such as **space constraints, noise, and retail diversity**.

## Dark Stores Debate

Retail spaces exclusively dedicated to **online order fulfillment**—often called *dark stores*—have sparked concerns over:

- **Increased noise & congestion** from delivery activities.
  - **Reduced street-level retail diversity**, potentially diminishing urban vibrancy.
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## Balancing Innovation & Urban Livability

To ensure micro-hubs enhance urban life rather than disrupt it, several strategies can be implemented:

- **Co-Location of Services:** Integrating **shared mobility options, parcel lockers, and waste collection** into single hubs to maximize efficiency and community benefits.
  - **Adaptive Reuse of Vacant Properties:** Repurposing empty storefronts as micro-hubs to **revitalize high-vacancy areas** while maintaining street-level engagement.
  - **Community Engagement:** Involving **residents in planning** ensures hubs **serve neighborhood needs** while preserving quality of life.
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## Legislative Considerations

Supportive policies play a crucial role in successfully integrating micro-hubs into urban areas.

- **New York City's Microhub Zones:** A **three-year pilot program** introduced on-street **Microhub Zones** in areas like the Upper West Side, Greenpoint, and Clinton Hill. These **designated curb spaces** allow truck operators to transfer goods to **e-cargo bikes and electric vans** for the final leg of delivery.
  - **European Regulations:** Many **urban planning laws restrict micro-hubs in residential areas** due to their classification as **industrial use**. There are growing calls for **regulatory adjustments** to allow logistics hubs within **residential zones** while balancing efficiency with community concerns.
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## Catherine Elliot (Ebikecity) on Micro Delivery Vehicles

*"I think e-micro trucks and electric cargo bikes are the missing link in U.S. cities. Keep the hubs outside the cities with bigger trucks stationed there, then use smaller vehicles for last-mile deliveries. If deliveries happen outside of peak hours, we remove a significant percentage of freight traffic. The advantage of micro delivery vehicles is that they fit within pedestrianized areas. Dijon, for example, has retractable bollards and many cargo bikes. It's unfortunate that more policy doesn't encourage this model."*



*"Pedestrianized streets are a game changer for quality of life. At the end of the day, we need to ask: Are big trucks 'fit for purpose' in increasingly dense cities? Paris raised parking fees for SUVs because they don't belong in urban areas—perhaps the same approach should apply to oversized delivery trucks."*

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## Urban Micro-Hubs: The Future of Sustainable Logistics

Micro-hubs offer a **sustainable, scalable solution** for urban freight. However, **careful planning, public-private collaboration, and adaptive regulations** are essential to:

- **Reduce emissions & congestion.**
- **Support small-scale, last-mile delivery models.**
- **Maintain urban vibrancy while integrating logistics into city infrastructure.**

## Waste Management & Urban Sanitation

New York City is advancing **waste management reforms** to improve sanitation and reduce environmental impact.

- **Rodent-Proof Trash Bins:** As of **November 12, 2024**, all **residential buildings with 1-9 units** must use **secure bins (55 gallons or less)** to curb litter and deter pests.
- **Extended Producer Responsibility (EPR):** The city is considering legislation to shift **packaging waste management** from municipalities to producers. The **Packaging Reduction and Recycling Infrastructure Act**—which mandates **packaging reduction, improved recyclability, and industry-funded recycling programs**—passed the state Senate but stalled in the Assembly.

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## Integrating Waste & Delivery Logistics

A **coordinated approach** to waste and freight infrastructure can **streamline urban operations**:

- **Microhub & Waste Collection Integration:** Locating **reverse vending machines for recyclables** within **micro-distribution hubs** optimizes logistics and supports a **circular economy**.
- **Public-Private Collaboration:** The **Department of Sanitation (DSNY)**, **transportation agencies, and private sector partners** can work together to design infrastructure that accommodates both **delivery services and waste collection**, reducing street congestion.

*Clare Mifflin (Center for Zero Waste Design):*

*"DSNY's plan to place large 'empire bins' permanently on the street won't work in the Financial District. This is the perfect place to reduce waste, expand*

*take-back programs through EPR, and integrate waste collection into microhubs."*

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## **Innovative Waste Solutions**

*Robyn Marquis (NYSERDA):*

*"A NYSERDA-funded study explored pneumatic waste collection along the High Line. Researchers proposed repurposing former waste collection spaces into microhubs—a great concept but costly!"*

*Clare Mifflin (Zero Waste Design Guidelines):*

*"The High Line project wasn't too expensive; it would have paid for itself by reducing waste collection costs. The real issue was the Parks Department opposing waste systems beneath the High Line."*

## **Urban Waste & Sanitation Reform: Next Steps**

- **Expand circular waste systems** by integrating recycling infrastructure into **microhubs**.
  - **Enhance waste collection efficiency** through **pneumatic systems and strategic bin placement**.
  - **Improve public toilet access for delivery workers and sanitation crews**, aligning with global best practices.
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## **Public Restrooms: A Critical Urban Need**

Access to **public toilets** is a major issue for **delivery workers, taxi drivers, and waste collectors**—especially evident during lockdowns when facilities were scarce.

- **NYC Taxi & Delivery Driver Advocacy:** Cabbies have lobbied for **parking placards** to allow quick restroom stops without fines.
- **European Models:** Many European cities provide **public toilets**, though some require payment, creating access barriers.

*Clare Mifflin (Center for Zero Waste Design):*

*"Public toilets for delivery workers and waste pickers are essential. Let's also add water fountains and bottle fillers—like in Paris."*

*Catherine Elliot:*

*"Some free toilets exist, but they're often repulsive. A clean, paid toilet for €1 is preferable."*

Catherine Ponte (NYC DOT):

"Toilets are challenging to site, but NYC has a program in place: [NYC Automatic Public Toilets](#)."

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## Bike & Shared Services, Including Cargo Bike Share

Expanding **shared cargo bike systems** could significantly benefit **local businesses in NYC**, providing a sustainable alternative for transporting goods.

*"People want to drive, take their kids to school, or do grocery runs. But shared cargo bike systems for local businesses—especially in cities like NYC—would make a huge difference."*

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## Global Models in Cargo Bike Sharing

- **Switzerland:** *Carvelo* offers a **cargo bike-sharing service**, allowing users to rent e-cargo bikes for urban transport. Their new **micro-truck service, Smargo**, is highly popular.
    - [Carvelo Cargo Bike Share](#)
    - [Smargo Micro-Trucks](#)
  - **Zurich:** A **cargo bike and trailer loan program** is being trialed at **hardware stores and supermarkets**. However, infrastructure limitations—such as **bike lanes being 3 feet wide while EU pallets are larger**—pose challenges.
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## NYC's Investment in Shared Mobility

- **Citi Bike's Expansion:** Investment in **bike-share systems** has grown, partially due to reinvestment requirements under **Community Reinvestment Act (CRA) funding**.

*Robyn Marquis (CALSTART): "Citi Bike's investment has been great, but early funding came from NY Green Bank and was tied to CRA requirements."*

- **Cargo Bike Trials in Retail:** There is potential for **U.S. grocery stores and home improvement retailers** to **pilot cargo bike and trailer rental programs**, similar to Zurich's approach.
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## Challenges & Considerations

- **Infrastructure Limitations:** Many cargo bikes require **wider lanes** than what's currently available in cities.

- **Logistical Challenges:** Ensuring **dock locations, rental costs, and vehicle sizes** meet business and consumer needs.
  - **Policy & Incentives:** Encouraging **retailers and logistics providers** to incorporate cargo bike-sharing into last-mile deliveries.
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## Expanding Cargo Bike Use in NYC

- **Encourage local businesses** to adopt **shared cargo bikes** for deliveries.
- **Pilot cargo bike-sharing programs** at **supermarkets, home improvement stores, and urban microhubs.**
- **Improve bike lane infrastructure** to accommodate **wider cargo bikes and trailers.**

## Adaptive Reuse in Private Sector Buildings

### Challenges of Office-to-Residential Conversions

Converting office buildings into **residential spaces** presents **major structural and financial hurdles:**

- **Plumbing Limitations:** Offices typically have **centralized restrooms**, requiring **extensive retrofitting** to create individual bathrooms—an **expensive and complex** process.
  - **Deep Floor Plans:** Many office buildings have **large, windowless interiors**, making it difficult to provide **adequate natural light** for residential units without major structural changes.
  - **Economic Feasibility:** Due to these challenges, **many conversions become cost-prohibitive.** (*Sources: CBIZ, CBCNY*)
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## Urban Logistics Hubs as a Viable Alternative

Rather than forcing difficult office-to-residential transitions, **repurposing office buildings for urban logistics hubs** offers a **practical and scalable solution:**

- **Utilizes Existing Infrastructure:** Office buildings are well-suited for **warehousing, micro-distribution centers, and freight consolidation hubs** without requiring **extensive plumbing or daylight modifications.**
  - **Addresses Urban Logistics Demands:** NYC's growing e-commerce sector **needs last-mile distribution space**, and **vacant office buildings could fill this gap.**
  - **Supports Sustainable Urban Development:** Reduces **commercial vacancies**, repurposes existing structures, and **minimizes the need for new warehouse construction.**
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## Strategic Benefits of Office-to-Logistics Conversion

- **Less Disruptive & Costly than Residential Conversion.**
- **Supports Sustainable Freight Solutions** by integrating **last-mile logistics** into dense urban areas.
- **Reduces Commercial Vacancy Rates**, revitalizing underutilized spaces.

Repurposing vacant office buildings as logistics hubs is a forward-thinking solution that enhances urban efficiency while supporting sustainable development.

## Other Planning Topics

### Pedestrianized Zones & Shared Streets

NYC is exploring **pedestrianized zones and shared streets** to enhance urban livability. These designs prioritize **foot traffic and community spaces** while requiring strategic solutions for **essential deliveries**:

- **Designated Delivery Windows** to minimize conflicts with pedestrian activity.
- **Retractable Bollards** for controlled vehicle access.
- **Smaller, Eco-Friendly Delivery Vehicles** to safely operate in pedestrian areas.

*Robyn Marquis :*

*"Alison Conway developed freight-accommodating design guidelines for Complete Streets. Some modifications for bike/ped access caused larger vehicles to get stuck in intersections."*

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### Complete Streets & Freight Considerations

The **Complete Streets initiative** ensures roads accommodate **all users**—pedestrians, cyclists, motorists, and freight carriers. Proper design is key to preventing issues like **double-parking**, which blocks bus stops and curb access.

Key solutions:

- **Dedicated Loading Zones** for trucks and deliveries.
- **Better Bike Lane Design** to maintain safety without impeding logistics.
- **Crosswalk Bulb-Outs & Neck-Downs** to shorten pedestrian crossings while ensuring clear truck routes.

*"Complete Streets are often incomplete when it comes to freight. If we want safer roads, we must ensure trucks have dedicated curb spaces." - unidentified.*

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### Repurposing Vacant Commercial Spaces

With increasing office vacancies—particularly in **FiDi**—**repurposing commercial buildings for logistics hubs** presents a viable alternative to traditional office-to-residential conversions.

- **Urban Distribution Centers:** Utilizing central building spaces for **last-mile logistics** optimizes real estate and supports efficient goods movement.
- **Mixed-Use Activation:** Ground-floor retail and public spaces can **maintain street-level vibrancy** while integrating logistics operations.

*Clare Mifflin: "Converting offices to co-living spaces with centralized plumbing makes more sense than full residential conversions."*

[🔗 Five Borough Housing Pilot](#)

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## Urban Agriculture: Feasibility & Best Uses

- **High-Cost Barriers:** Indoor urban agriculture is **financially unsustainable** in high-rent areas like FiDi.
- **Education-Focused Initiatives:** Greenhouses **in schools** provide hands-on learning opportunities.
- **Community Gardens & Rooftop Farms:** More viable for **local food production** and green infrastructure.

*Clare Mifflin:*

*"Urban ag inside buildings is too expensive for FiDi. Even Gotham Greens' Whole Foods greenhouse in Gowanus struggled financially. However, rooftop farms, school greenhouses, and community gardens work well."*

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## Urban Planning Takeaways for NYC

- **Balance pedestrian zones & freight access** with strategic **loading zones & vehicle restrictions**.
- **Ensure Complete Streets accommodate all users**, including **trucks and emergency vehicles**.
- **Convert vacant office buildings into logistics hubs** while preserving street-level activation.
- **Support urban agriculture where feasible**, focusing on **schools & community gardens** over high-cost indoor models.

💡 **NYC's urban planning strategies must integrate logistics, sustainability, and livability to create a resilient and efficient city.** 🚀🏙️

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## Extra...

*From Robyn Marquis: There is an opportunity for the ISR to include multimodal compliance pathways, not just truck replacements as in South Coast.*

This statement suggests that the **Indirect Source Rule (ISR)** could adopt a **broader, multimodal approach** to compliance, rather than focusing solely on **truck replacements**—as seen in the **South Coast Air Quality Management District (SCAQMD)** in California.

## Breaking it Down:

- **ISR (Indirect Source Rule):** A regulatory measure that aims to reduce emissions from facilities that generate significant transportation-related pollution (e.g., warehouses, ports, logistics hubs).
- **South Coast Model:** The ISR in **California's South Coast region** primarily emphasizes **replacing diesel trucks with cleaner alternatives** (e.g., electric or hydrogen-powered trucks).
- **Multimodal Compliance Pathways:** Instead of just replacing trucks, compliance could include **other strategies**, such as:
  - **Rail & Waterborne Freight:** Encouraging a shift from trucks to rail or maritime transport.
  - **Cargo Bikes & E-Vans:** Promoting last-mile delivery via **electric cargo bikes or smaller EVs** in urban areas.
  - **Off-Peak Deliveries:** Reducing congestion and emissions by shifting deliveries to **non-peak hours**.
  - **On-Site Renewable Energy & Charging:** Warehouses and distribution centers could generate **solar power for charging** electric delivery vehicles.

## Why It Matters:

- Expanding compliance options could make ISR more **flexible and cost-effective** for businesses.
- A **multimodal approach** could **further reduce emissions** by **diversifying** how goods are moved.
- It **aligns with sustainable urban logistics** by integrating **rail, micro-mobility, and cleaner energy solutions** into freight operations.

**Takeaway:** Instead of limiting ISR compliance to just truck upgrades (as in South Coast), policymakers could incorporate **multiple freight and logistics strategies** to achieve emissions reductions.

