

## Opinion Survey about Pedestrianization of Heritage Sites in the City of Iloilo, Philippines

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**Abstract:** To compliment the preservation of the heritage sites in Iloilo City, a pedestrianization system of its streets near the heritage structures, built during the American Colonial period in the Philippines, were tested from December 2013 to March 2014 during weekends by the City Government. An opinion survey was then conducted through a questionnaire survey of four types of respondents – the pedestrians, private vehicle users, public transport drivers, and business owners. Face to face interview was used to obtain the respondents' opinion in terms of what amenities, activities and traffic management schemes should be provided to support the pedestrianization system. Furthermore, the impact of the pedestrianization system on the travel behavior, business operation, service characteristics of affected public transport, and the environment in general was solicited. The results showed that the majority of the respondents favor the pedestrianization system but are concerned about the necessity to properly plan and implement it.

*Keywords:* Pedestrianization, structural equations modeling, heritage site

### 1. INTRODUCTION

One of the city in the Philippines that is known for its cultural and heritage sites is Iloilo City. Situated in the middle part of the country, Iloilo City is the regional center of Iloilo Province and is considered as one of the highly urbanized cities in the Philippines. The city is composed of seven main districts namely Jaro, Mandurriao, La Paz, Lapuz, Arevalo, Molo and City Proper.



Figure 1. Location of Iloilo City in the Philippines

Source: <http://www.wikipedia.org/wiki/Iloilo>

There are several historical structures built during the Spanish-American colonial period in the city that served as a religious-political power symbols such as churches. But there were also buildings, one to two stories high, built during this period that were used as commercial establishments on its first floor and office or residential on its upper floors which are still being used today. These buildings are called heritage buildings which is commonly found in the major streets of JM Basa (Calle Real) and Iznart or collectively more known as Downtown Central Business District Heritage Zone. In order to protect these structures from further deterioration, the local government established the Iloilo City Cultural Heritage Conservation Council (ICCHCC) in 2009 to restore and safeguard the heritage sites in the city. In Figure 2 below shows where the heritage buildings are found within the streets of JM Basa. In order to revitalize Calle Real, a proposed pedestrianization system of the JM Basa Street where it was closed to vehicular traffic to encourage walking along this street and was tested from December 2013 to March 2014 during Sundays. This is to promote and support more commercial engagements and traditional heritage programs along the streets. Again in Figure 2 and Figure 4 below shows the actual closing of the JM Basa Street extending from Plazoleta up to the Freedom Grandstand.



Figure 2. A section of the Calle Real (left) and barricaded entrance of Calle Real (right)

These heritage buildings are currently being restored and retrofitted to bring back its façade. An example would be the Villanueva Building or the International Hotel being restored from its old façade to its current façade as shown in Figure 3.



Figure 3. A heritage building before (left) and after restoration (right)

Source: Iloilo Cultural Heritage Foundation

Along with the restoration of the buildings is the pedestrianization of the streets. This is to attract people in the area, especially tourists, to go to these places and explore more in the city. There are several locations of these heritage buildings. Figure 4 shows other locations

of heritage buildings are located along JM Basa Street and Iznart Street together with their respective names.

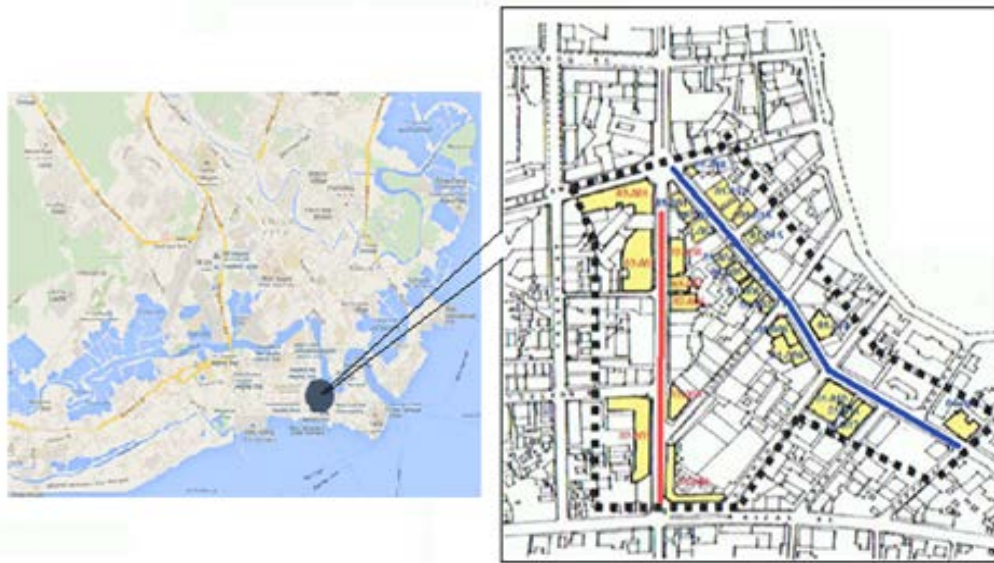


Figure 4. Map of the locations of heritage buildings  
Source: Google Maps(left) and ICCHCC(right)

## 2. METHODOLOGY

In order to determine the opinion of the people regarding the proposed pedestrianization of Calle Real, a face-to-face survey interview was conducted during the testing period (December 2013 to March 2014) of the said project. This was conducted within the vicinity of Calle Real only. There were three parts in the survey questionnaire mainly the socio-demographics of the individual, a their opinions on the newly implemented pedestrianization and about the important characteristics of a pedestrianized street. The respondents were divided into three main groups that are greatly affected by the implemented pedestrianization, these are the pedestrians, the public transport drivers, and the business owners.

### 2.1 Pedestrians

In the survey, the respondents were asked about their opinion on the pedestrianization of Calle Real. A 5-point likert scale was used with 1 - strongly disagree, 2 - somewhat agree, 3 - neither, 4 - somewhat agree and 5 - strongly agree. The list of question that were given are the following:

- A1. It will cause traffic congestion in adjacent streets even during weekends.
- A2. It should be permanently closed to traffic every day of the week to make the place popular.
- A3. It will encourage people to walk for a healthy lifestyle.
- A4. As a car/motorcycle owner, I do not mind if there is an available parking lot within five minutes of walking to my destination in Calle Real.
- A5. As a commuter, I do not mind to disembark from the jeepney/public transport and walk for one block going to Calle Real.
- A6. I do not mind getting off from a taxi and walk for one block going to Calle Real.

- A7. It is good for the protection of the environment.
- A8. People will enjoy more the scenery and activities in Calle Real when it is close to traffic.
- A9. If bicycles are allowed, it will encourage people to use bicycles.
- A10. People will be discouraged to go to the area because they do not like to walk.
- A11. It will enhance the historical and cultural legacy of Iloilo City.
- A12. It will revive commercial activities in this part of the City.
- A13. It will become one of the top attractions of Iloilo City for both locals and tourists.

## **2.2 Public Transport Drivers**

One of the most affected people in the implementation of the pedestrianization of Calle Real are the public transport drivers since their current service routes will be rerouted to give way to the pedestrianization. They were asked about their opinions on the pedestrianization of Calle Real. A 5-point likert scale was introduced with 1 - strongly disagree, 2 - somewhat agree, 3 - neither, 4 - somewhat agree and 5 - strongly agree. The list of questions that were given are the following:

- B1. Pedestrianization will increase the number of passengers I pick up and drop off
- B2. Pedestrianization will increase my daily income
- B3. Pedestrianization will increase the number of trips I make in a day
- B4. I do not mind the re-routing caused by the pedestrianization
- B5. It will cause traffic congestion in adjacent streets even during weekends
- B6. It should be permanently closed to traffic every day of the week to make the place popular and attract more people
- B7. It will encourage people to walk for a healthy lifestyle
- B8. It is good for the protection of the environment
- B9. People will enjoy more the scenery and activities in Calle Real when it is close to traffic
- B10. If bicycles are allowed, it will encourage people to use bicycles
- B11. People will be discouraged to go to the area because they do not like to walk
- B12. It will enhance the historical and cultural legacy of Iloilo City
- B13. It will revive commercial activities in this part of the City
- B14. It will become one of the top attractions of Iloilo City for both locals and tourists

## **2.3 Business Owners**

As for the owners of commercial stores in Calle Real, they were also asked about their opinion on the pedestrianization of Calle Real and how these may affect their businesses. A 5-point likert scale was introduced with 1 – strongly disagree, 2 – somewhat agree, 3 – neither, 4 – somewhat agree and 5 – strongly agree. The list of questions that were given are the following:

- C1. It will cause traffic congestion in adjacent streets even during weekends
- C2. It should be permanently closed to traffic every day of the week to make the place popular
- C3. It will encourage people to visit my business establishment
- C4. It will increase sales and profit of my business
- C5. It will put my business in a prime location, making it more advantageous and strategically located

- C6. It would be difficult for my customers to park near my establishment
- C7. It would increase my cost of operation due to taxes, permits, etc.
- C8. Delivery of materials to the establishment would be difficult since Calle Real would be closed to vehicular traffic
- C9. It will change the operating hours of the business establishment (extended operating hours or days)
- C10. It will enhance the historical and cultural legacy of Iloilo City
- C11. It will revive commercial activities in this part of the City
- C12. It will become one of the top attractions of Iloilo City for both locals and tourists

## **2.4 Combined Common Questions**

Aside from the individual questions that were asked among the groups of the respondents, The pedestrian, vehicle user, and owners also rated using a 5-point likert scale, with 1 – least important, 2 – slightly important, 3 – important, 4 – highly important, 5 – most important, on the importance of the following attributes and amenities.

- D1. Safety and Security (Presence of polices/guards)
- D2. Well lighted walkways during evening
- D3. Accessibility to public transport
- D4. Provision of Benches/Sheds
- D5. More open space for walking/well defined walkways
- D6. Aesthetics (Natural beauty of the place)
- D7. Cleanliness (Walkways are free of trash and there is presence of garbage disposals)
- D8. Parking facilities are available nearby (for cars and motorcycles)
- D9. Provide trees/greenery/decorative plants/flower pots
- D10. Bicycle facilities and lanes
- D11. Cultural activities for entertainment
- D12. Musical activities for entertainment
- D13. Provisions for persons with disability (PWD)
- D14. Calle Real should be provided with a roof to protect the pedestrians from the heat or rain Walkways with roofing for heat and rain protection
- D15. Easy-to-understand pedestrian information/signages

## **3. DESCRIPTIVE ANALYSIS**

### **3.1 Socio-Demographics**

A total of 289 survey respondents (180 pedestrians, 54 public transport drivers, 55 business owners) were collected during the testing period of the pedestrianization of Calle Real from February to March 2014. The respondents for this study were all above 18 years old in age. Shown in Figure 5 is a summary of the age distribution of all of the respondents.

For the pedestrians, the age bracket of 18-25 comprised 44.44% while the age bracket of 26-33, made up 31.67%. As for the rest of the groups 34-41, 42-49, 50 and above, composed of 9.44%, 8.33%, and 6.11% respectively. As for the average age of the pedestrians, it is about 29.17 years old. It can be said that pedestrians are composed mostly of the younger age group.



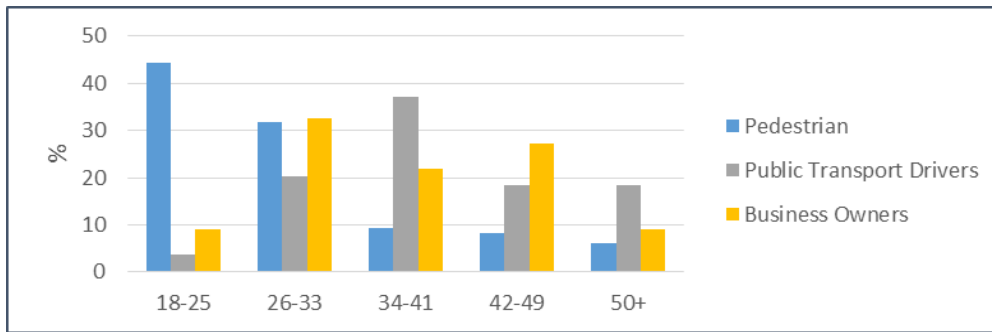


Figure 5. Age distribution of the respondents

As for the public transport drivers, the age group of 18-25 comprised 3.70%. The age bracket of 26-33 is made up of 20.37% while 34-41 age bracket is composed of 37.04%. For the age group of 42-49 and 50 and above, both made up 18.52%. The average age meanwhile is 39.96 years old. This goes to show that drivers are usually experienced drivers and are often in their 30's and 40's.

Lastly, for the business owners along Calle Real, the age bracket of 18-25 is comprised of 9.09% while the age bracket of 26-33 is made up of 32.73%. Meanwhile, for the rest of the groups 34-41, 42-49, 50 and above, they made up of 21.82%, 27.27%, and 9.09% respectively. The average age of the owners is 37.09 years old. It shows that the owners are also usually in the working business group.

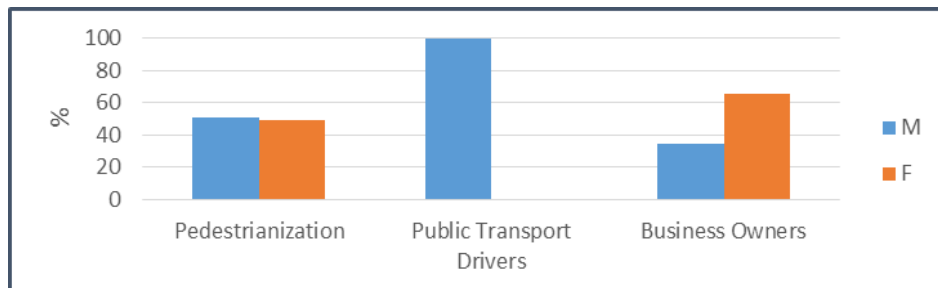


Figure 6. Gender distribution of the respondents

For the gender of all of the respondents, in Figure 6 for the pedestrians, it was almost equal with 50.56% male and 49.44% female. As for the public transport drivers, all of them were males. Lastly for the business owners, the males were composed of 34.55% while females were 65.45%. The reason for this is that females are more prominent as salesperson in order to attract buyers.

With regards to the employment of the pedestrians, 56.67% of the people were employed and the 43.33% were unemployed. As for the type of mode of the public transport drivers operate, 61.11% were jeepney drivers, 29.63% were "pedicab" drivers, 5.56% were tricycle drivers, and 3.7% were taxi drivers. Lastly for those who responded in the business establishments, 27.27% of the respondents were employees, 36.36% were owners, 34.55% were managers, and 1.82% were all-around person (does the duties of the three choices).

### 3.2 Results of the Opinion Survey

Shown in Figure 7, questions A7, A11, A12 and A13 were the top rated questions of the respondents. These were typically related to tourism of the area as well as the environmental factors affecting pedestrian walkways in the area. As for the low rated questions, these were question A1, A2 and A10 in which they show that people generally wanted the

pedestrianization of the Calle Real but only during weekends.

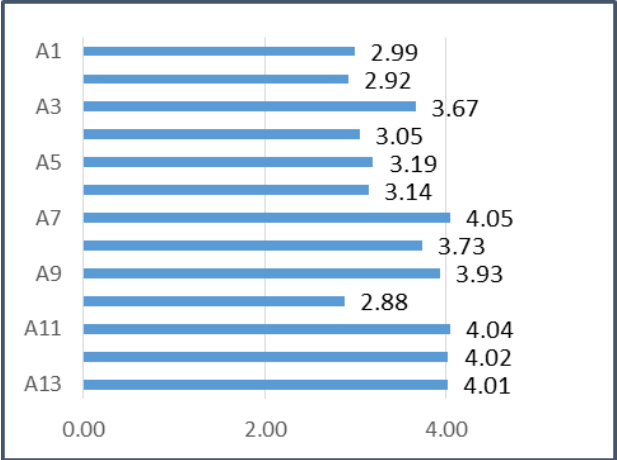


Figure 7. Average ratings of the pedestrians

The results in Figure 8 about the responses of public transport drivers showed they are not particularly satisfied with the rerouting scheme as well as the effect on their earnings as reflected in questions B1, B2, B3, and B4. Although they agreed with the idea of pedestrianization of the street to as tourist attraction and to help the environment, it seemed like the effect on their income was a great factor as reflected in the lower ratings.

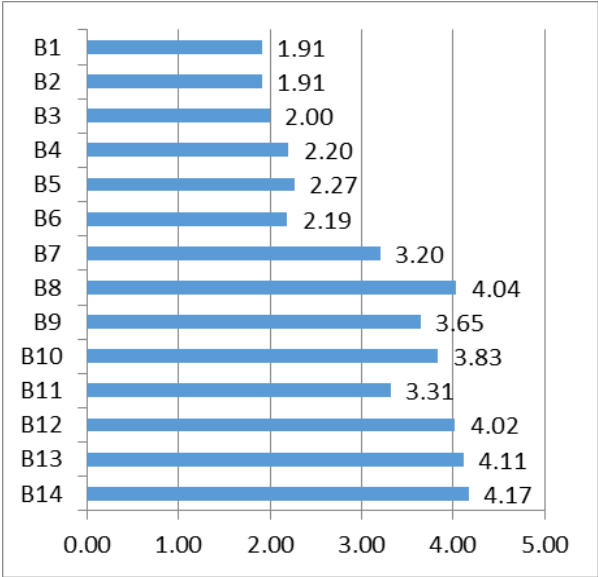


Figure 8. Average ratings of the Public Transport Drivers

As shown in Figure 9, business owners and employees generally preferred the implementation of the pedestrianization to some extent only since based on questions C3, C4 and C5, their perception on the business side of it was not encouraging. The three lowest rated questions showed that the businesses would not actually improve with the implementation of the pedestrian walkways.

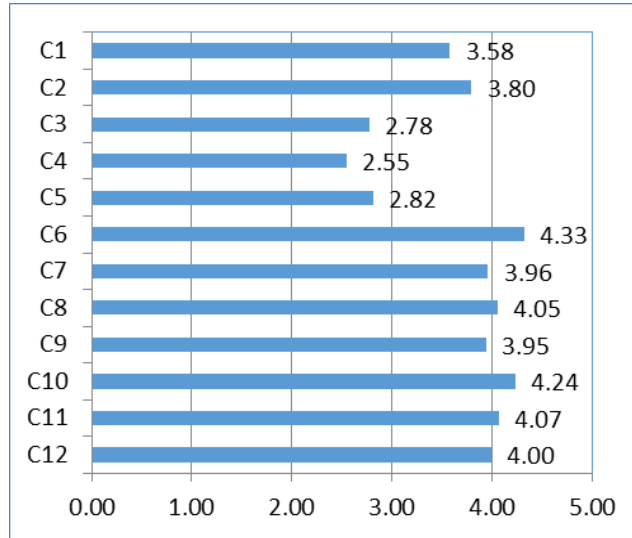


Figure 9. Average ratings of the Business Owners

The results show that the respondents perceived that the most important attributes and amenities to compliment pedestrianization are cleanliness and safety. The top three rated attributes in Figures 10 and 11, these are cleanliness, safety and security, and well lighted walkways during evening. For the three least rated attributes, these are roof protection for pedestrians, cultural and musical activities for entertainment. The reason could be that the locals are already used to the local entertainment as its purpose is mainly for tourists attraction.

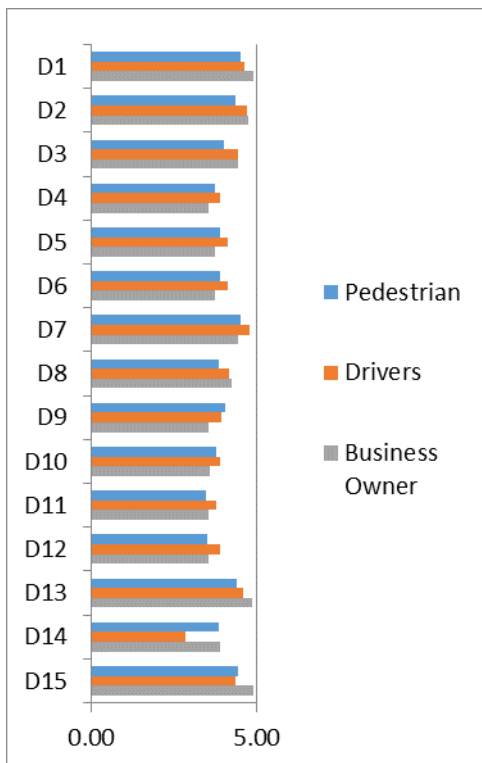


Figure 10. Ratings of the combined common questions

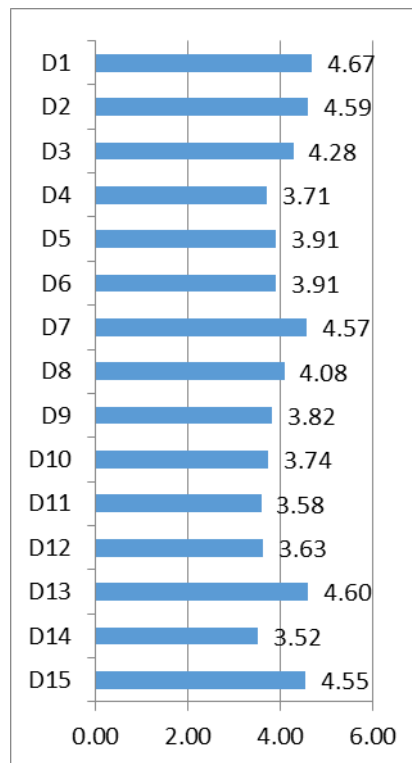


Figure 10 Means of the combined common questions



#### 4. FACTOR ANALYSIS

Using variables presented in the descriptive statistics, a factor analysis was done to group the inter-related variables using principal component analysis. But in order to do so, standard statistical tests should be done first for it to be accepted with adequate results. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy, and the Barlett's Test of Sphericity were the statistical tests used as shown in Table 1.

The tests showed that the values of KMO measure of sampling adequacy are well above the accepted value of 0.50. Therefore the sampled data obtained from the opinion survey were sufficient to use factor analysis.

Table 1. Statistical tests in factor analysis

	Pedestrians	Public Transport Drivers	Business Owners
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.704	.818	.756
Barlett's Test of Sphericity			
Approx. Chi Square	753.657	628.669	620.734
Df	45	66	66
Significance	.000	.000	.000

Table 2. Varimax rotation of pedestrians

Variables	Components			
	1	2	3	4
Tourism Related(T)				
A11	<b>.838</b>	.103	.203	.184
A12	<b>.869</b>	.197	.064	-.005
A13	<b>.879</b>	.106	.138	.126
Cultural and Musical Activities(CMA)				
D11	.160	.082	<b>.930</b>	.076
D12	.158	.089	<b>.929</b>	.062
Safety and Accessibility(SA)				
D2	.111	.052	.031	<b>.869</b>
D3	.104	.099	.096	<b>.860</b>
Walkability(W)				
A4	-.025	<b>.815</b>	.024	.161
A5	.197	<b>.804</b>	.164	.015
A6	.234	<b>.817</b>	.020	.009

Next is to determine the number of components to be further analyzed. This can be done using the eigenvalues which must be greater than one in order for it to be accepted as a significant component. The number of components that was determined for the pedestrian is four. The resulting eigenvalues of these four were 3.578, 1.579, 1.372, and 1.341 which has a total percentage variance of 78.712%. As for the public transport drivers, the number of components was three with respective eigenvalues of 4.810, 3.260, and 2.187, respectively.

The total percentage variance of the three was 85.48%. Lastly for the business owners, the total number of components was four. The eigenvalues of these components are 5.268, 2.388, 1.248, and 1.125 with total percentage variance is 83.568%.

Subsequently, the results of the varimax rotation show the relationship between the variables and the components. As per component, the values of the variables that are closer to one is said to be inter-related to one another. For the pedestrian in Table 2, there are four components which were categorized into tourism related, cultural and musical activities, safety and accessibility, and walkability. As for the public transport drivers in Table 3, resulting components were three which were divided into environment and tourism, transport facilities and cultural activities, and driver's income. Lastly, for the business owners in Table 4, the resulting four components were transport facilities and cultural activities, business strategy, safety and accessibility, and transport policies.

Table 3. Varimax rotation of public Transport drivers

Variables	Components		
	1	2	3
Environment and Tourism(ET)			
B8	<b>.916</b>	-.163	.071
B10	<b>.917</b>	.083	.092
B12	<b>.947</b>	.079	.129
B13	<b>.955</b>	-.015	.112
B14	<b>.943</b>	.014	.122
Transport Facilities and Cultural/Musical Activities(TCM)			
D8	-.064	<b>.849</b>	.105
D10	.100	<b>.832</b>	.105
D11	.043	<b>.947</b>	-.049
D12	-.076	<b>.903</b>	.031
Driver's Income(D)			
B1	.094	-.019	<b>.939</b>
B2	.051	.096	<b>.941</b>
B3	.248	.106	<b>.867</b>

Table 4. Varimax rotation of business owners

Variables	Components			
	1	2	3	4
Transport Facilities and Cultural Activities(TC)				
D5	<b>.822</b>	-.003	.197	.161
D9	<b>.874</b>	.018	.192	.112
D10	<b>.896</b>	-.108	.027	.179
D11	<b>.905</b>	-.059	.176	.183
D12	<b>.909</b>	-.063	.177	.143
Business Strategy(B)				
C3	-.143	<b>.896</b>	.151	-.032
C4	-.163	<b>.904</b>	.047	-.009
C5	.195	<b>.868</b>	-.202	-.094
Safety and Accessibility(SA)				
D2	.154	-.022	-.048	<b>.917</b>
D3	.344	-.105	.189	<b>.787</b>
Transport Policies(TP)				
C1	.174	-.011	<b>.925</b>	.000
C2	.489	.054	<b>.722</b>	.155

## 5. STRUCTURAL EQUATIONS MODELING

The first step in structural equation modeling is to validate the model using goodness of fit measures. This is to indicate that the model being created is acceptable. The method of estimation used was maximum likelihood method. The program that was used is the student version of LISREL 9.1.

The fit indices generally have a critical value of 0.9. Of the three models created in table 5, it is seen that the pedestrian model has the highest goodness of fit measure with five of them passing the critical value and three of which just under the threshold. This is followed by the business owners with two passing the critical value and three just under the accepted value. Lastly the public transport drivers, all of the fit measures did not pass the critical value.

This can be attributed to the low sample size which resulted into a poor model.

Table 5. Goodness to fit tests of the Structural Equation Model

Fix Index	Pedestrian	Public Transport Drivers	Business Owners	Critical value
Chi-Squared	91.126	312.751	100.592	-
Df	30	51	49	-
p-value	0.0000	0.0000	0.0000	-
Goodness of Fit Index(GFI)	0.913	0.659	0.777	>.9
Adjusted Goodness of Fit Index(AGFI)	0.841	0.479	0.644	>.9
Normed Fit Index(NFI)	0.916	0.631	0.859	>.9
Non-Normed Fit Index(NNFI)	0.912	0.566	0.892	>.9
Comparative Fit Index(CFI)	0.941	0.665	0.92	>.9
Incremental Fit Index(IFI)	0.942	0.671	0.922	>.9
Relative Fit Index(RFI)	0.874	0.522	0.809	>.9
Root Means Square Error of Approximation(RMSEA)	0.106	0.308	0.138	<.08

## 5.1 Pedestrians

The results of the factor analysis were then used to model the structural equations. It was identified that A11, A12, A13, A4, A5, and A6 were the main observed variables for the exogenous indicators that affects the pedestrians and grouping them would result to tourism and walkability. As for the endogenous indicators, D11, D12, D2 and D3 were the important observable variables which are divided into cultural activities, and safety and accessibility.

Table 6. Measurement of model equations for pedestrians

Exogenous Indicators	Exogenous Construct	
	Tourism(T),	Walkability(W)
A11	0.858	-
A12	0.826	-
A13	0.921	-
A4	-	0.673
A5	-	0.818
A6	-	0.797
Endogenous Indicators	Endogenous Construct	
	Cultural Activities(CA)	Safety and Accessibility(SA)
D11	0.895	-
D12	0.925	-
D2	-	0.767
D3	-	0.85
Structural Equation Modeling		
Endogenous Construct	Exogenous Construct	
CA	0.363T + 0.122W	
SA	0.271T + 0.139W	

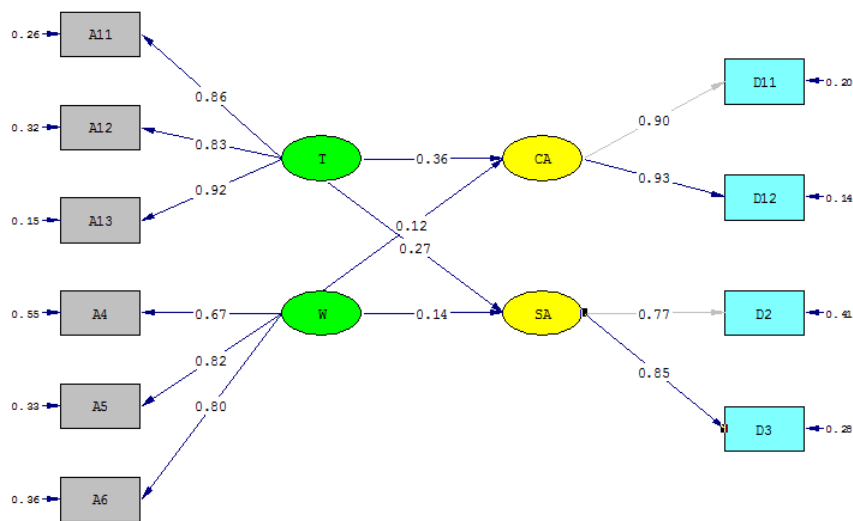


Figure 12. LISREL graphic presentation of the pedestrian model

It is seen that both of the exogenous and endogenous indicators were all positively loaded. There are two resulting structural equations from the pedestrian model. First is for the cultural activities and the second is for the safety and accessibility. Comparing the two equations, it is seen that tourism has a bigger impact on the cultural activities being done in the city while walkability on the other hand has a larger effect in the safety and accessibility. This makes sense since cultural activities would attract more people therefore tourist would likely to go to these activities. Conversely, safety and accessibility would include ease of walking for the people to fully patronize the pedestrianized system. Summary of the results are shown in Table 6 and Figure 12.

## 5.2 Public Transport Drivers

For the public transport drivers, environment and tourism, and driver's income are important exogenous construct which includes B8, B10, B12, B13, B14, B1, B2 and B3 as the observed variables. On the other hand, the endogenous construct transport facilities and cultural activities were composed of observed variables D8, D10, D11, and D12. Implementing the pedestrianization would cause rerouting the current public transports therefore may affect the driver's income and as well as the environment and tourism. With the structural equation created, it is seen that transportation facilities and cultural activities would be the key in enforcing the pedestrianization. Results are shown in table 7 and figure 13.

## 5.3 Business Owners

Likewise, businesses located in the pedestrianization of Calle Real felt they would be greatly affected. The observed exogenous indicators that were found to be important were C3, C4, C5, C1 and C2 while the observed endogenous indicators were D5, D9, D10, D11, D12, D2 and D3. The exogenous constructs were classified into business profit and transport policies. Conversely, the endogenous constructs were listed as transport facilities and cultural activities, and safety and accessibility. Two equations were created and it is clearly seen in both equations that businesses have a perceived negative impact if the pedestrianization is implemented. Comparing both, transport policies have a greater impact on the transport facilities and cultural activities than safety and accessibility. Table 8 and figure 14 displays the summary of results.

Table 7 Measurement of model equations for public transport drivers

Exogenous Indicators	Exogenous Construct	
	Environment and Tourism(ET)	Driver's Income(D)
B8	0.928	-
B10	0.929	-
B12	0.984	-
B13	0.994	-
B14	0.986	-
B1	-	0.95
B2	-	0.97
B3	-	0.878
Endogenous Indicators	Endogenous Construct	
	Transport Facilities and Cultural Activities(TC)	
D8	0.832	
D10	0.782	
D11	0.992	
D12	0.939	
Structural Equation Modeling		
Endogenous Construct	Exogenous Construct	
TC	0.0852ET + 0.0397D	

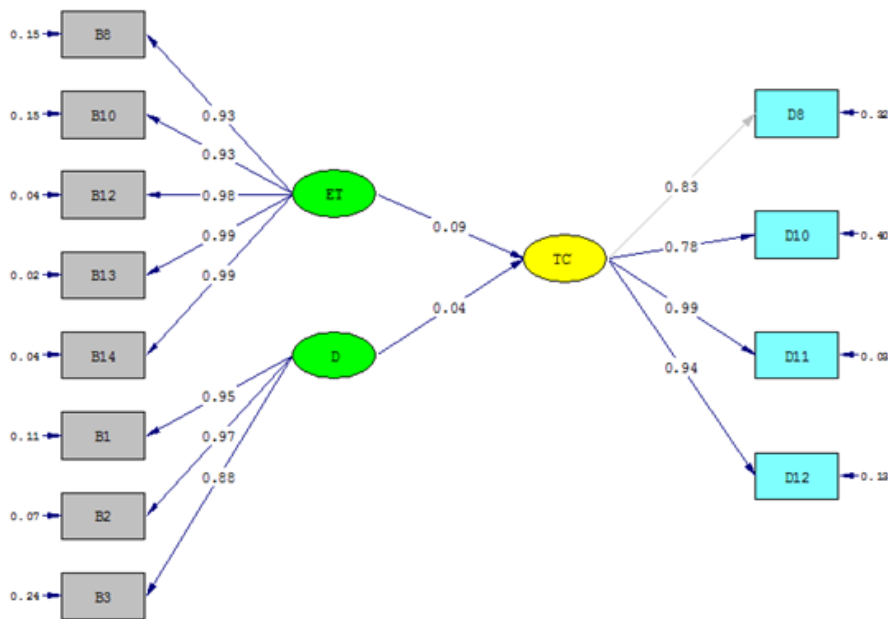


Figure 13. LISREL graphic presentation of the public transport driver model

Table 8. Measurement of model equations for business owners

Exogenous	Exogenous Construct
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Indicators	Business Profit(B)	Transport Policies(TP)
C3	1.172	-
C4	0.676	-
C5	-	0.555
C1	-	0.72
C2	-	0.928
Endogenous Indicators	Endogenous Construct	
	Transport Facilities and Cultural Activities(TC)	Safety and Accessibility(SA)
D5	0.811	-
D9	0.895	-
D10	0.89	-
D11	0.987	-
D12	0.984	-
D2	-	0.546
D3	-	1.473
Structural Equation Modeling		
Endogenous Construct	Exogenous Construct	
TC	$-0.272B + 0.706TP$	
SA	$-0.266B + 0.366TP$	

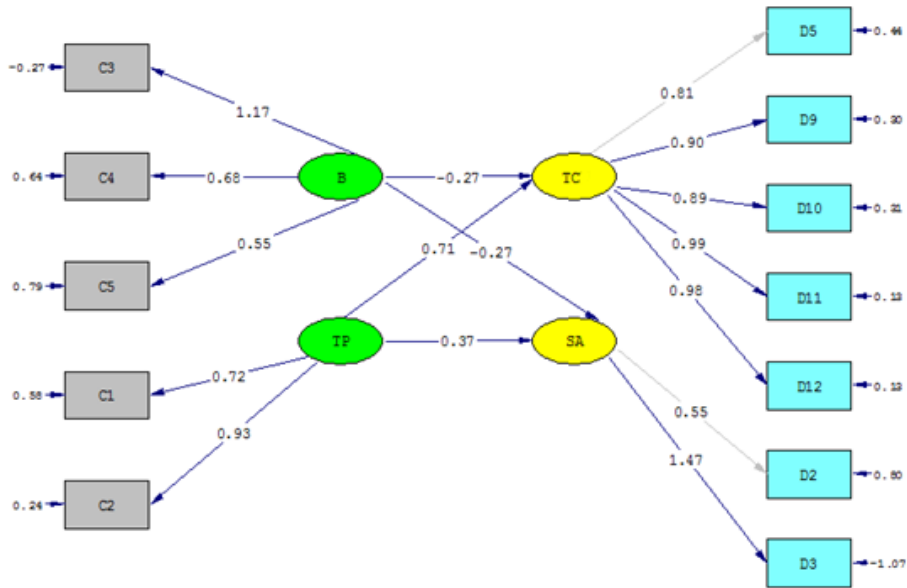


Figure 14. LISREL graphic presentation of the business owner model

## 6. CONCLUSION

The models created with the introduction of the pedestrianization of the streets along the heritage sites of Iloilo City were not as significant as seen in the goodness-of-fits of the models presented. However, several important findings and interrelated variables were found to significantly measure the impact of the pedestrianization. The results show that in all of the groups, cultural activities was the most important aspect of the pedestrianization, followed by tourism, transport facilities, and safety and accessibility. Further analysis show that for pedestrians, walkability of the streets is an important factor, for the public transport drivers, the effect on their income is an indicator whether they would like to support the pedestrianization or not, and lastly for the business owners, their business profit is an



important factor in the implementation of the pedestrianization. One side note to be considered during the factor analysis is that socio-demographic characteristics of the individuals do not affect the respondent's outlook of the pedestrianization. Improvements of the model could be done by increasing the number of respondents. Another is that the number of variables that was used in the program LISREL 9.1 student version was limited therefore the analysis was limited to 12 variables only.

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