

IMPACT ANALYSIS OF THE PROPOSED FERRY SERVICE ON COMMUTER TRAVEL IN ILOILO CITY

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Iloilo City

- One of the cities that were chosen by the Philippine Government to be granted multiple infrastructure developments in order to improve the economy.



IMPROVING ECONOMY

ILOILO PROJECTS ON THE RISE

INVESTMENTS

Shopping Malls



MEGAWORLD
CENTER MALL

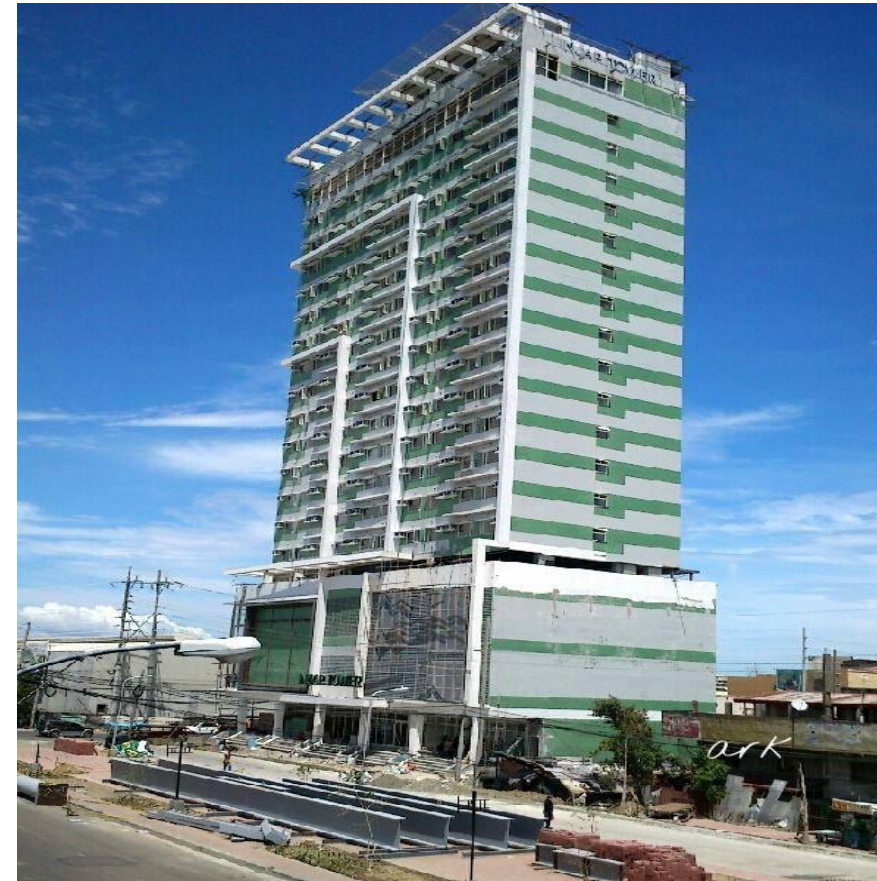
THE SHOPS AT
AYALA ATRIA



Hotels



COURTYARD BY MARIOTT



INJAP CONDOTEL

Hospitals



Business Parks





CONGESTION


Congestion





INFRASTRUCTURE





CONSEQUENCES



IMPROVEMENT PROJECTS AROUND THE CITY

REINVENTION



Esplanade



Iloilo River

- Chosen as a finalist in the Thiess International Riverprize 2013
- An estuary that runs through the middle of



Transportation Development

- In order to satisfy the growth of the economy, other modes of transportation are needed to lessen the congestion present throughout the city.

Table 1
Total Population by Census Year
Iloilo City, 1970 to 2010

Decennial Census	Total Population (in thousands)
1970	209.7
1980	244.8
1990	309.5
2000	366.4
2010	424.6

Water Ferry Service

CityCat Ferry, Brisbane



Sumida River Ferry services, Tokyo City

Water Ferry Service



New York Waterway in New York City

Pasig River Ferry, Pasig City



Why Water Ferry Service?

- Provides an alternative mode of transportation
- Can relieve road-based transportation congestion

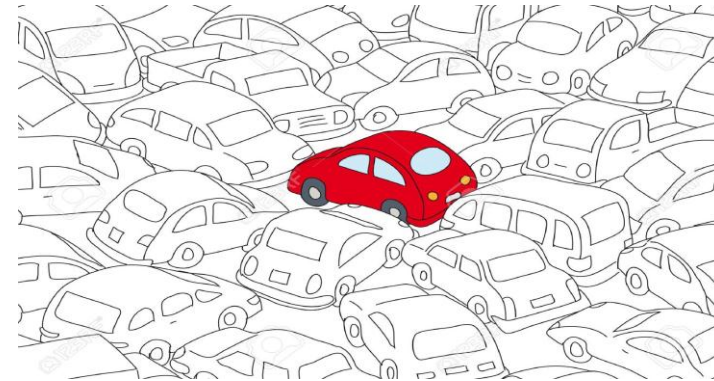
STATIONS WITH ASSIGNED WITHIN ILOILO RIVER



Station no.	Station Name	Landmarks
1	Carpenter's Bridge	Medical City Iloilo, Esplanade, Molo Church, Iloilo Supermart
2	Benigno Aquino Ave.	Smallville, SM City, U.P. Visayas Campus, John B. Lacson Foundation Maritime College
3	Jalandoni Bridge	University of San Agustin, Iloilo Central Elementary School
4	Dalan Luna	Gaisano City Shopping Mall, La Paz Public Market, Saint Paul University – Iloilo, Metro Iloilo Water District, Philippine Charity Sweepstakes Office
5	Provincial Capitol	Provincial Capitol, Days Hotel, Atrium
6	Old Dept. Of Foreign Affairs	National Statistics Office Region VI, SM Delgado, Marymart Mall
7	Fast Craft Terminal	New Iloilo Ferry Terminal
8	Parola	Camp Delgado, DENR, 2Go Travel, Iloilo Domestic Port, National Bureau of Investigation

STATEMENT OF THE PROBLEM

- Iloilo City's rapid growth in population inadvertently causes an increase in land traffic congestion



- Iloilo River is rehabilitated but remains unutilized

MAIN OBJECTIVE

- The main objective of the study is to assess the impact of a ferry transport service along Iloilo River on the urban travel in Iloilo City

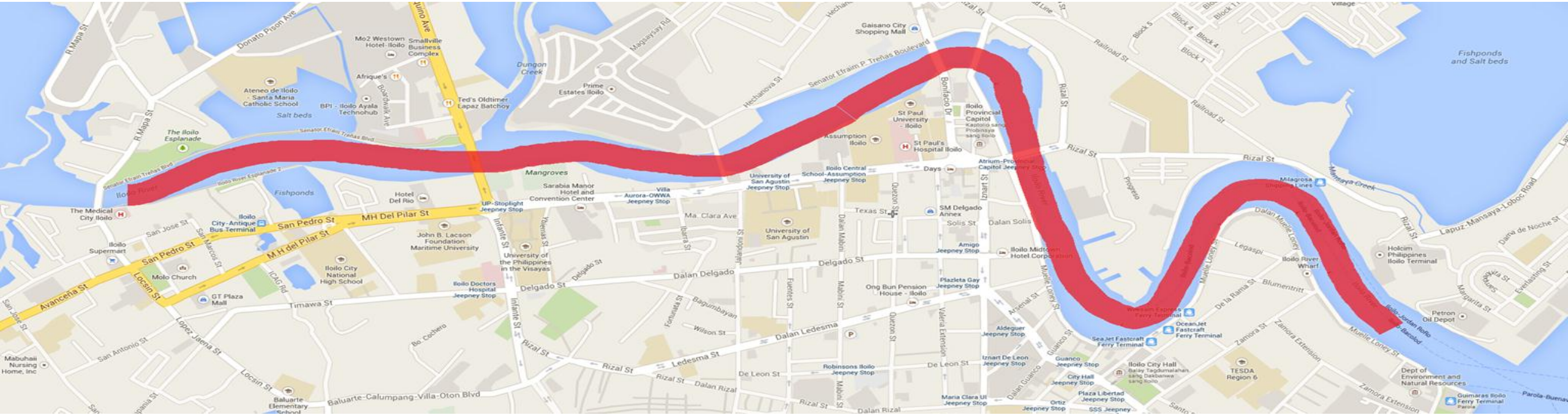
SPECIFIC OBJECTIVES

- To determine the travel characteristics of commuters travelling in the area given their choice of transportation
- To determine the service operating characteristics of the existing public transportation in the city
- To recommend river ferry transport routes and stations along Iloilo River
- To estimate the potential demand of the river ferry transport along Iloilo River
- To recommend other possible utilizations of the Iloilo River (e.g. its tourism potential)

SCOPE

- Areas to be studied:
 - All zones of Iloilo City
 - All municipality of Oton adjacent to Iloilo City

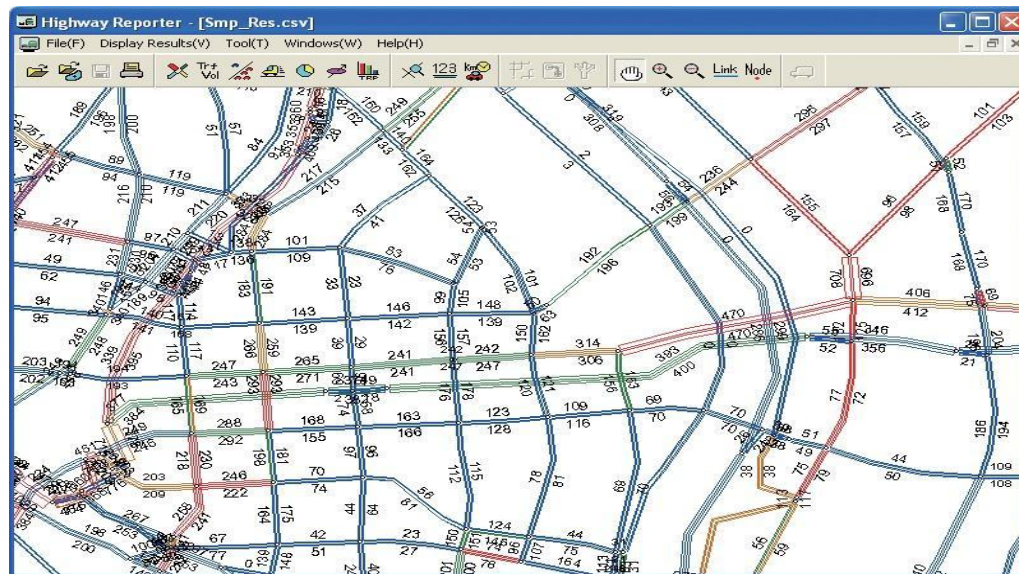
SCOPE: 6.41 KM



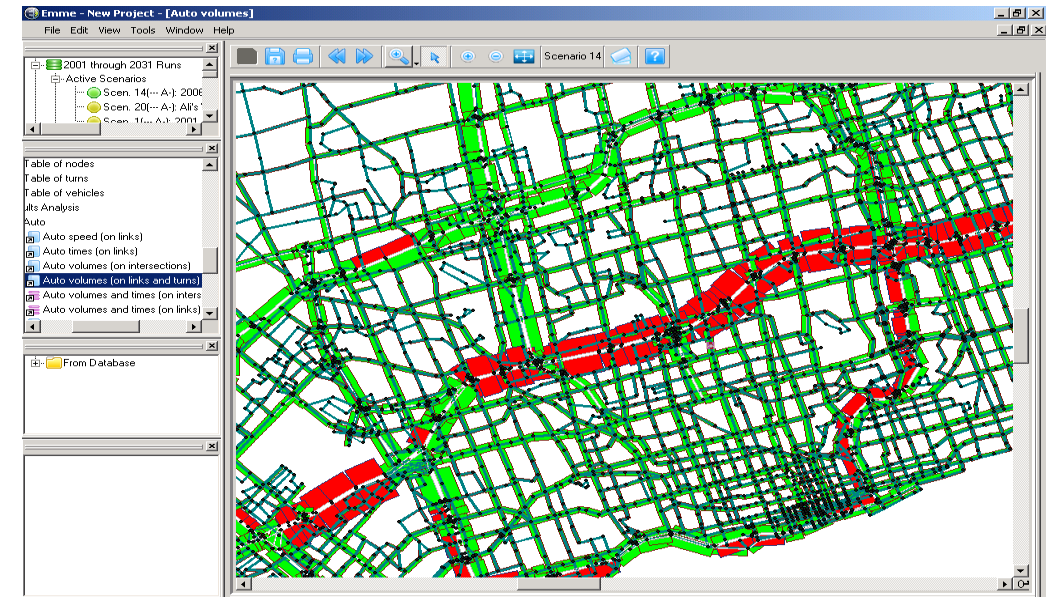
LIMITATIONS

Software used:

- JICA STRADA



- EMME



LIMITATIONS

Data Gathering:

- Survey questionnaire

- Secondary data

(NSO, LTO, DOTC, City Government of Iloilo, previous studies)

Good Morning! Afternoon patrons of Iloilo City! We are Civil Engineering students from DLSU-Manila and we are doing a study about Developing the Impact Analysis on Proposed Water Ferry Service on Commuter Travel in Iloilo City. Please help us answer the 17 questions for our study. Thank you.
Origin Address (at least barangay or street)

Destination Address (at least barangay or street)

What mode of transportation do you use to travel within Iloilo City?

- a. car
b. tricycle
c. taxi
d. ~~jeepney~~
e. walk
f. motorcycle
g. bus
h. others: _____

If using car, how much do you pay for parking?

Specify: _____

What is the purpose of your trip?

- a. Work
b. School
c. Vacation/Tourist
d. Shopping
e. Others
Specify: _____

How much do you usually spend per trip?

- a. less than 10 pesos
b. 10-20 pesos
c. 21-30 pesos
d. 31-40 pesos
e. 41-50 pesos
f. more than 50 pesos

What is the average travel time of your trip?

- a. less than 10 minutes
b. 10-20 minutes
c. 21-30 minutes
d. 31-40 minutes
e. 41-50 minutes
f. more than 50 minutes

If a ferry transportation service will be implemented in Iloilo city are you interested in using it?

- a. yes
b. no
c. not sure

Answer if you would be willing to use the ferry transportation service for each combination of cost and travel time.

Please answer YES or NO for each row.

Fixed Rate	Faster than Current mode by	Yes	No
5 pesos	10 minutes		
5 pesos	15 minutes		
8 pesos	20 minutes		
10 pesos	10 minutes		
12 pesos	15 minutes		
12 pesos	20 minutes		
15 pesos	10 minutes		
15 pesos	15 minutes		
15 pesos	20 minutes		
20 pesos	10 minutes		
20 pesos	15 minutes		
20 pesos	20 minutes		

Would you prefer air conditioned or non-air conditioned service?

- a. Air conditioned
b. Non-air conditioned
c. I don't mind either way.

Which of the following ferry stations would you use?

(mark "1" for origin and "2" for destination)
 _____ Carpenter's Bridge _____ Provincial Capitol
 _____ Benigno Aquino Ave. _____ Dept. of Foreign
 _____ Jalapopt Bridge _____ East Craft Termi
 _____ Davao Luna _____ Bacola

If none of the above, what are your suggestions?

For Tourism Purposes: Indicate if you think that you will patronize these activities in Iloilo River.

Activities	Definitely	Yes	Maybe	No	Definitely no
Floating Restaurant					
Boat Touring					
Fishing Park					

PERSONAL INFORMATION:

Gender _____

Age _____

Number of household members _____

Income/Allowance per month (in pesos)

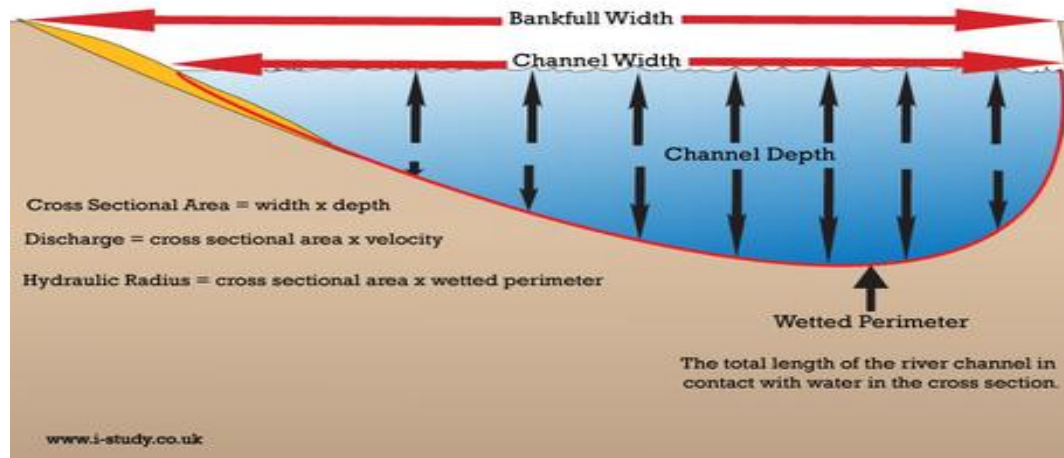
- a. less than 5,000
b. 5,000-10,000
c. 10,000-20,000
d. 20,000-30,000
e. 30,000-40,000
f. 40,000-50,000
g. more than 50,000



DELIMITATIONS



River Cross Section Measurements



-Environmental impact analysis

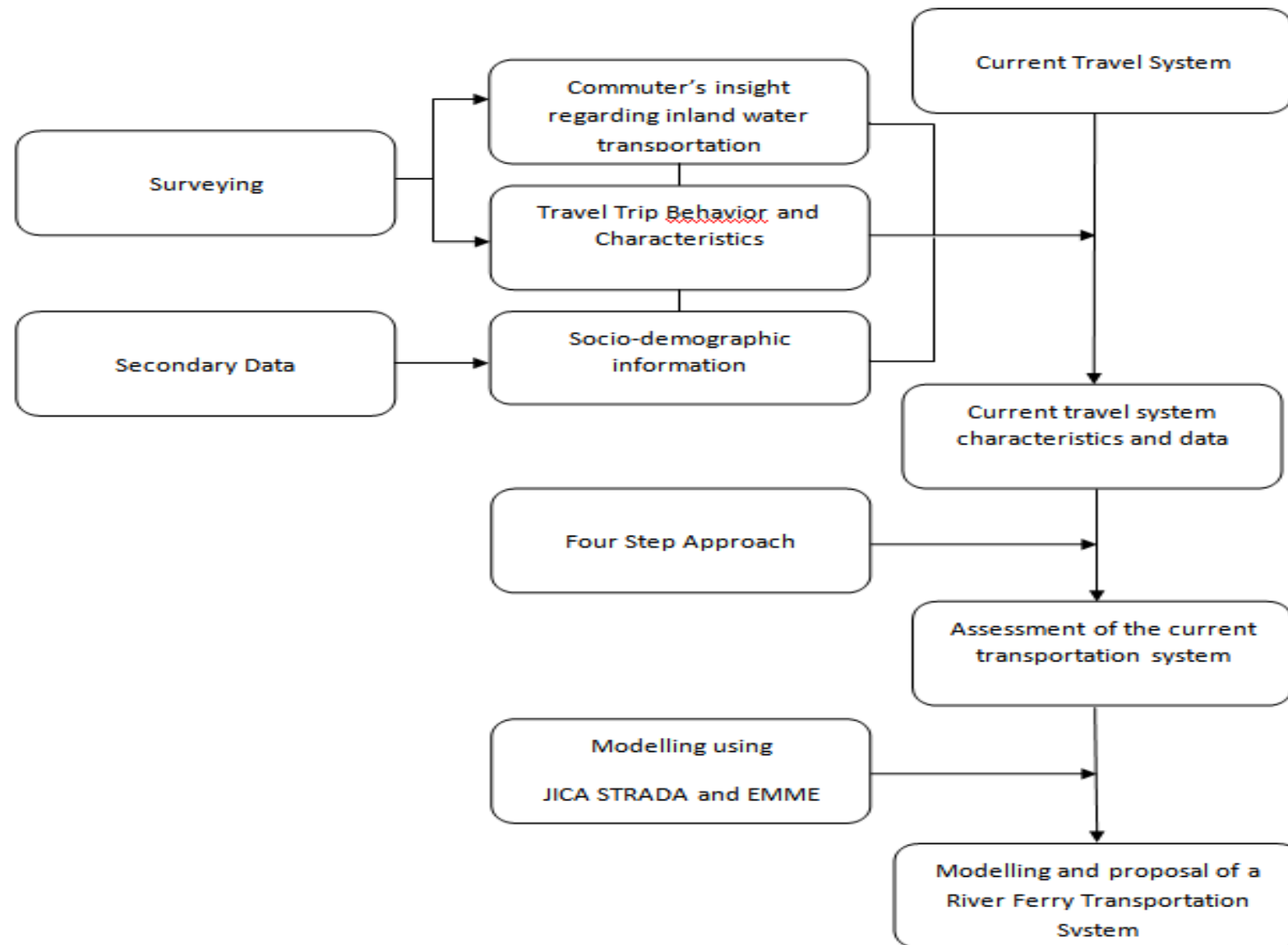
-Current physical characteristics of the infrastructures along Iloilo River

(Vertical clearance between bridges and water surface)

HYPOTHESIS

- The river ferry transport service will reduce congestion, especially along roads parallel to the river since some commuters will use the ferry service instead of the road-based modes of transport.

CONCEPTUAL FRAMEWORK



THEORETICAL FRAMEWORK

Four Step Approach:

Trip Generation and Attraction



Trip Distribution

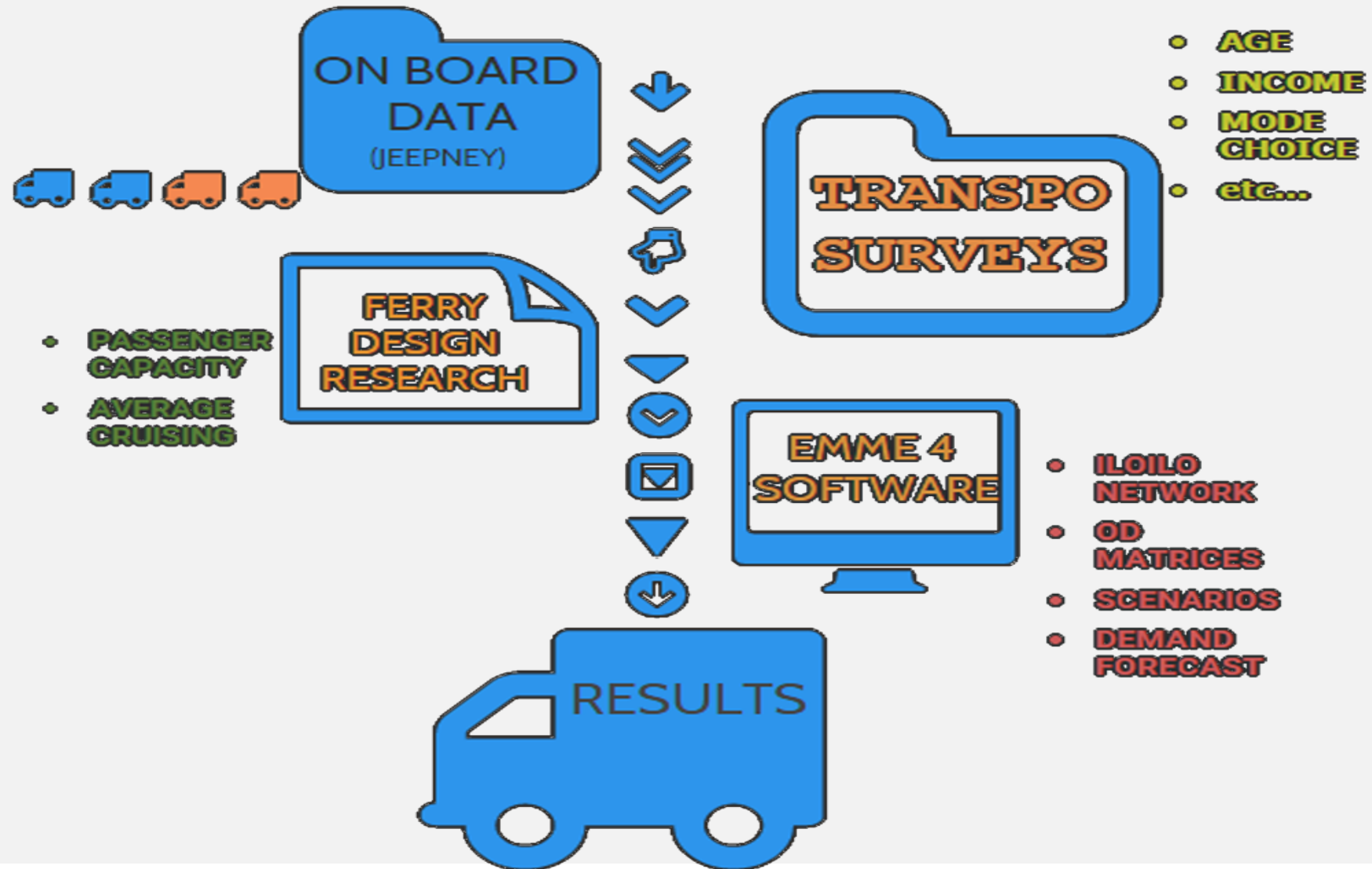


Modal Split Analysis



Route Assignment

METHODOLOGY

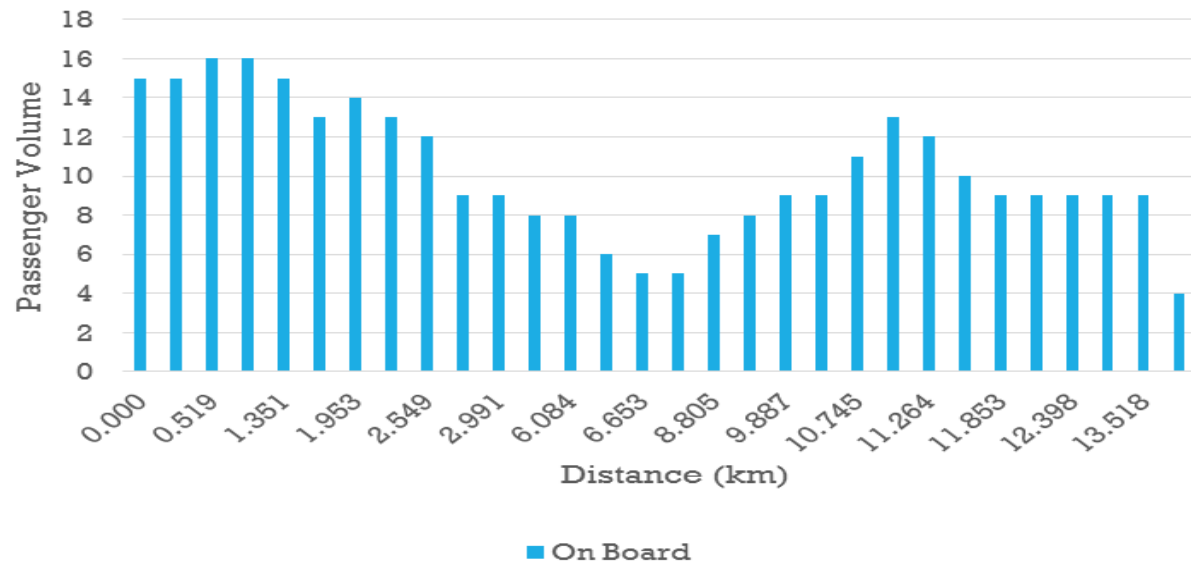


DATA ANALYSIS

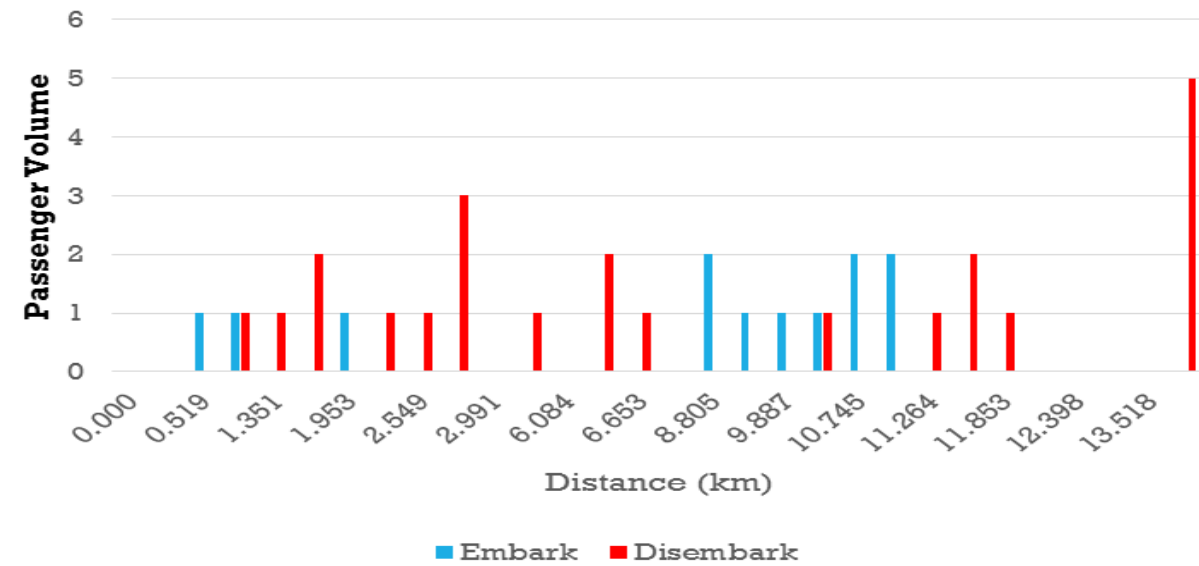
On board Characteristics of Iloilo City

Jeepney Route	Ave. Trip Length (km)	Ave. Boarding /km	Ave. Passenger Volume/km	Average Speed (kph)
Molo – Baluarte	8.86	1.58	9.38	9.57
Molo – Timawa	13.8	0.87	10.23	17.78
Villa – Baybay	10.12	3.56	9.25	8.47
Villa – Mohon	19.26	1.56	18.11	36.33
Mandurriao	8.47	0.48	8.69	20.75

ON BOARD SAMPLE

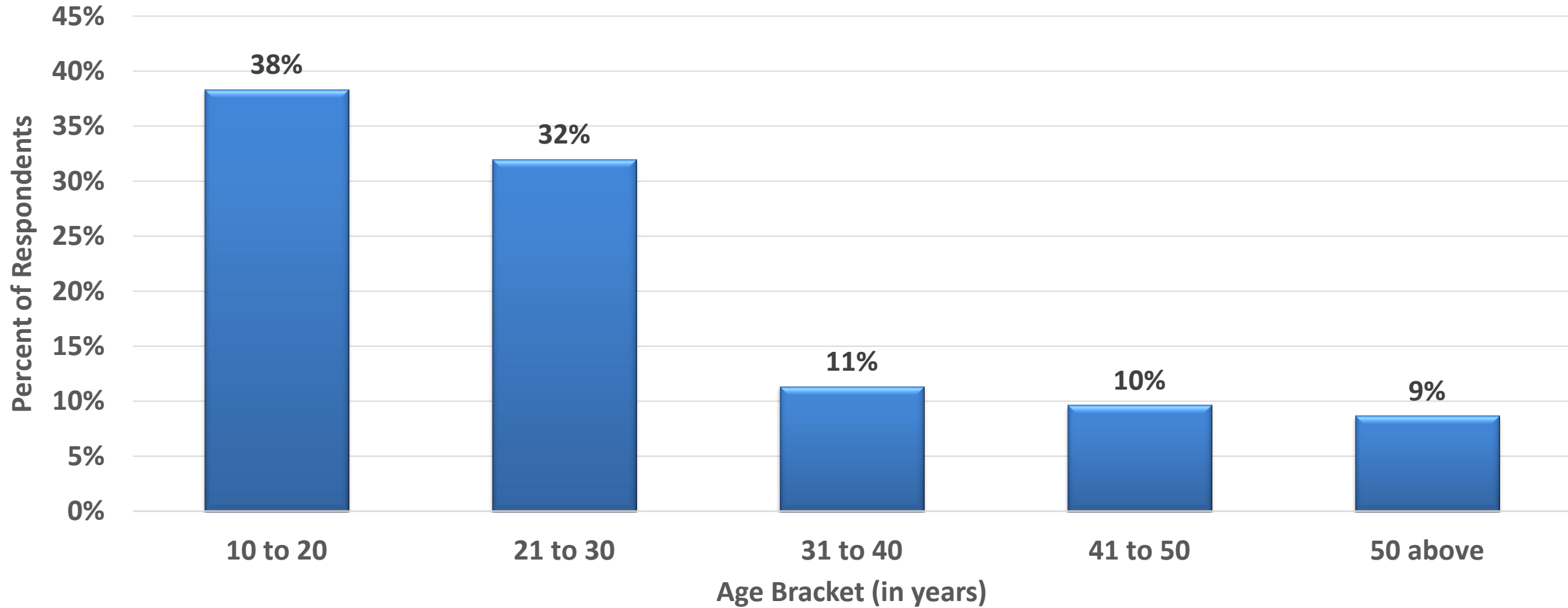


Passengers On-Board for Molo-Timawa

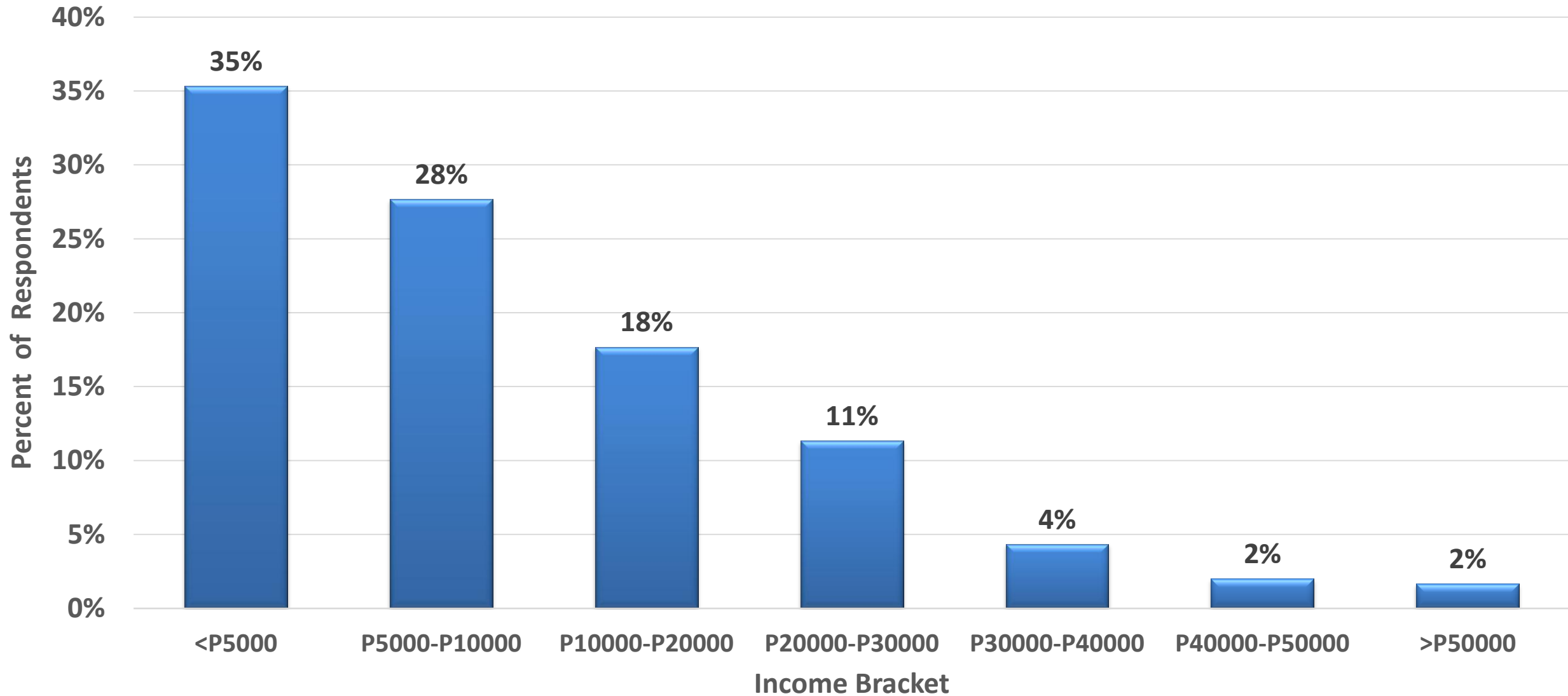


Passengers Embark and Disembark for Molo-Timawa

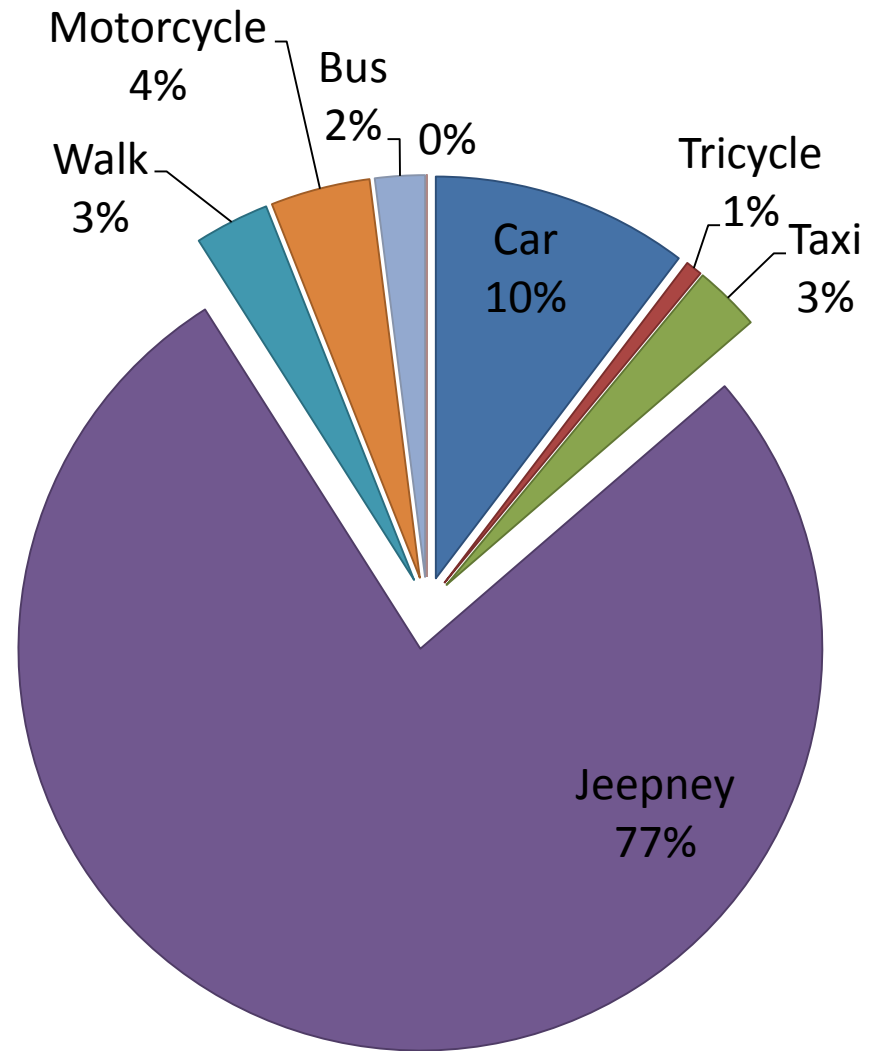
Age



Income

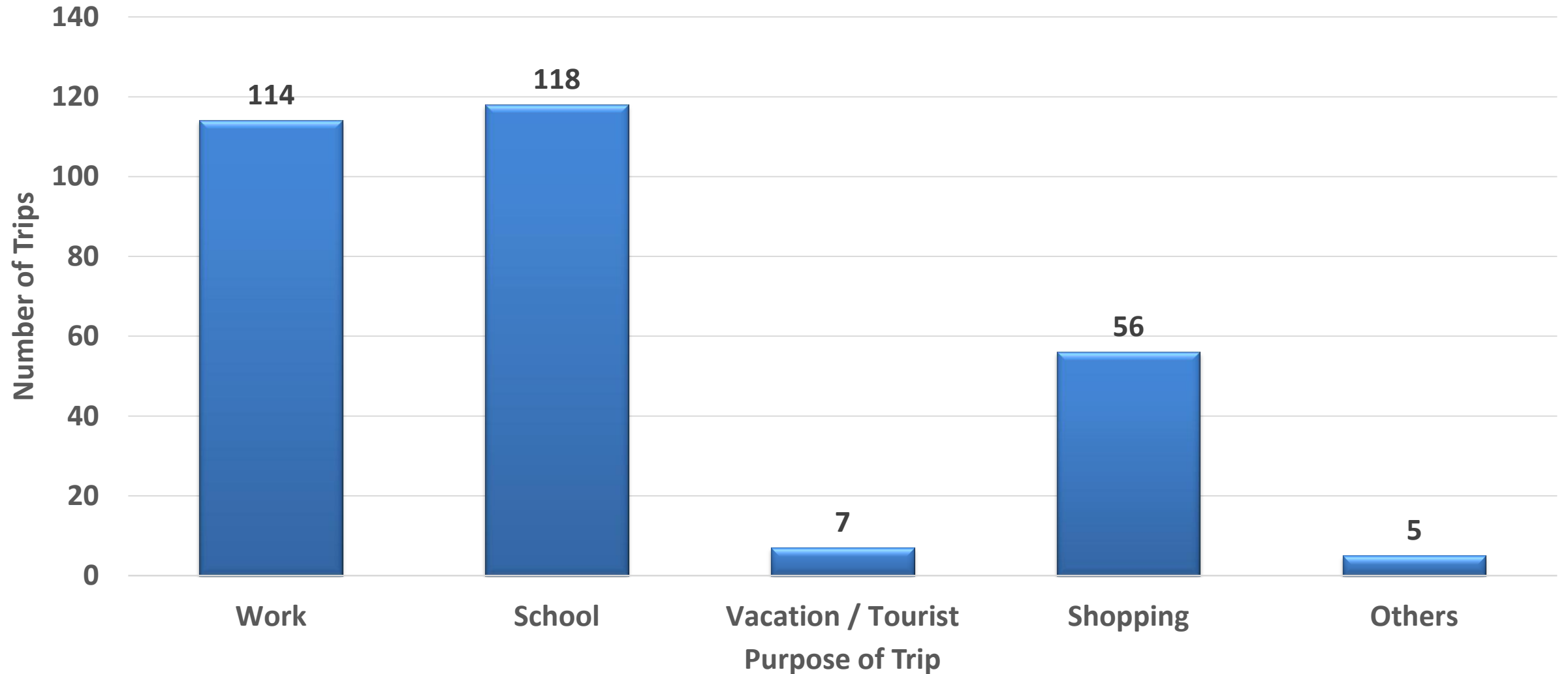


SURVEY QUESTIONS

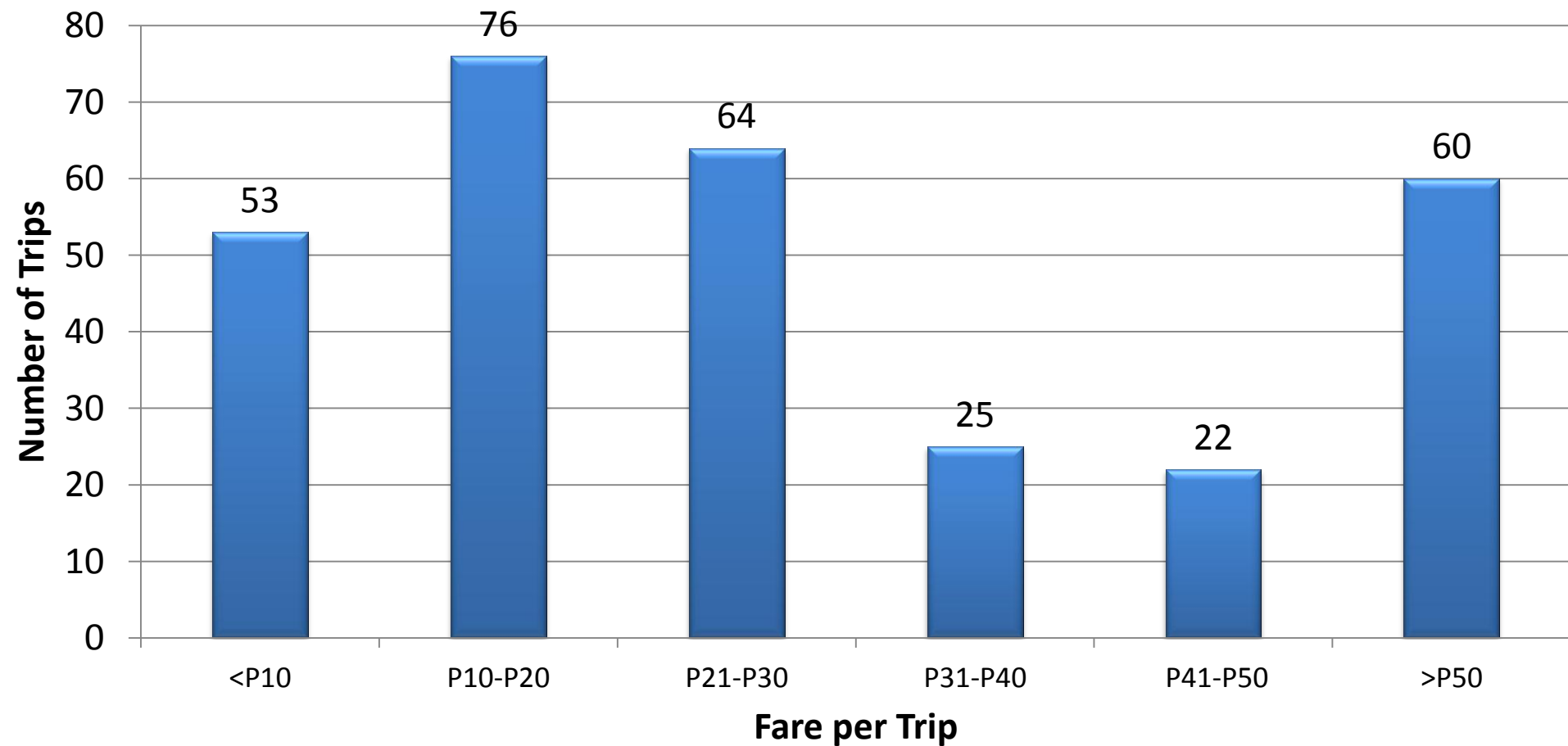


Transportation Modes Choice

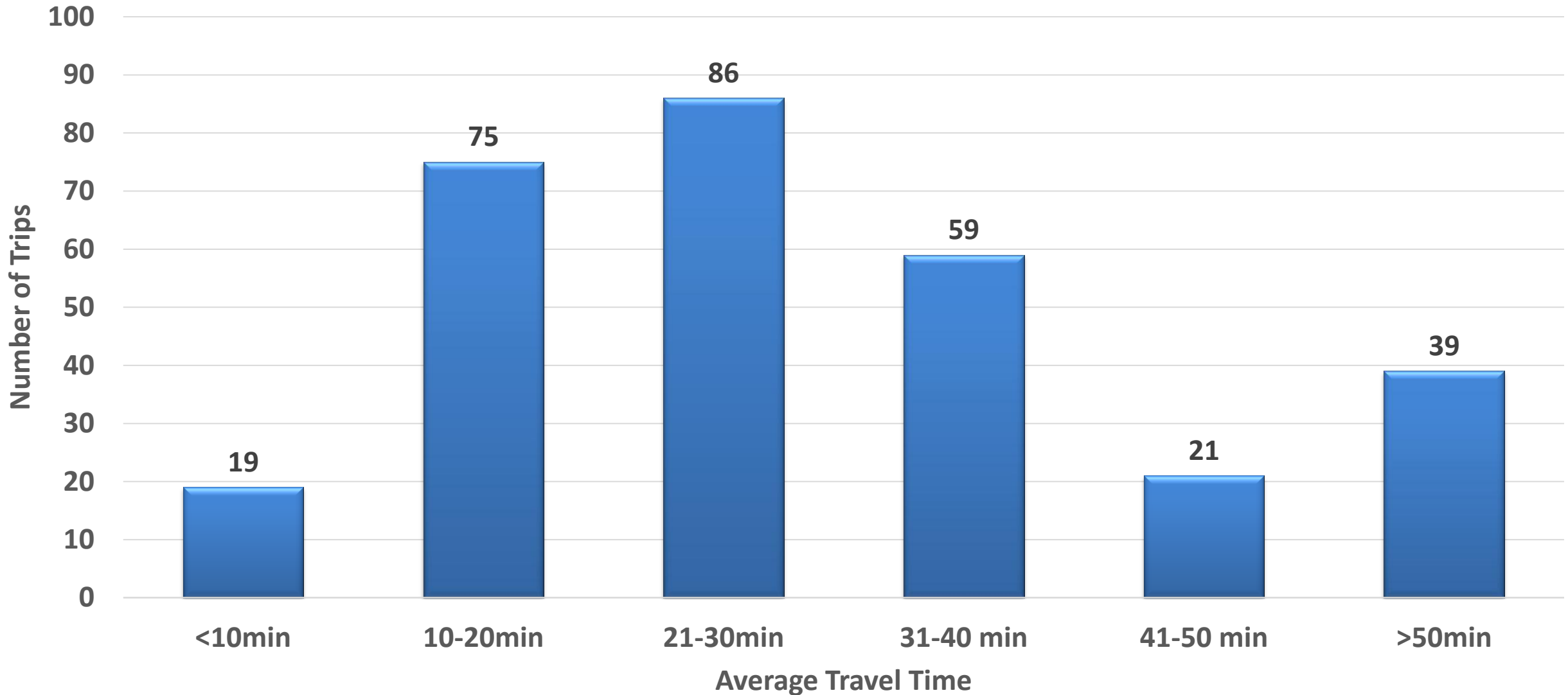
PURPOSE OF TRIP



TRIP FARE



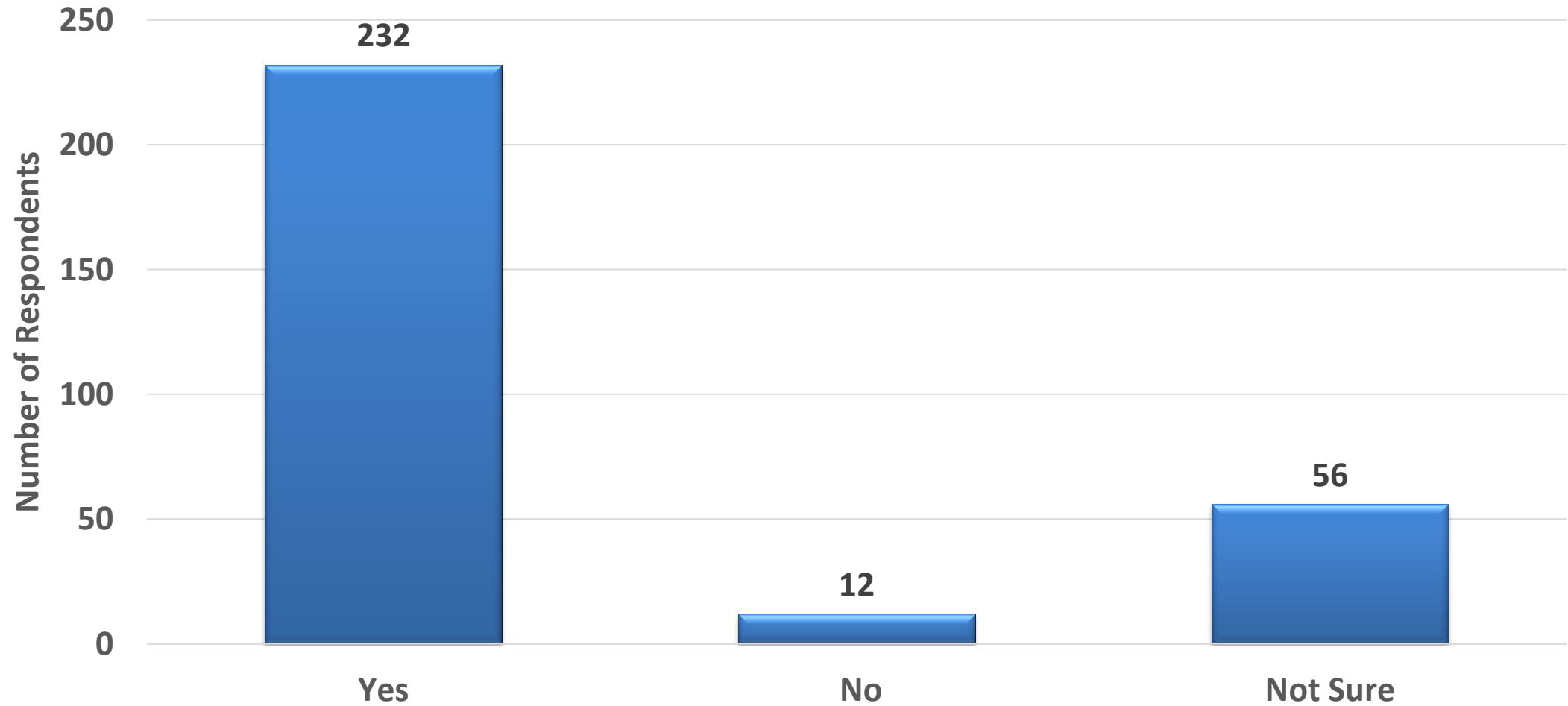
AVERAGE TRAVEL TIME



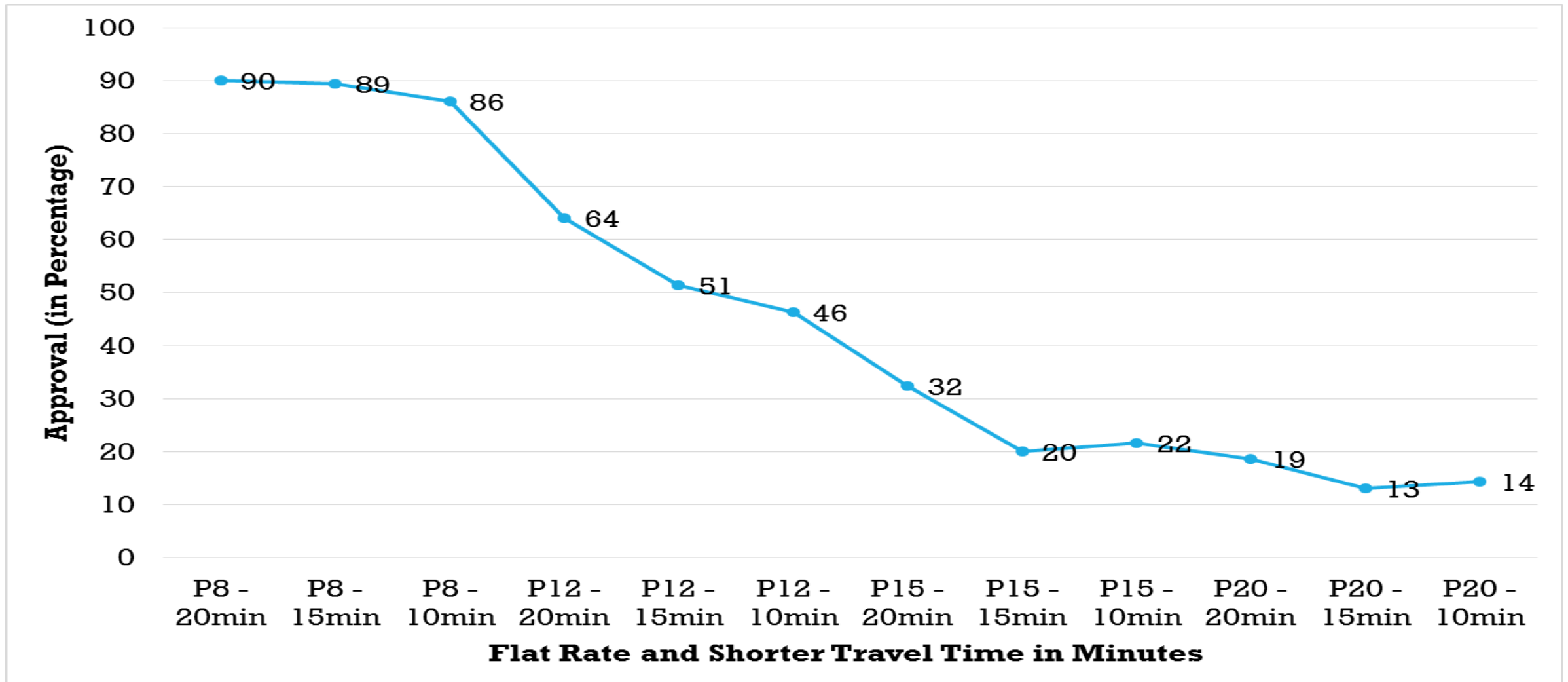
ORIGIN AND DESTINATION OF COMMUTERS



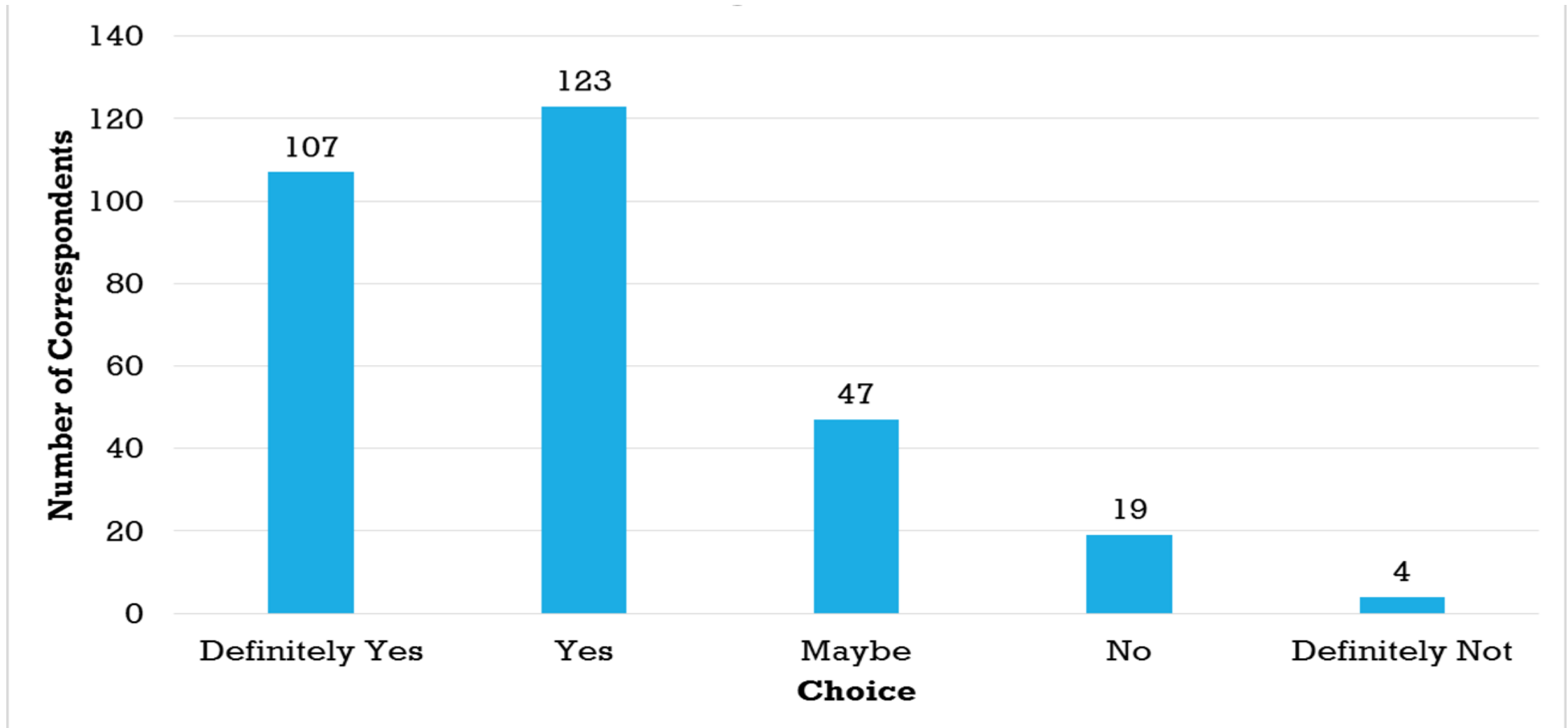
FERRY TRANSPORT INTEREST



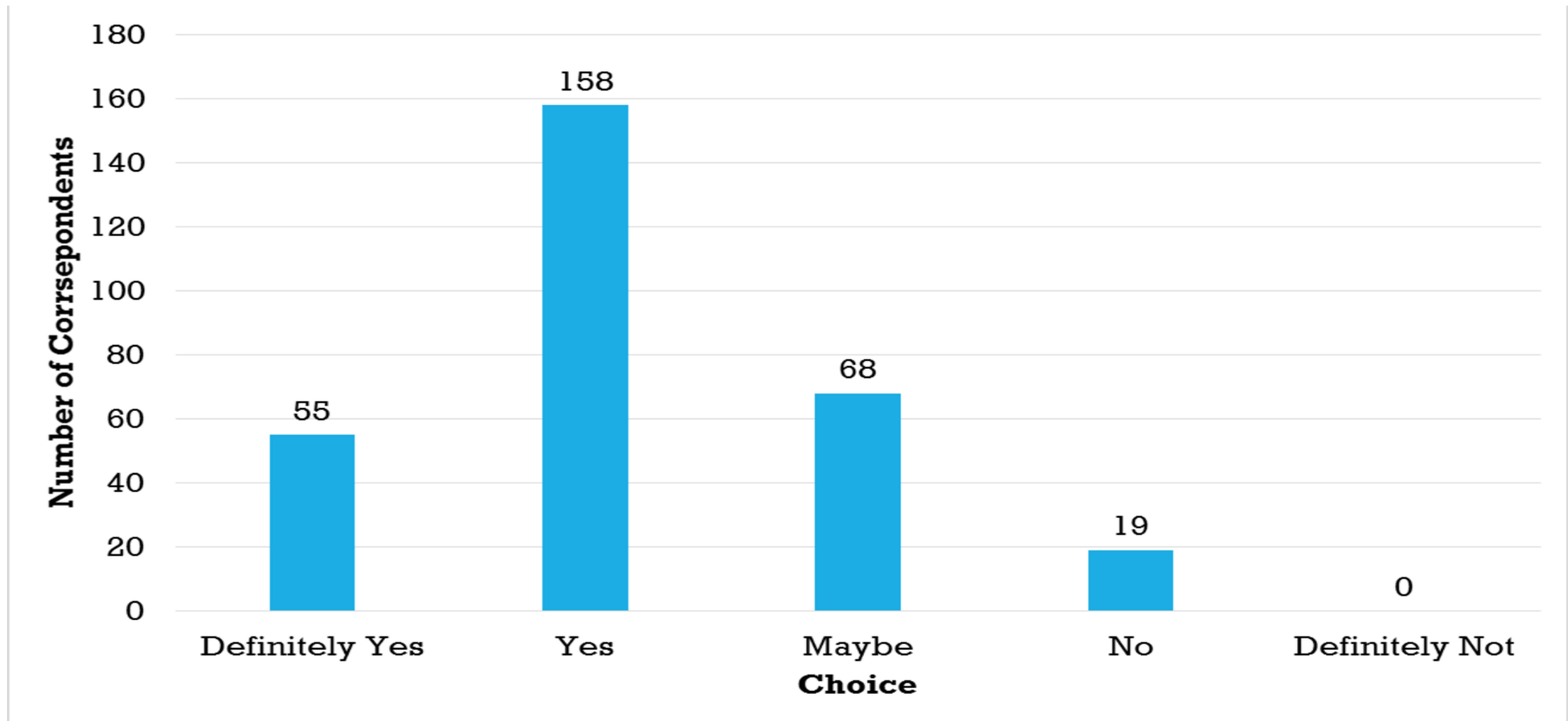
WILLINGNESS TO USE FERRY TRANSPORT



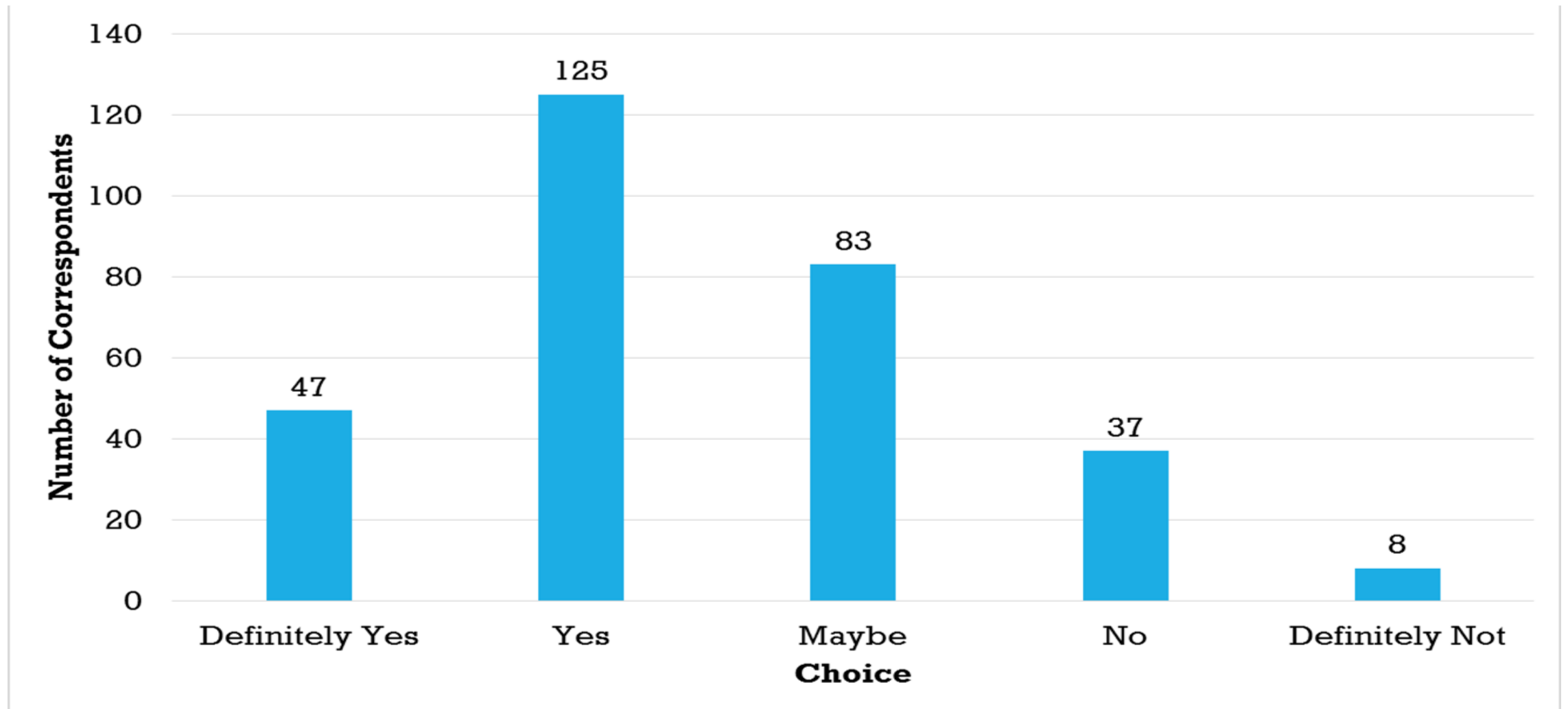
FLOATING RESTAURANT



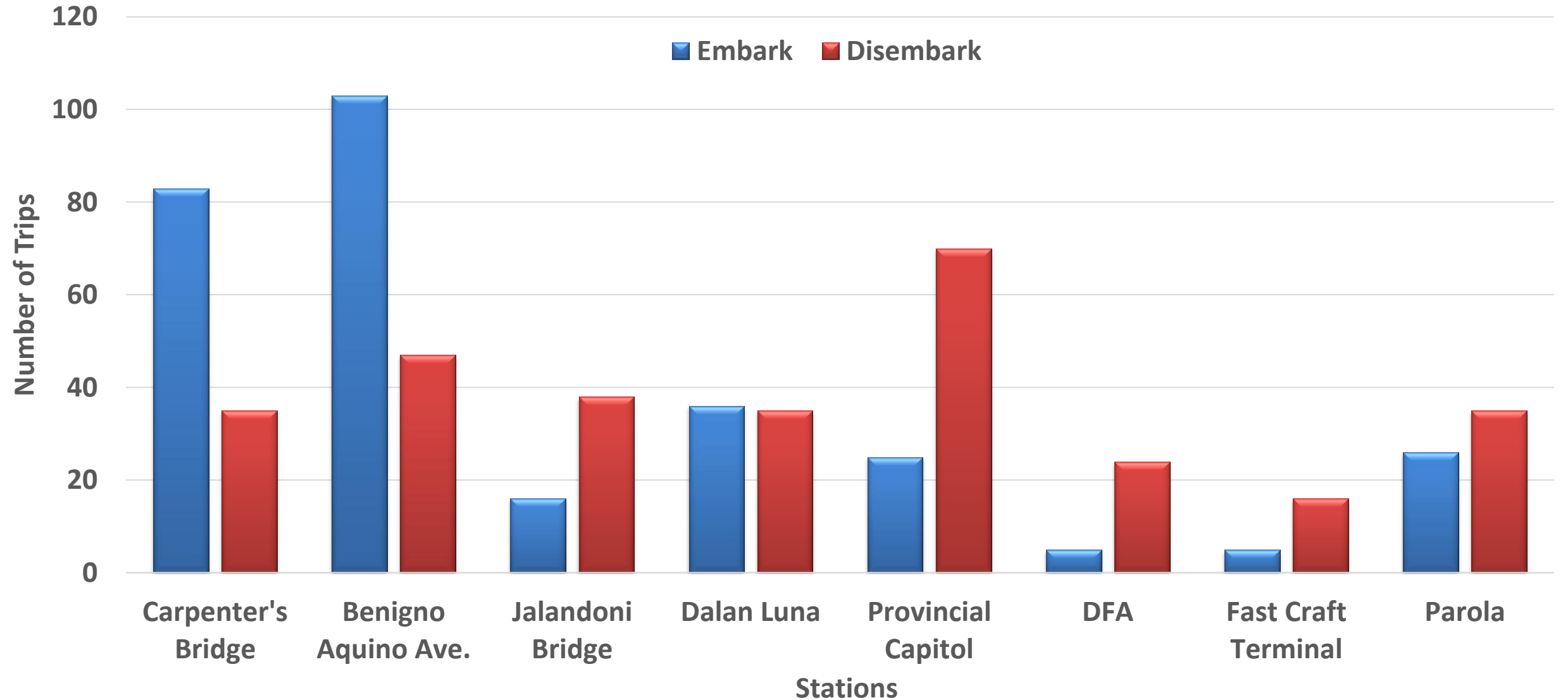
BOAT CITY TOUR



FISHING PARK



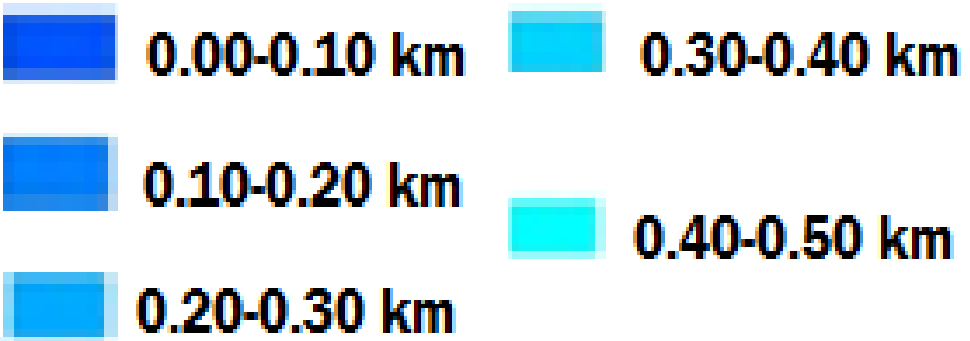
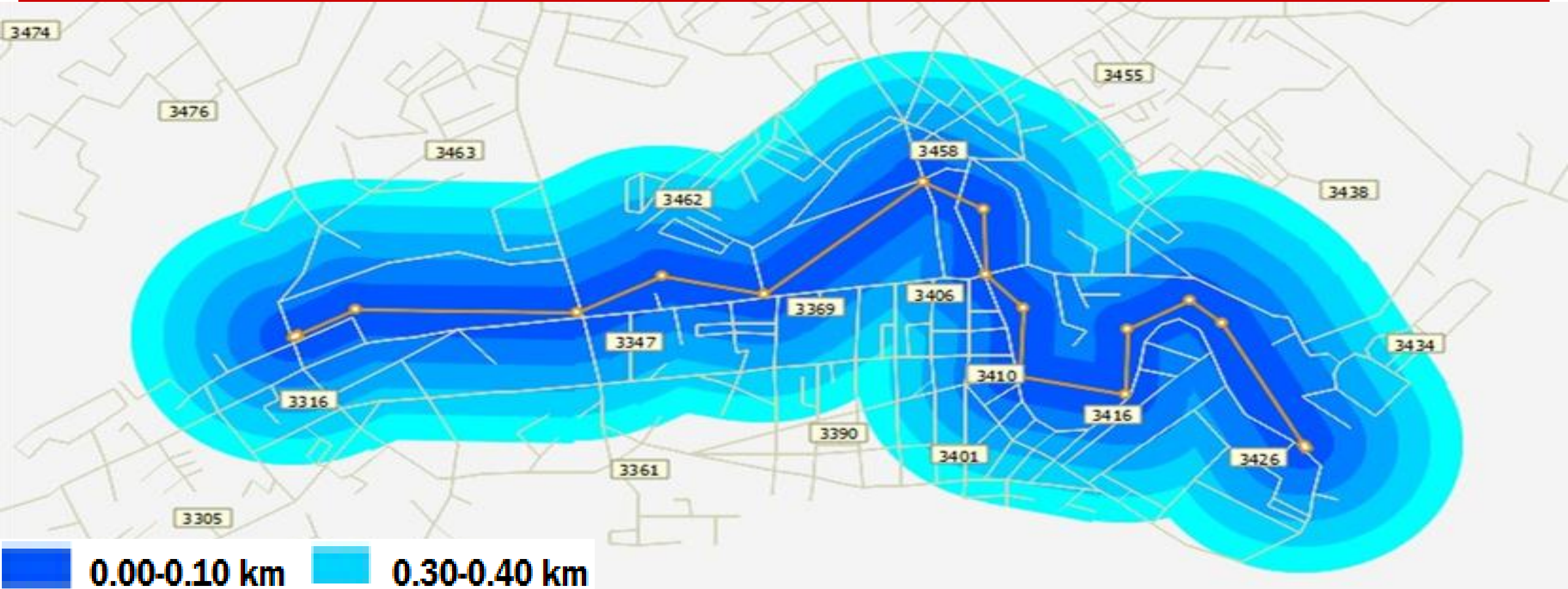
EMBARK AND DISEMBARK



FERRY DESIGN

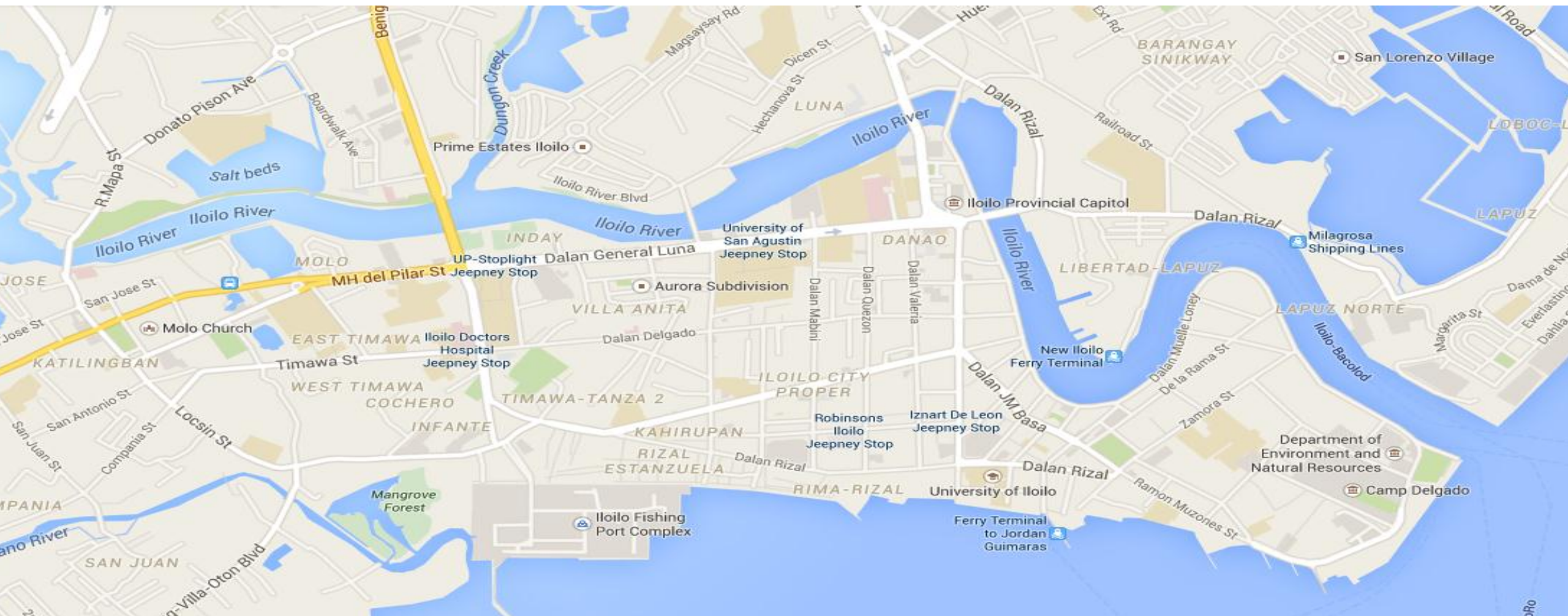
Ferry Characteristics	
Speed	16 knots (30 kph)
Passenger Capacity	50-60 persons
Headway	5 minutes

FERRY TRANSIT IMPACT AREA

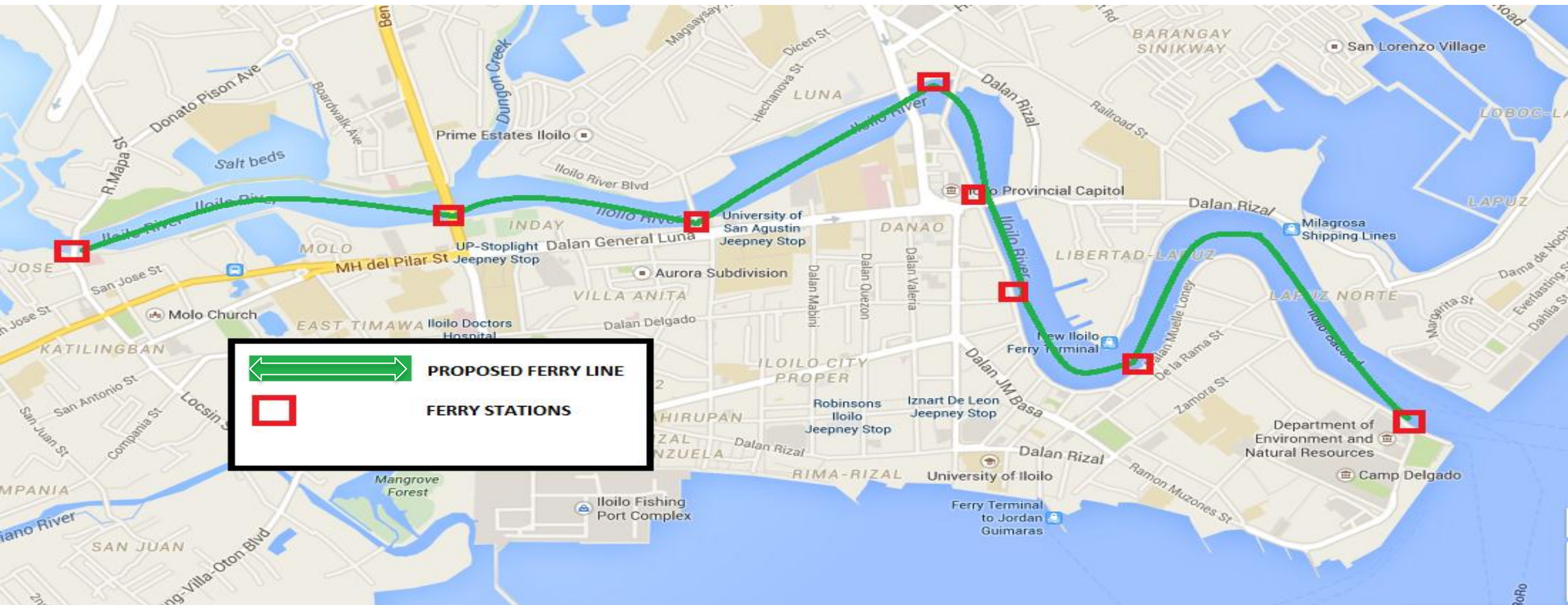


SCENARIOS

SCENARIO 1



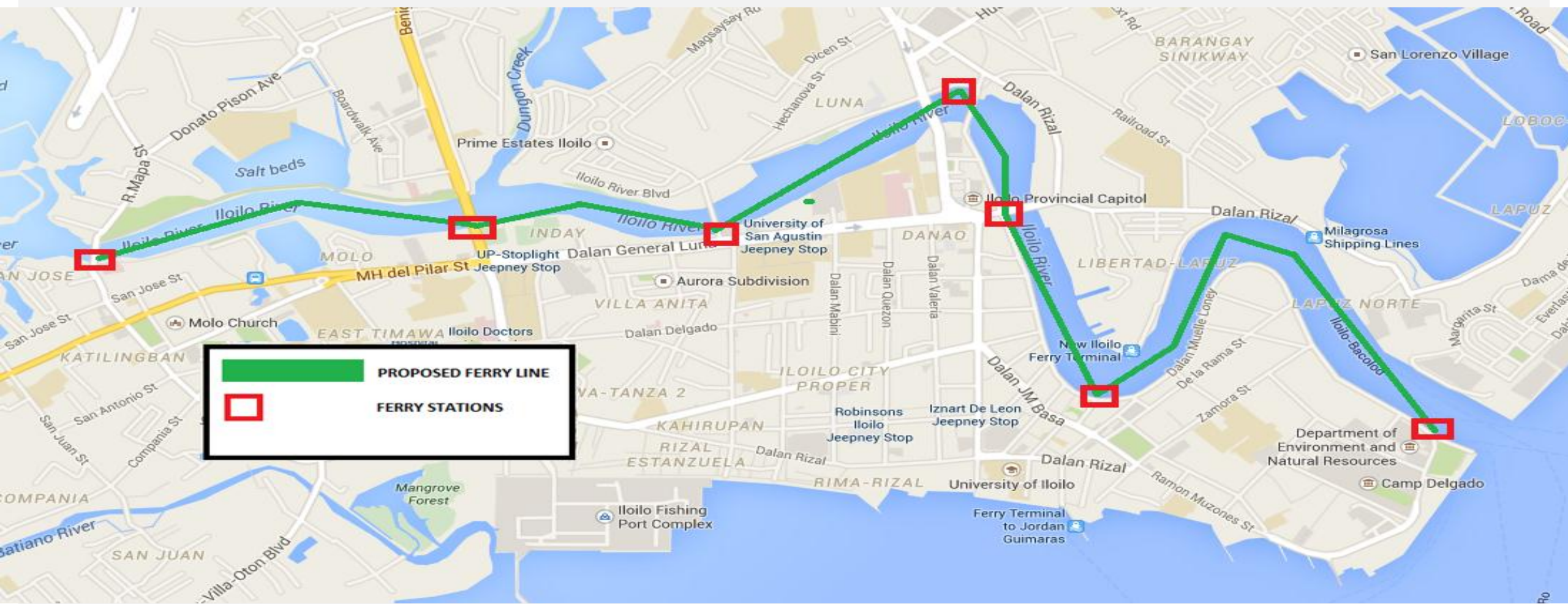
WITH FERRY



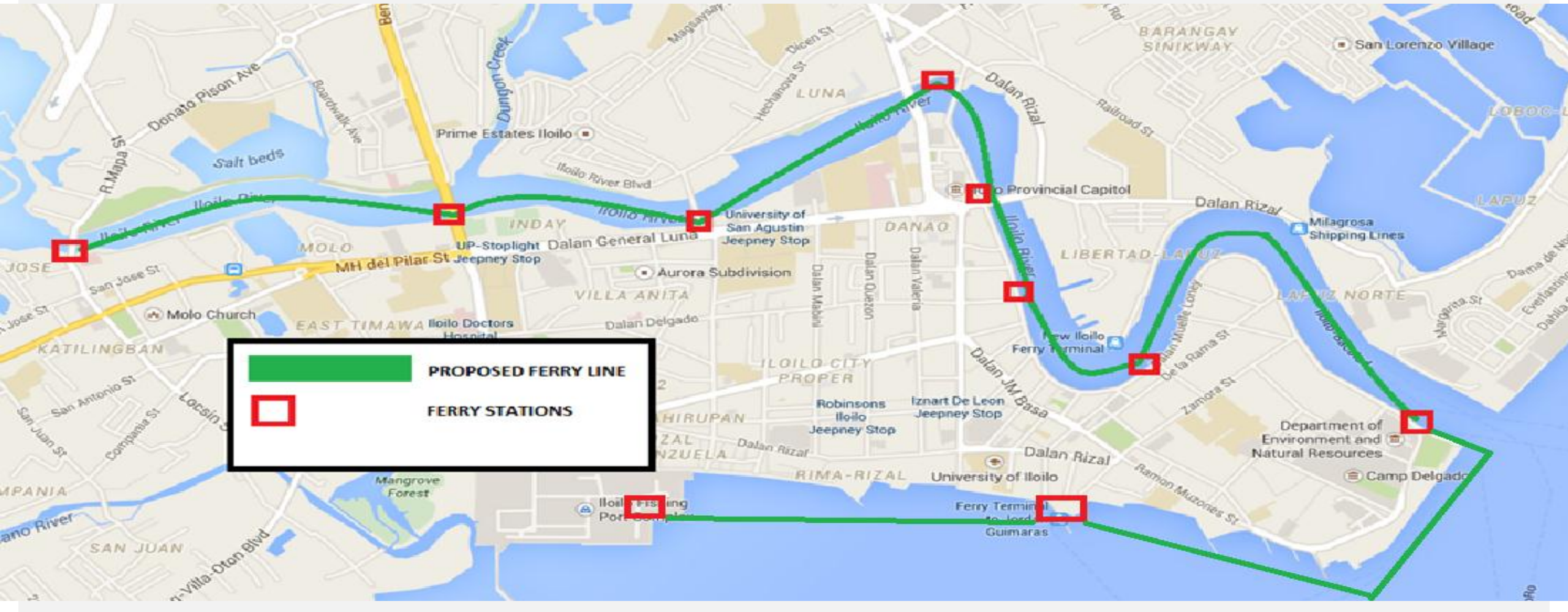
WITH EXPRESS LINE



7 STATIONS (LESS 1 STATION)



EXTENDED LINE (+2 STATIONS)



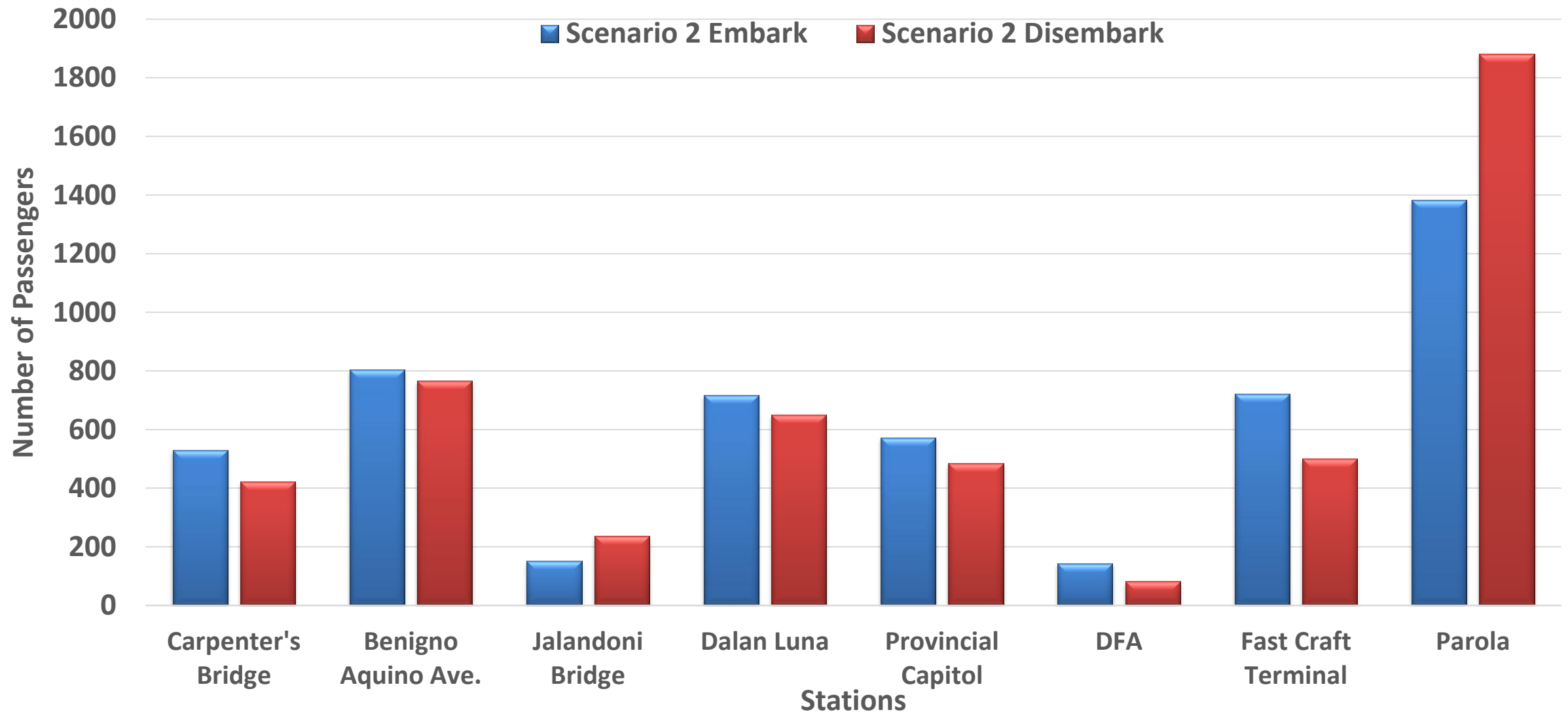


LINE RESULT ALONG ITINERARIES FOR FERRY 1 ROUTE CARPENTER'S BRIDGE TO PAROLA

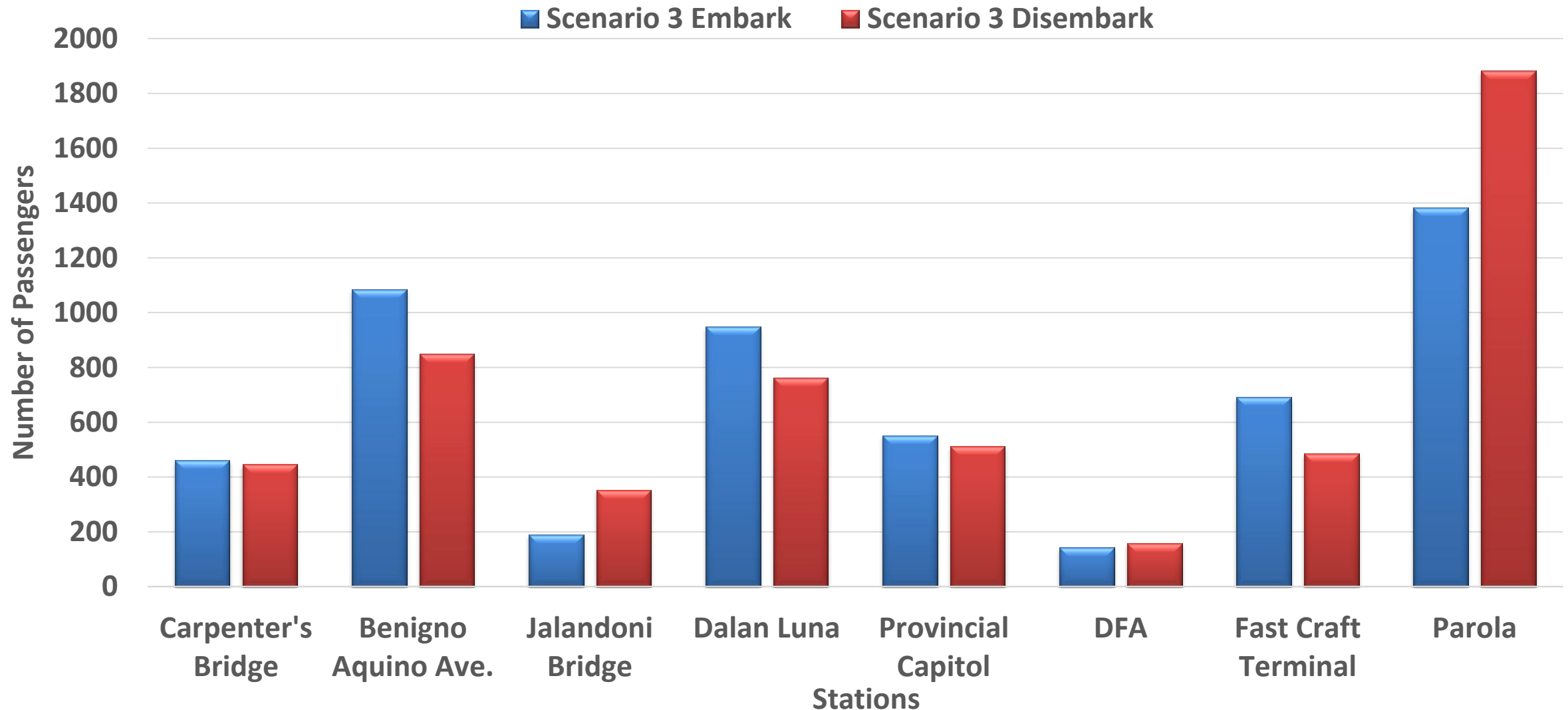


LEGEND (NABLA = EGRESS, TRIANGLE = INGRESS)

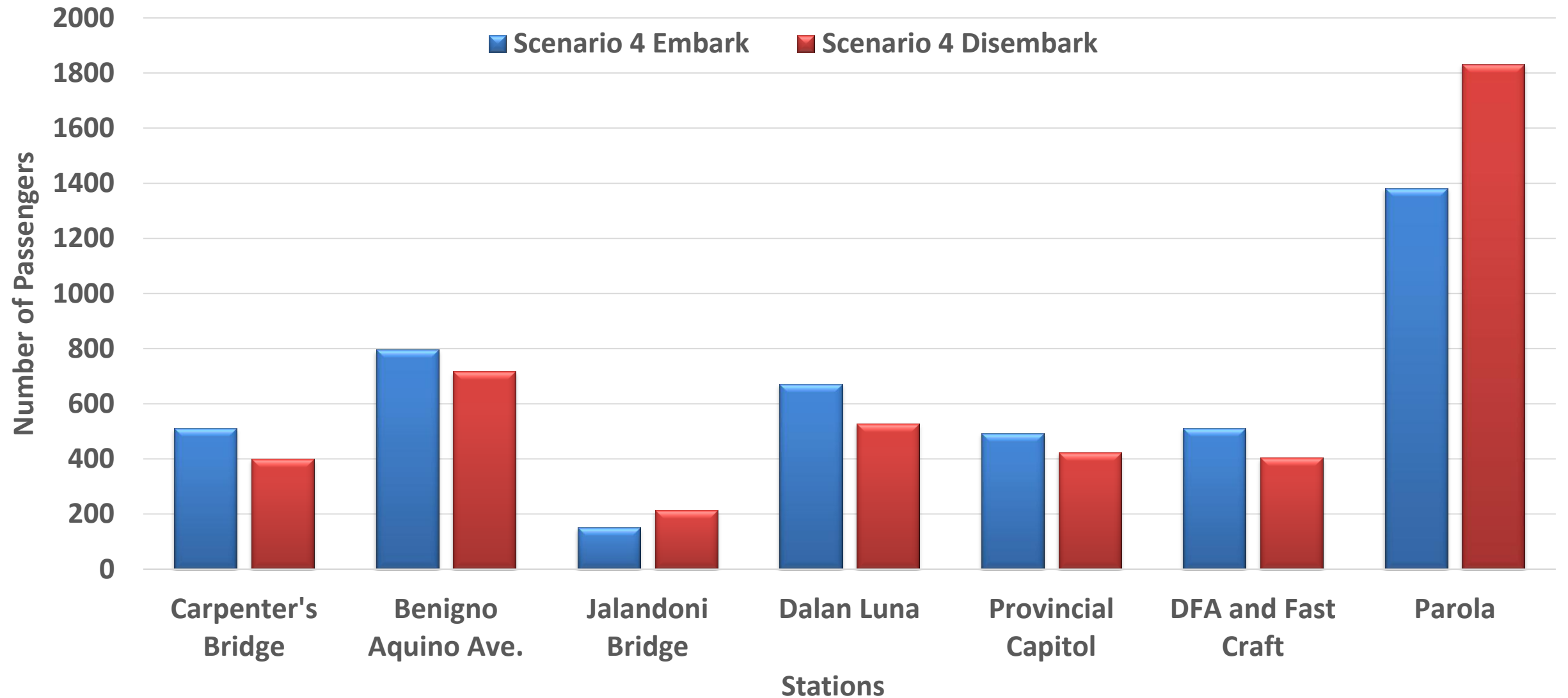
Embark and Disembark for Scenario 2



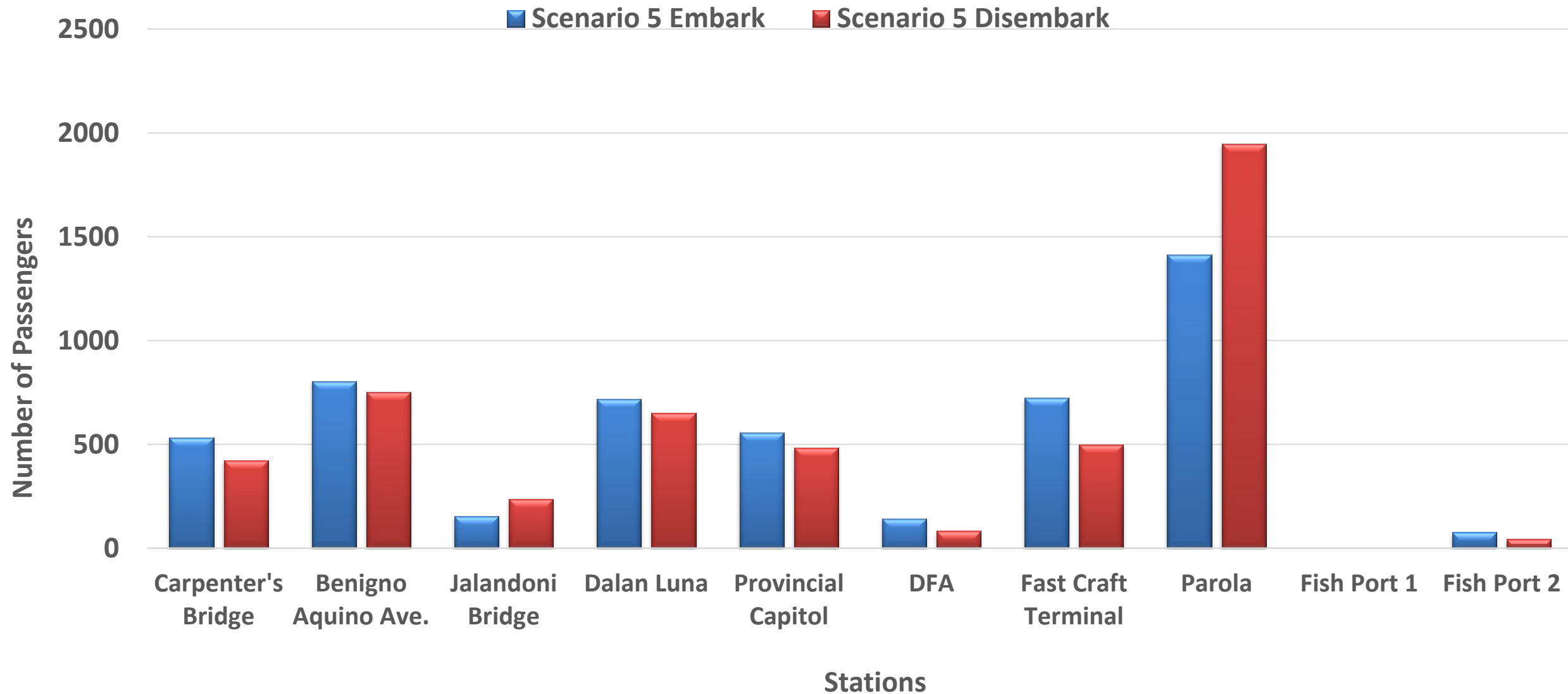
Embark and Disembark for Scenario 3



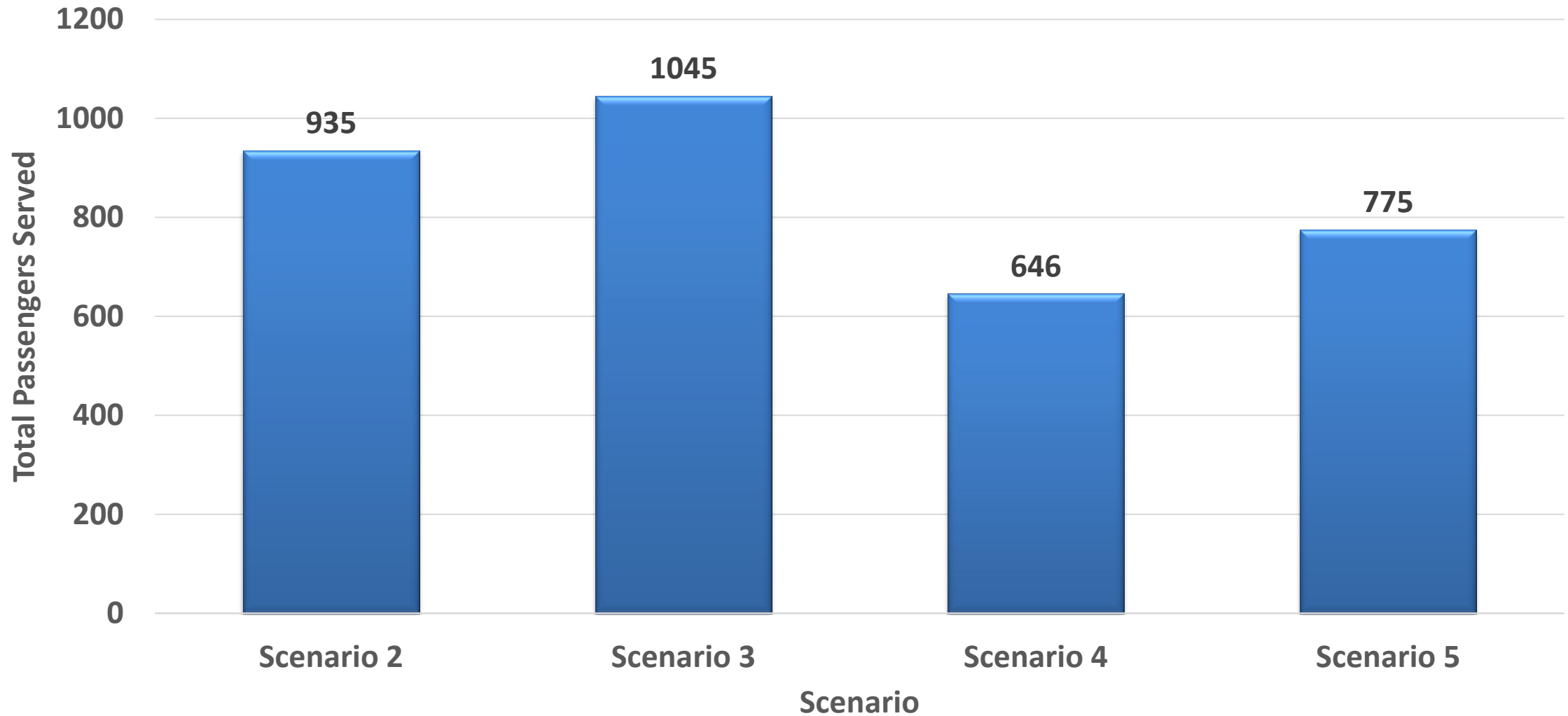
Embark and Disembark for Scenario 4



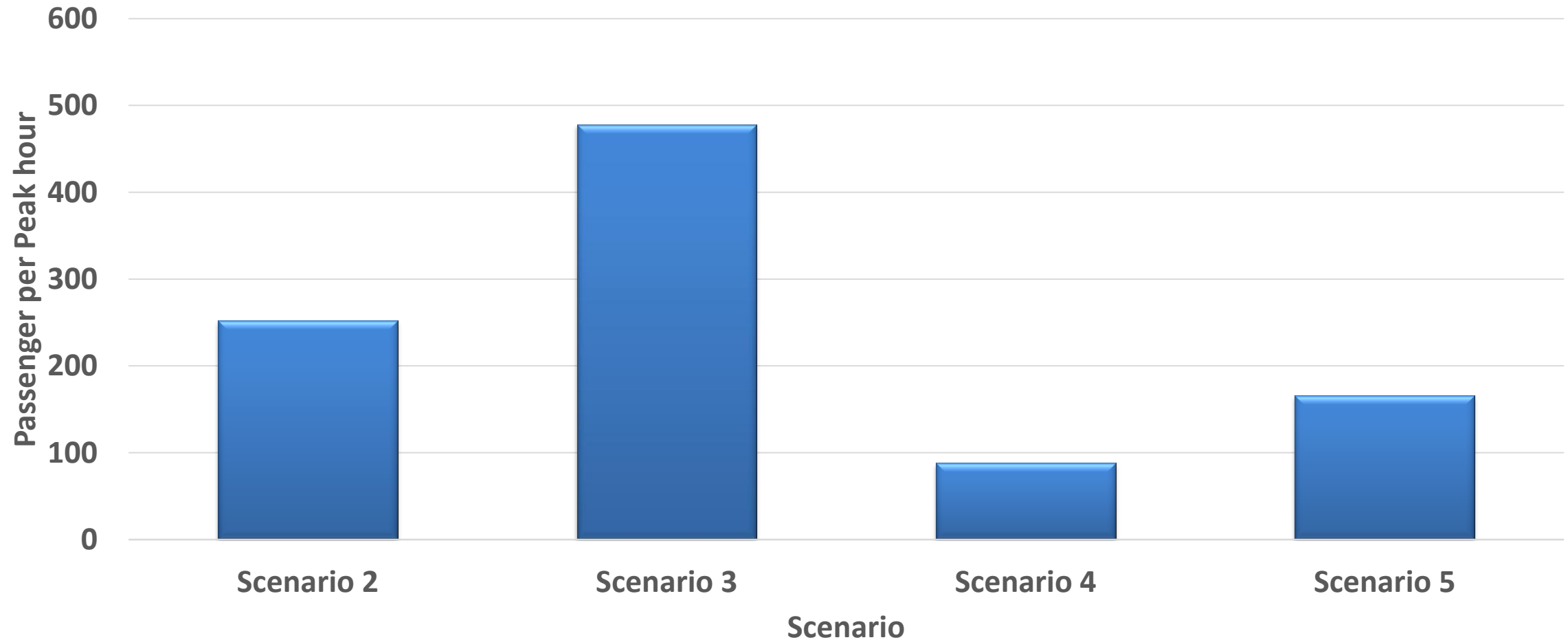
Embark and Disembark for Scenario 5



Total Passengers Served per Scenario



Potential Shift from Private to Public Vehicle Use



Total Trips and Growth Rate

Year	Population	Household Number	Total Trips
2014	425344	93355	233387.5
2020	367629	94521	204238.3
2030	489760	122253	272088.9

Year	Growth Rate
2014-2020	1.545%
2020-2030	1.17%

$$T_2 = T_1 e^{rt}$$

Where:

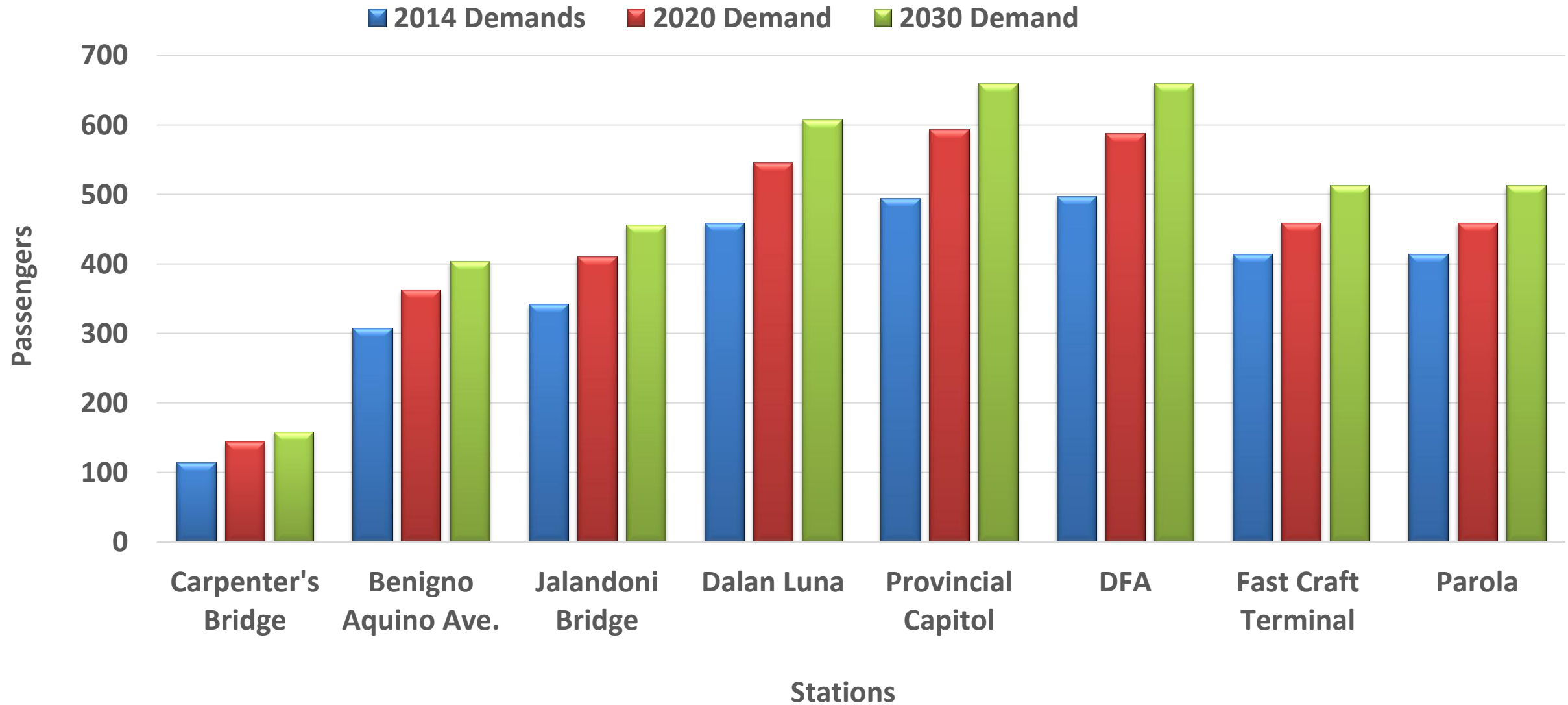
T_1 = Trips from initial year

T_2 = Trips from final year

r = growth rate

t = difference in years

Demand Forecast





CONCLUSION

Conclusion

- The majority of the trips occurring in the City of Iloilo originate from the outskirt residential areas and municipalities.
- Furthermore, their destinations are located in the city proper area with the trip attractors being the schools, offices and shopping malls
- Jeepneys are the modal choice from the transportation types

Conclusion

- EMME 4 results show that a river ferry system would be extremely beneficial due to its high demand in the given scenarios
- The most decongested roads in the results are the ones near the Iloilo River
- The proposed tourist attractions in the study are well received by the respondents; tourism in the city would contribute to the sustainability of the river ferry system as well as the city's leisure experience

Recommendation

- All Operating Hours: Originally Proposed 8 station River Ferry Line
- Morning Peak Hours: Originally proposed 8 stations + Express Line from B. Aquino to Parola
- Afternoon Peak Hours: Originally Proposed 8 stations + Express Line from Dalan Luna to Carpenter's Bridge

Recommendation

- Cost and Profit Study Analysis
- Study on intermodal facilities
- Improvement of Pedestrian facilities
- Possible expansion of the ferry system

REFERENCES

- [1] Sosuan, F. (2014, December) *Mode Choice Analysis of Urban Trips in Iloilo City*, De La Salle University, Manila City, Philippines
- [2] Mabilog, J. (2013, September). 16th International River Symposium . In J. Mabilog (Chair), *Iloilo River: Shaping Iloilo's Development Landscape*. Symposium conducted at 16th International River Symposium, Brisbane, Australia.
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- [9] Talley, W., Jin, D., Kite-Powell, H. (2008). *Determinants of the Damage Cost*. WMU Journal of Maritime Affairs, 7(1). 175 – 188