Factors Influencing the Usage of Footbridges Along Epifanio de los Santos Avenue (EDSA)

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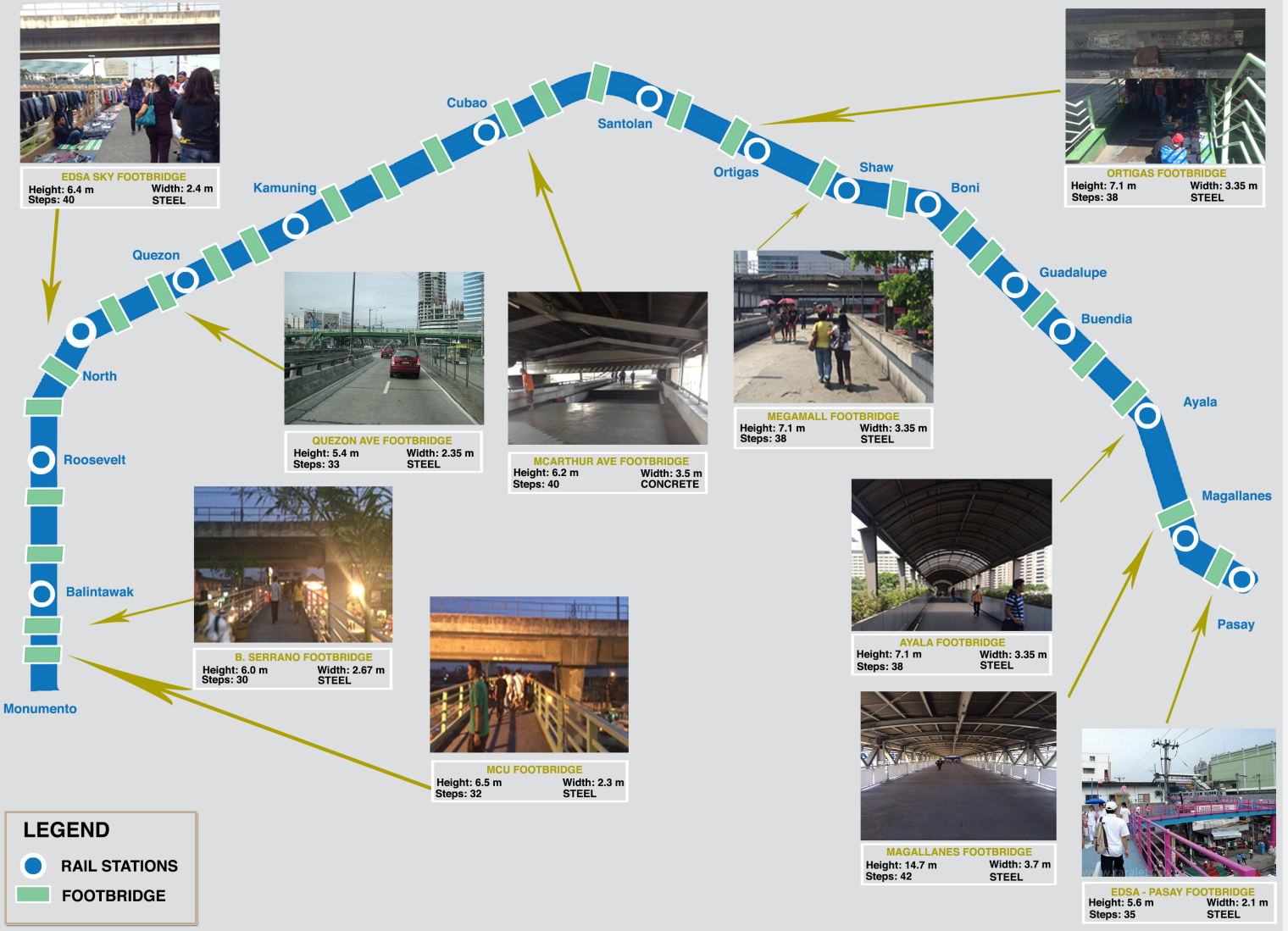
Background

- With the excessive amount of vehicles that traverse EDSA everyday, pedestrian utilities has been compromised.
- Footbridges serves as a dual purpose in the Philippines.
- The increasing problem of deaths and accidents because of jaywalking proves that a number of pedestrians do not use the footbridges

Background

Map of EDSA Footbridges



Main Objective

To determine the factors that greatly influence the demand for footbridges

Specific Objectives

- To obtain and compare the physical characteristics of footbridges along EDSA.
- To measure the current peak hour demand of footbridges along EDSA.
- To determine and compare the importance of each sub-factor influencing the use of footbridges based on the preferences of the pedestrians.
- To recommend further study regarding footbridges in Metro Manila.

Hypothesis

- The location of the footbridges, with respect to nearby land use activities and establishments, is the predominant factor the determines the demand for footbridges.

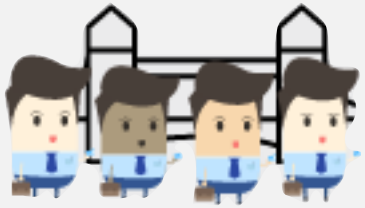
Significance

1. Would analyze the usage of chosen footbridges.
2. Consider the preferences of pedestrians while crossing
3. One of the first footbridge studies in the Philippines

Scope

1. 48 pedestrian footbridge including 11 footbridges connected to the MRT.
2. 4 Factors: Safety, Security, Comfort and Convenience
3. All survey respondent are of Filipino.

Methodology



Inventory

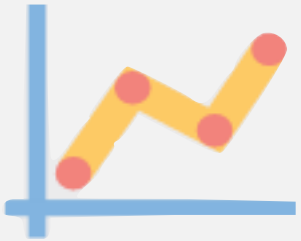
physical characteristics of footbridges along EDSA

Count

peak hour volume

Survey

questionnaires
random sampling

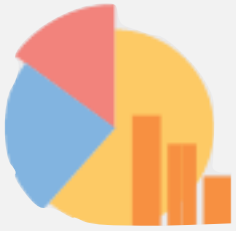


Data Analysis

Regression

Data Analysis

Level of Service



Data Processing

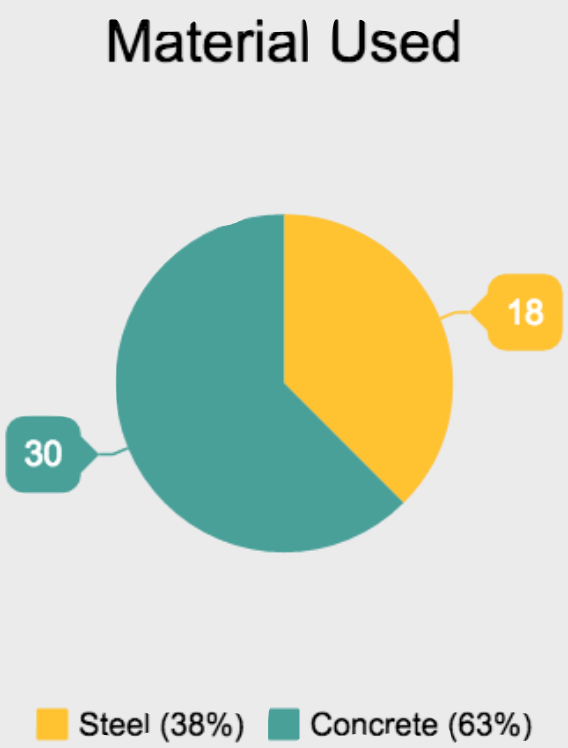
Data Analysis

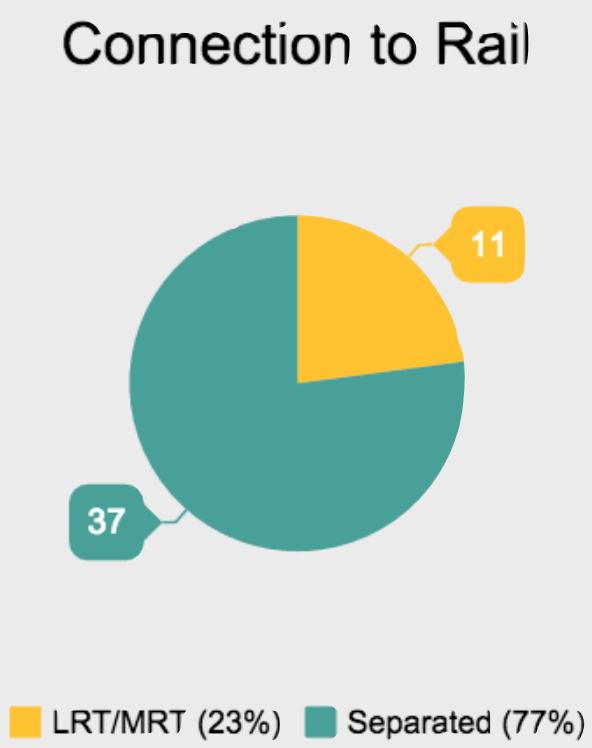
Analytical Hierarchical Process

Data Analysis

Likert Scale

Inventory

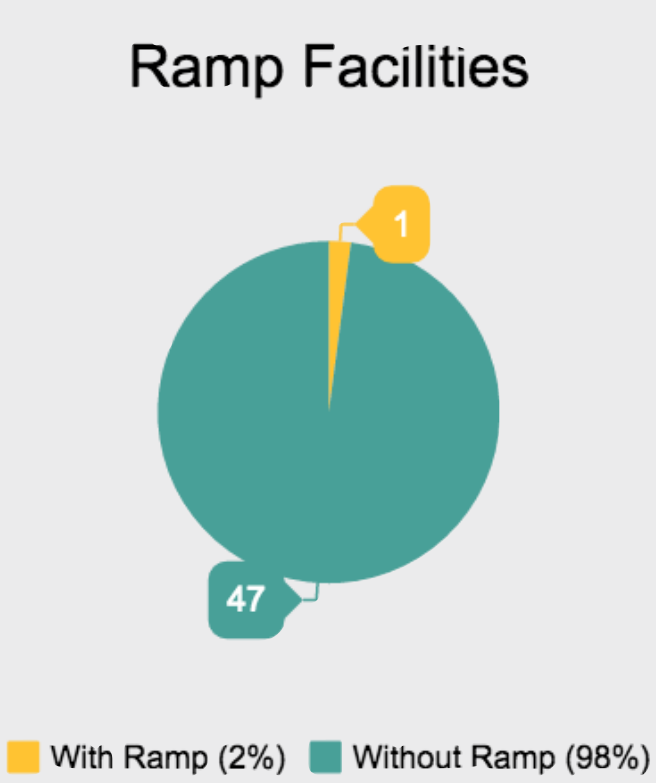


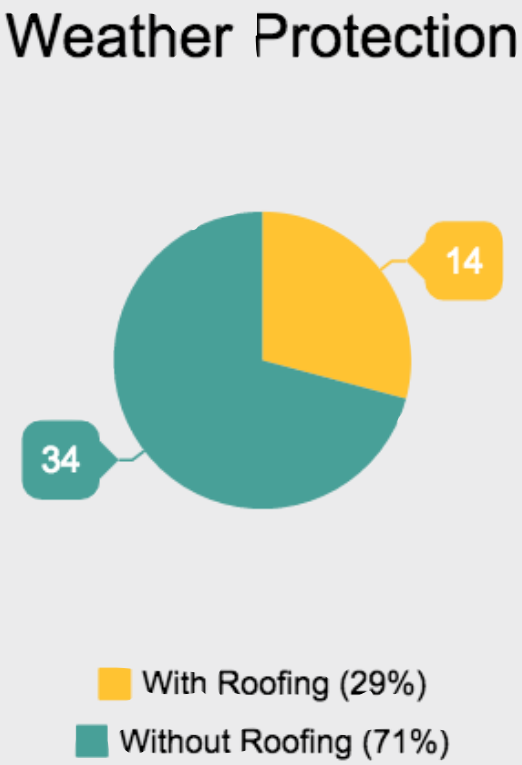


Material Used

Connection to Rail

Inventory

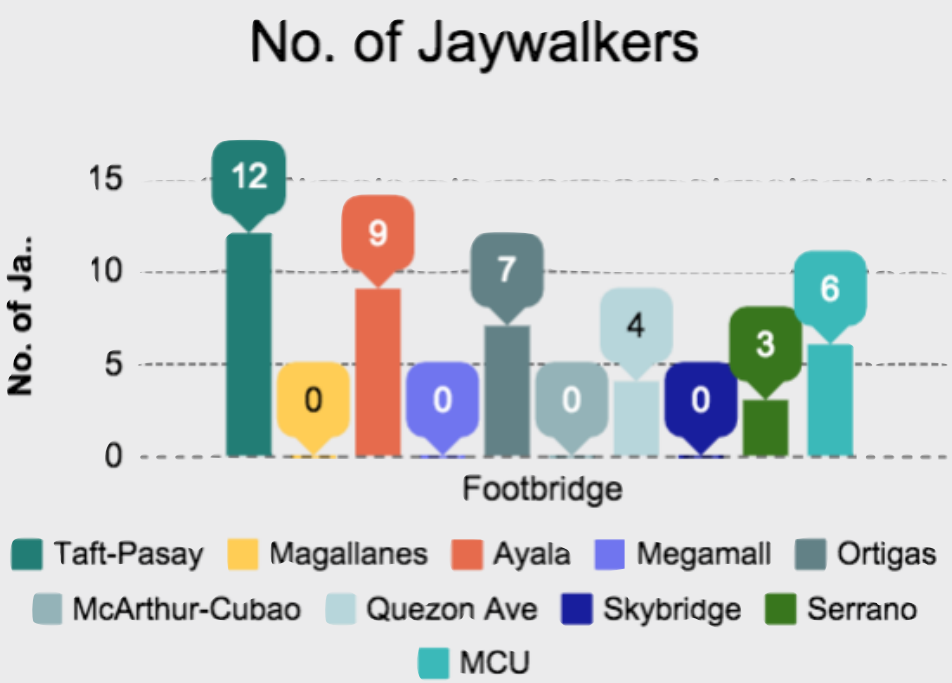




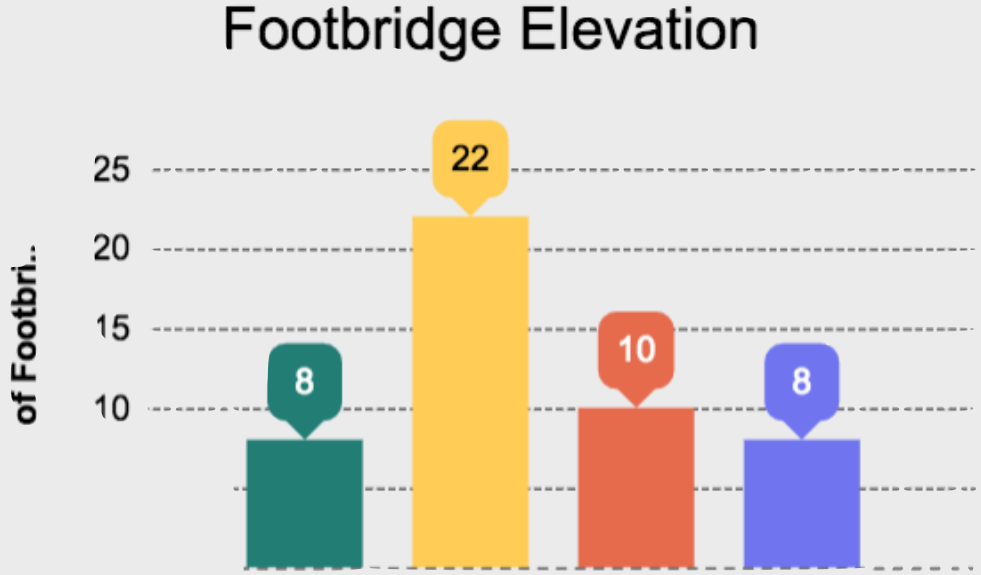
Ramp Facilities

Weather Protection

Inventory

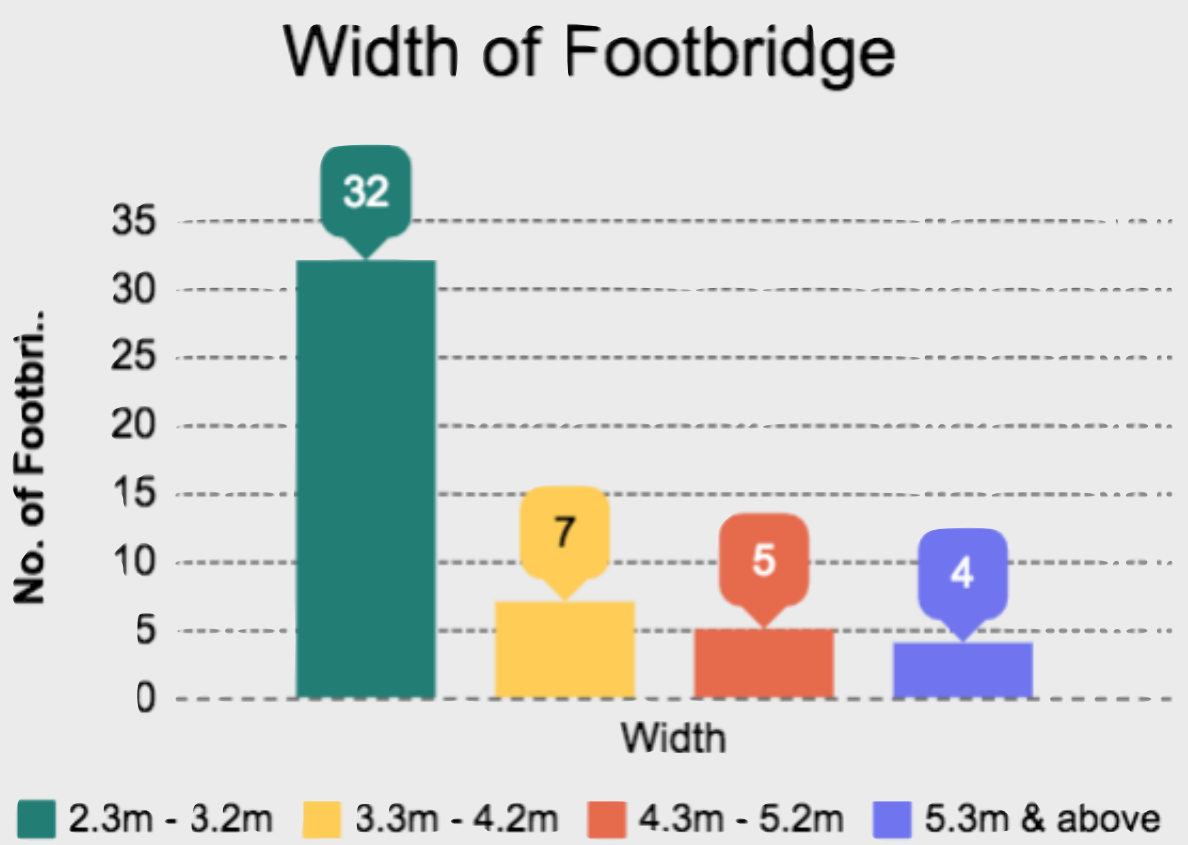


No. of Jaywalkers



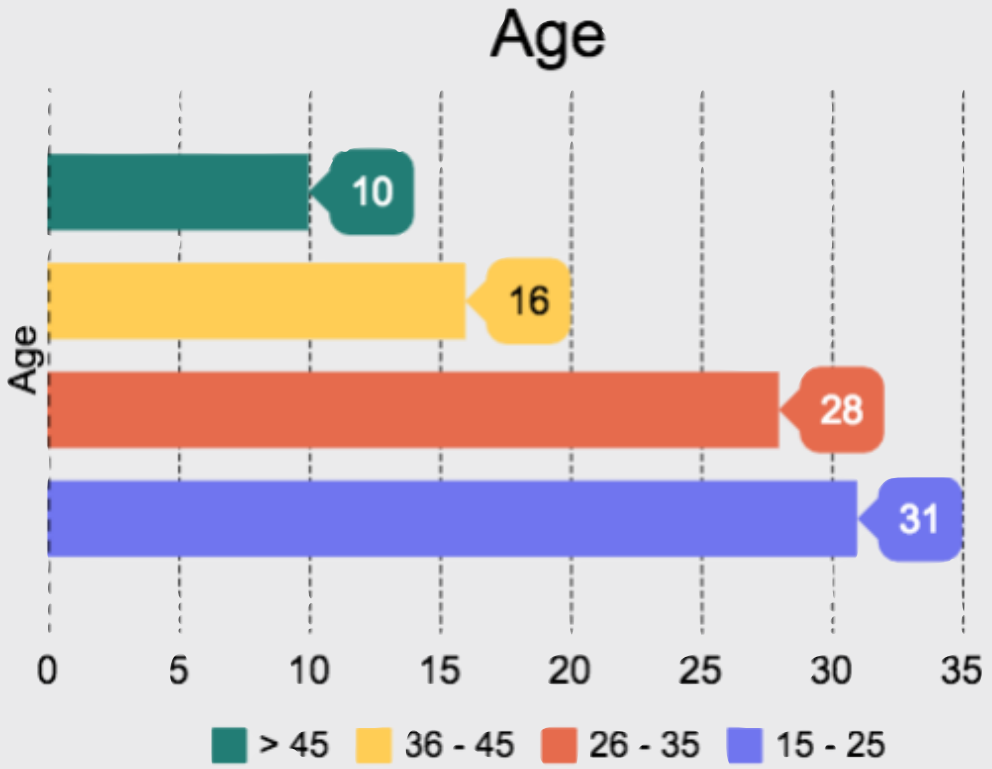
Footbridge Elevation

Inventory

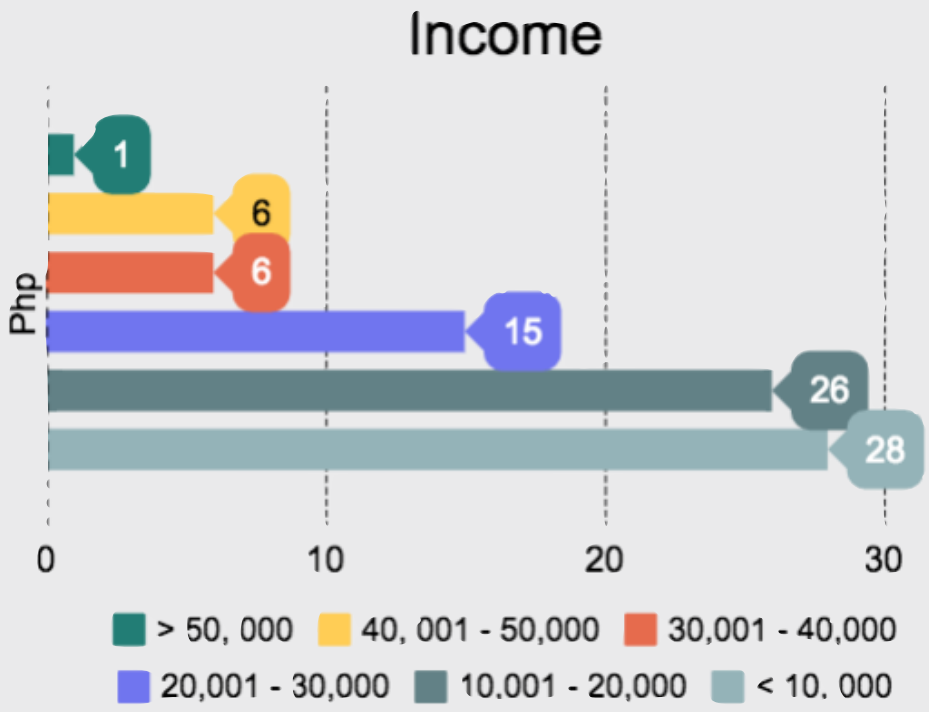


Width of Footbridge

Survey Results: SM Skybridge

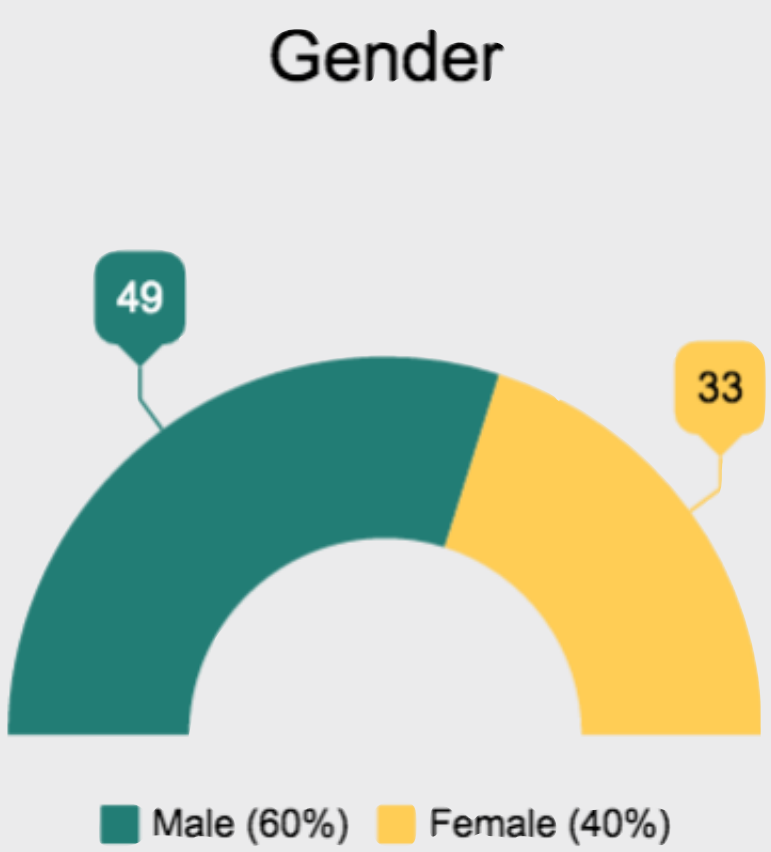


Age

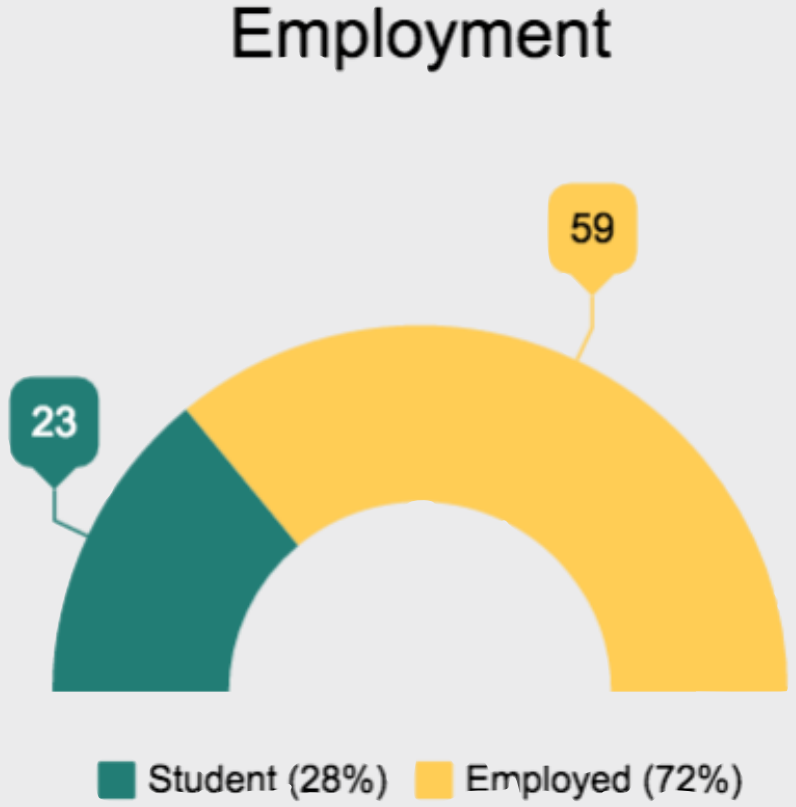


Monthly Income

Survey Results: SM Skybridge



Gender



Employment

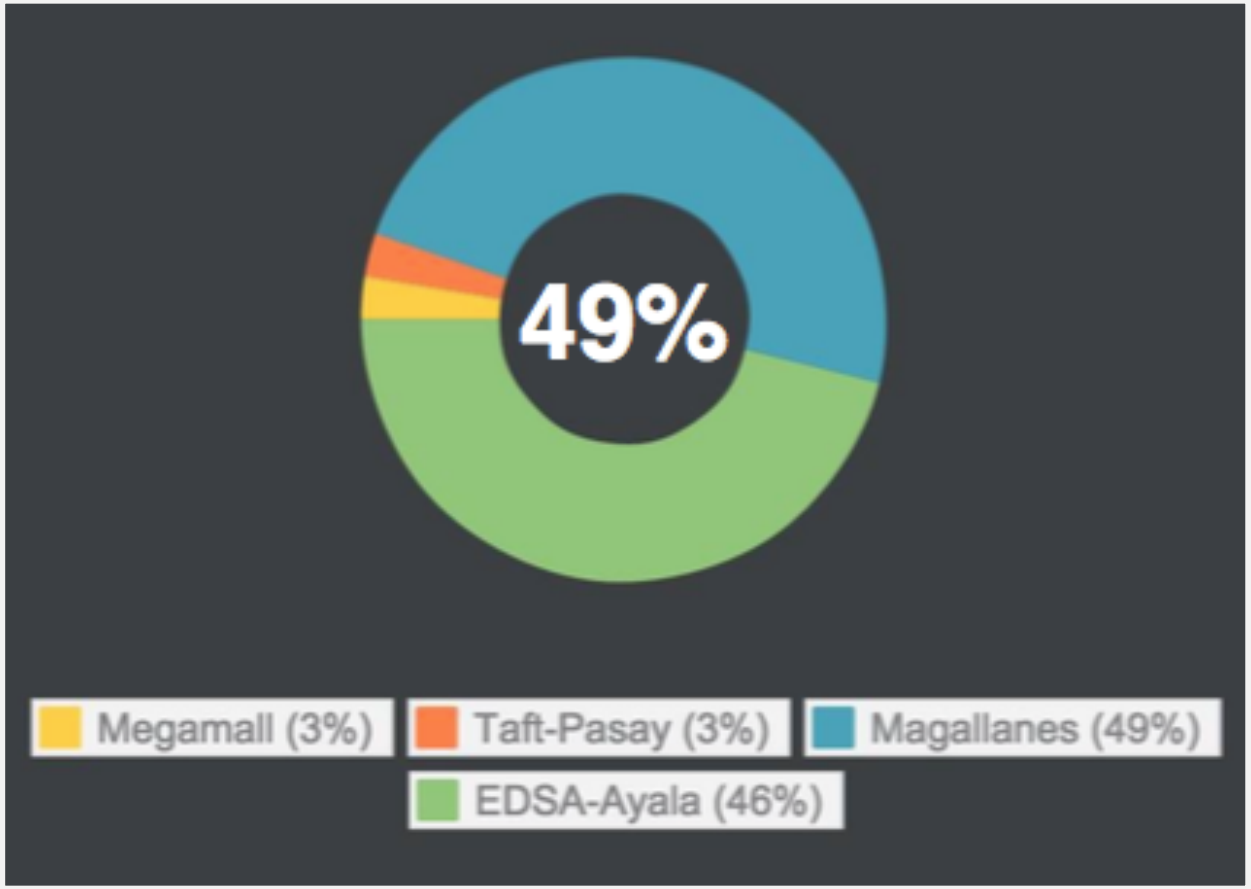
Survey Results: SM Skybridge

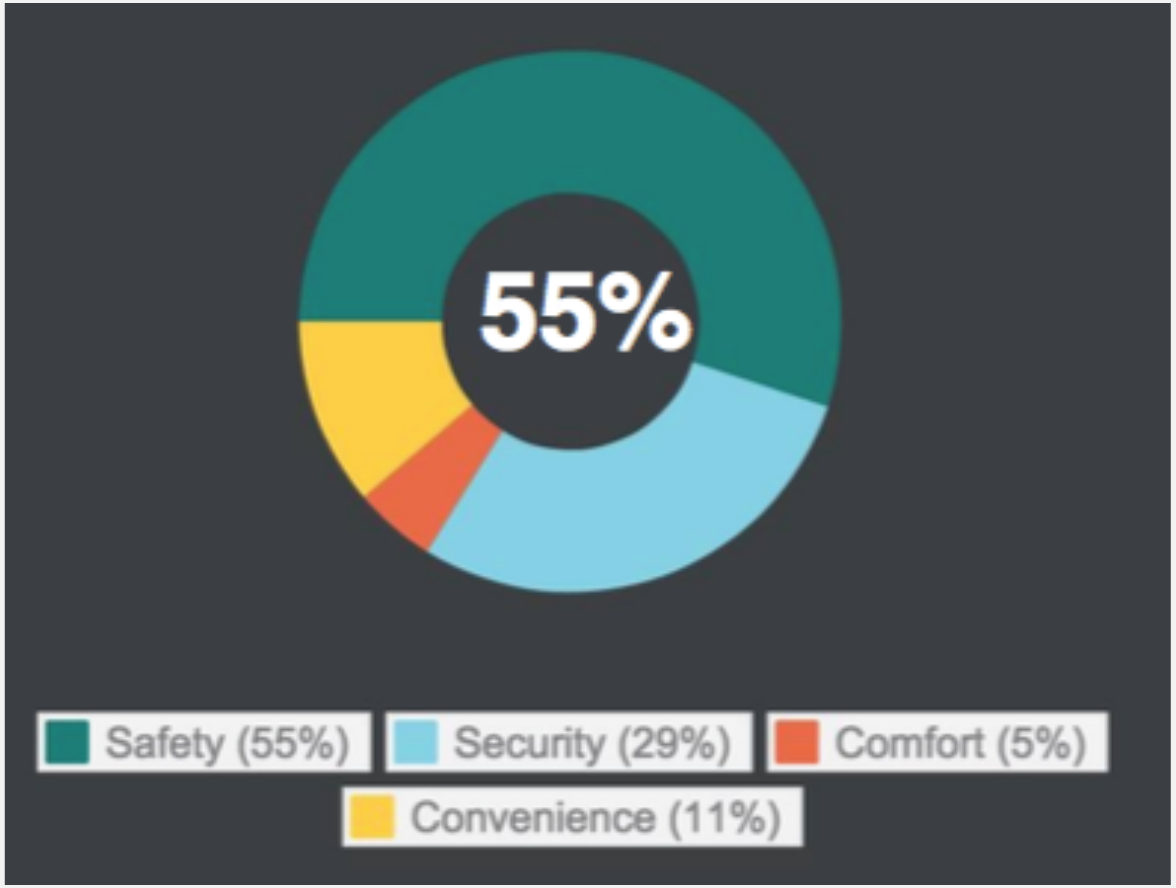
Destination

Level of Service Analysis

Footbridge	Effective Width (m)	Pedestrian Flow (ped/min/ft)	Level of Service Category
MCU	1.39	12.67	D
Skybridge	1.49	22.19	E
Quezon Avenue	1.44	17.01	E
Taft-Pasay	1.19	19.42	E

Analytical Hierarchical Process



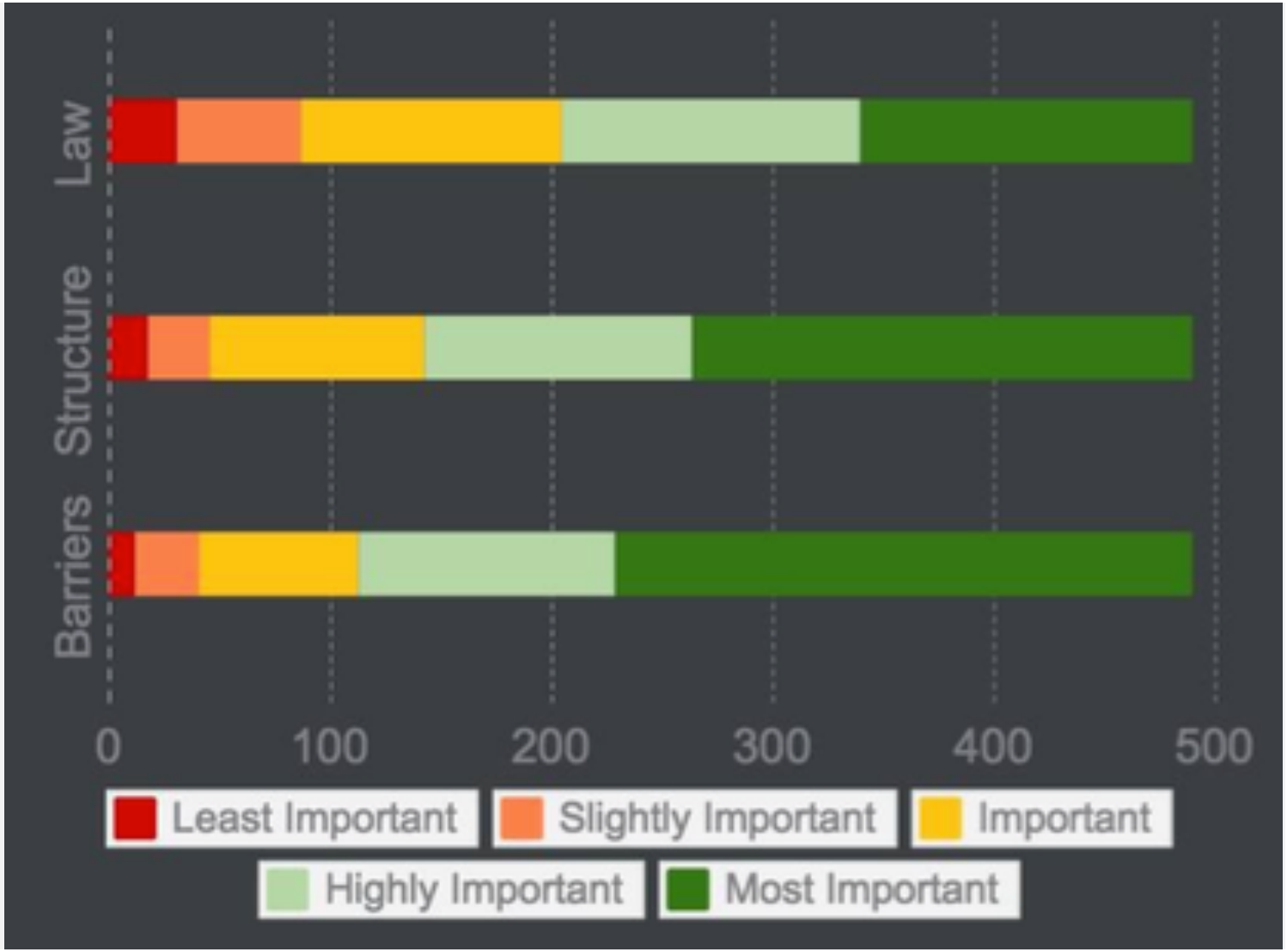


49% of responses are compatible with the design of Magallanes Footbridge

55% of respondents say that Safety is their first priority

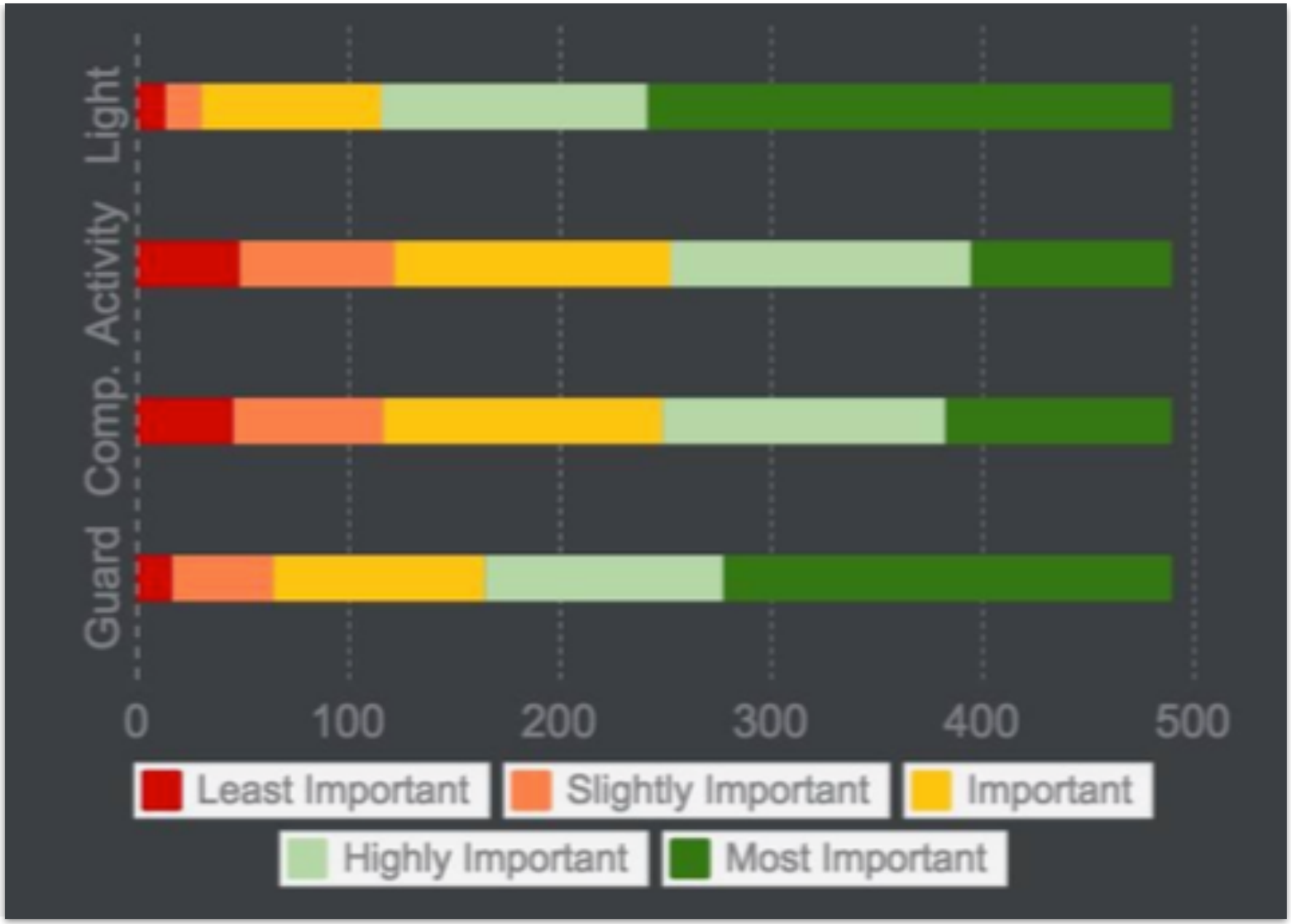
Safety

- Law Enforcement: 3.647
- Structural Safety: 4.039
- Barriers: 4.149



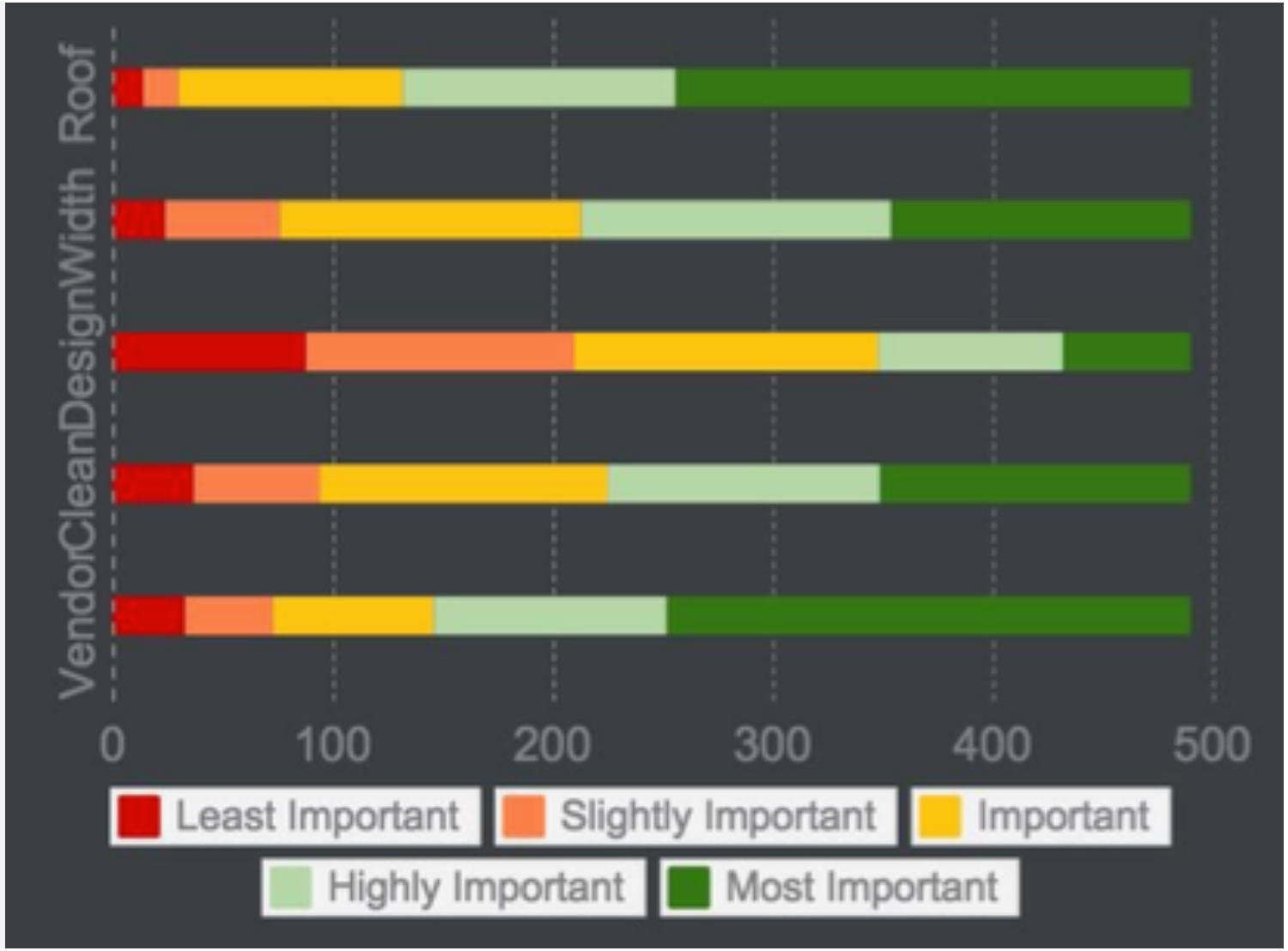
Security

- Lighting: 4.178
- Street Activity: 3.329
- No. of companions: 3.378
- Security Guards: 3.929



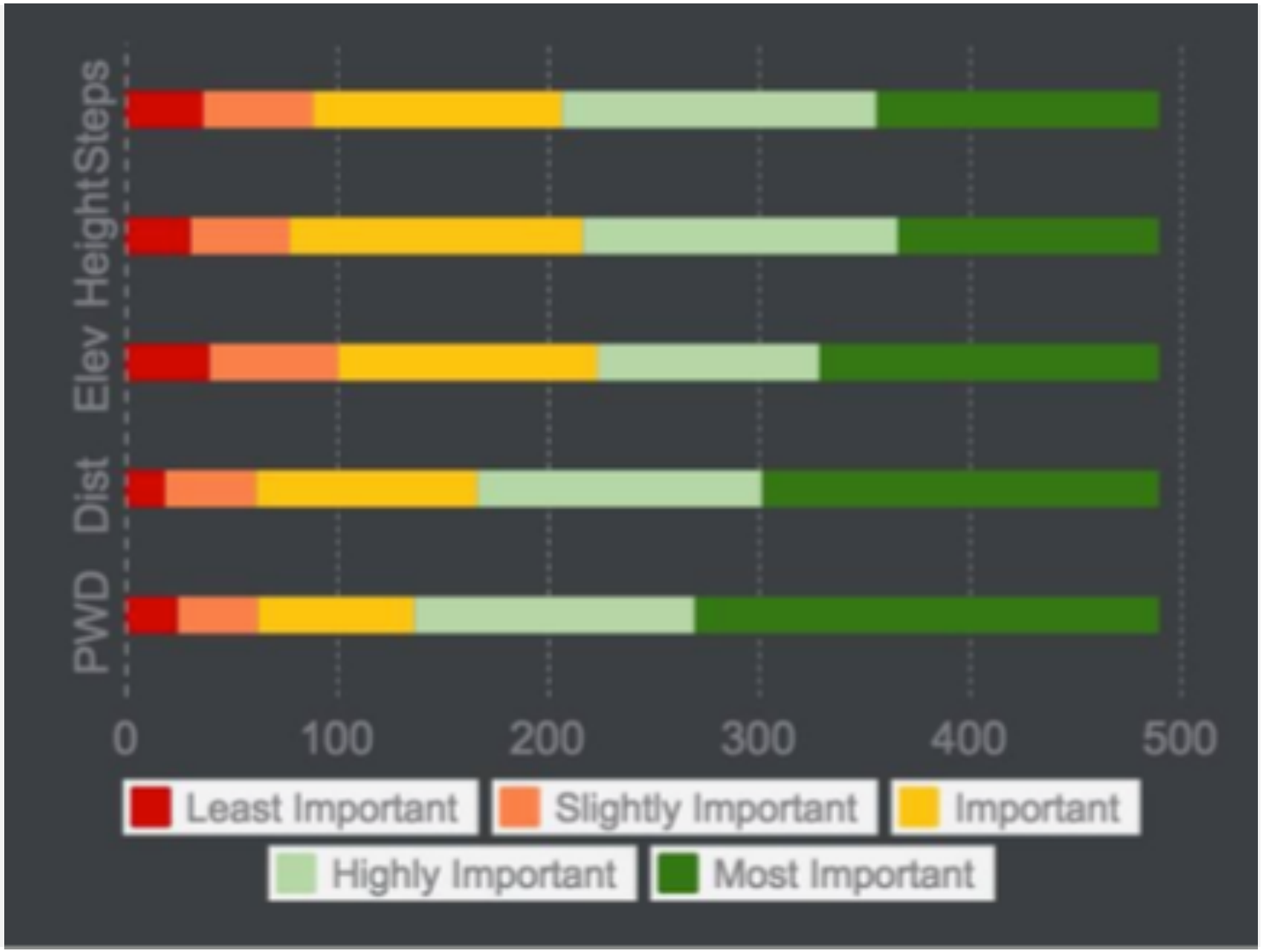
Comfort

- Walkway Width: 3.639
- Aesthetics: 2.800
- Cleanliness: 3.561
- Absence of Vendors: 3.971



Convenience

- No. of Steps: 3.594
- Footbridge Elevation: 3.588
- Escalators/Elevators: 3.584
- Walking Distances: 3.878
- PWD Facilities: 3.990



Analytical Hierarchical Process

Factors	AHP	Likert
Safety	55%	3.960
Security	29%	3.812
Comfort	5%	3.618
Convenience	11%	3.727

Regression Analysis

	PHV	Commercial	Residential	Institutional	Transportation	Work
Taft-Pasay	4325	3	5	1	5	4
Megamall	1934	4	2	2	3	2
MCU	2436	1	2	2	4	3
Magallanes	2035	4	1	2	5	2
EDSA-Ayala	1634	6	3	0	7	0
Ortigas	2257	3	2	2	2	2
EDSA-MacArthur	664	3	2	0	0	0
Quezon	1523	7	0	0	2	1
Skybridge	3767	5	0	2	1	4
	5223	9	4	2	5	2

Number of pedestrian generators within 1.5-km radius from the centre of the footbridge.

Regression Analysis

Variables (x)	P-value
(1) Commercial	0.004
(2) Residential	0.017
(3) Institutional	0.289
(4) Transportation	0.510
(5) Work	0.005

$$y = 351.51\,x_1 + 407.10\,x_2 + 229.83\,x_3 - 55.45\,x_4 + 703.35\,x_5 - 1378.83$$

$$r^2 = 0.97$$

Regression Analysis

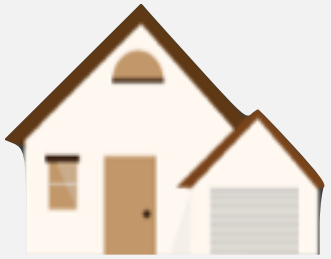
Variables (x)	P-value
(1) Commercial	0.001
(2) Residential	0.005
(5) Work	0.001

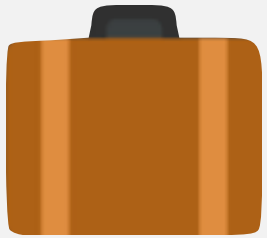
$$y = -1309.753 + 341.14\,x_1 + 352.65\,x_2 + 806.93\,x_5$$

$$r^2 = 0.95$$

Conclusion: Main Pedestrian Generator

- Establishments that are significant in the change of PHV: residential, Work and Commercial
- Location with respect to pedestrian generators significant in the change of demand of footbridge
- Footbridge amenities is not a significant determinant of demand.





Conclusion: Effective Width

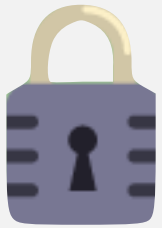
- Four footbridges failed considering LOS C as passing
- A standard of 3.3m of effective width will have all overpass at least a LOS C.

Footbridge	Level of Service Category
MCU	D
Skybridge	E
Quezon Avenue	E
Taft-Pasay	E

Conclusion: Design of Footbridge

55%

Safety



29%

Security

5%

Comfort

11%

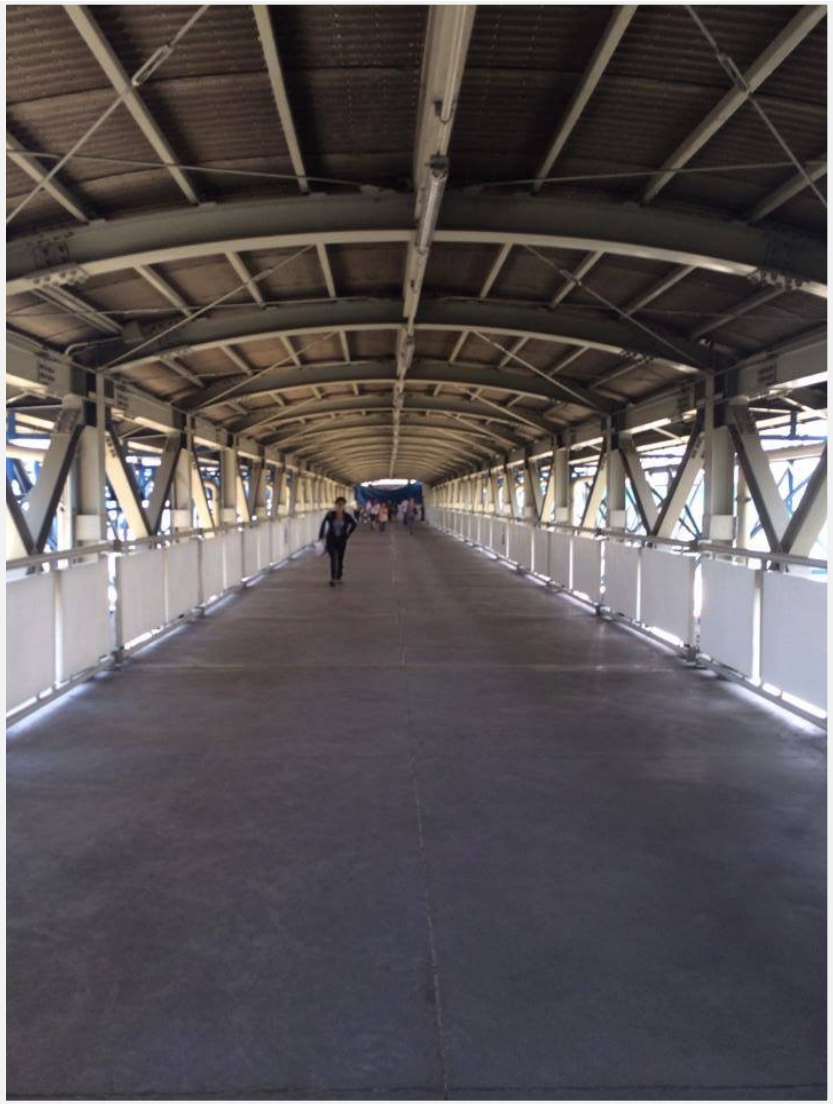
Convenience

Conclusion: Design of Footbridge

Ayala Footbridge

Caters to the preference of 46.12% of respondents

Conclusion: Design of Footbridge



Magallanes Footbridge

Caters to the preference of 48.57% of respondents

Recommendations

Footbridges should be erected in the proximity of commercial, work and residential establishments.

Amenities shall be present to cater to the preferences of the pedestrians.

A minimum effective width of 3.3 meters shall be present to at least have a level of Service C.

Recommendations

24-hour volume count would be beneficial for usage evaluation

A comparison with at-grade crossings may be done to broaden the aspect of pedestrian decision-making process

A separate data gathering for weekends could be executed in comparison with weekly data.