ISSUES IDENTIFIED AND LESSONS LEARNED FROM NCFRP 24 CASE STUDIES

Introduction

The NCFRP 24 research team produced six case studies to illustrate examples of dealing with actual or potential conflicts between freight and other land uses. These real world examples provide a unique contribution to the understanding of the variety of freight preservation issues that have been encountered around the country and the complex nature of solutions to these issues. Although each case study was borne out of particular geographic and historic contexts, the purpose of this illustration is to demonstrate potentially transferable solutions that have been undertaken around the United States. Some case studies focused on a specific infrastructure asset to be preserved, while others involved comprehensive plans governing a broader area.

TABLE 1
NCFRP 24 CASE STUDIES

Case Study	Mode	Government Level
Staten Island Railroad	Rail, Port	State, Regional, Local
Baltimore, MD Maritime Industrial Zoning Overlay District	Port	State, Local
Portland, OR, Guilds Lake Industrial Sanctuary District	Waterway, Rail, Trucking	Local
Joliet Arsenal, IL Redevelopment	Intermodal - Rail, Trucking	Federal, State, Regional, Local
Norfolk Southern, Austell GA Terminal Relocation	Intermodal - Rail, Trucking	Regional, Local
Atlanta Regional Freight Mobility Plan	Rail, Trucking, Air	Regional, Local

From these case studies, surveys, and other research conducted by the project team, a number of underlying causes of conflict were identified, as were process improvements for preventing or resolving land use conflicts. The following factors were identified as underlying causes of conflict:

- Planning for freight is generally inadequate
- Zoning approaches regarding freight are typically inadequate

- Funding for planning, corridor preservation, and conflict mitigation is often lacking or insufficient
- Lack of communication among stakeholders

The general process improvements for preventing or resolving land use conflicts identified were:

- Improved planning and zoning practices
- Cooperative regional planning
- Improved notification procedures
- Innovative funding practices
- Efforts at better communication between stakeholder groups

Sources of Conflict between Freight and Other Land Uses

Inadequate approaches to land use planning and zoning are obvious candidates for sources of conflict between freight and other land uses. Perhaps not so obvious, the research also found that inadequate funding for planning, corridor preservation, and mitigation, as well as lack of effective communication and cooperation among interested stakeholder groups (e.g., freight interests, residential and commercial interests, residents, and the public sector), are important contributors to such conflict.

Planning and Zoning for Freight is Generally Inadequate

The primary forum where conflicts between freight and other land uses are either avoided or created is the land use planning area. As a general rule, nothing is built in America unless and until the use of the land involved has been approved in a city or county general plan, the property has been specifically zoned for that use, a development site plan has been approved, and a building permit issued. These are all local government functions. Almost all issues about future land uses that may affect the present or future viability of ports, rail lines, airports, highways, and other freight facilities arise, or come to a head, in the context of zoning or development site plan approvals.

Land use planning is primarily governed by local governments with input from state and regional entities, such as state DOTs, MPOs, Councils of Governments (COGs), or regional visioning organizations. Zoning and site plan decisions are made in the context of a city or county's general or comprehensive plan, which contains the desired long-term development form for the local jurisdiction. Developers, homebuilders, and landowners often make property acquisition, investment, and planning decisions based on the local general or comprehensive plan.

Accommodation of freight needs in land use planning is typically not conducted in a comprehensive fashion in state, regional, or local venues. Most general or comprehensive plans, as well as most zoning codes, do not adequately account for freight

needs or potential conflicts. For example, Kansas City, which is a major freight hub, makes almost no mention of freight in its "physical framework plan."

As a root cause for the lack of integration into land use plans, freight was found to be a seldom mentioned topic within the standard land use planning curriculum in most universities. Furthermore, it was not found to be a common topic of seminars or continuing education courses for planning professionals. Most state codes contain required or optional elements to be included in local comprehensive or general plans; however, with few exceptions, freight is not mentioned with respect to land use issues. Moreover, no design guidance for developing around freight facilities or corridors is readily available.[1] Because of the lack of education about freight, many local planners view freight as a state or federal issue.

General awareness of freight activity is further hindered by the inadequate identification of freight facilities and corridors on maps used for planning purposes. The lack of information about the location of freight facilities and corridors contributes to the granting of zoning, permitting, and variance requests that place incompatible land uses (e.g., residential developments) in close proximity to freight activities, or even encroaching on freight corridors. As the Atlanta Regional Freight Mobility Plan (ARFMP) case study indicates, mapping of freight facilities is a significant and expensive undertaking. Although private entities, such as railroads, have detailed maps of their facilities, they may be hesitant to enter them into the public record, because they may contain confidential and competitively sensitive information.

Another reason for the failure to incorporate freight in land use planning is the lack of involvement of freight entities in local land use and transportation visioning and planning processes. Freight entities may be notified of specific project proposals when they own property in proximity to the proposed project, but they generally are not seen as key stakeholders in local land use planning and zoning decisions.

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[1] None of the initiatives studied have led to any specific site layout, buffering, or other mitigation-type guidance that could be used by planners and the development community to better structure the actual use of a lot. The best examples of design guidelines that the research team could find were: (1) the guidelines developed by the U.S. Department of Housing and Urban Development (HUD) in the early 1980s for HUD-assisted developments near or adjacent to hazardous commercial and industrial facilities; and (2) guidelines produced by the California Air Resource Board in its Air Quality and Land Use Handbook, which provides recommendations for siting new sensitive land uses such as residences, schools and playgrounds beside rail yards, distribution centers, truck stops, and airports. While airports provide the best guidance for noise and vibration mitigation in their manuals, aircraft noise is quite different from noise created by trains, trucks, or port activity. Furthermore, most airport planning manuals do not consider the nuisance created by light. Thus, a "one-size-fits-all" approach does not adequately address issues encountered by the various freight transportation modes; issues faced by different modes require different approaches.

Another important zoning issue that confronts revenue-strapped localities is the amount of tax revenue to be collected from parcels of land and their uses. Zoning to protect or preserve freight facilities and corridors can lead to a short-term loss of revenues for a community. Baltimore's Maritime Industrial Zoning Overlay District (MIZOD) was critiqued on this front by researchers at the Abell Foundation, who noted that unconditional preservation and protection of underutilized or marginal properties denied a cash-starved city, with the highest tax rate in the state, the opportunity to generate greater benefits from otherwise feasible alternative uses. Finding the right combination of zoning (both proscriptive and prescriptive) to promote, protect, and preserve freight facilities and corridors without depriving the local area of legitimate development opportunities is a delicate balancing act.

Multimodal freight needs are not well integrated into comprehensive and general plans and zoning structures. Because freight needs are not adequately accounted for, inadequate comprehensive plans are produced that create the potential for recurrent conflict. Similarly, zoning codes generally do not protect freight facilities from conflicts, and there is no readily available specific model freight zoning code that could be adopted by local jurisdictions. For example, while typical zoning codes might include generic industrial classifications, they do not conform to the specific attributes or needs of freight activity. Furthermore, while industrial zoning designations may be applied to freight facilities, they do not extend to corridors.

State and regional planning does not do much to fill the gap. Most state DOTs and MPO long-range plans deal with freight only in a cursory way, largely because of lack of resources. A 2003 survey found that only 22 percent of MPOs have a staff person dedicated to freight, and most MPOs spend less than 5 percent of their staff time on freight.[2] Regional visioning processes, such as Envision Utah or Envision Central Texas, rarely put much emphasis on freight. Freight entities are generally not involved as stakeholders in state and regional planning and visioning processes.

In summary, notwithstanding the considerable time, money, and staffing effort (both public and private sector) involved in land use planning and zoning efforts, freight and its impact on land use is a topic that is only handled sporadically. Compounding the issues, transportation planning involving freight generally does not deal much with land use.

Funding Often Lacking or Insufficient for Planning or Preservation

Producing information on a region's freight facilities for planning purposes is an expensive undertaking. For example, Atlanta's regional freight planning development cost $4 million and took over four years to develop a baseline map of the city's freight network, chokepoints, bottlenecks, and critical facilities. Furthermore, the stated costs do not include time that was donated to this process by both the public and private sector.

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[2] Survey results available from the Association of Metropolitan Planning Organizations at https://www.ampo.org/content/index.php?pid=50.

Relocation and preservation activities can run into the millions of dollars, particularly when projects are stretched over many years. While New Jersey and New York both had excellent laws on the books regarding the right of first refusal to purchase rail corridors that may be abandoned, finding access to funding at the moment of abandonment may not always be easy. In the case of the Staten Island Railroad, the State of New York was fortunate in that an earmark in The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) allowed the corridor to be purchased. However, the New Jersey side of this equation exhausted the fund that the state legislature had created to purchase abandoned rail corridors. This fund has not hitherto been replenished. This also speaks to the importance of understanding just how imperative it is to preserve corridors. Repurchasing or re-parceling of any long, linear and contiguous corridor is cost prohibitive, and the use of eminent domain to aggregate parcels can be very controversial in many locations.

One way to deal with the lack of funding is through proactive planning. It is generally cheaper to avoid conflicts through proactive land use planning and zoning rather than to mitigate conflicts that already exist. For example, if a local comprehensive plan and zoning code ensure that housing is not located in a way that conflicts with a rail line, the costs of sound walls, property purchase, or even relocation of the rail line can be prevented.

Lack of Effective Communication among Stakeholders

Poor communication is at the core of many conflicts between freight entities and other stakeholders. Poor communication also exists between various levels of government entities in many cases. Among other things, lack of communication leads to conflicting expectations and lack of buy-in for solutions.

The importance of involvement by freight operators in community outreach or informational sessions that local and state planners hold for multiple long-range and other planning efforts was underscored in the case studies. For example, in the case of the Whitaker intermodal terminal in Austell, GA, Norfolk Southern initially assumed it had public support for the project and did not engage in a concerted public outreach effort. This lack of engagement with the local community was seen as a factor in the failure to gain public support. This case illustrates how quickly a community can turn against a project if it feels it has not been engaged or feels threatened by a project.

Often, a regional or state entity may have a more holistic view of the benefits of freight than will a local jurisdiction, which is only directly affected by a piece of the freight system. One prominent example is the State of Oregon's industrial lands task force, convened by the governor, which noted that the "… state has an interest in discouraging conversions of prime industrial lands."[3] Conversely, local governments with close ties to

[3] Oregon Industrial Conversion Study Committee & Department of Land Conservation and Development in conjunction with the Economic Revitalization Team, *Promoting Prosperity: Protecting Prime Industrial*

the business community are often the first to find out about new private initiatives that may have a regional or statewide impact.

Process Improvements for Preventing or Resolving Land Use Conflicts

The research performed in the NCFRP 24 case studies and previous experience of the project team also uncovered a number of approaches for preventing or resolving land use conflicts between freight entities and other relevant stakeholder groups.

Improved Planning and Zoning Practices

As discussed above, land use planning and zoning usually do not adequately deal with freight. Improved planning and zoning practices must begin with education. The following section lays out specific tools encountered in the case studies that could be more widely used.

While most cities and counties utilize an "industrial" zoning designation, they generally do not create specific zoning categories for freight facilities and corridors. Freight is industrial activity, yet its impacts are distinct from other forms of heavy industry. As an exception to the general rule, some cities have attempted to protect freight through the implementation of "industrial sanctuaries" or "industrial overlay districts." These are zoning mechanisms designed to preserve land for freight-related land uses and prevent the encroachment of incompatible uses. Both Portland's GLIS and Baltimore's MIZOD were based, in part, upon the rationale that zoning change requests led to business uncertainty and inability to secure continued funding for some of the freight facility components because of the loss of contiguity of this area.

Industrial sanctuaries and overlay zones can overcome some of the shortcomings of the lack of specific freight-related zoning categories, but they have limitations. The most noticeable of these is that the overlay zone may not effectively protect the corridors that lead into the overlay zone. MIZOD was heavily critiqued by local consultant groups reviewing its effectiveness for this limitation. MIZOD was found not to consider or address off-dock and off-port land use that facilitates and supports port growth and expansion. Another limitation to overlay zoning is that it does not protect other freight facilities that may not be contiguous to the overlay geographically but are a necessary component within the overall supply chain.

It is difficult to maintain boundaries of an industrial overlay zone without specific, intuitive, and clearly marked boundaries that separate industrial from non-industrial use. Baltimore's MIZOD, for example, is considered successful because it is based on marine access with at least 18 feet of draft. This criterion set out in unambiguous terms the areas where port and associated industrial operations need to be protected. On the other hand,

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Land for Job Growth, November 2004, at http://www.oregon.gov/LCD/docs/economicdevelopment/indconvrep.pdf?ga=t.

MIZOD has been critiqued because it did not establish effective buffers (for either new development or around existing freight facilities) or define what traditional uses should be located therein.

While Portland's Guilds Lake Industrial Sanctuary set out parameters for areas of protection, the zones at the margin of this sanctuary were viewed as having a less logical function than the sanctuary's overall objective and purpose. The ambiguity also led to the adjacent community of Linnton's thwarted attempt to instigate a zoning change to allow a downtown mixed-use type development in between its energy cluster components. This illustrates that, notwithstanding years of planning and development of an overlay zone, a city adjacent to the overlay can forge ahead with plans that fly in the face of the previous planning activities. Linnton was heavily involved in the discussions and meetings that led to the development of GLIS, so it came as quite a surprise to the energy industry groups that this zoning variance was being considered by the city's planning commission.

The Linnton example also provides another argument for ensuring that boundaries that are set around an industrial cluster should be communicated to outlying communities. This would also reduce real estate expectations. At the demarcation point between industrial facilities and residential or commercial properties, transitional stepped-down zoning from one use to another requires careful consideration and development. In many communities, these areas are some of the last remaining real estate parcels that can be developed to maximize taxable revenues. Demarcating these areas is critical to ensure that any overlay zone retains its contiguity and efficacy, and so that cities and counties can continue to ensure development of their tax base.

Industrial sanctuary zones are a tool that could be more frequently incorporated into the city/county's comprehensive plan as a policy element. Portland, for example, adopted the GLIS vision statement, policies, and objectives into its comprehensive plan. This is critical to continued long-term planning for freight and will help to ensure that when the comprehensive plan is updated, freight will still have a seat at the table.[4]

In addition to industrial sanctuaries and overlays, other zoning mechanisms can be used to facilitate freight initiatives. Property developer CenterPoint benefited by Ellwood, Illinois' creation of a new I-4 flexible zoning designation for manufacturing and distribution which enabled the development to proceed. This designation laid out a plan for container storage expansion through a new ordinance. The public-private partnership process can lead to the development of better understanding of freight needs and subsequently to the development of effective tools for codes and zoning.

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[4] It should also be noted that any sunset provisions that may be incorporated into overlay-type ordinances may also provide the assurance of continued industrial use for capital sources. This was part of the rationale that led to the re-adoption of the MIZOD in Baltimore.

A final note on overlay zones, industrial sanctuary zones, and other zoning tools is that, while they can be a very useful means for preventing conflicts, they cannot be used to mitigate for conflicts already in existence.

One way to ensure that freight planning occurs more often and more thoroughly at the local level is by amending state codes to include freight as one of the required elements of local general and comprehensive plans, not just as a transportation issue but as a land use issue, preservation issue, and as an economic development goal.

Cooperative Regional Planning

It was clear from the case studies that planning for freight facilities cannot be delegated to a single entity and is required across multiple levels of government, from the state level to the local level. Because of the far-reaching effects of local decisions on geographically-extended supply chains and other economic activity, preservation of freight corridors and facilities typically needs to transcend the local level and take into account these wider-ranging considerations. The preservation and revitalization of the Staten Island Railroad is an example of a long-term priority held by multiple state and local parties whose continued engagement led to a successful output. Similarly, the establishment of Baltimore's MIZOD was assisted by the participation and support of the Maryland DOT, which runs the port, and the State of Maryland. Maryland had invested heavily in the port and had a strong vested interest in seeing the port remain viable into the future. City and state planners were also aware that if existing assets at the port were not preserved, the port had no other alternative but to shrink in size and scope. Since not all ports, airports, truck and rail yards, and corridors will be able to garner support for long-term planning and across-the-board funding, this may limit the transferability of MIZOD to other areas. At the same time, other areas may not have the specific limiting factors that Maryland faced in terms of access to deeper draft channels and dredging constraints.

When freight plans are created at the state, regional, or local level, they typically focus on transportation needs with little attention to land use. The best example of comprehensive regional planning studied was the ARFMP. The Atlanta regional freight plan, while a milestone in terms of its complexity, partnering, and communication efforts, still only devotes five pages in total to land use. The plan recommended that land use and zoning codes should be amended. However, if this recommendation was to be a springboard for better land use activities, it has not yet borne fruit. According to the city's zoning code website, as of November 2010, it had not yet made any changes to its zoning code regarding freight and land use as recommended by the ARFMP.

Many regions throughout the country are involved in regional visioning processes at one time or another. These processes tend to be voluntary efforts involving cooperation among various public and private stakeholders. They can be led by regional governance groups, such as COGs, or by private entities, such as chambers of commerce. These efforts typically look at future scenarios involving various land use and transportation

choices for the region, but they generally do not expend much effort examining freight, nor are freight stakeholders usually heavily involved. If freight stakeholders become more closely involved in visioning processes, and if visioning processes include freight as a key issue, these visions could help to direct local land use and transportation decisions for decades to come. One key outcome of a regional visioning process is educating stakeholders about the long-term implications of various decisions; a regional vision could be a significant tool for educating land use decision makers about the importance of planning for freight.

Improved Notification Procedures

Conflicts between freight and other land uses often arise because of lack of notice and the creation of investment-backed expectations. Improved notification in various settings could help prevent or mitigate many types of conflicts. For example, real estate contracts and other notice documents could include sections discussing the possible freight-related impacts that may occur as a consequence of living in proximity to freight activities.

Notification to communities that are in proximity to a freight facility or corridor also forms a subset of communication, as well as planning and permitting processes. In the discussion that surrounded the continued utilization of Baltimore's MIZOD, press releases from City of Baltimore planning staffers indicated that better management of buffer zones was needed, requiring the addition of language into real estate contracts noting that one may live near a freight facility.

Similarly, the Joliet and Austell case studies highlighted how intermodal facilities can impact a community and must be addressed both through communication and, at some levels, through notification to the community about the impacts. Austell provides an example of how a project that seemed to be a solution to a problem quickly turned into another problem, with concomitant costs in litigation fees and other required permitting and mitigation engineering activities.

When overlay zones are created, planners also need to be aware that goods movement and the freight industry are dynamic and may require future land use components to tie into the existing industrial/freight area, yards, facilities, or corridors. Forward planning such as that performed by Will County in Illinois regarding the Joliet facilities, including the creation of the cargo container storage model ordinance, provided certainty among the multiple parties involved in developing future acreage for capacity improvements. This also provides an element of notification that this area will continue to have freight activity and that any purchases of property should be made bearing this in mind.

As part of improved notification, mapping of freight facilities and corridors needs to be improved. Maps that have been created within local jurisdictions, MPOs, COGs, and state DOTs to show the location of the components of the freight facilities and network, could be amalgamated together for future utilization by both planners and developers.

Given the extreme costs of developing Geographic Information System (GIS) components from scratch, freight groups could become a partner in improving the freight mapping process. In many instances, freight groups already have in-house GIS layers that show where their routes, yards, and facilities are located geographically. They also have knowledge of bottlenecks and other elements that are necessary for business functions (e.g., truck rest areas). While freight entities may be hesitant to share confidential maps with others, their knowledge could be very useful to planning entities when comprehensive plans are created or updated. Such mapping would also begin the process of teaching the general public about freight itself and shifting the public mindset toward thinking about how freight affects their individual lives and communities. It would also provide planners with specific knowledge of facilities to reduce the permitting and variance requests which often lead to residential development being placed into proximity with freight activities.[5]

Innovative Funding Practices

To deal with the lack of funding for freight planning, preservation, acquisition, and other activities, innovative practices are needed to leverage investments. First, the entity spearheading the preservation strategy must secure the right and standing to become an investor. Certainly, New York's and New Jersey's statutory right of first refusal for potential railroad abandonments was a key factor in the successful reinstatement of the Staten Island Railroad.

In many instances, prime opportunities for freight-related acquisition have come from the Base Realignment and Closure process undertaken periodically by the U.S. Military. Multiple military sites that were closed following the end of the Cold War were redeveloped as freight facilities.[6] The Joliet Arsenal case study is an example of successful redevelopment. While the success rate of conversion from military to freight use is far from perfect, these sites often make logical freight/industrial development platforms as they have already been through an environmental remedial process during closure, are already zoned for a heavy industrial type of activity, and have buffers from residential use.

The Atlanta Regional Freight Mobility Plan highlights the benefits of donation of private sector groups' time and efforts to a planning process. In the case of Atlanta, the

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[5] The team is aware that access to maps is a contentious issue given the fact that once maps are provided to state, local, or federal agencies they become part of the public record and are subject to Freedom of Information Act rules. Security concerns may also play a part here, as freight groups may be wary of providing "detailed" mapping information, especially for hazardous materials, because of the potential for terrorist threats against infrastructure.

[6] Examples include San Antonio and Austin, TX; Rickenbacker, OH; Richards Gebaur Air Force Base in Kansas City, MO; the 440th Air Reserve Base in Milwaukee, WI; and Alameda Navel Air Station in Alameda, CA. The EPA has produced the guidebook, *Turning Bases into Great Places: New Life for Closed Military Facilities*, to aid communities in redeveloping these sites. The guidebook can be found at http://www.epa.gov/smartgrowth/pdf/bases_into_places.pdf.

representation of freight groups on the boards and committees that advised the planning process also led to the development of projects to mitigate some of the conflicts that arose because of land use and freight activity intersections. Task force participants created a list of congestion bottlenecks along with suggested remedies. This led to the formation of the regional priority freight highway network. As the priority freight highway network was developed, it also led to improved knowledge of how corridors contributed to the region's economic geography. This led to the discussion of how this should be a crucial consideration for network and land use management. Donating the time of staffers and expertise into the planning process by the freight segment delivers multiple benefits and can lead to policy and planning changes.

Resolving Communication Challenges

The case studies uncovered a number of specific communications challenges that needed to be overcome in the process of preventing or resolving land use conflicts. Some of these challenges were met more successfully than others.

In the example of the Staten Island Railroad, one of the largest communication challenges was in conveying the indirect congestion benefits to citizens in New Jersey who did not expect to realize the more tangible job creation benefits of the project. Delivering a freight supportive message is especially complicated for areas that are already split between freight and non-freight use. In the case of MIZOD, Baltimore has areas around the port that have been redeveloped into mixed-use and residential developments. Residents around the harbor could not see or understand the difference between areas that no longer have deep water access, which were being redeveloped into higher value uses, and areas with deep water access, which were being preserved for uses dependent on that access. In the example of the Whitaker intermodal terminal, the residents of Austell had never had direct experience living next to a rail yard and had an instinctively negative impression of what would likely happen if the terminal was built. Basic miscommunication in this area included the fact that the site's total acreage, which was much larger than the physical footprint of the industrial site to allow for buffering, was used as a negative talking point against the project, when it actually made the site less intrusive to surrounding uses than smaller freight yards in Atlanta.

Communicating the importance of preservation of industrial land and freight connections is extremely important because in many instances, suitable and available property for relocation is not available. In the case of Baltimore's MIZOD, analysis also found there were many suitable substitute locations for attractive mixed-use development within the urban area, but there were no substitutes for deep water frontage. Communication and outreach efforts sometimes pay dividends far into the future. The wide-ranging discussions of future uses for the Joliet Arsenal facility, which began even prior to its closing, helped the project to overcome some early hiccups—such as the proposed placement of a landfill on the site—and emerge with a stronger, sounder plan at the end.

Portland and the State of Oregon have undertaken multiple inventories and reviews of Portland's industrial land holdings to redress perceptions that industrial land is unimportant. Portland's 2004 industrial districts atlas noted that "…. Portland's industrial districts are unknown territory to most residents." The governor, in convening the industrial lands task force, tasked it with "… addressing the perception that many of the fast growing areas critical to Oregon's economy have not maintained an adequate supply of industrial lands…" While Oregon and Portland are to be commended for their activities, the cost of continuously conducting inventories to make the case for preservation underlies the case for better communication about the value of freight to our economy (locally, regionally, and globally), and the tax revenues and other benefits that a community gains because of a vibrant freight network.

The Joliet Arsenal Redevelopment shows how communication, correctly undertaken, can lead to community support for a project. The most important communication tool that this project developed was the state-created Joliet Arsenal Development Authority (JADA). This authority not only developed a strategic plan for the site's redevelopment, job creation, and tax revenues, but it was also a forum for over a dozen public agencies to work together. The developer of the site, CenterPoint, estimated that it dealt with over 50 governmental entities while developing the project. JADA also developed a short list of transportation projects as a way of generating agreement among stakeholders as to which projects were most critical. This led to the creation of a Transportation Management Association for the area that is expected to serve as a coordinator for those projects involving multiple jurisdictions.

Communication regarding resumption of freight service is another critical element that the freight groups may need to undertake. In the case of the Staten Island Railroad resumption of service, CSX conducted a significant public outreach campaign to notify the public about the resumed service and also went to schools to ensure that children did not play in the right of way.

Engaging the freight community can also assist a local jurisdiction in ranking the severity of bottlenecks. The freight groups involved in the Atlanta plan provided ranking scores for funding prioritization on projects that were placed into the Transportation Improvement Program submitted to Georgia's DOT. Freight interests also noted that some of the new types of in-fill and urban mixed-use development did not provide for effective freight deliveries. Being able to meet in a neutral forum and discuss such issues is critical to getting planning and site designs formulated to make sure that freight needs are appropriately accounted for.

Specific strategies for improving communication between freight and land use stakeholders would include the formation of standing planning committees and also the regular exchange of internal planning materials and decisions, redacted where necessary. Private sector groups including local chambers of commerce can play an important role in keeping freight issues on the agenda and ensuring buy-in from the business community

when a freight-related project is proposed. Improving communication through various levels of government is also required and must be a two-way channel.

Summary of Lessons Learned

The critical issues identified in the NCFRP 24 research are:

1. The primary forum where conflicts between freight and other land uses are either avoided or created is the land use planning area.
2. Local governments have primary jurisdiction over land use planning in America.
3. Land use planning processes generally plan inadequately, if at all, for freight, for a variety of reasons, including the following:
    a. Land use planners are typically not taught about freight and do not understand why it is important to the economy or how it works.
    b. There is a lack of maps that identify freight facilities and corridors.
    c. Freight entities are generally not significantly involved in local land use and transportation visioning and planning processes.
    d. Cash-starved jurisdictions have an incentive to zone for uses with higher tax values.
4. State and regional planning does not do much to fill the gap in freight planning.
5. Regional visioning exercises generally do not deal adequately with freight.
6. Funding is often lacking or insufficient for freight planning and preservation.
7. There is a lack of effective communication among freight and land use/transportation planning stakeholders.

Our research has identified a number of potential solutions to these current issues, such as:

1. State codes could be amended to require freight to be one of the key elements that states, local jurisdictions, and planning agencies plan for, in terms of both transportation planning and land use planning.
2. Guidance needs to be provided to land use planners regarding appropriate planning and zoning practices that relate to freight. For example, overlays and protection zones can be put in place not just for the industrial areas that are serviced by freight, but also for the corridors that link to them.

3. Cooperative regional planning efforts, such as regional visioning processes, should include freight entities as key stakeholders and make freight a significant focus of their efforts.
4. State and national associations related to planning or development, and cities and counties can be instrumental in providing the appropriate education and tools.
5. Freight entities should participate as stakeholders in local, regional, and state planning and visioning processes.
6. Private sector groups, including local chambers of commerce, can play an important role in keeping freight issues on the agenda and ensuring buy-in from the business community when a preservation project is proposed.
7. Freight groups (both private sector and governmental) need to partner with educational institutions to ensure that the underlying principles of freight activity are included as part of the curriculum at the graduate and undergraduate levels in planning, architecture, policy, engineering, and law disciplines.
8. Ports, which have started tracking port-related job impact throughout the region, need to make a similar scale effort to quantify the congestion and noise impacts that they produce outside of the immediate port area. Port master plans should illustrate affiliated congestion and chokepoints beyond their own properties.
9. Innovative funding practices, including public-private partnerships and rights of first refusal, are needed for freight planning and preservation.
10. Real estate contracts and other notice-type documents should include sections discussing the possible freight-related impacts that may occur as a consequence of living in proximity to freight activities.