RECLAIMING TRAFFIC INFLUENCED URBAN RESIDUAL SPACES FOR THE PUBLIC: SPECIAL REFERENCE TO COLOMBO

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Abstract

Although highly populated districts like Colombo, suffer from decrement of open public spaces, there are many unused areas within the city which has not considered for its full potential. It's observed that most of them are generated due to traffic related issues. The attention given to revitalize them is questionable. Therefore the study aims to identify the possibilities of traffic related urban residual spaces being reclaimed for public use. The study will explore most suitable reclaiming possibilities in selected urban residual spaces. Usage qualities, spatial qualities of existing residual spaces and revitalization possibilities were tested in this study. Data collection was done via questionnaires, interviews and systematic observations. Four cases were selected with variation in its physical layouts and locations in order to represent the traffic related urban residual spaces in Colombo.

The study reveals spatial and usage qualities of traffic related residual spaces which vary, mainly due to location type and size of the site; people feel insecure in residual spaces due to vehicular movement and that feeling could be mitigated by physical separations and strategies. Lack of accessibility affects the users to be limited in to a particular category based on gender and age. With reducing the size of the residual space, the reclaim possibility is being changed. Due to traffic movement, most of traffic related spaces has higher visibility, defined site boundaries and it's a potential for reclaiming. Lack of management and control is the main reasons behind the residual symptoms. Although the traffic related residual spaces have residual symptoms, respondents believed that there is a possibility to reclaiming those spaces for public use. Every residual space has unique appropriation /intervention by users. By evaluating these appropriations it's possible to select most suitable reclaiming possibility for residual space. Well organized public-private partnerships will help to evade residual symptoms and allow better management and control of reclaimed public spaces.

Keywords: *Residual space, Reclaiming, Traffic related, Spatial and usage qualities, appropriation*

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Urban residual spaces

Theorists and researchers have defined urban residual spaces as lost spaces, non-spaces, leftover spaces etc...

According to Trancik (1986) lost space is:

> "the left over unstructured landscape at the base of the high rise towers or the sunken plazas away from the flow of pedestrian activity in the city ,...they are the Romans land along the edges of freeways that nobody cares about maintaining much less using....also the abandon water fronts, train yards, vacated military sites and industrial complexes. They are the vacant blight-clearance sites-remnants of the urban renewal days-that were, for a multitude of reasons never redeveloped" (p.3)

Trancik (1986, p3) defines the "lost space" as "the undesirable urban areas that are in need of redesign, anti-space, making no positive contribution to the surroundings of users". Winterbottomm (2000) denotes three types of residual spaces:"non-spaces, "leftover spaces", "dual –use spaces "he used the term "dual used space" for areas which functioned in certain time with certain function and become residual on other times. Further he refers the "left over spaces "as un-programmed spaces detached from surrounding spaces.

Rilvin (2007) suggests that people also used less designed spaces found from their surrounding without only using plazas and public squares. He used the term "found spaces" for those spaces that are located in convenient places which have easy access and high visibility.

According to occupation pattern of leftover spaces, Alanyali, (2009) argues that leftovers are signified with misuse, underuse and "appropriation". Based upon these three aspects, she concludes six typologies of leftover spaces in the Turkish context mentioned as underutilized, potentially exploitable, abandon, appropriated, obsolete and unproductive.

According to Khalil & Eissa (2013);

> "Urban residuals offer a potential alternative to the scarecity of open spaces.this alternative should be seriously considered by governments instead of depending completly on vacant plots of land-which are usualy a scace resource.the sucess of formal interventions or the permanance of appropriations in such spaces unravels a social agreement of accepting such interventions" .(p.120)

Nowadays, urban land demand is excessive due to rapid population growth. Urban Open lands for public spaces are rapidly decreasing. Only 7.05% of open spaces have been recorded in 1996 According to land use distribution in city of Colombo. (source-city of Colombo development plan-1996).In 2013 it have reduced up to 6.5%(source-urban transport system development project by JICA-final report-August 2014).In that decreased percentages, the spaces used as open public spaces are minimum. Although it's need urban parks, community parks, local parks and mini parks according to hierarchical structure and general characteristics of urban centers (source-National physical plan of Sri Lanka -2030) .Therefore, smart usage of urban lands are becoming essential fact in urban landscape. Though there are many unused areas within Colombo district, the attention for revitalizing them is questionable. At the first glance; most of residual spaces within the city limits are created as a result of traffic related solutions. It is observed that the general attitude towards urban residual open space is that, it couldn't be used for any other useful manner.

Many studies are available regarding urban spaces and its characteristics in Sri Lankan context. But the extension of such researches towards urban residual spaces is scarce. A study on "reclaiming residual spaces for the public: a case study from the city of Cairo" (2013) has a potential to further develop and apply to the study of reclaiming possibilities of residual spaces for the public in Sri Lanka.

The causative factors of residual space

Trancik (1986) argues that low control, undefined ownership and lack of management are the reasons for emerging "lost" spaces. Alanyali, (2009) refers to lack of control and maintenance as a reason for leftover space. Further she has identified two scenarios for a space to become a leftover space: a non-designed place by authorities, therefore it doesn't serve the public and has disorderly appearance and designed places by authorities but has subjected to no longer being used.

> "....two scenarios for a space to become leftover; first, a space never having its share of design by the authorities and therefore it doesn't serve the public and those spaces are usually characterized by a ruined disorderly appearance and second, a space which was once designed by the authorities but has been subjected to deterioration and became no longer used." (as cited in Khalil & Eissa ,2013,p.107)

Social –Spatia1 understanding of residual spaces

Madanipour (1996) denotes that the attempt to integrate the social and physical dimensions of space, or in other words to contextualize the physical space into human practices, is an important fact in our understanding of space so it's necessary to consider social; and physical dimensions together.

Spatial qualities

Alanyali, (2009) refers to lack of boundaries and disorderly appearance as significant qualities of leftover space.
"Space can be measured: it has defined and perceivable boundaries; it is discontinuous in principle, closed, static, yet serial in composition. Anti-space, on the other hand, is shapeless, continuous, lacking perceivable edges of form" (as cited in Trancik, 1986, p 61)

Khalil & Eissa (2013) has explored the spatial qualities which is been presented by various theorists and studied the residual spaces by eight physical qualities namely; easy accessibility, security level, site boundaries, site topography, uniformity of form, area of site, sites location, neighboring facilities, site's proximity to heavy circulation routes .
Khalil & Eissa, (2013) further explains that:

> "Site's accessibility could be dangerous, easy or unfeasible which affects possibilities of appropriation. A site's visibility affects its exposure and defines whether it would be noticed by vehicles moving on a high speed or pedestrians- and thus defines the potential customers. Also, the area of the site affects the amount of appropriators it could host and impacts the types of activities assigned to it. Qualities referring to the site within its context include neighboring facilities which may provide the site with a

high pedestrians' flow. …. A site's location within the city is also a factor that might attract or repel appropriators."(p.113)

Usage qualities

"There is no logic that can be superimposed on the city. People make it, and it is to them, not buildings, that we must fit our plans" (Jacobs, 1958, p 160). According to Tuan, (1977, p 36) "The human being, by his mere presence, imposes a schema on space…..he notes its absence when he is lost…... "In the absence of the right people and things, places quickly drained of meaning so that their lastingness is an irritation rather than a comfort." (Tuan, 1977, p140)

Alanyali(2009) argues that leftover spaces are signified with underuse, misuse and "appropriation "based on that ,she mentioned six typologies can be emergence in Turkish context as underutilized, potentially exploitable, abandon, appropriated, obsolete and unproductive. According to her usage qualities are the indicator of residually. Khalil & Eissa (2013) explains that "Usage qualities of the site explain its current occupancy patterns. A space could be occupied on certain days of the week and abandoned on others …. Previous functions of a site may also affect its appropriation pattern". Khalil & Eissa (2013, p.113) considers pre and post-intervention usage qualities of residual spaces as below; Pre-intervention usage qualities-Use for site, users of site, time of use, frequency of use post-intervention usage qualities-intervention activity, intervention body, intervention time, intervention frequency.

As per Khalil & Eissa (2013, p 108) "residual spaces are often acted upon and become informally modified by users to host various activities. This informal modification is referred to as "appropriation ".Korosec. & G.E.P.E (1976) denotes that appropriation activities lay under one of two categories: urging activities fulfilling a necessary need or optional activities such as recreation, entertainment. Gehl(1987)further explains about those nessesary optional activities. Gehl (1987,p13) explained that, the outdoor activities in public spaces can be divided in to three categories:necessary, optional and social activities. Nessasary activities: "include those that are more or less compulsory"; optional activities: "those pursuits that are participated in if there is wish to do and if time and place make it possible.social activities:"all activities that depend on the persence of others in public space". Further he explains that "when the quility of outdooor areas is good ,optional actiivities ocure with increasing frequency .furthermore,as levels of optional activity rise,the number of social activities ussualy increases substantially."

Table 1: Relationship between activities and quality of the physical environment

Source- Gehl, J. (1987),P 13
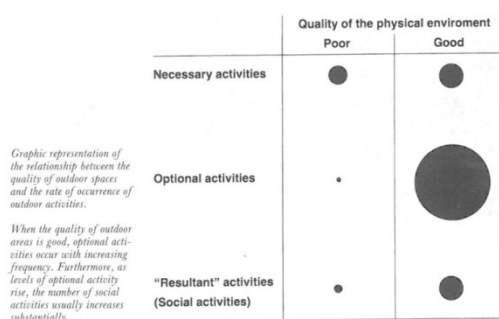
Manifestation of urban residual space

Tancik (1983) identifies unused sunken plazas away from the flow of pedestrian activity, abandoned water front, train yards, vacated military sites, areas beneath highways as "lost space". Further according to Rilvin (1986), strips of sidewalks isolated from surroundings, islands, street Intersections & squares were geologically set off from surrounding space as "found spaces". Loukaitou-Sideris (1996) identifies decaying parks & playgrounds as "cracks in the city". Cisman (2005) recognizes the gaps between one thing and another, collisions of scale and uses, leftover spaces under, over and along elevated highways and railway lines, or large urban voids and ruined places, fenced parks invisible from outside as "sight out of sight". Alanyali (2009) identifies unbuildable areas, interstitial zones, space related to circulation routes, abandoned as in x-function sites, neglected (designed but not used), vacant buildable lands as "leftover spaces". Khalil & Eissa (2013) defines the residual spaces as "inactive publicly owned latent pieces of land that are potentially exploitable".

According to many theorists, inactiveness, public ownerships and not well maintenances are the common features of residual spaces although they have named differently. As per the reviewed literature, train yards, areas beneath highways, street intersections, Street Islands and squares are sorted as geologically set off from surrounding space, hence have identified as residual spaces. Among these leftover spaces under/ over and along elevated highways and railway lines could be considered as traffic related residual spaces.

Revitalizing urban residual spaces

Trancik(1986,p5) explains that "we need to reclaim these lost spaces by transforming them in to opportunities for development...existing public plazas, streets ,and parking lots that are presently dysfunctional and incompatible with their contexts can be transformed in to viable open spaces"
According to Khalil & Eissa (2013);

> "Urban residuals offer a potential alternative to the scarecity of open spaces.this alternative should be seriously considered by governments instead of depending completly on vacant plots of land-which are usualy a scace resource.the sucess of formal interventions or the permanance of appropriations in such spaces unravels a social agreement of accepting such interventions". (p.120)

Further they denote that, the interventions upon residual spaces could be either formal or informal. Formal interventions manifest in approaches by government or organizations with pre planned activities. Informal interventions manifest in appropriation.
Accordingly, as per the two theorists' discuss above, the revitalizing approach is a "transformation" and "a potential alternative" for open, dysfunctional spaces with considering appropriations by users.

Framework for examine Revitalizing possibility

Khalil & Eissa (2013) present list of factors that"decide whether a leftover space is likely to be appropriated or not, and could portray persumed modes of appropriation".

Khalil & Eissa (2013) state that although the residual spaces have different forms, "they all prove to be latent spaces with a potential for better utilization"further they discovered that "

formal and informal interventions of such spaces improve their utilization,either through leisurly or nessasary activities".

Table 2: Physical and usage qualities of residual spaces

Source- Khalil, M.H., & Eissa, D.M., (2013). Reclaiming Residual Spaces for the Public:A Case Study from the City of Cairo , In proceeding of the international urban design conference: University of Moratuwa: Sri Linkup. 114.

Physical Qualities	**Intrinsic Qualities**	Accessibility	Safe , Dangerous
		Security level	High, Average, Low
		Visibility	Exposed, Hidden
		Site boundaries	Defined- Loose
		Site topography	Flat, Hilly
		Uniformity of form	Regular, Irregular
		Area of site	Tight, Spacious
	Extrinsic Qualities	Site's location	Peripheral, Central
		Neighboring facilities/assets	Views, Transportation facilities,...etc.
		Site's proximity to heavy circulation routes	Roads or Pedestrians Paths
Pre-intervention Usage Qualities		Current use for site	Vending, Recreation, etc., or None
		Current users of site	Locals, Externals
		Time of current use	Day, Night
		Previous use for site	Industrial, cultural, etc.

It's expected to develop and apply the study found in "reclaiming residual spaces for the public: a case study from the city of Cairo" (2013) for reclaiming possibilities of residual spaces for the public in Sri Lanka. Main research problem of this study is what are the possibilities of traffic related urban residual spaces for reclaiming for public use?

Mainly quantitative approach was selected to full fill the research objectives where main intention was to achieve more accuracy in comparison of the 4 cases. However, since there are several qualitative aspects, a qualitative study was able to carry out to identify some implications on the objectives. The method used in each stages of this study is shown by table 3. The main research objectives, data which is needed to achieve it and the data collection tool/method is summarized as follows (table 3).

Table 3 : Summery of methodology

Research Objectives	Data needed	Data collection tools/method
1. Examine a theoretical framework to identify –Defining the Residual spaces, their social -spatial characteristics.	Definition for urban residual spaces spatial, usage characteristics	Literature review. **Use the framework which is used by** Khalil & Eissa (2013) **for identifying** social-spatial characteristics with authors' improvements.
2. Examine a theoretical framework to measure the impact level of identified social-spatial characteristics for reclaiming urban residual spaces	Users' perceptions/author's observations about identified social-spatial characteristics	**Structured close ended questionnaire** (allowed to present reasons behind the selections), **Systematic observations** Activity logs.
3. Identify the reclaiming possibilities for selected urban residual spaces as public space	Analyzed data(Users' perceptions/author's observations about identified social-spatial characteristics)	

Selected Cases

Pilot visits were done to select most suitable cases from which the four different cases were selected. The selected case studies has been divided in to three main categories: Open side space - C1-BJ, Open middle space - C2-KJ, C4-MJ and Underneath middle space - C3-DF.The key factors of those cases are summarized in the table below.

Table 4: Summary of selected cases

Case	Case 1-BJ	Case 2 -KJ	Case 3 -DF	Case 4 -MJ
Name	Side space of Bambalapitiya roudabout	Roundabout at Kottawa junction	Underneath space of Dehiwala flyover	Roundabout at Maradana junction
Location	Colombo 04	Kottawa	Dehiwala	Maradana, Colombo 10
Characteristics	open Lenear,long ,Side space of the street	Open,triangular space created by streets	Open Linear space in between roads	Open,triangular space created by streets
Present usage	Unorganized parking	Paved area with "Bo "shrine	Parking	Landscaped area

Sampling and data collection

60 sample users per case were selected and have answered the questionnaire at the selected sites. The interviewers were randomly selected and the surveys were carried out during two

days indusive of weekday and Sunday in order to analyze the difference. 10 users were interviewed per one time period (Morning, Afternoon and Evening).

Introduction to selected cases

Case 01 - Side space of Bambalapitiya roudabout (C1-BJ)

As a result of new traffic plan in 2011, the road running in between Galle road and R.A De Mel Mawatha was converted as one way road. Earlier it was a two way road and there was a center island with a water feature (See Fig: 3). According to the new plan, Center Island was combined with neat bus stand created with open side space. Small milk bar and other small structures existed before has been removed.

Fig 1: Lawn area, image from Galle road side

Source-Author

Fig 2: C.T.B bus stand

Source-Author

In present day the side space is equipped with the Ceylon transportation board (C.T.B) bus stand, three wheeler park and open landscaped area which are barricaded by a fence. In front of the side space there is a public parking space. Kadawatha - Bambalapitiya bus service starts from this bus stand. This side space is owned the Road Development Authority (R.D.A) and C.T.B and maintained by Colombo Municipal Council (C.M.C). Although private vehides are not allowed to park in C.T.B bus stand, people tend to park their private vehides by making the area more congested.
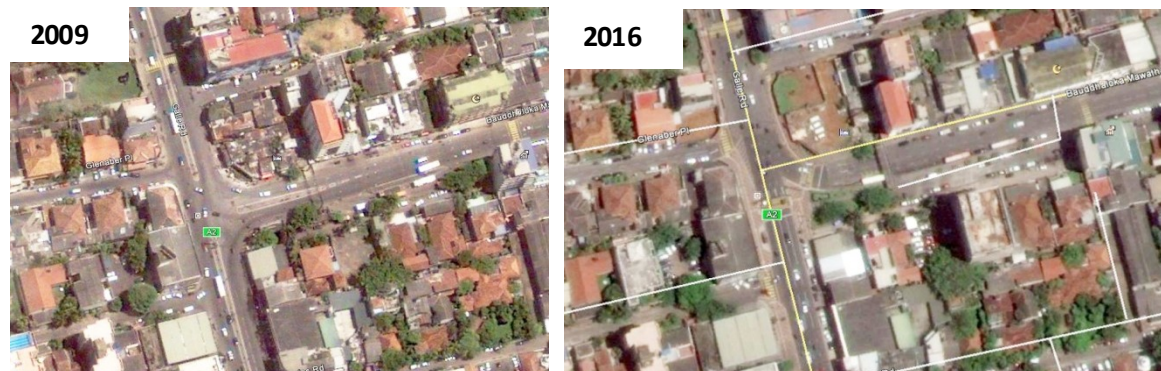

Fig 3 : Transformation of the space
Source-Google Earth

Indications of residually

The area is a poorly designed. The existing parking areas aren't properly demarcated. People park their vehides wherever they desire. The lawn areas were covered by fences. The water feature doesn't suit the space. This is an example for" identified strips of sidewalks" which is explained by Rilvin (1986) as "found spaces".

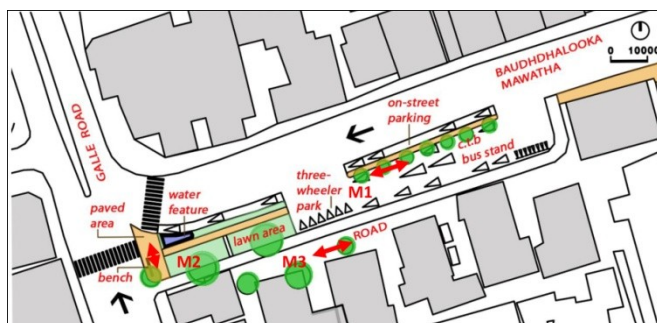**Fig 4:** Bambalapitiya junction -Micro Context

Source-Author

Fig 5: Bambalapitiya side space-existing plan ;User's movements with directions-M1- user's movement 1, M2- user's movement 2, M3- user's movement 3

Source-Author

Case 02- Roundabout at Kottawa junction-(C2-KJ)

Fig 6: Kottawa Middle Island and surrounding

Source-Author

Fig 7:"Bo "shrine in Middle Island

Source-Author

The selected island is located in the middle of this junction with a "Bo "tree. The traffic plan (2015) which they used earlier was changed here in (2016). Previously, the center island was comparatively larger (see Fig: 8) which has been used as part of the bus stand. There was also a small shrine that people used to go often and worship. According to new development plan; a part of the bus stand was removed from this middle space and the large middle island was divided into two individual islands

2014

2015

Fig 8: Transformation of Kottawa junction

Source-Google Earth

Now both center islands have paved with cement blocks. The "Bo "tree was left with a small shrine in one island. This place is owned by R.D.A and maintained by Municipal Council.
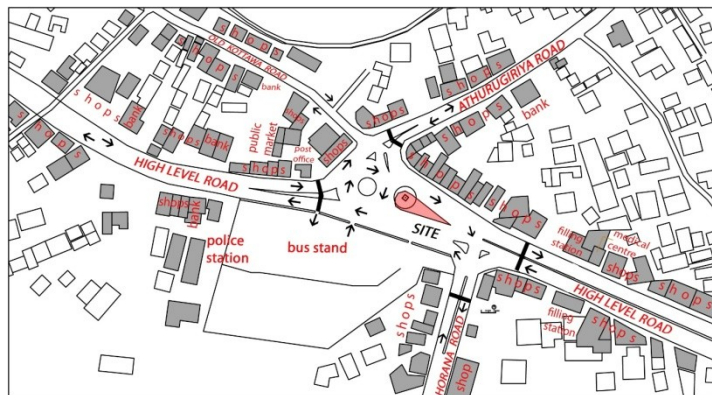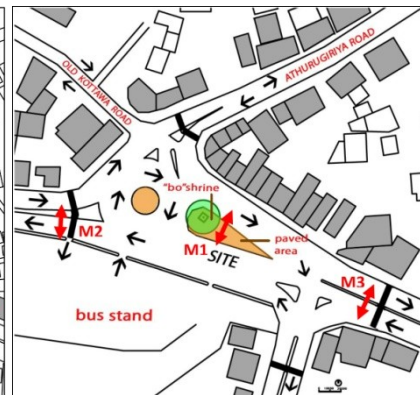
Fig 9: Kottawa middle island micro context

Source-Author

Fig 10: Middle island-KJ User's movements with directions
M1-user's movement 1, M2- user's movement 2, M3- user's movement 3
Source-Author

Indications of residually

The selected island is located in the middle of the junction. Center islands are paved using cement paving. It is related to the "islands" which was described by Rilvin (1986) as a" found space". And according to Alanyali (2009), this is a" space related to circulation routes". Further it has indeterminate spatial qualities according to Rilvin (1986).

Case 03- Underneath space of Dehiwala flyover –(C3-DF)

Dehiwala junction that connects Galle Road, Srimath D.B Jayathilake Mawatha and station road is another location. The fly over was built over Galle road at Dehiwala junction in 2009 as a solution for traffic congestion during peak hours. It's a two lane flyover which is 337m in length and 7.35m width. The underneath space is currently used as parking space and there are two pedestrian crossings under the fly over. This underneath space belongs to R.D.A and maintained by Municipal Council.

Indications of residually

The underneath space is currently used as an unplanned and uncontrolled parking space. It is related to the "leftover spaces under …elevated highways "as Crisman (2005), and also"areas beneath highway" as Trancik (1983) explains. Crisman (2005) uses the term "sight out of sight "to describe such abandoned usage quality.

Fig11: Dehiwala flyovers and it's underneath space
Source-Author

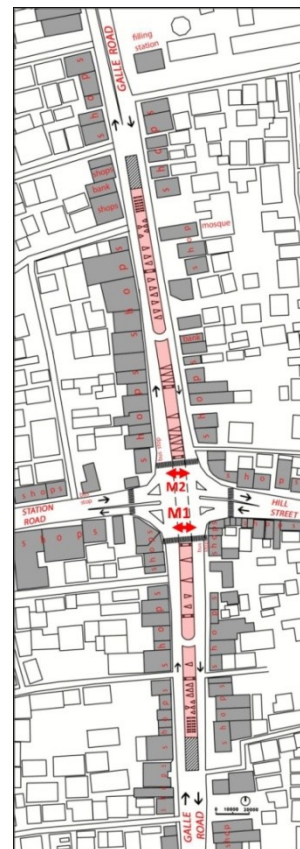**Fig12:**Dehiwala flyovers and it's underneath space
Source-Author

Fig 13: Dehiwala junction-macro plan

M1-user's movement 1, M2- user's movement 2

Source-Author

User's movements with directions-M1-user's movement 1, M2- user's movement 2

Case 04-Rounderbout at Maradana

iunction- (C4-MJ)

Fig14: Maradana middle space with void

Source-Author

Fig15: Maradana middle space-paved path way

Source-Author

The island is located at Maradana Junction. It consists of landscape and a void area which was is generated by road bridges. Earlier the void spaces and landscape areas were divided by a middle road. But after the new traffic proposals, middle road was closed by combining the two parts and Panchikawaththa Road was converted to a one way road. Railway tracks runs under the void space. (See Fig :16)
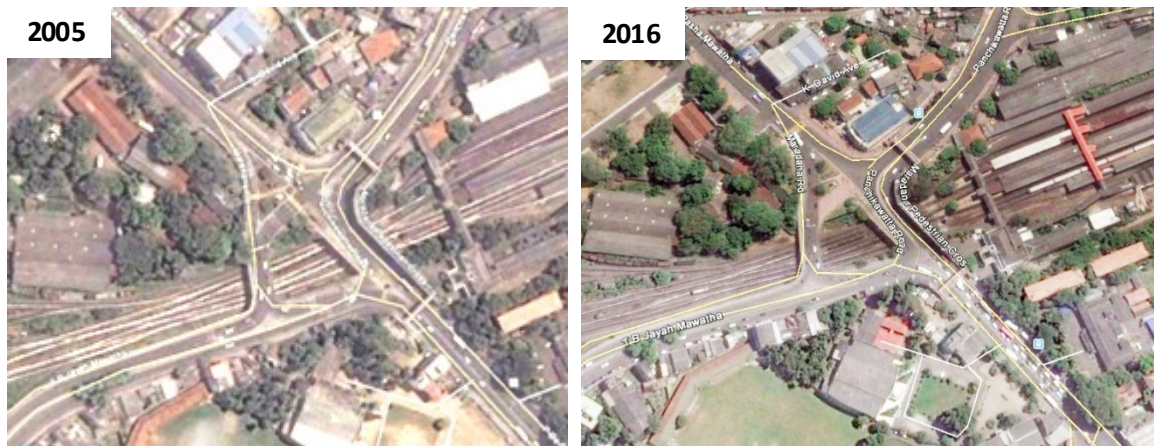

Fig 16: Transformation of Maradana middle space

Source-Google Earth

This space is used as a landscaped area with flower pots and a statue. This space belongs to R.D.A and maintained by C.M.C.

Symptoms of residually

Presently there is no proper activity planned except a mere pass-by. Original designs were changed and now it has become an unplanned space. It belongs to" islands which is explained by Rivlin(1986) as "lost space" . "Leftover spaces over railway line is explained by Crisman(2005)as sites out of sight".
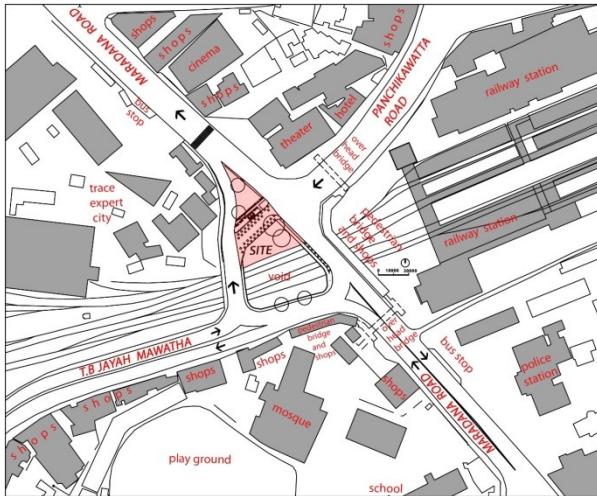
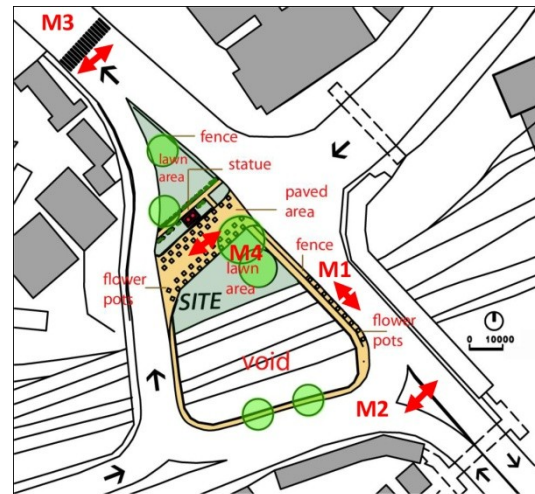**Fig17:** Maradana middle space- Existing plan

Source-Author

Fig18: Maradana middle space-micro context plan. User's movements with directions-M1-user's movement 1, M2- user's movement 2, M3- user's movement 3, M4- user's
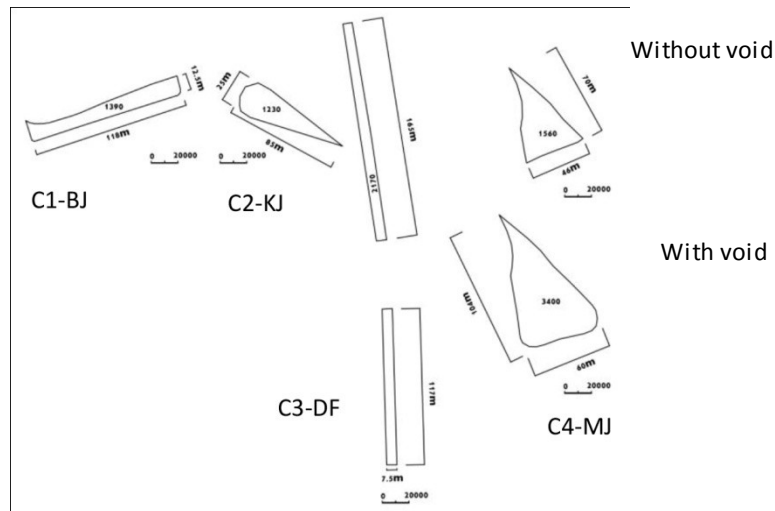
Source-Author

Comparison of cases

Impact level of physical characteristics

Table 5: physical characteristics comparison

Case	Uniformity of form	Area of the site	Site location	Site boundaries	Neighborhood facilities
C1-BJ	Open, Regular, leaner flat	Spacious area 1390Smwidth 12.5m(max) Length 118m	Peripheral side space	Well defined by two roads, and a multi-story building.	City hotel, Mosque, private educational institutes, shops, night club, financial institutes, fashion stores, shopping complexes adjacent to the place.
C2-KJ	Open, Leaner, triangular, flat	Not a spacious, Tight Area 1230Sm Width 25m(max) Length 85m	Center, middle space	Well defined by surrounding main roads.	Public market, police station, bus stand, post office, financial institutes and shops are located around these immediate surroundings
C3-DF	Open, regular, underneath space	Spacious Area 2170 Sm Width 7.5m Length 282m	Center, middle space	Well defined by surrounding main road.	Bus stand, railway station, fashion stores and shops are located around these immediate surroundings

C4-MJ	Open, ,triangular, flat	Spacious than C2-KJ Area 1560Sm 3400Sm (with void) Width 46m Length 70m	Center ,middle space With corner void	Well defined by surrounding main road. It's also has boundary fences.	Railway station, Tracie expert city (IT city), cinema, Elphiniston Theatre, Tower Hall, Hotels, Zahira college, Police station and shops are located in this immediate surrounding area

Site area   - C3-DF > C4-MJ > C1-BJ > C2-KJ

Fig19: Site area comparison

Source-Author

According to above site area comparison C3-DF has a larger area. C2-KJ has a small site and the usable area is reducing due to the triangular shape. There is an opportunity to increase the area of the C4-MJ by adding the void space. It doubles the existing land area of the C4-MJ.
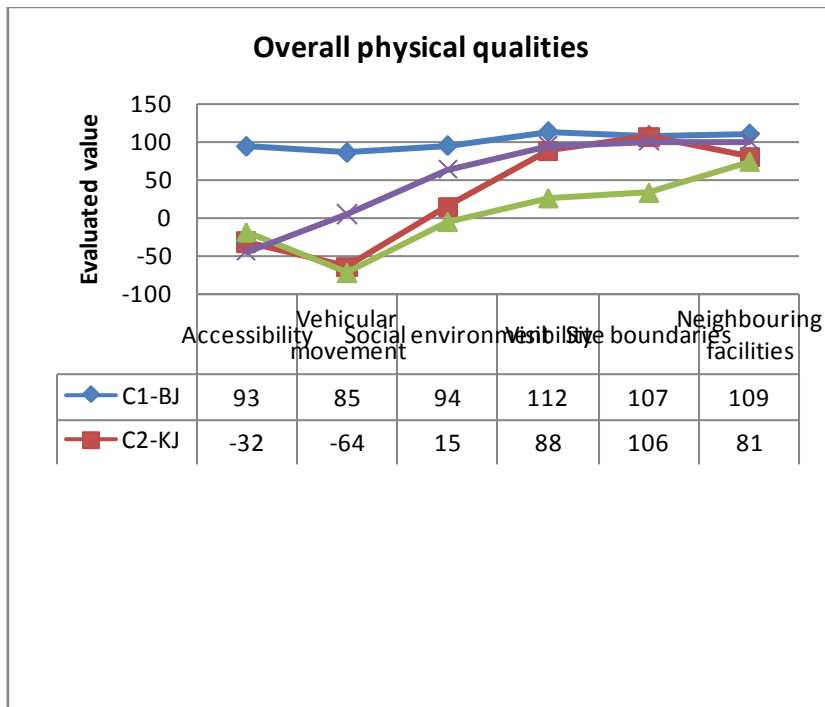
User perceptions

Overall physical qualities

	Accessibility	Vehicular movement	Social environment	Visibility	Site boundaries	Neighbouring facilities
C1-BJ	93	85	94	112	107	109
C2-KJ	-32	-64	15	88	106	81

Fig 20: Survey result-overall physical qualities-all cases

Accessibility

User perceptions show that C1 is a place which has highest accessibility while C2, C4 have lower values. People can easily access the C1. There are three pedestrian crossings to reach this place from main roads. Vehicles can easily reach and drop people off.

In the cases of C4 and C2, People can't easily access the place. Presently there are no pedestrian crossings to reach this place from main roads. It's very difficult to reach this place due to heavy traffic flow in and around the main roads. There is an overhead pedestrian bridge in Case 4 to cross the main roads. However, reasonable numbers of people tend to cross the middle island without using overhead bridge despite the danger

Fig 21: Pedestrian movement-M2 (C4-MJ)
Source-Author

There are two pedestrian crossings with traffic lights to facilitate pedestrian movement across this underneath space in case C-3. Although the bus stops are very close to this pedestrian

crossings .there are no demarcated bus bays. Thus, it creates unnecessary traffic which disturbs the pedestrian movement and makes them uncomfortable to use it. Vehicle parking underneath this space also create disturbances to the pedestrians.

Fig 22: Pedestrian crossings are blocked
by buses- (C3-DF)
Source-Author

Fig 23: Road is blocked by vehicles from
Underneath parking area- (C3-DF)
Source-Author

When comparing the cases by observations and user perceptions it shows that open side spaces (ex-C1-BJ) are more accessible than open middle space (ex-C2-KJ, C4-MJ) and underneath middle space(ex- C3-DF) .

Security level: in terms of vehicular traffic & social environment

As shown in the results of user perception, C1-BJ is the highest secured place in terms of vehicular movement and social environment while C3-DF has the lowest values. Further users feel that C2-MJ is secured than C4-KJ and C3-DF.

Case1-BJ is safe in terms of vehicular traffic due to a separation from main road on street parking lane and pedestrian pavement. During day time activities happened here are visible to everyone. Three wheeler park generally functions during the whole day, due to city hotel customers. Even in the day time three-wheeler drivers are in watchful eyes of the surrounding area. Thus it's a safe place in terms of social environment. According to their opinion, if this place becomes dangerous people may neglect the place and leaving them any of the hires.
 "We don't allow anyone to behave in a disturbing or dangerous manner to people. If this place is named as unsafe, people don't come….definitely we will lose our jobs…."
-Three wheeler driver in the park (personal communication, January 26, 2016)

Fig 24: People are waiting and moving – C1-BJ
Source-Author

Respondents believe that case 2-KJ isn't safe due to heavy traffic flow surrounding main roads. Further some people believe that this is a safe place due to its' openness, visibility but it isn't a safe space in terms of social environment caused by lack of proper lighting during night time. Although it is junction, there are no street lamps visible. (See Fig :25)

Fig 25: Dark Middle island in night time (C2-KJ)

Source-Author

Fig 26: Dark corner spaces at the end of fly over (C3-DF)

Source-Author

According to respondents, C3-DF is insecure in terms of vehicular traffic due to disturbances causing to pedestrians because of the improper bus stops and parking activity. Further people believe that this isn't a safe space in terms of social environment due to the lack of light at night time.

Although there is a heavy traffic flow in main roads, users believe that C4-MJ is safe in terms of vehicular traffic .they feel like that due to the surrounding boundary fences. Further due to its openness, people believe that this is a safe place in terms of social environment.

As per The overall user perceptions, there is a better sense of security (safety) from vehicular movement than in a middle space. As a result of this side space, the sense of security from vehicular movement can be increased by physical separation like on street parking, shady tree line etc...In case one, there is sense of security due to on street parking and pedestrian pathway. In open middle spaces people feel unsafe due to vehicular movement. When physical barriers are introduced, the unsafe feeling is reduced. Although the C4-MJ is an open middle space people feel that it's a safe place from vehicular movement due to fences around that.

Visibility

Users believe that C3-DF has lower visibility level while other cases have high visibility level.C1-BJ, C2-KJ and C4 are not covered spaces. As this is an open space, everyone can see the activities happening around. C3-DF isn't a fully covered space (covered only upper side by the flyover). This is an open space and everyone can see the activities take place here in day time. But the visibility of corner ends is less due to parking activity in day time. At night time the visibility of corner space is further lessened. It's shown that when visibility level is low people feel unsafe regards to social environment.

Site boundaries

It's shown that the users feel that C3-DF has no defined site boundary compared to other cases. C3-DF has only small curb at some areas and hasn't even that curb in Middle area and the main road are in same level in those areas. It's clearly shown that, defined site boundaries are help to increase sense of security from vehicular movement (ex-C4-MJ).

Neighboring facilities

Majority of users are using these spaces while they come for neighboring facilities in and around the areas. In C1-BJ, there are bus stand, parking place and Three-wheeler Park. People come there because of one function, but the facilities in the space are helpful for increase the functionality of that place.

Impact of usage qualities

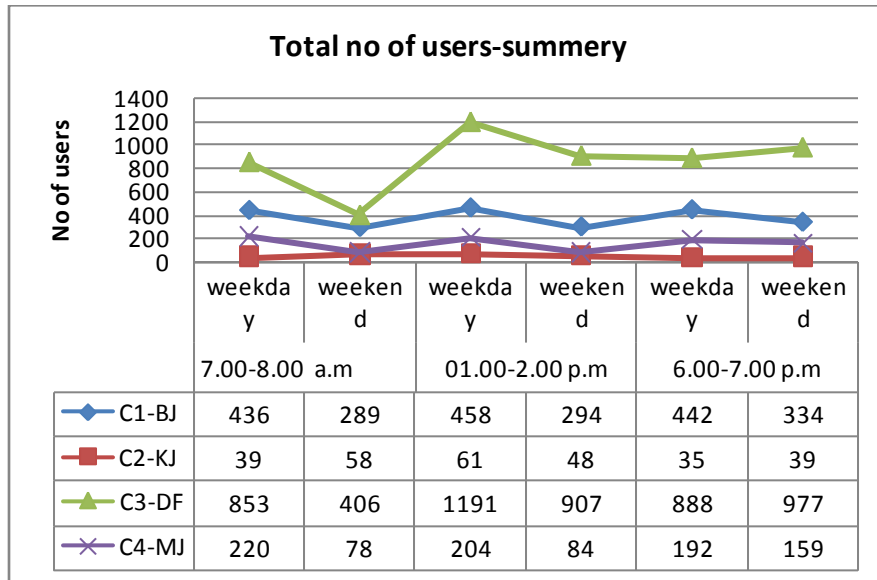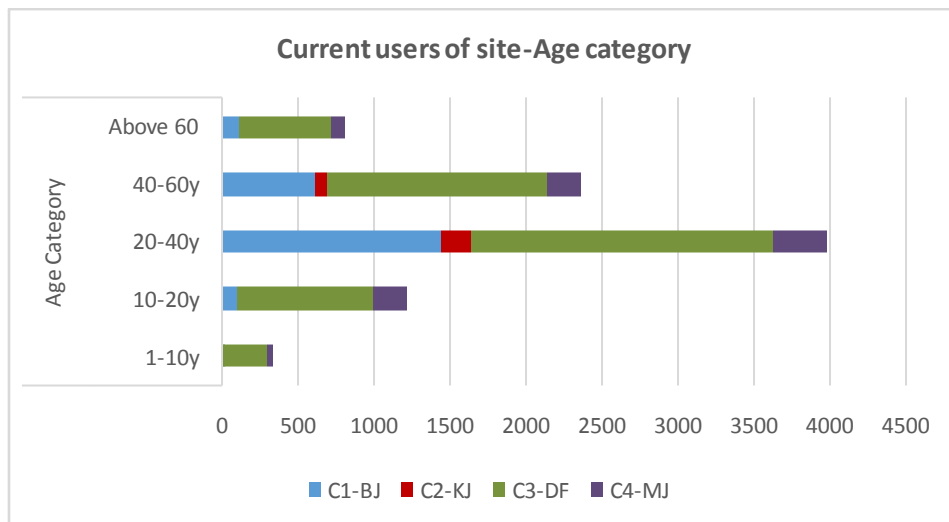**a) Current users of site (no of users, age category) with time-weekday & weekend**

Total no of users-summery

	weekday	weekend	weekday	weekend	weekday	weekend
	7.00-8.00 a.m		01.00-2.00 p.m		6.00-7.00 p.m	
C1-BJ	436	289	458	294	442	334
C2-KJ	39	58	61	48	35	39
C3-DF	853	406	1191	907	888	977
C4-MJ	220	78	204	84	192	159

Fig27: Survey result-total no of users-all cases

Current users of site-Age category

Case	Age Category				
	1-10y	10-20y	20-40y	40-60y	Above 60
C1-BJ	6	97	1441	603	106
C2-KJ			191	89	
C3-DF	286	892	1992	1440	612
C4-MJ	36	220	360	231	90

Fig28: Survey result-total no of users-all cases

Among three cases, the numbers of users are higher in Case3-DF. During weekdays and also weekends there are larger number of users because it's obligatory to pass this space to reach other side of the road and facilities have been provided for crossing (pedestrian crossings and traffic lights). This place is used by all age categories, genders and it's is an advantage for reclaiming as public space. Lowest numbers of users are in Case2-KJ. Majority of users in Case2-KJ are in aged 20 to 60 years. The users below 20 years and above 60 years aren't using this place. It clearly shows that this place is difficult to be used by children and elderly people due to lack of accessibility.

b) Current use, activity of site weekday and weekend

Table 6: Survey result- Current use, activity of site weekday and weekend

Case	Day	Passing	Loiters	Activities in loiter time				
				Talking	Watching	Smoking	Reading	Other
C1-BJ	weekday	1250	86	65	19	2		
	weekend	847	70	57	12	1		
		2097	156	122	31	3		
C2-KJ	weekday	72	52	2	50			
	weekend	132	13	3	6	4		
		204	65	5	56	4		
C3-DF	weekday	2922	10	6	3		1	
	weekend	2276	14	11	3			
		5198	24	17	6			
C4-MJ	weekday	602	14	9	4			
	weekend	317	7	4	3			
		919	21	13	7			

Majority who uses these spaces are the people who pass by. The numbers of people who use this for crossing link are higher in week days than weekend except in C2-KJ. Due to comparatively low traffic flow, people tend to cross that space in weekends than weekdays. Except in case 2-KJ most of loiters are talking to each other or use mobile phones while standing or seating in these spaces. In case 2-KJ, users have to spent more time on this middle area due to heavy traffic flow in week days. The users always have to wait and watch for an opportunity to reach other side of the road.

C1-BJ: Among the users who loiter, most of them just talk to each other or talks over the phone (each other or via cell phone). Some users are waiting for someone or a bus. There is only one seating place at the end of this space near Galle road. Some users merely use the space to sit

Case 2-KJ : Most of the time, the users have to wait more than 5 minutes (generally 5-15 time duration) until they get a chance to cross the road. Although there is a 'Bo 'shrine, it is difficult for people to reach there to worship due to lack of accessibility. According to the observations most of bus drivers, conductors and shop owners have to cross this place to reach other side of the road. Some of them use this space to have a smoke. Some people park their motorcycles under the shading of "Bo" tree and wait a little time.

Case 3-DF: The owners of parked vehicles in this space spent some time here. Some people stop in this middle space to talk over the phones. Few users stop here and talk with their friends who meet while crossing the road. Some people read newspapers sitting on their motor cycles. Yet, hardly anyone spent more than 15 minutes here.

Fig29: people sitting on benches near Galle road side –C1-BJ

Source-Author

Fig30: Invented activities in underneath space by people-C3-DF

Source-Author

Case 4-MJ : In weekends, the number of users increases in the evening due to low traffic flow and its easy accessibility. In weekday evenings, people come into this place to watch trains and sit on the steps of the existing statue while chatting with each other. In afternoons the cleaning workers sit on the stones under the small tree here and chat with each other for some time.

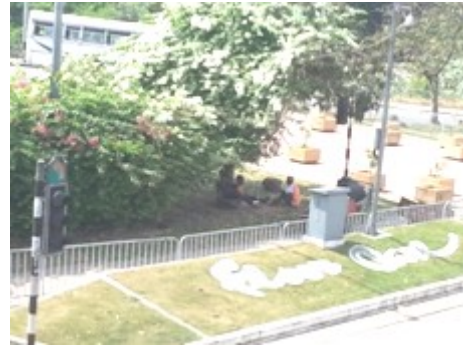**Fig 31:** People movement -M1 in C4-MJ
Source: Author

Fig32: People are seating under the shaded area
and chatting
Source: Author
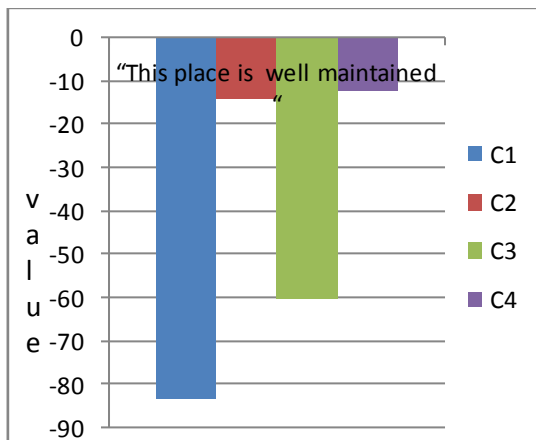
Reasons for existing residual qualities

Fig33: User perception regarding maintaining of the space
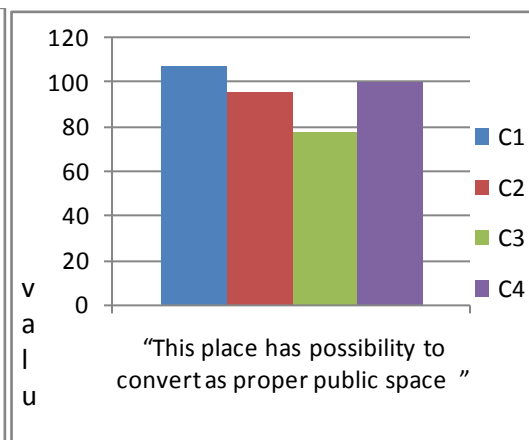

Fig 34: Possibilities for reclaiming as public space

All the respondents believed that the places aren't maintained properly and the places have reclaiming possibility as public spaces. The case 1–BJ is maintained by the Municipal Council and private vehicles are not permitted to park in C.T.B bus stand but People Park their private vehicles there. The place is not properly cleaned and it hasn't properly controlled parking activity. Case 2-KJ, case 3-DF and case 4-MJ are owned to R.D.A and maintained by Municipal Council. In Case 2-KJ, there aren't any street lamp posts or pedestrian crossings towards the "Bo shrine". Although it isn't properly maintained, the main reason for the residually is low accessibility to the island. In The case 3-DF, it's not properly supervised the existing parking facility. Some heavy vehicles are parked here the whole day. Even at night time this space isn't lit up properly and this darker environment is a threat and the pedestrians insecure. In The case 4-MJ, there are flower pots here as landscape elements. But they are used as a decoration. It's better to make shadings landscape point of view.

There are boards mentioning the sponsored private companies for the maintenance of case 1-BJ and case-MJ. But it doesn't seem to work properly.

Possibilities for reclaiming as public space

All of the respondents believed that the places aren't maintained properly and the places have reclaiming possibility as public space. Thus, the selected four case studies can be summarized as below.

C1-BJ

Majority are expecting a place for seating, waiting with shading (58%) to spend until they stay there for a little time. It lacks proper seating spaces except the bench near Galle road side which is also not shaded. Due to hot climate it's important to provide shading spaces with seating arrangement in urban spaces as such. The place already has potential to develop as a shaded space without covering it by fences.

32% of respondents proposed to introduce small facilities like milk bars, food outlets, newspaper shops and lottery kiosk which may intend to attract users. Before the new traffic plan, there was a small milk stall and a lottery kiosk at the corner of this place which was functioning well. Several people mentioned about the milk shop and lottery kiosk in their interviews which proves that it might have been functioning really well.

Finally it appears that this place needs small additional supportive activities/functions to strengthen the existing potentials as public space.
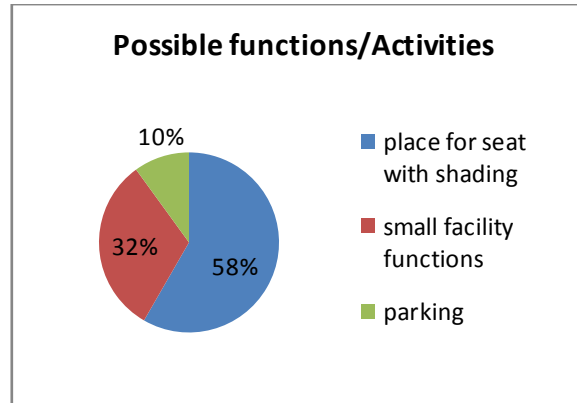

Fig 35: Survey result-possible functions/activities -BJ

Fig36: Cement benches near Galle road

Source-Author

Fig37: Lawn are covered by fences

Source-Author

C2-KJ

Majority are expecting a connecting point with pedestrian movement (60%). They expect a solution like underpass, bridge, pedestrian crossing. 40% of respondents proposed open landscaped area. They expect a water feature, information boards...etc. in this space. However, it appears that it's a needed solution to access this place if it is converted as a proper public space.-Maintenance problems like lighting up at night time can be solved easily. Otherwise this place could be an open landscaped area which discourages people to use it.
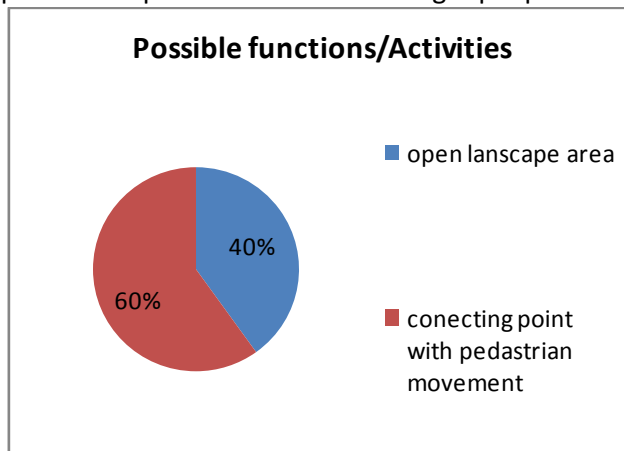

Fig38: Survey result-possible functions/activities-KJ

C3-DF

Majority (33%) is expecting an open landscape area (painting the bridge with colors, flower fence etc. 23% of respondents proposed to remove the existing parking function. Small facility functions like lottery kiosk, drainage and pavement improvement, seating facilities for passengers are other proposed functions by the respondents.

High pedestrian movement can be seen here. So it's important not to block this movement by vehicle parking. Removing existing parking block is important because it create traffic in the vicinity. It's also important to introduce bus bays to prevent traffic congestion and make pedestrians feel insecure. It's important to build some obstructions to prevent vehicle parking in the middle island spaces which are allocated for pedestrian movement. It can be done aesthetically pleasing way to the context without conventional steel barriers. Other than painting the bridge with colors this underneath space can used for street art.
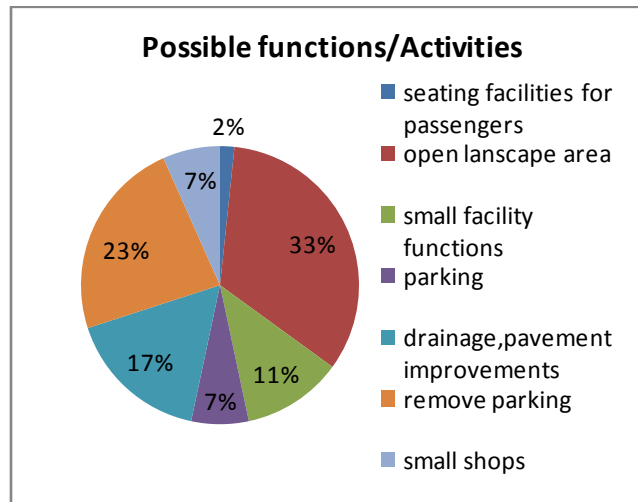
Fig 39: Survey result-possible functions/activities-DF

C4-MJ

Majority (47%) is expecting a place for seating with shading to spent some time here. there is no place for waiting, expecting some one or meet someone around this junction even though there is a railway station, they have not provided such place for the public. The railway passengers expect a place for spent some time other than standing in front of the railway station. The shop owners of the pedestrian bridge had some negative imagination regarding the above garden idea. They thought that if it covered by bushes and trees it'll be a place for illicit activities in the middle of the town. However, it's clear that there is a need for landscape area with some kind of shade with seating. But it should maintain the quality of openness as it was important for a safe public place.
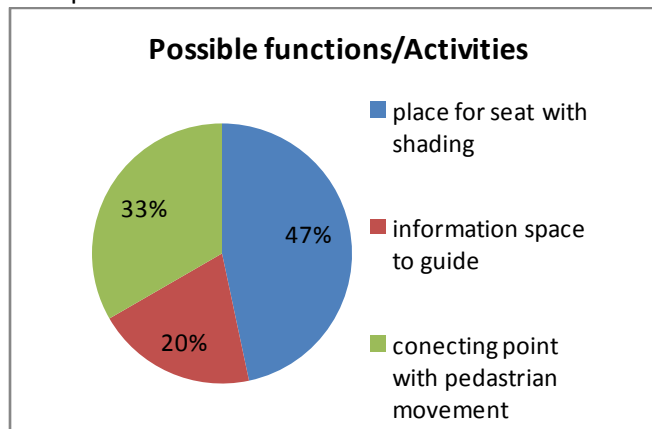

Fig40: Survey result-possible functions/activities-MJ

33% of respondents are expecting a connecting point with pedestrian movement here. According to their views it'll be used as an underground pathway. However it has a potential to combine with existing movement patterns and key supportive functions like cinema ,Theatres, railway station, school, trace expert city which surrounding here. 20% of respondents are expecting informative items like displaying railway time table etc...to aware the train schedules easily. It is a possible idea but it should be done without creating disturbance to the drivers.

POSSIBLE INTERVENTIONS FOR RECLAIMING

Open side spaces have a better sense of security (safety) from vehicular movement than in a middle space. As a result of this side space the sense of security from vehicular movement can be increased by physical separation like on street parking, shady tree line etc...In case one, there is a sense of security due to on street parking and pedestrian pathway. In such side space, the required additional supportive activities/functions strengthen the existing potentials. Then the optional activities may be increased and it leads to the improvement of social activities.

In open middle spaces people feel unsafe due to vehicular movement. When-physical barriers are introduced, the unsafe feeling is reduced. Although the C4-MJ is open middle space people feel that it's a safe place from vehicular movement. In middle space, accessibility is a main issue which caused comparatively low usage of the space lead to being residual. Then the users could be limited to some age category. In C2-KJ most of users are 20yrs to 60 yrs but when increasing the size of the middle space with safe atmosphere, people tend to use it neglecting its' difficulty in access.(ex-C4-MJ). It's a needed solution to access-these middle places if it is converted as proper public space.

When considering similar type local examples suitable for C4-MJ, Rajagiriya Children Park seems to be a successful open middle space as a public space. Rajagiriya Children Park has positive features in terms of public space. It has three pedestrian accesses from three directions to the place so all age categories can access there easily while it generates a safer feeling without any interference of vehicular movement. There is a level deference between pedestrian paths and play area. It also provides some secure feeling from vehicular movement. It has children play spaces in middle space. Playing is the optional activity here. Shady trees, seating arrangements, pedestrian crossings, surrounding pedestrian paths provide better physical environment. So the place helps to increase social activities like gathering, discussing, watching the playing children, etc. Comparatively the area of the land in Rajagiriya is higher than C4-MJ and C2-KJ. So it has enough area for the activity. But C4-MJ has comparatively lager area than C2-KJ. The usable area of C4-MJ could be increased by using the void ("sites out of sight" according to Crisman (2005). In the cases like C4-MJ the middle place may be a connecting point of pedestrian movement with easy pedestrian accesses, improved buffer zone like pedestrian pathway in between road and middle space. It has to be a place which facilitates people for optional activities like seating, rest and spent some time in busy urban environment

Fig41: C-1 Rajagiriya Children Park with surrounding pedestrian path, on street parking and elevated functional space

Source-Author

Fig42: C-2 elevated functional space-Rajagiriya Children Park

Source-Author

Fig43: C-3 light up functional area at night time

Source-Author

The places like C2-KJ could be an open landscaped area which discourages to cross this space. In narrow space it could be effective. Ex. C2-KJ but for the cases C4-MJ it's not a proper solution because it's comparatively a larger space. When considering similar type local examples suitable for C2-KJ, there are some positive features in Rajagiriya middle spaces along main road and middle space in Panchikawatta. Rajagiriya middle space is tiny elevated, lawn area in between two roads. Because of the high elevation people can't cross the space and disturb to the traffic flow and discourage dangerous pedestrian movements. The height also does not disturb the views of drivers. Although it's elevated, the vehicle can be seen from other side from driver's eye level. The Panchikawatta middle place is used to build-up image of the area. A horse which made from vehicle parts is used as a monument in higher elevation. (Panchikawaththa area is popular for spare parts sales). If it is not providing accessibility as a result of traffic related solution; the solution might be a combination of Panchikawatta and Rajagiriya middle space. The small middle space like C2-KJ might have the features which discourage to cross this space while helping to enhance image of the area as visual usage of the space

Fig45: C-4 Panchikawaththa middle space-residual space as used for enhance immovability

Source-Author

Fig46: C-5 Rajagiriya middle space-elevated space to prevent crossing

Source-Author

Underneath middle spaces like in C3-DF people feel difficult to access due to parking of vehicles. It's important to build some obstructions to avoid vehicular parking in the middle Island space which is allocated for pedestrian movement. Generally underneath space of flyovers have pedestrian crossings to facilitate the pedestrians and huge number of pedestrians use to cross this kind of spaces. So it's different than open middle spaces like C2-KJ and C4-MJ. And it's necessary for the movement as a result of orientation of flyovers. Generally those underneath spaces are shady spaces from any weather conditions. Hence, it could be used for optional activities related to public art, small seating arrangement for resting and to spend some time under the shade. This solution may be a combination with physical and visual usage because the fly over eventually becomes an urban element. It's important to avoid hidden corner spaces in day and night time which lead in creating unsafe social environment for the users.

Fig47: Parks Pasupati, is a Park located under Pasupati Bridge,Bandung, West Java which has graffiti wall, seating benches for seating and exhibit items
Source- https://nadhirajihan.files.wordpress.com/2015/01/105915869.j

Conclusion

Open side spaces are the most reclaimable category than middle and underneath spaces due to physical characteristics. Accessibility is a main physical character which caused comparatively low usage of the space lead to being residual. Then the users could be limited to age category 20 to 60 years. Users have a low sense of security (safety) from vehicular movement in a middle space than a side space. The sense of security from vehicular movement can be increased by physical separation like on street parking, shady tree line and pedestrian pathway etc. All created spaces have to be visible properly in day and night time. Then it has a sense of security due to its openness and not encouraging improper activities. Visibility is there in most of the traffic related residual spaces. The traffic related reclaiming possibilities which is possible to apply can be divided in to physical and visual usage. For underneath spaces, the solution may be a combination with physical and visual usage. The size of the middle open space is caused to its usage. People tend to use comparatively large size of middle space with safe atmosphere from vehicular movement than small middle space. Small middle space might have the features which discourage to cross this space while helping to enhance image of the area (urban image) as visual usage of the space.

Additional supportive activities/functions strengthen the existing potentials for reclaiming. Thus the optional activities should be increased that leads to the improvement of social activities. All traffic related residual spaces have "appropriation" which was explained by Aranyali (2009). Spatial qualities like accessibility, security, area of the site and visibility are the main factors caused to the "appropriation" related to traffic related urban residual spaces. Based on that appropriation it's possible to improve those activities if it suitable. If there is a necessary usage, it's a greater potential for reclaiming. When introducing optional activities as reclaiming

possibility, the physical quality of the space must be improved for proper facilitating Lack of maintenance and consideration affects existing residual qualities. Well organized public-private partnerships among traffic related, maintain related statutory bodies and private sector will help for evade residual symptoms and better management and control of reclaimed public spaces.

This study is limited to residual open spaces (Open side space and Open middle space and open underneath space) in urban areas of Colombo administrative district which are being created by traffic related issues. Since this is a basic study, four cases were selected as a representative sample of reclaiming possibilities for the public use. But the validity of the study will enchase by selecting more cases for different types. Further this study could be developed to study about reclaiming possibilities of non-traffic related residual spaces.

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