3) A Freight Data Architecture Application at the Local Level Using Commodity Flow Survey (CFS) Data

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Poster Summary:

The need for a freight data architecture has prompted several major studies, including NCFRP 12 Specifications for Freight Transportation Data Architecture, (in press). The establishment of such an architecture will make it possible to link a variety of existing freight data, and other related datasets, together to create a more robust understanding of freight activities. Previous research, using a special tabulation of the 2007 Commodity Flow Survey, revealed a set of associations between the 4 digit North American Industrial Classification System (NAICS) codes and the 5 digit Standard Classification of Transported Goods (SCTG) codes. These associations were found to be very simple, simple, complex and very complex. For those industry groups where the association between industry group (NAICS) and commodities (SCTG) is very simple, or simple, it should be possible to “crosswalk” the NAICS/SCTG codes to the Land Based Classification Standards (LBCS) system and provide local planning agencies with a clearer picture of freight activity at the local level.

To test our hypothesis, we used local administrative and primary survey data collected in Albany, New York by the Capital District Transportation Committee (CDTC), the Metropolitan Planning Organization (MPO) for the Capital District, as part of one of their “Linkage Studies” - the Railroad Avenue Transportation and Revitalization Plan (funded 2009-2010). The study area has historically been an industrial district that was served by freight rail with spurs currently lying abandoned in some locations. Today, the area contains several abandoned and/or perceived brownfield sites. However, it is within close proximity to I-90, I-87, Albany NanoTech and the University at Albany, and has potential for redevelopment from support industries that may look towards the area once it has been revitalized.

The initial mapping of the land uses relied upon tax property classifications that delineated parcels into Industrial, Retail Services, Storage/Warehouse, etc. However, this was found to be too general to develop improvements to cater to particular activities on parcels. As part of the study’s outreach, CDTC staff made multiple visits to the site to invite business owners/tenants to a public meeting. During the visits, staff took anecdotal notes of each business’s apparent business or service type. This information was then used to create a more detailed dataset. The next step was the application of the Land-Based Classification Standards (LBCS) by the designation of the five dimensions of land: Activity; Function; Structure; Site; and Ownership (see http://www.planning.org/lbcs/).

In a few cases, multiple addresses were found to be located in a single parcel, particularly in buildings with more than one business or tenant. The issue of multiple activities on a single site
requires a modification of the LBCS methodology, including the use of colored stripes or dotted symbols to display parcels with multiple classifications. In order to build crosswalks between NAICS/SCTG and LBCS, we first matched the LBCS codes already developed to the 4-digit NAICS codes with similar land-use and activity descriptions. Once the corresponding NAICS codes were generated, we used the previous “crosswalk” between NAICS codes and the 5-digit SCTG codes to identify the commodity flows for each parcel. The NAICS/SCTG crosswalk was originally created by the Census Bureau staff as an audit tool for validating the 2007 Commodity Flow Survey dataset. The tool was useful in identifying mis-matches between economic activities and commodities generated during the data collection phase. The data was then visualized to display a relationship, by number of 5-digit SCTG designations per 4-digit NAICS code. These relationships were characterized as: very simple, simple, complex, and very complex associations. These associations were then mapped in GIS with different symbols for each of the four association types. MPOs can use these relationships to target their effort when collecting data for freight modeling or activity-based modeling. They can focus their efforts and financial resources primarily on parcels displaying the “complex and very complex” relationships, while directly applying the 5-digit SCTG commodity descriptions to those designated as “very simple and simple”, as indicated through the use of the crosswalk. Future work will require a strategy for validation, including follow-up interviews or data gathering via the internet. The techniques used in this process will be applicable to any other Metropolitan Planning Organization or local municipalities using the same methodology. Using the advantages of a freight data architecture (e.g., standardized coding schemes, “cross-walks for connecting datasets, and explicit modifications, where necessary) at the local level, will facilitate the incorporation of freight into mainstream transportation planning efforts.