The Modelling of Commercial Zone Management on The Strip Development in Medan

D Lindarto¹; D D Harisdani¹; S G Sembiring¹

¹Lecturer of Master Degree Program of Architecture Department, Faculty of Engineering, Universitas Sumatera Utara, Jl. Dr. Mansur Kampus USU Medan 20155

Abstract. The face of urban development is accelerating with the development of strip development models that are not followed by environmental planning. Dr. Mansur street corridor in Medan city showing the strip development causing by growing activity of Universitas Sumatera Utara (USU). Such unplanned growth poses problems for the city's degradation and the economic vitality along Dr. Mansur street. Such commercial zones shows a crowding atmosphere. The aims of this study was to create a model of city management addressing sprawl issues and un-sequential scenes in Dr. Mansur street, qualitatively descriptive with visual and behavioral observation methods through the identification of regional attractiveness. Using linkage strategies derived models in the form of sequential patterns that emphasize local characters visually, structurally, and collectively. The results show that with a linkage strategy linking USU's campus and hospital districts, Bens Café, Selayang Swimming Pool, PPIA, and Syafiatul school via the pedestrian path of Dr. Mansur street corridor, sporadic growth can be organized into clusters that minimize crowding. This study is useful to the city government as a guidance of commercial zone management and revitalization programs in purposes to improving the vitality of the city.

1. Introduction
The face of urban development has accelerated in the commercial zone with the development of a strip development model as a ribbon-type pattern. Trade and service activities occupy the area along the route as a means of transportation support for the ongoing commercial dynamics. The acceleration of drastic land-use changes is often not followed by anticipatory environmental planning. A notable symptom is the transformation of residential housing zones into trade zones [1].

Dr. Mansur street corridor in Medan city as the primary access to higher education activities of the Universitas Sumatera Utara (USU) over the last ten years has shown intensive strip development. The growth of educational activities has led to a growing number of commercial activities supporting multiplier effects in the form of cafes and restaurants, stationery shops, rent houses, apartment rentals, food courts, etc. Such unplanned growth poses a problem of urban degradation and economic vitality of Dr. Mansur Street corridor, which is pathological. The face of the city has created traffic congestion, declines in land use, mix-used land use, and are indications of urban sprawl. The development of the commercial zone of this street shows a sporadic pattern of irregular spots of activity. This led to the atmosphere of Dr. Mansur street does not show sequences of continuous and continuous crowding.
A strip development symptom with the character of sporadic activity and crowding can be managed with a planning model that combines and links the activities between several attractive regions called linkage models [2]. This study aims to develop a zone management model to address the problem of strip development (sprawl and unsequential scene) in the Dr. Mansur street corridor in Medan city.

2. Literature Review

The continuous sequence atmosphere and the crowding that occur along with the clutter and traffic congestion on Dr. Mansur street leads to urban stress and increased public aggression [3][4][5]. The model of regional development to anticipate the degradation of vitality and crowding is a model of revitalization by utilizing the linkage method of processing potential attractiveness modeled as a semicircle connecting one element to another, one node to another, or one district to another. Its emphasis is on the processing of movement systems and infrastructure on open space patterns. These lines can be road network, pedestrian path, open space, and so on.

The linkage model is a city-based network consisting of network circulation. Existing networks can be streets, pedestrian paths, linear open spaces, or forms that are physically interconnected between cities/regions. In the design of network theory, this is useful as one point of reference in organizing the movement system [6]. The linkage model is a system of statement ideas drawn from the lines connecting the elements of the city. The emphasis is more on circulation diagrams than space diagrams. The circulation dynamics become urban form generators, with an emphasis on connections and movements but the need for less space conditions.

Linkage is a simple city adhesive, a form of effort that unites all levels of activity that produce the physical shape of a city. There are three types of collective linkage [6][7], namely, visual linkage, structural linkage, and collective linkage.

In visual linkage, there are two or more fragments of the city that are visually linked together. There are two visual linkages, namely a linkage that links two regions neutral and a linkage that connects two regions, with a single link visual linkage producing a line, corridor, edge, axis, and rhythm visual relationship. Line elements connect two places directly to one mass sequence, either a building or a sequence of trees with mass. Corridor elements are made up of two rows of masses that form a space. Edge elements connect an area to a single mass but do not need to be created in a thin mass such as a line. The axis element is similar to the corridor but uses more axes to highlight the part that is considered important. Rhythm elements connect two places with variations in mass and space (repetition, variance, contrast, and so on) (Fig. 1).

![Figure 1. Visual linkage (Trancik, 1986).](image)

Structural linkage is an attempt to combine two or more forms of city structure into a single order or form of structural network better known as collages, or patterns of city structure [8]. Structural linkage is intended to combine two or more areas with a specific pattern or to combine two areas by highlighting a specific area. The function of structural linkage is to stabilize and coordinate the environment by prioritizing an area within a particular structure, shape, or function that forms a particular order. There are three structural linkage models (Fig. 2).
Collective linkage is a linkage that expresses the collective nature of a city's unique characteristics and physical (spatial) form of internal and external meaning. Collective linkage was developed organically (Fig. 3).

The compositional form is created from a combination of two-dimensional stand-alone buildings creating a linkage of a space-based on a 2-dimensional arrangement. The mega form is a sequence linked to a straight-line and hierarchical framework. Connecting structures such as linear frames or as the grid. Group form is an additional accumulation of structures throughout the open space. Group forms arise from the addition of accumulated forms and structures that usually stand beside public open space.

The attractiveness of a city element that is an element of the formulation of a linkage model can be studied through characterization of the character in the indicator sense of place [9] namely landmarks, nodes, edge, path, and district. Linkage models can be built with maps that depict the position of the attraction elements by identifying and analyzing patterns over a number of city-building elements until they are found to be the basis for regional linkage design [10].

3. Methodology
With the aim to develop a city commercial zone management model to address the sprawl and un-sequential scene in Dr. Mansur street corridor, then this study will use qualitative descriptive method [11]. Data were obtained through visual and behavioral observations as early identification of regional attractiveness. Visual observations are guided by indicator sense of place in the form of landmark, path, node, edge, and district elements [9]. Continued with mapping the region's attractiveness elements so that can be analyzed in their respective distribution patterns. The sense of place was superimposed so that an attractive spot was obtained as a square point to connect the street with a visual, structural, and collective linkage strategy. By using a street-square linkage strategy, it was obtained that a model of sequential pattern that prioritized local character locality so that clusters were obtained made the Dr. Mansur street corridor is no longer crowding and more effective in area structuring reviews.
4. Result and Discussion
Dr. Mansur street is along the collector artery of Medan city of 2.05 km, the border of the Merdeka District with the Padang Bulan District (in front of the USU campus). The road accommodates movement of people and goods from the eastern and western suburbs (and vice versa) across three Medan city districts, namely Medan Selayang, Medan Helvetia, and Medan Sunggal. Dr. Mansur Street corridor connects Jamin Ginting road with the Setiabudi road.

![Figure 4. Map of Dr. Mansur Street (source: google maps, 2019).](image)

As a road collector artery, Dr. Mansur street is used by pedestrians and medium vehicles. The position connecting the main road of Setiabudi and Pattimura makes Dr. Mansur is a solid street for vehicles. Important points of transport nodal are the Simpang Kampus-Jamin Ginting road, the intersection of Perjuangan street, Selayang junction and Setiabudi road junction. Land-use changes that were once residential zones became commercial zones causing traffic congestion with street parking, yard parking, and irregular loading-unloading activities.

![Figure 5. Dr. Mansur Streetview.](image)

In general, the street environment of Dr. Mansur street is shady by the many trees. Such condition invites the commercial activities of hawkers (internet and food vendors) (Fig. 6). The trade dominates from the Simpang Kampus (Dr. Mansur street junction with Jamin Ginting Road) to the 46 BNI building, totaling about 100 points with varying intervals (5 secs. 10 m).
Along the way, Dr. Mansur street had a food trade activity occupying a pedestrian path by the street vendors. Congestion is caused by stopping buyers and parking. It appears that the vehicle stopped for a moment to buy food/drinks due to the parking space on the roadside taken by motorcycle (Fig. 7).

Through physical and behavioral observation identified a number of places with characters showing strong attraction as a landmark are USU Hospital, USU Gate 1, BNI Bank, AW Resto, Bens Café, Mansur Apartments, and Grandhika Hotel. The potential nodes as a node are the Simpang Kampus, the intersection of Perjuangan street, Selayang junction and Setiabudi road junction. The district is well known in Dr. Mansur street corridor is USU Hospital, USU Campus (campus of Faculty of Medicine and USU Rectorate), Selayang Swimming Pool, and Syafiatul school district (Fig. 8).
Figure 8. Finding of physical and behavior observation at Dr. Mansur street.

Based on the results of the identification, it is possible to obtain a pattern that is the basis for the commercial sequential design of Dr. Mansur Street corridor as a visual linkage corridor, structural joined linkage, and collective linkage group form.

4.1. Visual Linkage Corridor
As a street corridor, Dr. Mansur street exhibits rigidity as a massive arterial corridor as a strip development (ribbon type) with a range of commercial activities along the way (Fig. 9).

Figure 9. Visual linkage corridor at Dr. Mansur street.

4.2. Structural Joined Linkage
Structurally a means of arterial Dr. Mansur street is the joined junction between Jamin Ginting road and Setiabudi road. Commercial activities along the way made the connection more intense and created a corridor atmosphere with a straightforward and direct direction. The connection is strengthened by collector access along the way Dr. Mansur street to the surrounding street (Fig. 10).
Figure 10. Structural joined linkage at Dr. Mansur street.

4.3. Collective Linkage Group Form
Collectively, patterns of group form can be found that linkage of the USU Campus, USU Hospital, Selayang Swimming Pool area, Bens Café area, Stationary area, Indonesian American Friendship Foundation (PPIA) area, and the Syafiatul School area (Fig. 11).

Figure 11. Linkage Collective Group Form.

5. Conclusion
Area revitalization to address the chaos of sprawl strip development in the Dr. Mansur Street corridor can be approached with visual, structural, and collective linkage-based design models through expressions of commercial activity and urban design elements. Conceptually the linkage model overcomes crowding by spreading (anti-sporadic) activity through the formation of activity clusters at USU's campus and hospital districts, Bens Café, Selayang Swimming Pool, PPIA, and Syafiatul school offering interesting sequential patterns along the Dr. Mansur Street corridor.

The concept of this commercial zone management model is the starting point of the analysis and strategy for the design of detail design through the expression of local wisdom of commercial activity taking place in this street corridor. The disclosure of such local wisdom will affect the activities of the community without resorting to the meaning that this model accommodates the local activity that is unique in the pursuit of development, namely the enhancement of the national economy based on local wisdom. This study is useful to the city government as a guide for commercial zone management and revitalization programs in improving the vitality of the city and the city's economy.
Acknowledgments
The authors gratefully acknowledge that the present research is supported by Universitas Sumatera Utara. The support is under the research grant TALENTA Universitas Sumatera Utara of the Year 2019 Contract Number 361/UN5.2.3.1/PPM/KP-TALENTA USU/2019.

References
[1] Lindarto, D. (2017). The Determinant Factors of Regional Development Toward Land Use Change in Deli Serdang. In IOP Conference Series: Materials Science and Engineering (Vol. 180, No. 1, p. 012280). IOP Publishing.
[2] Zahnd, M. (1999). Strategi Arsitektur 2 Perancangan Sistem Kota Secara Terpadu, Teori Perancangan Kota dan Penerapannya (Vol. 2). Kanisius.
[3] Hennessy, D. A., & Wiesenthal, D. L. (1999). Traffic congestion, driver stress, and driver aggression. Aggressive Behavior: Official Journal of the International Society for Research on Aggression, 25(6), 409-423.
[4] Bourne Jr, L. E., & Yarouch, R. A. (2003). Stress and cognition: A cognitive psychological perspective.
[5] Putri, D. U. M., Anward, H. H., & Erlyani, N. (2016). Peranan Penyesuaian Diri terhadap Stres Akibat Kemacetan pada Mahasiswa Fakultas Kedokteran Universitas Lambung Mangkurat Banjarmasin. Ecopsy, 3(2).
[6] Trancik, R. (1986). Finding lost space: theories of urban design. John Wiley & Sons.
[7] Maki, F. (1964). Investigations in collective form. The School of Architecture.
[8] Rowe, C., & Koetter, F. (1983). Collage city. MIT press.
[9] Lynch, K. (1960). The image of the city (Vol. 11). MIT press.
[10] Choo, H. H. (2017). Urban Pedestrian Linkages in the Heritage District of Kuala Lumpur. UIA 2017 Seoul World Architects Congress Paper.
[11] Creswell, J. W., & Clark, V. L. P. (2017). Designing and conducting mixed methods research. Sage publications.