EVALUATION OF THE SITE TRANSPORTATION MANAGEMENT PROGRAM(STMP) OF SEOUL

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Abstract: The paper briefly review and evaluate recent pedestrian policies of Korea including "Site Traffic Management Program(STPM) of Seoul." The paper generally review recent pedestrian planning issues in South Korea, legislative and political efforts by and on behalf of pedestrians, downtown community streets and car-free streets, standards for speed humps, and STPM of Seoul. Regarding to the STPM, the implemented site in Seoul reached to 110 sites and main purpose of it is to increase the safety and comfort of pedestrians by segregating the conflicts between cars and pedestrians.

1. RECENT PEDESTRIAN PLANNING ISSUES IN SOUTH KOREA

The City of Seoul faced widespread motorization starting in the 1980's. The number of registered vehicles in the city grew from just over 630,000 in 1987 to more than 2.2 million in 1997—equivalent to an annual rate of 13.5% over that ten year period. But given the relatively short period in which South Korea's capital city has had to respond to the demands of motorization, it has quickly become a leader in the effort to introduce new transport policies and initiatives.

The first section of the Seoul Subway (the first subway in Asia outside of Japan) commenced service in 1974 and has since grown to a 230 km network of seven lines. An eighth line is presently under construction and four more are under design. The city has also introduced several new transport policies and facilities including exclusive bus lanes, traffic impact assessment analysis, congestion tolls, and downtown public parking.

However, the increase in motor vehicles has also brought a steep decline in pedestrian safety and in the general quality of the urban environment for pedestrians. By the early 1990's the vehicle-related transport problems in Seoul were no longer limited to traffic congestion on arterial streets. Even neighborhood streets, which had previously born little vehicular traffic, became choked with illegally parked cars and motorists in search of short cuts. Like Japan, these local streets often feature mixed traffic and no sidewalks.

The increase in vehicles brought about a loss in road and community space for residents, and a rapid increase in collisions between cars and other road users. At present the lives of approximately 500 pedestrians are taken each year by motorists in Seoul. Throughout the country, it is reported that nearly half of all motor vehicle related deaths are pedestrians, or more than 7,000 fatalities annually.

The Road Structure Ordinance of Korea states that there should be sidewalks on all roads to ensure the safety and convenience of pedestrians. Width guidelines for sidewalks are presented in Table 1. In addition, at the beginning of the 1980's, the South Korean

Government initiated a new town construction program in order to relieve the growing shortage of housing in the Seoul Metropolitan Area. These new developments have had no trouble incorporating space for pedestrians from the beginning, but it has been quite a bit more difficult to add or improve pedestrian facilities in the existing urban neighborhoods.

Table 1. Standard Widths for New Sidewalks in South Korea

Classification	Minimum Sidewalk Width* (meters)	Minimum Sidewalk Width* (feet)
Urban Areas		
Main and Sub-Arterials	3.0	9.8
Connecting Streets	2.25	7.4
Local Streets	1.5	4.9
Rural Areas	1.5	4.9

* The absolute minimum permissible sidewalk width is 1 meter, allowable only in cases where made necessary due to other constraints.

In this context, various agencies responsible for traffic management and safety have recently introduced several new policies and initiatives with a particular focus on pedestrian needs. The following sections explain four of the most notable pedestrian-related initiatives introduced so far in Seoul. They include:

- legislative and political efforts by and on behalf of pedestrians,
- downtown "community streets" and car free streets,
- standards for "speed humps," and
- the "Site Transportation Management" program.

On account of the dominant role that Seoul occupies with respect to cities in South Korea, the experiences of Seoul are particularly illustrative for the country as a whole. It is likely, and indeed intended, that the pedestrian policies initiated in Seoul will become standard practice in the remainder of South Korea's many vibrant and growing cities in the years ahead.

2. LEGISLATIVE AND POLITICAL EFFORTS BY AND ON BEHALF OF PEDESTRIANS

Several recent efforts to improve the circumstance of pedestrians in Seoul have been led by both local citizen advocates, as well as by the city government. One advocacy group, the Networks for Green Transportation (NGT), has been at the forefront of the struggle for a pedestrian-friendly urban environment since 1992.

This group has helped to expose the harmful consequences of motorist negligence, weak and unenforced traffic safety laws and regulations, the lack of safe pedestrian and bicycle facilities, the lack of traffic calming on residential streets, and growing auto-dependence. They have also been pioneers in the struggle to use a "rights" framework for the development and promulgation of effective transport policy, pointing out the fact that "the rights of pedestrians, women, youth, bicyclists, the poor and the handicapped are often sacrificed to the private motorist" (1).

The actions of NGT's 4,000 members, other like-minded citizens, and conscientious local political leaders have helped turn some of these goals into legislative reality. In August of 1996 Seoul City Government took a major step towards advancing the cause of pedestrian and bicycle travel in the city by creating an internal "Section on Green Transport." The legislative

bill creating this Section did so with the intent to provide for the "Improvement of Pedestrian Environments and Pedestrian Rights."

In addition, an "Ordinance on the Rights of Pedestrians and the Walking Environment of the City of Seoul" was enacted on 15 January 1997. This Ordinance is believed to be the most significant legislative initiative to date regarding pedestrian issues. It makes it the responsibility of Mayor to ensure the rights of pedestrians to good environments for walking and to establish ongoing five-year improvement plans for pedestrian environment improvements, including a financial investment plan. The Ordinance's salient features are outlined in Table 2.

Table 2. Key points of the "Ordinance on the Rights of Pedestrians and the Walking Environment of the City of Seoul", 1997 (2)

Project Feature	Explanation
Purpose:	To advance the rights of pedestrians to a better walking environment.
Responsibility of the Mayor of Seoul:	To insure that the purpose of the ordinance is achieved. The mayor is also expected to initiate and fully support an ongoing series of five-year improvement plans for the pedestrian walking environment.
Obligations to and Responsibility of the Citizens of Seoul:	The citizens of Seoul are entitled to a good walking environment and up-to-date information on the status of the walking environment and the five-year improvement plans. In return, they are expected to cooperate with enacting the improvement plan.
The Five-Year Improvement Plans:	These plans for the pedestrian walking environment should include components on the current and forecasted situations for pedestrians in the city, a statement of direction and detailed plan for reversing any undesirable trends noted in the forecast as well as promoting the desirable trends, and a strategy for necessary funding and other resources needed to achieve the plan's goals.
Funding:	The Mayor's office is responsible for funding the provisions of the Ordinance.
The Current Plan:	The 1999-2003 plan calls for 312.8 billion won (about US$250 million) worth of improvements for pedestrians.

In addition, an "Ordinance for Children Protection Areas" (CPA) was enacted on 1 September 1995 in order to permit the application of measures to protect vulnerable road users such as children in the vicinity of elementary schools. According to this law, CPAs can be designated within 300 meters of elementary schools based upon local policy judgements related to of traffic volumes, parked cars, and traffic signal periods at pedestrian crossings. At present 750 elementary schools and kindergartens are hosts to the growing number of CPAs (see Table 3).

Table 3. Number of Children Protection Areas in Seoul, 1995-1998

Year	1995	1996	1997	1998
Number of new CPAs	121	116	216	297
Total number of CPAs	121	237	453	750

3. DOWNTOWN "COMMUNITY STREETS" AND CAR-FREE STREETS

Among the first initiatives in keeping with the legislation described above was to begin implementing "community streets" and car-free streets in business districts throughout the city. In design, "community streets" are much like their Japanese counterparts: busy but narrow commercial streets with a high degree of mixed pedestrian and vehicular traffic.

Such streets are often most appropriate in or near central business districts, near major public facilities, or in historic preservation areas. Street design features the use of textured and/or colored pavement, bollards, and landscaping to provide dedicated space for pedestrians within the road right of way. It also provides strong physical and visual cues to motorists that pedestrians are priority users of the entire street (3).

The City of Seoul, Section on Green Transport introduced its first community street in downtown Seoul at the beginning of 1998 (see Figure 1). The length of this street is 270 m (886 ft), and it is 11.5 m (38 ft) wide (building face to building face). So far Seoul's first community street has been well-received by neighbors and other street users, and it is felt to have resulted in decreased vehicular traffic (although official statistics are not yet available). Plans call for the introduction of about 15 more community streets in the next 5 years, totaling approximately 14 km in length.

Figure 1. The First "Community Street" in Downtown Seoul, 1998

Although car-free streets were first introduced unsuccessfully in South Korea's capital city during the early 1980's, since 1997 "car-free" status has again been afforded to five Seoul streets as part of a new initiative to give more secure space to pedestrians. These five streets were selected by local agencies within the city government, and have also received 2.091 billion won (about US$1.6 million) in physical improvements, mostly in the form of improved pedestrian amenities and traffic-calming treatments.

While a few local residents and merchants again objected to the pedestrianization schemes, most street users have found them to be quite favorable. Two of the newly modified streets are free from cars during weekends only, two more every afternoon and evening, and one has

been fully pedestrianized (see Figure 2). During 1998 there are plans to relieve five more streets of car traffic, while it is intended to expand the program by an additional 25 streets over the next five years, totaling 14 km in length. Table 4 presents details on the Seoul streets that currently enjoy car-free street status.

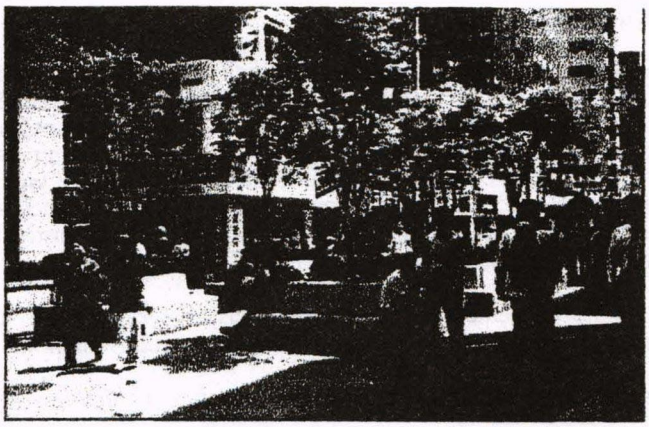

Figure 2. Fully-Pedestrianized Street in the Gwanchul District of Seoul, 1998

The Myungdong Street car-free program was evaluated by 200 pedestrians and shop owners in 1998. About 90 % of the pedestrians surveyed responded favorably to the car-free street, with nearly all agreeing that the car-free area should be expanded. Of the shop owners, 82% responded favorably to the car-free street and most agreed that the pedestrian environment had improved. Finally, despite the present economic crisis facing South Korea, 10% of the retailers surveyed answered that their income has increased since the car-free program was initiated. Hence, the program has been judged a success.

Table 4. Details of Car-free Streets in Seoul

Street Name	Length (m)	Width (m)	Car Free Hours	In Effect Since
Insadong Area	340	9	Sundays 10:00-20:00	13 Apr. 1997
Chungang Street	1,080	6-9	Daily 11:00-23:00	20 Aug. 1997
Myungdong Street	480	6-9	Weekends & Holidays 11:00-23:00	29 Aug. 1997
Gwanchul Area	150	15	Daily 11:00-23:00	7 Oct. 1997
Changdong Area	210	6-8	Daily 24 hours	2 May 1998
Galhyun Area	380	8.3	Daily 16:00-22:00	Under Development
Banghak Area	150	12		Under Development
Sucho Area	530	7		Under Development

4. STANDARDS FOR "SPEED HUMPS"

In August 1997, the Korean Ministry of Construction and Transport released its official *Guidelines on the Installation and Maintenance of a Road Safety Facility* [Speed Humps] (4). The main purpose of the humps is to ensure that vehicles will be operated at speeds of under 30 km/h (19 mph); they are designed to cause discomfort to the driver who crosses them at a speed exceeding this threshold.

The guidelines were based upon several years of research into effective speed hump design and performance, results of which indicated a 29.6% decline in average vehicle speeds after introduction of the hump device (from an average of 20.5 km/h (12.7 mph) at the intended point of placement to an average of 14.4 km/h (8.9 mph) subsequent to hump installation).
This addition to the Road Traffic Law focused on criteria for two different types of humps, as well as a road marking technique known as an "image hump." The guidelines feature detailed descriptions of speed hump functions and classification, as well as instructions on their placement, structure and design, technical details of construction / installation, and maintenance.
The recommended hump placement guidelines emphasize locations on streets serving primarily local / residential traffic. Notable features of these locations might include:

- the nearby presence of a school, kindergarten, hospital, church, or senior citizen's institution;
- the nearby presence of a playground, park, or other recreational facility;
- mixed-traffic streets (without sidewalks, but which still feature significant pedestrian activity); and
- other streets for which vehicle speeds are intended to be kept below 30 km/h (19 mph).

Cross-sections of the standard Korean speed hump are illustrated in Figure 3. It is permissible to place humps such as the one shown at intervals from 20-90 meters (65-295 feet) in order to maintain low vehicular speeds. As of mid-1998, 156 humps had been installed throughout the City of Seoul, 94 of which were located in school zones.

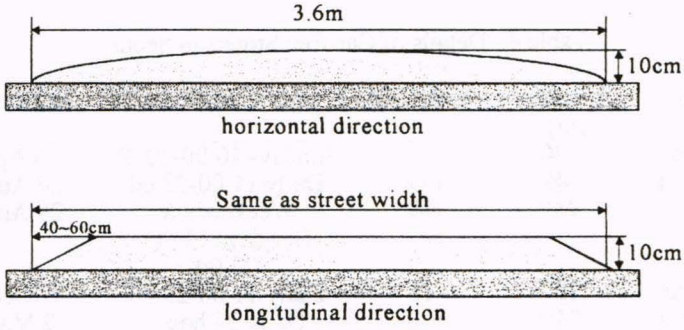

Figure 3. Cross-sections of the Standard Korean Speed Hump (4)

The guidelines also permit the installation of less expensive "image hump" markings where deemed necessary. Unfortunately, as the data in Table 5 indicate, these markings have been shown to be much less effective at reducing speeds—loosing much of their impact just days after installation (5).

Table 5. Impact of "Image Humps" on Driver Speeds Over Time (Residential Street), 1996

Time	Car		Bus	
	Ave. Speed (km/h)	Number of Samples	Ave. Speed (km/h)	Number of Samples
Before Installation	37.21	94	35.69	71
One Day After Installation	32.69	121	33.78	61
Eight Days After Installation	35.25	96	35.99	69
Four Months After Installation	35.43	112	35.17	68

5. The "Site Transportation Management" Program

As greater numbers of cars have found their way from Seoul's arterial roads onto the narrow back streets of primarily residential neighborhoods, community residents have become increasingly disturbed by the concomitant loss of public space and increase in danger. However, most neighborhood streets are administered at the *Gu* (Ward) level, rather than by the overall Seoul City Government.

Wards are "self-government districts" within Seoul, roughly analogous to the Boroughs of New York City; there are a total of 25 Wards in Seoul. Unfortunately, the Wards had a history of poor administrative conditions, prompting the Seoul City Government early this decade to search for more effective local street management policies. In this context, the "Transportation Improvement Program" (TIP) initiative was launched.

The TIP initiative has been designed to encourage Ward governments to independently develop proposals, strategies, and financial plans for promoting transit use, addressing parking issues, making improvements to neighborhood streets, and solving traffic safety problems for pedestrians and bicycles. One of the first programs to come from the TIP process was the "Site Transportation Management" (STM) concept.

Drawing upon the lessons and results of the Dutch "Woonerf" concept, other traffic calming practices of western countries, and the "Community Zone" initiative of Japan, STM was conceived as a Korean approach to comprehensive neighborhood traffic management. Begun in 1994, STM implementation has involved the installation of a range of physical traffic calming devices, through traffic prohibitions, one-way streets, and parking regulations, all applied in a coordinated fashion throughout target neighborhood areas, under direction of the Ward Government.

At present, 24 of Seoul's 25 Wards are home to at least one completed STM project, while Kangnam Ward (home to Seoul's highest auto per capita auto ownership) features 11 completed projects and seven more under planning. Table 6 outlines the progress of introducing STM throughout Seoul's Wards.

Table 6. History of Site Traffic Management (STM) Project Installation in Seoul

Year Initiated	Site Traffic Management Projects				Wards Represented (of 25 total)
	Completed	Under Construction	Planned	Total	
1994	2	0	0	2	2
1995	21	0	0	21	15
1996	26	0	0	26	20
1997	29	0	1	30	20
1998*	1	6	24	31	16

Source: Each Ward's Department of Transportation Improvement
* Figures are only for the first three months of this year.

6. CONCLUSIONS

Korea can be seen to have pioneered the introduction of many innovative concepts in addressing the impacts of motorization on pedestrians and other non-motorized road users. However, it appears that these accomplishments will need further reinforcement in order to withstand the "predatory" nature of automobiles, and their constant pressure to consume more road space as vehicular congestion increases.

Korea was quick to motorize, and seems also quick to be implementing a great deal of proven strategies for ameliorating many of the problems that have come with it. But these programs will require the dedicated support of the government agencies and sustainable transportation advocates in order to be fully realized.

The increasing role of public participation in Korean transportation decision-making is also notable and instructive. Community involvement is likely to be a key to "locking-in" the gains that are made for pedestrian-friendly streets. In Seoul, the efforts of the citizen-led NGT advocacy group have been an important force in encouraging the city government to enact its pro-pedestrian legislation, and continued community support will be needed to see the planned "Five Year Pedestrian Environment Improvement Plan" through to a successful completion.

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