

# Urban Characterization by the Green Supply Chain Management Concept: A Review

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**Abstract-** In a review of the supply chain management of an urban area was examined in an imperative to demonstrate the benefits of a supply chain management method for an urban designing. Supply chains provide the critical infrastructure for the production and distribution of goods and services in our network economy and serve as the conduits for the manufacturing, transportation, and consumption of products ranging from food, clothing, automobiles, and high-technology products, to healthcare products. Cities as major population centers serve not only as the principal demand points but also as the locations of many of the distribution and storage facilities, transportation providers, and even manufacturers. In this paper a new model is developed for the design of sustainable supply chains with a focus on cities that captures the frequency of network link operations, which is especially relevant to cities due to frequent freight deliveries. Descriptive interviews were reviewed thoroughly with the conceptualization of the substantiated philosophy as a sociological technique of examination. All in all, this attempt of review established that the supply chain management method with its multidisciplinary foundations and assessments can benefit to overawed sectoral barriers in urban design.

**Keywords-** Green supply chains, Logistics, Urban Design

## 1. Introduction

The sustainable supply chain network model developed in this paper allows for the optimization of supply chain network activities and frequencies of link operations so that the total costs are minimized as well as the environmental impacts and wastes with a weight imposed by the cognizant firm decision maker for the environmentally-based criterion. Green supply chain management is defined as an environmental process which highlight the way how it is noticed and comprehended by a person, or by a society in the urban design [1-2]. Analogous to the word “landscape” which mentions to visual décor, supply chain management indicates to the auditory décor, [3-6]. The instituting of the perception of supply chain management has encouraged the restoration of the indulgent of auditory performance and conveyed a new facet for learning sound situations more absolutely and meticulously. For more than an era, a lot of theoretic and experiential supply chain management have been implemented all over. Schafer’s groundbreaking theoretical effort of supply chain management offered analytical methods, applicability in ecological organization and an inclusive theory of acoustic design.

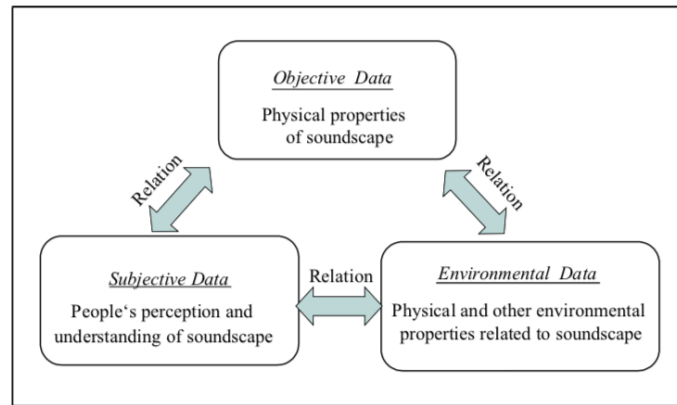


Figure 1. Structure of Supply chain management [7]

## 2. Structure of Green supply chain management

Green supply chain management is an environmental highlighting the means how it is professed and comprehended by an individual, or by civilization, and therefore it varies with the correlation between individual and any such atmosphere in the urban design [8–11]. Consequently, green supply chain management contracts with the subsequent three parts and the association amongst them: (1) structure; (2) people's observation and appreciative of ecosystem; (3) inclusive atmosphere where atmosphere endures. Concurring to the nature of supply chain management, the representation of supply chain management should explicit these contents and characteristics in Figure 3. Objective data explicit the physical properties of sound, which can be marked equipment. Subjective data illustrate the psychological points of supply chain management, such as identification of sound, partiality of sound, and other Semantic Differential (SD) shapes of the environment, which can be attained by questionnaire investigation, meeting, psychological experiment, and so on.

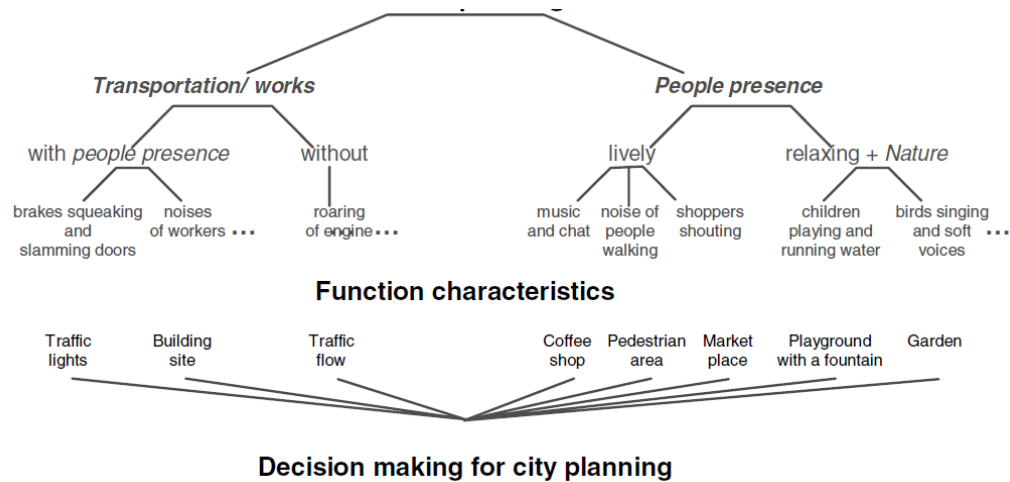
### 2.1 Urban Design Characterization and Management

Urban planners and designers need more information to improve the cities' environmental

quality. One of the most important elements of urban environment is the acoustic comfort. Till now, green supply chain mapping is the only way to evaluate outdoor acoustical environment. Using in-situ measurements and simulation tools, we can obtain the Sound Equivalent Level values around urban spaces [12–16]. However, these values cannot define the urban sound quality. The supply chain mapping main goal is to determine the annoying urban spaces due to traffic in order to protect smart cities by considering environmental issues. The supply chain management concept has been established to address this lack of comprehensiveness while seeking for the adequate urban quality.

Urban supply chain managements consist of a mixture of many different sounds with various duration, spectrum and intensity envelope, which together reveal the context. In fact, all types of sound sources must be considered to analyse the supply chain management in the urban design.

Generally, "the term 'supply chain management' refers to the acoustic environment at a place, like a residential area or a city park, as perceived and understood by people, in context. It is the acoustic equivalent to 'landscape', and includes all sound sources, wanted as well as unwanted". In another way, we can say, "all of the sounds present in this place make up its acoustic environment, and people's experience of this acoustic environment is the supply chain management of the place."



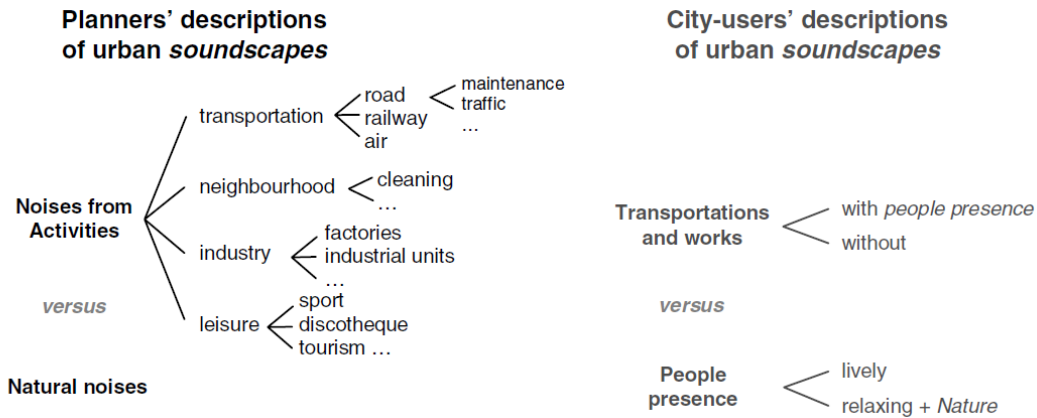
**Figure 2.** Categorization of urban supply chain managements from subjects' descriptions and their relations to potential functions for city management.

The main methods of urban design are concentrating on noise quantification defined by equivalent sound level parameters such as [17-22] according to world directive on environmental noise. Other parameters such as traffic noise index and estimated noise pollution levels can be used [23–30]. World Health Organization (WHO) produced guidelines for community noise [31–36]. These guidelines explain the effects of noise on human health, for example the noise-induced hearing losses, sleep trouble, psycho-physiological effects, speech intelligibility and social behavior. The Organization for Economic Co-operation and Development (OECD) documents published in 2008 did not focus on typology of urban supply chain managements [37]. Majority of researchers approved that LAeq measurements are not enough to the description of an overall supply chain management.

City inhabitants identify and evaluate the supply chain management of the urban public spaces in a relatively different way than they perceive the sounds introduced into their dwelling environment. Therefore, modern urban supply chain management

planning is evolving new philosophies and concepts to realize this difference. In fact, supply chain management is perceived as an important part of the urban environment, contributing to categorize and specify this environment. The physical characteristics of the acoustic environment needed to evaluate this quality go far beyond the overall environment level and include spectral and temporal [38–43] structure. Today, the search for suitable physical indicators is continuing but they might not be sufficient, and the most important indicators can be produced by the listeners themselves.

Researchers have discussed the sustainable supply chain managements and demonstrated how policy makers deal with urban design and environmental issues [44–48]. Moreover, they discussed the effect of positive sounds in urban spaces and raised the question whether it can be mapped and involved in the urban supply chain management evaluation. Another work introduced semantic principles exploring the important features of a supply chain management [49].

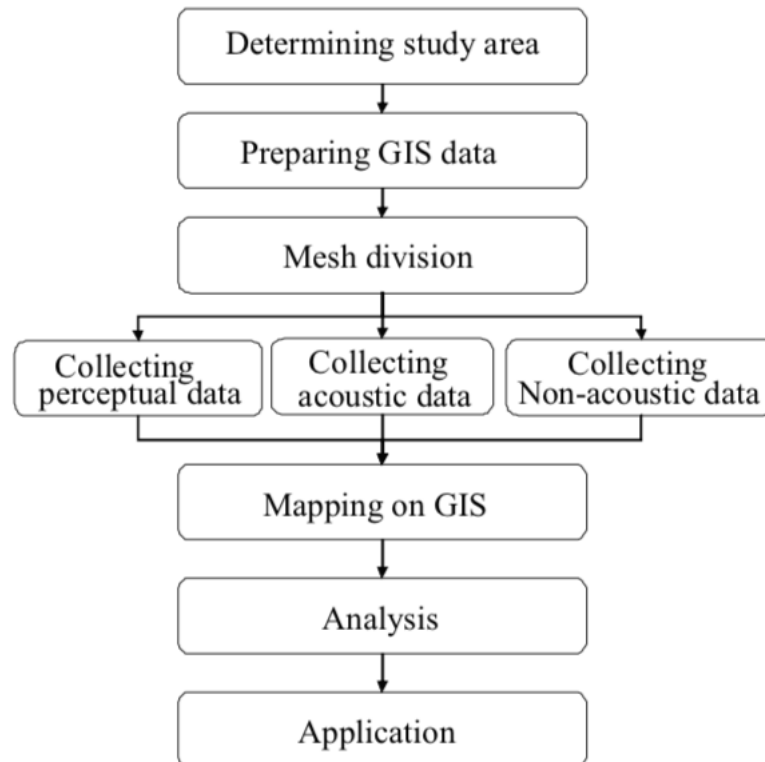


**Figure 3.** Comparison between planners and city users' verbal descriptions of urban supply chain managements.

However, the issue is still discussed. How to identify supply chain management and which guidelines can be proposed in order to realize a desirable supply chain management. Listening to urban spaces seems to be the only way to realize its acoustical environment. This way may achieve the desirable comfort level to be taken into account in the urban regulations. The main difficulty to evaluate and analyze the urban supply chain management is the sound sources characterization. Furthermore, the characterization of urban fabric, urban spaces morphology, and landscape elements design and building facades' morphology and materials have a great influence on the sound diffusion and sound propagation in urban areas.

**2.2 A Framework for improving urban green supply chain managements**

In their article “A framework for improving urban supply chain managements”, researchers discussed the negative and positive terms of urban characteristics [50–55]. They attempted to progress thinking on positive green supply chain managements and using as a decision-making tool for supply chain management assessment. They proposed a framework based on Kano Model approach to cover the composition of green supply chain management in objective terms to be used as a means of understanding the range of applicability of approaches to create positive green supply chain managements [56].



**Figure 4.** Flow of developing green supply chain management [57]

This framework is structured in three parts. The first part describes the elements comprising a supply chain management, the second part describes the factors that can influence supply chain management is perception, while the third part is concerning the relationship between the intervention design on the space and perception effects of that space.

The framework suggests that the meaning of “positive supply chain management” for a public space is relatively different for planners; serious listeners; users of the space. They found that planners and serious listeners are influenced by the supply chain management itself, either in meeting legislation and reducing nuisance, or as an artistic or creative opportunity. However, the users of the space or the most important group of people are more concerned with the space itself and have their perception of it influenced by the supply chain management, which is an inconvenient and highly complex intermediate step. Furthermore, the researchers discussed the possibility to adapt this framework for urban supply chain managements.

An intensive questionnaire survey and supply chain management measurements were done by W. Yang and J. Kang to evaluate the acoustic comfort in urban and open public spaces [11], [58–61]. The results

demonstrated that people tend to show more tolerance in terms of acoustic comfort evaluation. It is found that background sound is an important factor for supply chain management evaluation in urban open public spaces. The results showed that a lower background level makes people feel quieter. Furthermore, the analyses of the sound elements indicated that the acoustic comfort evaluation is greatly affected by the sound source type [62–66].

### 2.3 Role of urban green supply chain management

In this paper I focus on the design of sustainable supply chains for sustainable cities. The goal is to capture the system-wide network structure of supply chains and to include the frequency of the various supply chain network economic activities, along with the environmental impact costs, as well as the waste management costs. I first construct a model that emphasizes the operational aspects and then demonstrate how, as a special case, it can also handle design of a sustainable supply chain network from scratch. In order to distinguish between the various operational costs associated with manufacturing, storage, and distribution, and the environmental impact costs as well as the decision maker’s willingness (or not) to address the

environmental impacts, I introduce an associated weight for the minimization of environmental impact costs and waste costs. Besides the role of urban supply chain management, as well as microclimatic data, in achieving the environmental quality of urban areas, Researchers explain the analysis and use of supply chain management data in urban design strategy [67–76]. As the supply chain management was developed in order to study the acoustic dimension of a site, this paper details

how this concept enhances the traditional acoustic measurements, dealing with the quantitative aspects, by adding qualitative data using binaural audio recordings. The soundwalk methodology is presented as being accessible to users, urban-planners, and city decision-makers as major means of keeping track of the supply chain managements in relation to the heritage of the city.

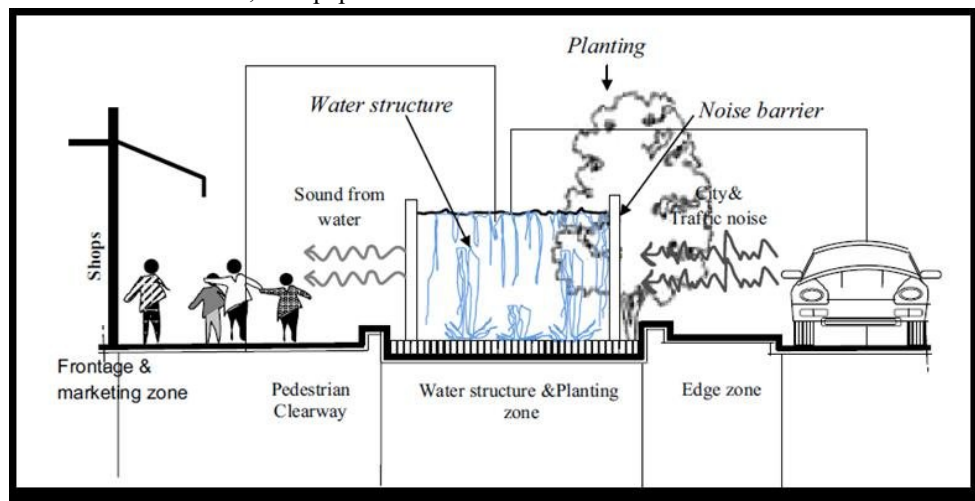


Figure 5. The Role of landscape architecture on urban green supply chain management experience [77]

Smart cities require more than just strong urban planning teams and high use of technology, but also an active and willing stakeholder participation that includes logistics professionals. In fact, supply chains may be among the industries with the highest gains from increased smart city infrastructure.

#### 2.4 Criteria for Sound Comfort

In order to determine the criteria for sound comfort in urban environments, researchers used a combination of two simultaneous on-site procedures in various urban situations to investigate the appraisal of urban supply chain managements, in typical locations: thoroughfare, pedestrian areas, playgrounds and market squares [78–82]. Pedestrians' opinion about supply chain managements is gathered through questionnaires (survey data), and physical acoustic parameters were processed and calculated through recorded samples of ambient sound environments. The study analyses how to "fit" the sensible interpretation of urban supply chain managements with acoustic measurements. The relationship between perceptual and physical descriptions is believed to provide

appropriate assessment of urban areas to guide urban project.

The cross analysis between survey data and acoustic parameters indicates that the sound level is appropriate to the description of main thoroughfares, but for similar sound level locations (square, market, or playground) two further perceptive factors were remind. The results obtained point the limitation of matching a unique acoustic parameter with two cognitive representations (a global point of view versus a discrete listening) of the same acoustic phenomenon. The understanding of urban ambient sound environment needs multidisciplinary approach, so that both physical and psycho-sociological parameters can be investigated [1], [82–85].

Researchers studied the tranquillity of various environments in a country park and surrounding moors on the urban fringe [86–88]. The study focusses on nine locations - environments and man-made features and sounds - that were thought to significantly affect tranquillity. The experiment utilized a jury technique for evaluation involving small groups of walkers to different locations where participants were asked to complete a questionnaire and measurements of the physical supply chain

management. Landscape images were used to interpret the results and give insights into the importance of the various factors affecting tranquility. The analysis consists of comparing the average ratings of tranquility made by the jury members with the predicted tranquillity rating (using Eq).

The results presented are useful when considering improvements at the study area and in countryside areas where the public have access and intrusive traffic noise, wind turbines and dumping of rubbish are an issue. When planning new open green spaces, the tranquility prediction equation can be used to inform supply chain management and landscape designers in order to provide restorative places and promote health and well-being.

Another group of researchers presented a tool (model) for dynamic traffic noise prediction based on a GIS-based microsimulation of the traffic in an urban neighborhood or part of a town rather than concentrating on one intersection or one street [89–94]. This has the advantage to work on more realistic traffic dynamics situation, where sources at a greater distance can be also considered. Multiple reflections and diffractions are taken into account through a propagation model based on acoustic beamtrace methods and a vehicle emission model [20].

The model analyzes the influence of real urban traffic situations (traffic flow management, road saturation) in the usual equivalent sound level maps and allows calculating and visualizing statistical noise levels and indicators. A part of Gentbrugge city, Belgium, is taken as a validation area and different traffic demand scenarios are simulated. Additional urban parameters about the vehicles and the environment are used to best achieve a emission simulation. The information on buildings used in the propagation model, was loaded from GIS and some assumption were necessary for the external walls absorption coefficient and roof shap.

Rather than tackling overexposure to unwanted sound after it occurs and in a remediating fashion, researchers discussed an integrated approach to land use planning, urban development, urban traffic management and quality of life and presents some recent developments in this area putting the urban supply chain management and its design in a different perspective [78–82].

### 3. Conclusion

This paper reviewed the green supply chain management with the perception of urban design,

that is, how we can trace, portray or direct the supply chain management. Concurring to its conception, the supply chain management should put prominence on not only substantial topographies but also people's awareness of supply chain management, as well as the inter-relationships among these features. Then, the procedure to make supply chain management was reviewed from the stage of structure making, characterization of urban noise, city planning, improvement framework of urban design through GIS technique. Moreover, the criteria for sound comfort was in green supply chain management were discussed. We could conclude that supply chain management can be an accurate and appropriate technique for the representation and investigation in environmental issues of the city development and urban design.

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