POST PROJECT EVALUATION OF OLMT:

A CONSUMERS' PERSPECTIVE

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DEDICATION

To the moments that hold the essence of WORTH
Living this one Life.

&

To my loving Father whose words guide to realms of grace, gratitude, & goodness.
To my inspiration my Mother who talks no more
To their legacy of honesty, dedication and patience genetic coded in our generations.

&

To Osama, Daud, Fauzan, Parus, Hadi, Ibrahim, AbdusSalam, Abdullah and Mahdi.
To Mahnoor, Aaisa, Noorulain, Mariem, and Amna
To WE the Six Stars of the Soucient Suns
We continue.

ACKNOWLEDGMENT

“Then which of the Blessings of your Lord will you deny”

(Surah Ar-Rehman)

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ABSTRACT

The importance of socio economic projects is critical to the Pakistan's meta-objective of rapid economic growth. With the ever-changing national socio-economic scenario, the theoretical dimensions of developmental projects, therein a sustainability prospect; need a rigorous outcome based evaluation of socio economic post project impact of such projects: especially from the lens of their absorption, reach and effectivity according to a consumers' perspective. This is critical to derive desired results from integrated economic endeavors and sociological structuring since with the growing emphasis on human conduct and dynamics, as critical factors in determining the projects' success, the projects are managed as cognitive systems. Orange Line Metro Train is a pilot project is an abridged endeavor in the mass transit system on launch. Its sociological reach is fundamental. The study builds research design to evaluate the systems and operations as are used and deciphered by the consumer. It proposes specified area of strategic concerns and revisits to policy design; along with validating and refreshing the sociological need of the project. The identified area of research, the consumers' amenities valuation (CAV), is a rarely explored area of academic research where evaluation of the human factor is ripe to germinate new dimensions to emerging social structure with revised valuation of amenities.

Key Words: CAV, Cognitive Systems, Sociological reach.

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LIST OF ABBREVIATION

OLMT	Orange Line Metro Train
CAV	Consumers' Amenities' Valuation
SI	Sociological Impediments
PPS	Project Political Success
TEE	Transport Economist/Economics
PSR	Project Sociological Reach
OMLT	Orange Metro Light Train Technical Features Representation Term interchangeably used with OLMT

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CHAPTER 1

INTRODUCTION

1.1 Background

Mass Transit Plans is a constructivist response to the rapidly changing demographic trends interweave with economic, social, and political tendencies to create a dynamic context for the functioning of cities, towns and metropolitan areas. The fast-paced urbanization as migration towards cosmopolitan hubs and its related issue of exponential transformation of land for residential, commercial, industrial and transportation purpose present challenges to city governance structures. The national and city governments need to develop a road map to better understand these undercurrents and factor them into proactive decision-making on public spending, infrastructure investments and urban design. The United Kingdom's Tube Rail is the oldest urban mass transit metro rail that started its operation in 1863: 2nd followed United States in 1892. The 21 century world is characterized as times of global trend of fast Urbanization and Mass transit plans is the key component of the modern urban infrastructure that is characteristic to contribute to density and clustering that originates innovation and productivity in tight correspondence with state meta objective of socio-economic development under the prevailing challenges. It stretches the borders of the cities metro areas in direct proportion to denser development around suburban stops and a comparatively stress-less commute (Florida, 2018).

The rapid trend of mass transit networks is a neo statistical lens of the

econometrics. The metros are crucial assets for efficient, sustainable mobility in the cities worldwide. Thus with 194 cities of the world 61 countries in close focus the growth in the number of transit systems since the earliest systems, created in the late 19th century to the surge in the opening of new transit systems in the 1970s, ‘80s, and ‘90s, and to an even bigger surge in the past decades has been remarkably diligent . From 2000 to 2009, 30 new systems opened; from 2010 to 2019, 45 new systems are predicted to open, 33 of those in the Asia-Pacific region alone (UITP, 2018). The very recent report released 2021 shows remarkable further growth of mass transit infrastructure by 25% out of which 21% is credited with Asia Pacific region where China alone is accredited for 17% of this growth (UITP, 2021). The global mass transit highlights reflect metro networks at 84 cities in Asia Pacific, with 3300Km of infrastructure generating revenue service between 2018 and 2020, and London annual ridership at 1.5 billion in 2019. Below is a figure that represents the mass transit system per decade growth since 1863.

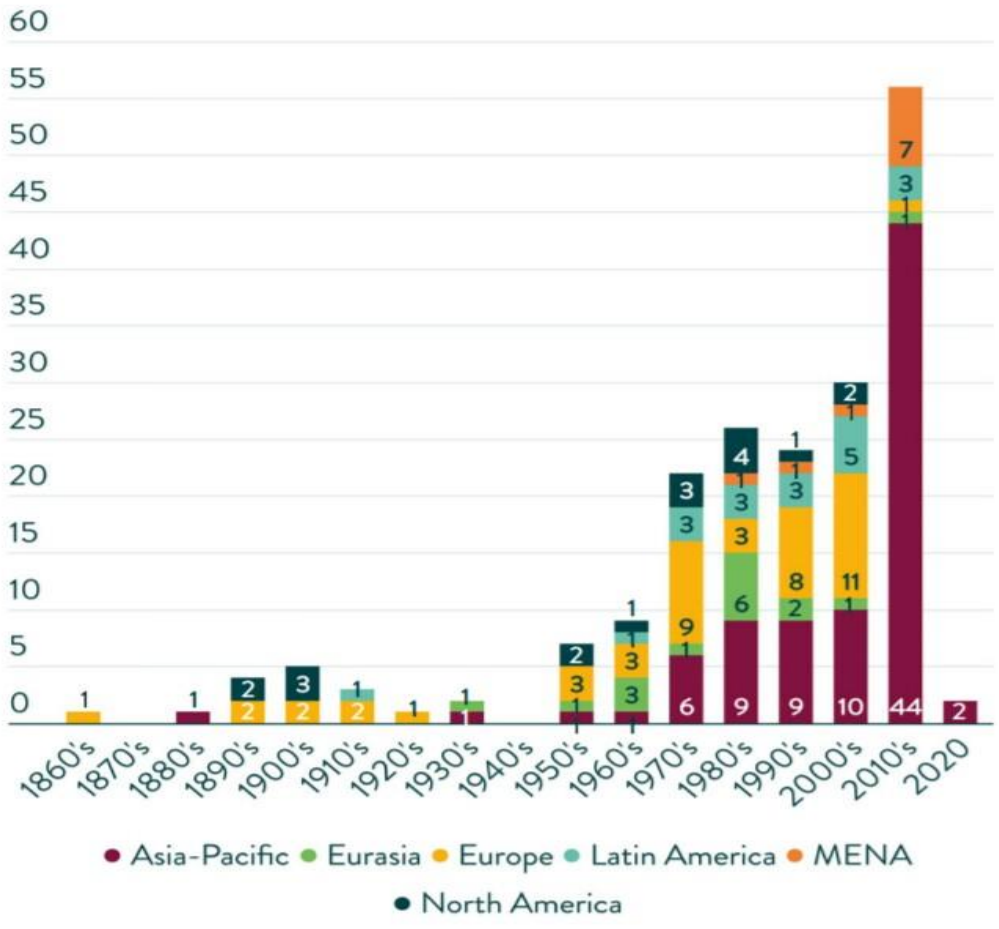

Figure 1.1: UITP Report 2021 - Metro system opening per decade 1863 - 2020

Since 21st century Asia Pacific region is the lead in this development with new metro cities in China, India, Pakistan, Indonesia. A regional representation of the same infrastructural growth between 2013 to 2020 according to UITP report is as follows (UITP, 2021).

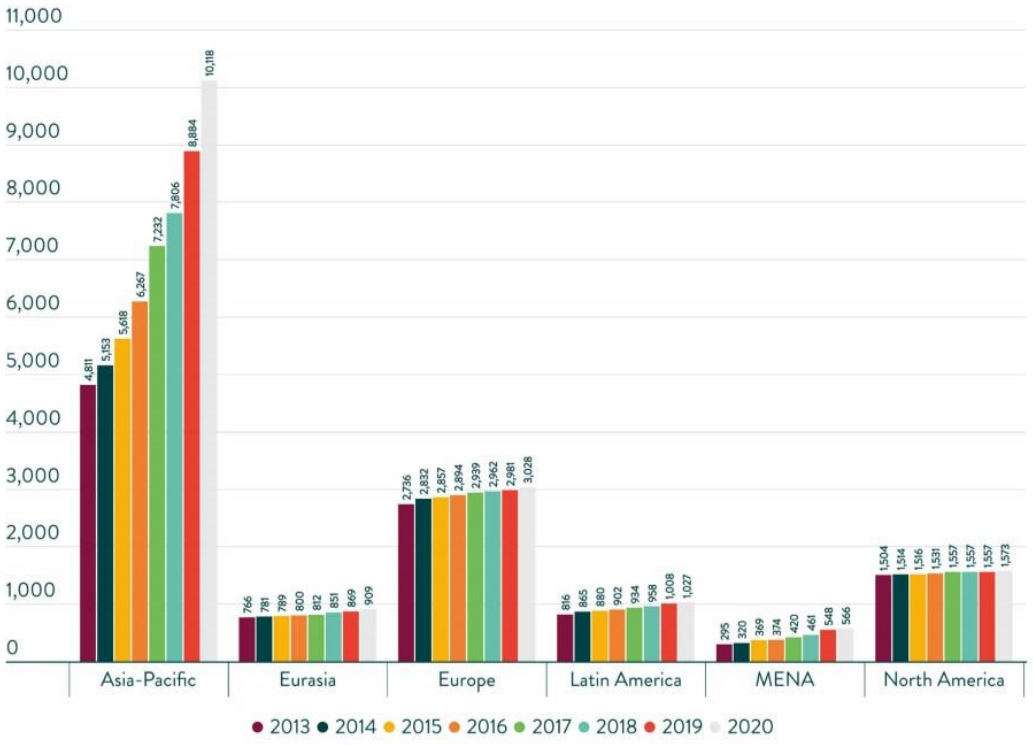

Figure 1.2: UITP Report 2021– Total line evolution per region (km) 2013 -2020

China is the lead both in the in-state and international proprietor mass transit infrastructure development. And a substantial portion of its reach cover the rural areas. The current developments in China resonate the Adam Smith theory of economic development where the well-connected lines of communication through efficient transportation creates value (Smith, 1998). China is also the lead proprietor of world transit projects. Japan operates world's most efficient transit system with highest passenger count, and speed matrix. Despite the complex number and congested structure the light rail experience in Japan is one of the most comfortable and user friendly. India with Japanese collaboration have stepped into the hanging light rail structure and is among world's busiest light rail mass

transit hubs. Korea became the fifth country to operate and own a high-speed railway in 2004, called 'Korea Train Express (KTX). Pakistan has joined the queue with the operation launch of Orange Line Metro Train (OMLT). London recently have revamped the world's oldest urban mass transit and launched the biggest extension in its urban transit. The only odd example in this strong mass transit surge in the recent century is USA. Appended below is a figure on world's longest mass transit networks.

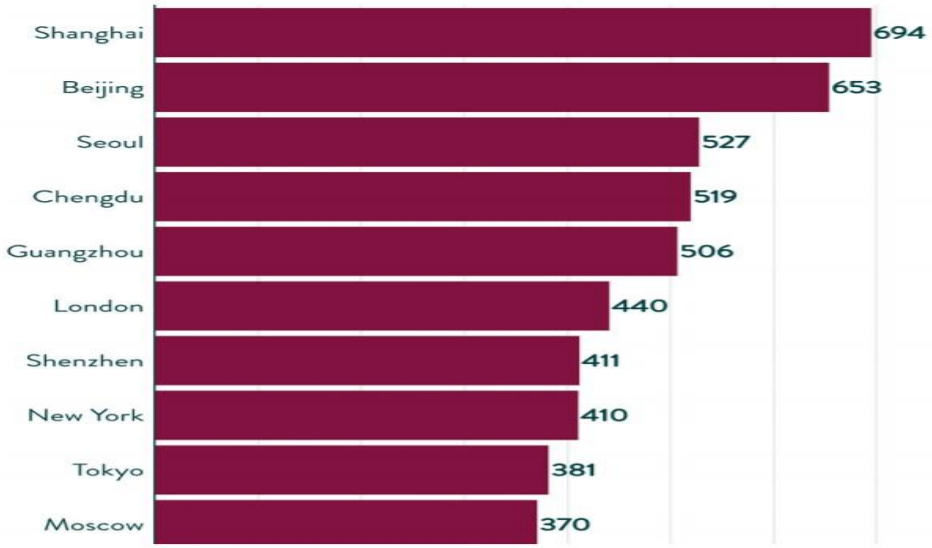

Figure 1.3: UITP Report 2021 – Top 10 longest networks

With the start of 21st century, there is a boom in this industry and the prime objective the transport economists dish out in economic appraisals of these socio-economic projects is to develop sociological reach by placing value on consumer experience. The field of economic appraisals have made significant advancement. It uses the will to pay methodologies to place value on consumer experience infrastructure. This helps with developing better representation of consumer valuation of the acclaimed amenities in project evaluation. Thus, the proposed socio economic projects are conceived with better understanding of the underlying dynamics of socio psychological understanding of consumers' evolved cognitive matrix: and, in the very recent proposition

of post Covid 19 economic composition tracing any transition or additional valuation configuration. This is a context to the state Meta objective of, out lined rapid economic growth.

The importance of socio economic projects is critical to the states meta-objective of rapid economic growth. With the ever-changing national socio-economic scenario, the theoretical dimensions of developmental projects, therein a sustainability prospect; need a rigorous outcome based evaluation of socio economic post project impact of such projects: especially from the lens of their absorption, reach and effectivity according to a consumers' perspective. This is critical to derive desired results from integrated economic endeavors and sociological structuring since with the growing emphasis on human conduct and dynamics, as critical factors in determining the projects' success, the projects are managed as cognitive systems (Dalcher, 2019).

The eminent research in the fields of Urban Planning, environmental science, decision Science and many others considers social fabric as viable proponent therein emanates scientific inquiry. Its far-reaching rational grounds supervenes diverse economic social and ecological application (United Nations 2015). The importance allocated to reality of the social fabric designates the proposition of social reach as the center of gravity for the success of the socio-economic projects.

The literature available extensively discusses the success of mega projects against the PMI standard of scope, schedule and quality whereby the social and environmental out comes are least explored (Flyvbjerg 2017). Consumers' perspective as end users their experience with the post project operation or product is an area with considerable gap. Whereas advocating the long-term integrated planning policy goals, the most emphasized area is public interest yet usually a handsome majority of these project fail to support substantially the pre project campaigns articulated in terms of positive economic, environmental and social outcomes. The review of available literature on especially major urban rail transport reflects that acclaimed public benefit are at the metropolitan scale planning objectives and usually ignored the local scale issues. Thus, the transport mega projects are often quoted for intricate, adverse, unplanned, and disproportionately distributed social impact.

The global research trend of valuing public transport consumer experience has categorized values for a range of amenity infrastructure including information, environment, access, customer facilities, and security amenities (Currie 2020). Pakistan since the start of 21st century have underwent significant transformation when it comes to migration to its cosmopolitan hubs from its rural settings. The transforming demographic configuration have resulted in challenges of exponential transformation of land for residential, commercial, industrial and transportation. The government of Pakistan developed a road map to address the issues of urbanization and environmental deterioration in the form of different socio economic mega projects. To ensure their sociological reach the dire need is to better understand the undercurrents and factor them into proactive decision-making on public spending, infrastructure investments and urban design.

Orange Line metro train is one such socio economic mega mass transit project. Its scope statement and out lined objectives in PC-1 documents the five points of concern i.e. information, environment, access, Security amenities and customer facilities. The study aims to evaluate Orange Line Metro Train (OLMT) post project socio-economic outcome based evaluation following a Qualitative design. The current politico economic developments have rendered clear the importance of CPEC for Pakistan as viable project to bring about a new chapter in Pakistan's economic existence in the region as a potential actor in multiple states – both regional and extra regional, stakes. In this connection, the flagship project of BRI CPEC is worth exploring. Thus, substantial policy decisions are underwent to align the national policy with regional politico-economic developments. CPEC is a combination of sustained projectised activity that involves Pakistan from city to division to province and then state level nationally: and at regional and extra regional level globally. It is majorly centered on building Lines of Communication in the form of Highways Railways and Light Rails. Applying the scientific tool the project viability against the global economic recession and rapidly changing business dynamics are measured yet it confronts issue of social reach and existential urgency (Ball 2019).

Orange Line Metro Train is Pakistan's first Light rail project that since its inauguration have borne the tangible effects of Covid 19 and South Asian Economic Crisis. All this have redefined the critical realities fundamental to the success and

sustainability of these socio economic projects' social reach. Moreover, with more informed public opinion on the rapid urbanization and national and global prioritization of environmental concerns is one really pertinent element that have greatly affected the socio cultural reach and sustainability of socio economic projects. Pakistan is on a fast track of urbanization while building for sustainable economic engagements to complement the increase economic prospects. Lahore is the largest cosmopolitan city of Punjab and second largest city of Pakistan. Rapid urbanization has changed the socio-economic dynamics with change in its city size, population size and new configurations of population distributions. These are important elements of newly coded patterns of sociological interaction and prioritization, which determine the policy effectivity for the urbanizing populace (Eaton et al., 1997).

In South Asia, Pakistan is among the grave economic centers with complex development of economic activity and highly burdened currency. It is rapidly urbanizing too. This configuration has undergone drastic evolution in mass transportation business dynamics and management preferences. The sociological reach being a capital problem is affecting the project success dynamics.

With the rise in population in urban areas of Pakistan from 17% to 37% since 1951 till 2010, it was forecasted that half of the population of Pakistan will live in urban areas in the next 10 to 15 years. This is the time when Lahore is living this aggregated forcast of the reality. The major reasons categorized as a prologue to urban growth are population growth and migration (Husain, 2014), employment, education and perceived better opportunities.

OLMT is to address the raised need of an estimated population of 11,126,285 inhabitants (Pakistan census, 2017) of Lahore. When considering the user-friendliness, Lahore has an extensive network of roads. The provincial highway department estimates around 1265 KM of roads in this city. Approximately around 4 million vehicles are registered with the Excise and Taxation Department of Lahore. Prime medium of transportation in Lahore city are Metrobus, rickshaws, taxis, cab services (Careem and Uber etc.), vans and busses (Sehar, 2017). OLMT is the pilot project of metropolitan railway network of reference three more light rail projects.

Pakistan with its prospect pipelines and exchange trade route projects, engulfing

it from its north to south and east to west, is a current hub of fast tracking economic transformation of the region. Its concrete role in executing economic projects of Caucasian, Central Asian and Pacific regions is a serious call for well worked out policy decision making to secure Pakistan's state and public interest and keep intact its ideological autonomy. In these times, the impact of compromised social reach of its socio-economic projects in the wake of economy under critical loan debt load will have probable impact over its political and diplomatic amenity. Moreover, South Asian economic recession and Covid 19's dynamics have redefined the past scale of consumers' prioritization and realities of sociological issues impeding projects social reach. Thus to keep the public on the state agenda side it's normative to explore consumers' perspective of amenities and soft factor values and sociological issues impeding project social reach.

1.2 Research Gap

The fast track changes happening in its city area, population size and new configurations of population distribution are critically important elements of newly coded patterns of sociological interaction and prioritization that determines now the policy effectivity for the urbanizing populace. The least explored area in this connection is a consumer's perspective of amenities and soft factor values. OLMT project being a pilot project is a blue print for its reference projects socio-economic effectivity. The valuation of costumers' perspective on factors that determine their view of amenities and soft factor values. Through benchmarking, it can help determine good practices and develop methodology to access future project propagated against their social delivery.

1.3 Problem Statement

End users are very important stakeholders and their satisfaction with product performance is of key importance once it comes to post project outcome based evaluation (Deret HT. Walker, 2005). Moreover, the growing emphasis on human conduct and

dynamics as critical factors in determining the success of projects (Dalcher, 2019). In this connection while determining the success of projects the most ignored area is the end users consumers' perspective of the amenities and soft factor values against which the social delivery is acclaimed. This creates a huge valuation gap and often leaves sever pitfalls influencing the future project selection and planning impeding the dependable decision-making. Thus, the research problem of the study is structured around the elements that impede the sociological effective reach, adaptation and delivery of such socioeconomic projects. Orange Line Metro Train is one such project and its normative evaluation will help identify the potential gaps that will help in effective policy formation.

1.4 Research Objective

- To explore sociological issues impeding the project reach with end user.
- To evaluate the consumer's criteria of valuation of amenities and soft factor values.

1.5 Research Questions

i. Which sociological issues impeding the project reach with end user and why?

ii. How the consumers determine the criteria of valuation of amenities and soft factor values?

1.6 Significance

This study will further the approach to handling project reach by providing valuable addition to the existing knowledge of impact on stakeholders – end users. It will provide outcome-based evaluation on identified elements of sociological concern within the socio-economic project – Orange Line Metro Train as viewed by the target sections of stakeholders. This will help fill in the gap between normative conception and acceptance of the future socio economic projects of OLMT nature in particular and other such

projects in general.

1.7 Organization of the Study

This study is arranged in 5 chapters i.e.

1.7.1 Chapter 1 Introduction

This chapter summaries the background of the research study while identifying the research gap, problem statement, objectives of this study intends to accomplish, research questions, and significance of the study.

1.7.2 Chapter 2 Literature Review

This chapter outlines the literature review the literature review is organized into four main themes. It outlines the mind map generated at NVivo qualitative research software. It presents the scope using the stacked venn diagram to establish relationship of the variables. The scope paradigm approach is coded at segmented pyramid reflecting how the identified relationship factors at stacked venn are measured through the segmented pyramid and show containment, proportional and interconnected relationship. This chapter also explain the formulation of the framework model to deal the purpose of the study.model in light ofliterature review.

1.7.3 Chapter 3 Methodology

This chapter includes the detail design of the research methodology including targeted population, sample and sampling technique. This chapter also discusses the approach and instrumentation used for data collection and development of the questionnaire. The software used to run data analysis was NVivo. Finally, it describes the details of analysis used to examine the latent constructs.

1.7.4 Chapter 4 Analysis and Findings

In this chapter, the data analysis and findings of the study have been discussed. The demographic characteristics of the respondents have been elaborated and recorded. The data run results generated at Nvivo are recorded and explained how they correspond with the outlined matrix of identified factors and reciprocate the measured findings.

1.7.5 Chapter 5 Discussion and Conclusions

The final chapter includes the discussion and results of the empirical study stating the discussion of variables and their results, conclusion of model, implications of the study, limitations and recommendations for future studies.

CHAPTER 2

LITERATURE REVIEW

The literature review for this study is organized under four themes i.e.

1) National policy on socio-economic development and challenges
2) Mass transit projects and socio-economic development
3) Sociological project appraisal dimensions of transport economists.
4) Valuation structure and policy of the identified components of consumers' amenities.

2.1 National Policy on Socio-Economic Development Challenges

The national policy adoption of the all-17 UN SDG's categories the mass transit plans as backbone to national interest and national development. Thus, the policy decision making was under taken onto the subjects of immediate and grave concern. One such challenge is of rapidly and drastically changing demographic challenge. These policy descions making and planning in this is happening under the main captions of Urbanization and need for corresponding mass transit planning. It is an area of major economic and diplomatic activity. This brings in the need for learned interest evaluation of both the national and international actors and value grading to the same against probable rations of who win. Since it is a universal fact that there is no free cup of tea in international relations. Thus the invest flow generated in the elms of China Pakistan joint economic ventures of future prospects are channelization of Chinese

national interest policy in Pakistan's need based approach. Thus, objectification and bifurcation of the developmental networks and projects in their operational phases is necessary to the propagated need of the people of Pakistan – the consumer. In this connection, following research publications were explored to further identify the gap.

2.2 Mass Transit Projects and Socio-Economic Development

The global market trending project industry is heavily mantled on the construction industry and the massive investments are currently in the mass transit projects. In connection to this is one potential discipline of metro Light rail projects. The light rail projects are quite in the run since the start of the 21st century. The trend is getting pace and now Pakistan is on the stage too playing along china that has one the biggest light rails networks of the world. Categorized as the world's leader by numbers of mass transit systems in 21st century as well as the major proprietor of the fastest growth of such projects. Pakistan had stepped in the filed with its first light rail getting into operation in 2020 with china as a major proprietor.

A reflection on the global history of light rail the first of its kind in this direction was the 1863 United Kingdom London Metropolitan Railway also named as 2-penny rail due its low-cost travel fare. It was a n underground facility. It was built under ground. The next significant development s this industry came with the Beach Pneumatic Transit System in 1870 and was categorized as a failed attempt as developing the mass transit in New York. In 1890 came the electrified underground urban Railway City and south London Railway. In 1893 came Liverpool Overhead Railway Coming to USA success series in mass transit came in 1972 USA Bay Area Rapid Transport (BART) San Francisco Bay Area Metropolitan Atlanta Rapid Transit Authority (MARTA) in 1972, Washington Metro in 1976 and the Baltimore and Miami in 1980. The list is entailed to but a question that why what was not successful in USA in 1870 took o whole century to work wonders today. Was its just the technical failure or it was also a n infrastructure project miss connived to identified delivery like the Aswan Dam that was in potential delivery was ahead that times sociological needs.

The 3rd thing kept in consideration in this section of literature the trends of Mass transit projects and their success rate.

2.3 Sociological Project Appraisal Dimensions of Transport Economists.

This section of literature review focus on the literature that is analyzing the project appraisal propositions dished out in the fabric of sociological design justifying the scope of mass transit projects that need analysis in comparison of public service. The transport infrastructure economists are usually using the element of sociological service generated through such projects and the in present time proposition of economic evaluation showing negative ratios even over the lengths of substantial times during which the estimated changes deviations even by fraction would substantially compromised the delivery. Until the campaign is driven successfully projecting public delivery. However, these are the matters of politics and business yet the reach can by dynamicized based on structuring channel for such socio-economic mega projects within the social design. Thus, a comprehensive planning is required in this domain. So, the literature also include academic materials on the subject concerns.

2.4 Valuation Structure and Policy for Identified Components of Consumers' Amenities.

This part of the literature review include literature explored on the subject of policy and operation in global transit industry on improving the customer experience The focus was on identifying the areas on which the consumer amenities are apprised and evaluated. The literature analyzed reflected the five factor in extensive considerations across global transit industry i.e. Information, Environment, Access, Customer Facilities and Security Amenities. Further, literature related to the current mass transit projects of the country was explored for focused analysis of the mentioned amnesties in project appraisal proposition. The research was the conducted on to the subject of the valuation of these amenities in focus; in the on ground operation of

OMLT, in view of developing and strengthening the same on a sustainability scale. Thus came in the literature produced direct in connection to OMLT.

The key document that was used in the stationing this phenomenological Qualitative research on quantifiable grounds the key project document of Ministry of Development and Reforms PC-1 was used to extract Project scope and objective related to the sociological appraisal of the project justification and the following mind map wad conceived.

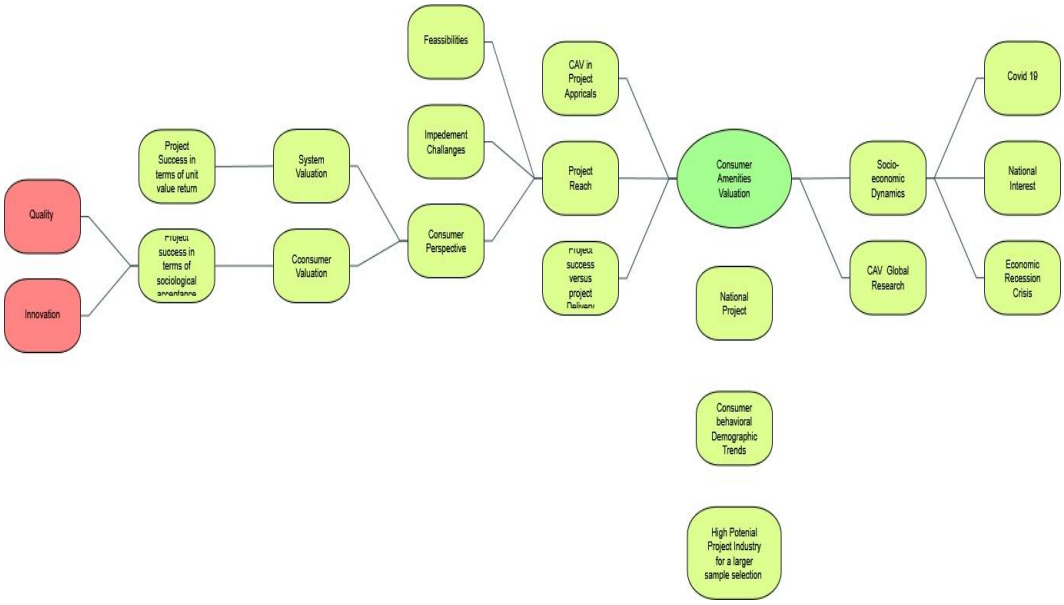

Figure 2.1: Project Mind Map

With CAV at the center with the stretched umbrella of National interest bracketed with the Covid 10 and economic challenges how is interacting strategically with global documented and critically explore knowledge hub while devising policy plan for its state meta objectives through adopting different sociological projects. In this journey the prime objective of quality and innovation how are reached effectively or otherwise. The factors that impact the operational dynamics are the gap between policy justification campaign narrative and on ground understanding of the same factors availability and operation. The critical role of consumer perspective is valuated through the parallel analysis of consumer valuation and system valuation that produce the

product of project success in terms of unit value return and project success in terms of sociological penetration. In connection to this the study set the project scope as displayed in the following figure.

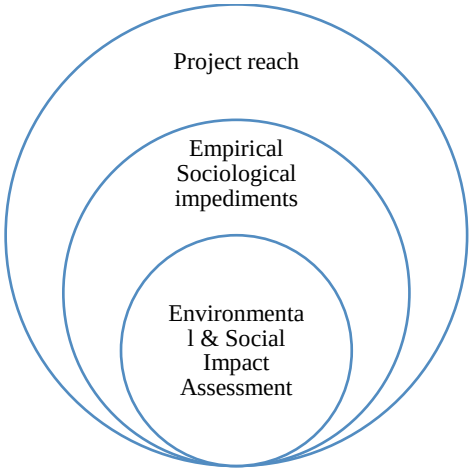

Figure 2.2: Project Scope

In connection to evaluate the OMLT project the study concentrate the focus onto the study of the relation between project reach and environmental and social assessment how is effected at the gaps in empirical sociological impediments lens. The scope of the study is thus precisely diagramed at stacked venn diagram. The study then furthers the scope paradigm approach in the following illustration.

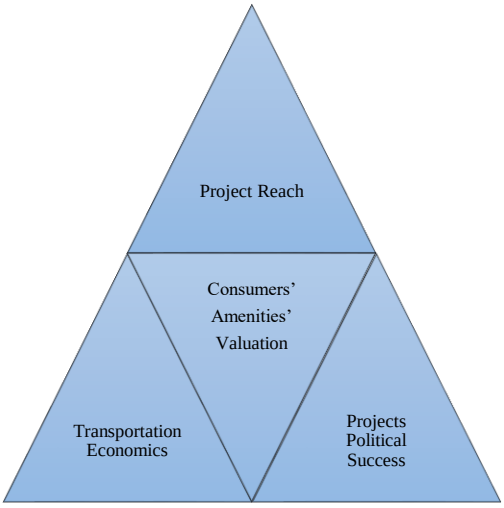

Figure 2.3: Scope Paradigm Approach

The segmented pyramid is used to present how the CAV is interconnected with the Project political success, transport economics/ economists (TEE) and project sociological reach (PPS). A three cone and chalice structure is used where CAV is centered at heart and provides a strong base to the transport economists to win huge investment proposals and strategize project political unit return success (PPS) measure. The tope cone is of project reach (PSR) and reflects that how the CAV dealt at the Project political justification and transport economists project appraisal directly impact the project reach. CVA and Project reach create a diamond potentially capacitated at carving the desired sociological project reach and deliver sustained quality. The next follows a framework model.

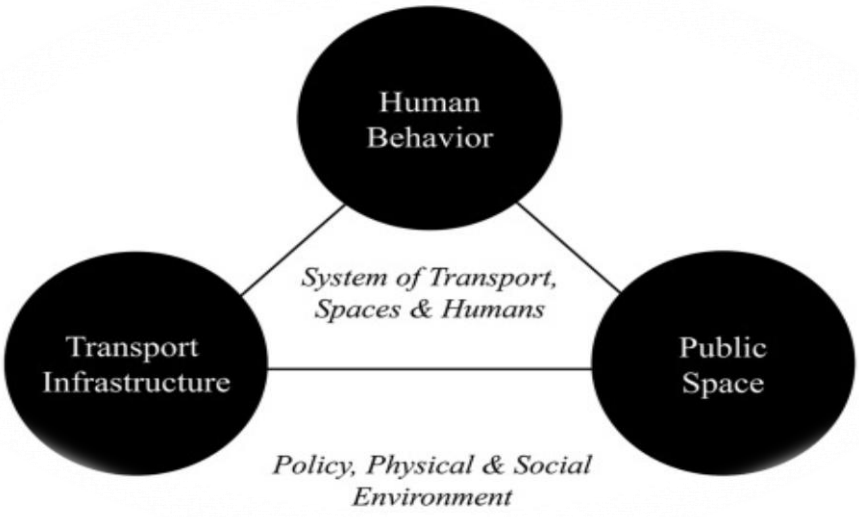

Figure 2.4: Project Frame Work

This framework is used with a unique approach where the changes created at segmented pyramid CAV and corresponding three cones are further analysed within the framework of transport infrastructure, Public space – the OMLT stations, paths, parking places, business sectors, services sector, religious, archeological, historical and recreational places claimed to be impactfully connected and made accessible by the OMLT as per PC1.

Following are all the document explored for the study;

Public transit consumer amenities deals with a range of secondary upgradation which is indirectly related to service quantity or operations and can improve the standard of the traveler experience. Instances include passenger facilities, information provision, personal security initiatives, and stop/station quality. While much fieldwork has settled the value that local transport users place on different social graces, there is less know-how of present practice in the usage of consumer amenity valuations. This research aims to understand present practice across public transit agencies in determining employing public transit consumer amenity valuations. A research of public transit agencies in eleven cities (Sydney, Melbourne, Brisbane, Auckland, Perth, Paris, London, Vienna, Toronto, Singapore, and Oslo) was set about demonstrating that Australian cities, although Melbourne, in general have extensive inclusion of consumer amenities as part of public transit project assessments. Australasian practice includes consumer amenities more regularly in project assessment than Oslo, London, and Singapore. Toronto, Paris, and Vienna, even though they take up advanced assessments for many projects, rarely include consumer amenities in these assessments. While companies use advertised sources of consumer amenity values particular to their country, Singapore and Toronto use consumer amenity values from London (De Gruyter 2018).

This research is established upon exploring and validating the impact of a mega project program i.e. CPEC on the development of infrastructure and sustainable management of project. For economy-boosting and infrastructure development, the CPEC has great significance. The primary aim of the current study is discuss economic boost, environmental protection, and international relations determining the success of the project. It also addresses management of project as a mediator between economic

boost, environmental protection, the success of the CPEC, and international relations. Questionnaires have helped gathering the primary data, and for analysis, PLS-SEM has been used. The final results showed that international relations, economic boost, and environmental protection have a favorable association with the CPEC's success. The results also slowed that management of the project moderates among the nexus of the economic boost, the international relations, and the CPEC's success. The results of the current study directed how China and Pakistan could make the CPEC project more durable with the effective implementation of policies required for environmental protection, economic boost, and friendly relations with other foreign states. This research was endeavor to substantiate the different elements to examine their interrelation with each other in a modern environment, culminating in a leading boundary for the success of mega programs that impact project management (Xialong et al., 2021).

The environmental impact associated with mega constructions many a time has remarkably negative orientation on cities. Cities all across the globe operate better when they have an advanced public transit system. Sadly, while expanding Asian mega cities, governments have been unsuccessful to develop sustainable transport systems and the cities face serious environmental risks amidst urban development. The lack of effective measures regarding public transit is a prominent reason for such rapid increase of different problems such as rise in number of private automobiles, which further leads to congestion on roads, noise and air pollution, which eventually affects human health. Therefore, as a developing country, Pakistan is just about to face a huge crisis. The congestion of traffic in Pakistan is mainly coped with by building subways and overheads, but the answer is not in constructing these. Transport issues ought to be consolidated with a comprehensive plan that consists of better public transit systems. To find a solution for the traffic issues of metropolitan city of Lahore, the projects such as Kalma Intersection, Azadi Square, Metro Bus, and Orange Line Metro Train have been attempted. The aim of such projects is reducing dependency on automobile, limiting land waste, addressing the transport system sustainability, and making living and working places healthy and convenient. However, the environment of the city is really disturbed due to such projects. This paper spotlights the dangerous effect of mega transit projects on Lahore's environment, using a methodical literature review procedure

which is employed to summarize, assess, approach, and convey the outcomes and consequences from a comprehensive literary survey. The study sample included the review of EIA reports, newspaper articles/interviews, and research studies, which shows that such mega projects often do not comply with the environmental impact, standards, and requirements Nawaz et al., 2019).

National Engineering services Pakistan (PVT.) Limited. Environment and public Health Engineering Division 1-C Block N, Model Town Extension Lahore, Pakistan. This report offers the results of "EIA of Construction of Lahore Orange Line Metro Train Project (Ali Town – Dera Gujran)." To follow the Pakistan Environmental Regulations as perceived in the Pakistan Environmental Protection Act (PEPA) 1997, PMA (Government of the Punjab) charged NESPAK with performing an EIA study of the suggested project. The EIA study targets the recognition of the probable social and environmental impacts of the suggested project on its instant environs on both long and short term basis, hinting at the measures of mitigation and recognizing the responsible companies to execute those policies. The general object of this project is providing a congestion free, smooth and safe traffic facility to the travelers of the area of the project (GOP EIA Report, 2015).

Civic rail transit mega projects are encouraged as they generate a positive social adaptation on a metropolitan scale, yet they create complicated unplanned negative effects on local scale. Environmental and Social Impact Assessment (ESIA) and reexamination aid the policymakers in assessing and control the environmental and social effects of mega projects. Employing the politically successful South West Rail Link of the Western Sydney as an instance, we identified the government barriers and implementation challenges in applying EIA and ESIA reexamination across spatial scales. These barriers and challenges impact the management and planning of the transport infrastructure development (Mottee 2020).

The politics that surrounds the implementation of the Lahore Bus Rapid Transit Corridor, Pakistan's first mass transport project finished in 2013, in order to examine the purpose that infrastructure mega projects serve to in highly democratizing and factional regimes of the global South. Using as a case study the Lahore BRT, the paper put forward that infrastructure development is more and more interconnected with

concepts of modern governance and political legitimacy, especially with the developing competition in democracy. We contend that transformations led by democratization in the political and institutional background of the authority of the state has fashioned new purposes for mega projects, which somewhat justifies why state authority is deployed for the projects being overlooked for many decades. At the end, the paper warns that this new purpose for infrastructure, while making a breakaway from the former patterns, can at the same time restrict the probabilities for durable interventions moving forward (Sajjad, 2022)

The pandemic of COVID-19 has thrown the society into disorder as we witnessed it in various ways, especially with its harsh impact on households with low incomes. Even before the pandemic, there was a rise in the ownership of private cars and a decrease in the ridership of mass transport in the Metro Boston. This was further worsened by an important spatial mismatch because of which low-income passengers became more and more dependent on mass transport. Narrations of overcrowded trains and buses since early March have intensified mental fear among daily transport customers, some of whom have purchased their personal cars already or plan to do so within a year. Considering the several active policy responses of various cities in Metro Boston, we are hopeful that in regional and urban movement, sustainable and optimistic mobility will become a main theme in the post-pandemic recovery era (Basu 2021).

In the lives of settlements, significant importance belongs to open spaces. More environmental and ecological importance is given to the areas with high rate of green coverage. Such green areas improve the climate of the urban areas, prove beneficial in reducing the heat-island effect with ecological-balancing functions, and abate environmental damage. Lately, open spaces (i.e. green spaces and green areas), their components, and their effect on our environment have been paid less attention to. The atmosphere of Lahore is under threat owing to the mega transportation projects. This research highlights the vitality of green spaces to our environment, which is badly damaged as a result of all projects. It also highlights the socioeconomic circumstances and the will of the locals of Lahore where the Orange Line Train Project was launched. Finally, the author proposes quite a few useful means which allow the engineers and

planners to hold onto these projects and simultaneously reducing the environmental harm (Shahid, et al.2020).

A critical understanding of the travel behavior within a cultural context is vital to understand what goes into the cognitive structuring of a particular construct of a geography. It is essential to understand it for it aids the policymakers to effectively develop the urban and transportation planning policies. Large scale motorized mobility has told hard upon the city environmental structure and urban assets. Therefore a singular model approach of land use or socio-demographics, falls short of openly validating people's preferences, so it is needed to take correlational set of paradigms in isolation. The multiple attributes i.e. land use, socio-demographic and travel information on travel behavior and particularly preferred travel mode is a viable correlational set of paradigms to study impact matrix on the travel behavior. The phenomenological approach in the qualitative inquiry aviated through a structured questionnaire for interviews to obtain the data. The relationships model of variables was deciphered through the Multinomial logit model (MNL). The classification of land was highlighted with spatial maps. With results projected that the increase in income level is a factor where people swapped walking with riding a vehicle and the preferred approach is to ride a vehicle for longer trips. It was further investigated that people prefer to walk or ride a vehicle in residential and commercial areas. Based on the results, several planning related policies were recommended (Shakeel, Jahanzaib, 2019)

Highlighting the Potentials of Transit Oriented Development A Case Study of Orange Line Metro Train, Lahore. Transit Oriented Development (TOD) offers various benefits to transport users: making the streets safer, reducing dependence on vehicles, reducing pollution, endorsing healthy environs in the city, and improving fare revenues to transport systems and services. All of these particularly are anticipated from the preference of Transit Oriented Development along with the ongoing Orange Line Metro Train Project in Lahore under CPEC. It spotlights the potential of both the TOD and the Orange Line Metro Train Corridor, and the rules, regulations, and policy that ought to be adopted to support and execute both of them. TOD has a great potential together with several sections of the Orange Line Metro Train Corridor; it can be utilized by choosing such novel policy guidelines for the zoning of land use (Shakeel, & Liu, 2019).

The Benefits of Metro Rail in Mumbai, India is a study about reduced form and structural approaches. This study examines the factors of value, time, and controlled environment degradation from real and acclaimed welfare perspective. Certain short and medium term advantages are evaluated; the probability of broadening the medium term advantages has also been discussed (Suri, 2022).

The re-concentration on planning and working on enhancing the consumer experience is one of the current international trends in public transit systems. The economy experts have progressing in the field of economic assessment using agreeableness to pay for the principles to put a value on consumer experience substructure so as to more suitably represent consumer valuation of social graces in project appraisal. The paper imparts a global examination of this domain by covering on paramount international research agendas on the topic under discussion. The first stage of the project gathered the results of over 500 appraisals to estimate the overall span and values for a range of agreeability infrastructure involving Information, Access, Environment, Security Amenities, and Customer Facilities. Values were standardized between currencies of different countries where they were evaluated and adjusted to make current value judgments. The second stage of the project was an attempt to understand power practices in using consumer experience infrastructure appraisals in practice using a research of twelve cities in Asia, Australia, Europe, and North America. This based patterns of usage by the broadness of modes assessed, kinds of methodology used, and the degree of refinement with which valuations were taken on. Finally, the third stage of the project included a transnational expert Delphi survey of practitioners and researchers engaged in assessing values of consumer experience infrastructure. The main aim of the survey was issues and problems in measurement methods and habits in approaches to measurement. This paper gives a synopsis of all the stages of the research project and offers an outlook on best exercises for industry in supplying methods and valuation for measuring consumer amenities in public transit in the future (Currie & Fournier 2020).

According to assessing the potential of sustainable urban regeneration in Lahore: a case study of orange line metro train route, in urban planning, one of the far-reaching fields is urban restoration. It sets up new civic structures in urbanized communities and

molds the urban locale. The long range hope of urban restoration projects along with transportation corridors is promoting sustainable patterns of civic growth by guaranteeing all urban blueprint features and generating higher compactness along transport and no-motorized transport usage. This research examines the capability of urban restoration along the route of the Orange Line Metro Train (Rafiq et al., 2022).

At the Critical Review & Analysis of EIA Report of Lahore Orange Line Metro Train Project for Working Out the EIA Performance Index of Project. Environmental Impact Assessment (EIA) is imperative prior to starting a mega-project. It is mandatory as per the Pakistan Environmental Protection Act (PEPA) 1997, under (Section 12). The study administers EIA Performance Index for Orange line Mega Train Project (OLMTP). In the contemporary time of advancement and development. The analysis attempts to develop needed policy and smart examination of the errors, mistakes, and gaps in the former projects to lessen the chances of repetition of the identical errors in imminent relevant projects (Rasheed et al., 2022).

Like many developing countries, Pakistan is facing economic and environmental challenges in its transit sector (especially in public transit). Pakistan is about to obtain finances for its infrastructure-related programs under the China-Pakistan Economic Corridor (CPEC) project. The Orange Line Metro Train (OLMT) is one of the CPEC projects. This research uses conventional techniques such as benefit-cost ratio (BCR), linear trend regression, and geometric progression to study the economic probability of this project. The final results reflect that with the security in exchange rate and the given rate of interest, the project is economically possible, with a BCR of 2.11 and Internal Rate of Return (IRR) of 3.07 per cent. Moreover, the vulnerability analysis has been carried out for probable changes in fiscal conditions as well as for several interest rates for debt compensation. The research is valuable for lawmakers interested in the benefit-cost assessment of public transit ventures (Ali, et al. 2021).

According to measuring the accessibility benefits of public transport: an evidence from Lahore orange line metro train (OLMT). The inadequacy in the public service delivery in Lahore is caused by rapid migration and urbanization; the Lahore Orange Line Metro Train (OLMT) is a notable public transport – the first light rail mass transport project of Pakistan which would cater to the needs of the surging population of Lahore. This

current research is founded on the ex-post assessment by examining various accessibility benefits, social inclusion and passengers' will to pay. It also builds a case for approachability betterment by pointing out the gaps that may create obstacles for customers or discourage non-customers. Another crucial concern is substantial subsidization – a disproportionate burden on government financial means. Some likely policy choices have been suggested to make the project economically sustainable (Idrees & Sarwar 2022).

In Amsterdam, the north-south metro line became functional in the summer of 2018, along with changes in the existing metro, bus, and tram system within the city. This paper undertakes an ex-post study of the transit impact of the changes in the network. Employing two collections of smart card transactions, each of five to six weeks, and similar Automatic Vehicle Location (AVL) data, a before-after differentiation is prepared, concerning travel times, ridership, travel time credibility, and number of relocations. According to the final results, there was an increase of 4% in system wide working day's ridership and a powerful shift from bus and tram to metro. On a regular working day, over 6,000 hours of travel time is conserved. 21% of the travelers experienced more than one minute decrease in time of travel; 13% of the travelers experienced more than one minute increase in time of travel. Moreover, somewhat fewer movements are made, and the cumulative effect on travel time credibility is somewhat positive. The resulting daily social advantages of the new public transit network for a regular working day (7am-7pm) are roughly €54,200. The transit-related social advantages on a yearly basis are roughly 22 million euros. An ex-post analysis is uncommon in both literature and practice. Therefore, in so many cases the achieved benefits of substantial infrastructural investments stay unknown. This analysis gives an instance of scientific methodology development employing various data sources that facilitates such ex-post assessments, leading to betterment in public transit planning and evaluation (Brands et al., 2019; Brands et al 2020; Mottee et al., (2020)

The study analyzed that the relevance of epicurean pricing models has a prolonged history in evaluating the outwardness associated with civic infrastructure, such as public transit. Nevertheless, the accuracy of results is critically dependent on empirical and methodological considerations, such as: i) existence of spatial hidden

component (spatial autocorrelation); ii) temporary breaks from associated to different phases over which the substructure is built; and iii) heterogeneity of the impact along the course ans stations. This paper targets to assess the effect of Montreal's metro expansion to the suburban city of Laval (made public in 1998 and began operating in 2007). A spatial difference-in-difference (SDID) calculator based on a recurrent sales approach is employed to separate the effect of the closeness to the novel infrastructure on one-family house values depending on the execution phases and the terminals. The final results are suggestive of the fact that only one among the three novel substructures shows an optimistic impact of closeness after the first performance of the transport service. The results of the study tend to reckon the sometimes soaring expectations in terms of financial impacts of such a venture, at least for inhabitation properties (Devaux, et al. 2017).

From 2000 to 2009, 30 new systems opened; from 2010 to 2019, 45 new systems are predicted to open, 33 of those in the Asia-Pacific region alone (UITP, 2018). The very recent report released 2021 shows remarkable further growth of mass transit infrastructure by 25% out of which 21% is credited with Asia Pacific region where China alone is accredited for 17% of this growth. The global mass transit highlights reflect metro networks at 84 cities in Asia Pacific, with 3300Km of infrastructure generating revenue service between 2018 and 2020, and London annual ridership at 1.5 billion in 2019. Below is a figure that represents the mass transit system per decade growth since 1863 (UITP, 2021).

One of the important corridors along the BRI is the China–Pakistan Economic Corridor (CPEC) where China has pledged to provide a capital of US$57 billion, of which $14 billion has already been invested in thirty early-harvest programs. Going away from the corridor's geopolitics, this chapter emphasizes on the financial basis of the CPEC. It contends that, being the captain and champion of the BRI, this corridor would be a blueprint for both bilateral and multilateral coordination. It is expected that the CPEC will cause a miracle on the Indus much the same to the miracles in the post-war Korea, Japan, and ASEAN in the 1980s (Malik, 2018).

In 2015, the 2030 agenda for Sustainable Development Goals (SDGs) was adopted by the United Nations General Assembly for an inclusive and prosperous future

for all. Considering the contributions of IJGIS periodicals to sustainability, this publication describes the academic relevance of GI Science to the UNSDGs. GI Science, with its knowledge production and body of knowledge, has much to provide for addressing the shortages recognized by the 2019 UN High-Level Political Forum on Sustainable Development. The COVID-19 pandemic endangers sustainability in a plethora of ways, but also signals the reduction of environmental contaminants by decreasing manmade activities and brings out the hidden social and health inequities. This publication spotlights opportunities for GI Science benefits to the UNSDGs, summarizes analysis challenges of the UNSDGs to GI Science, and embraces submissions of GI Science study on UNSDGs to IJGIS (Yuan 2021).

United Nations Development Agenda: Development for All. This editorial attempts to share the resources of the United Nations Development Agenda in a pleasant format for shareholders of all sorts. It evaluates the rulings of the major summits and conferences held between 1990 and 2005 in a consolidated manner, and brings out implications for present and future progress strategies. Beyond everything else, it should suffice to make the summit and conference concepts and results more accessible and more smoothly integrated to enlighten public discourse, strategy debate, and popular decision-making on issues of development (United Nations 2007) .

Pakistan's Implementation of the 2030 Agenda for Sustainable Development: Voluntary National Review. *SDG Section, Ministry of Planning, Development and Reforms*. In October, 2015, Pakistan attached itself to the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). Pakistan's first Voluntary National Review drafts the country's degree of readiness for attaining the SDGs, reviews development on various SDGs and proposes future plans, which depend on institutional mechanisms, multi-stakeholder engagement, and the allocation of economic resources and the organization of policies (Government of Pakistan. 2019)..

National Transport Policy of Pakistan 2018, *Ministry of Planning Development and Reforms.* The strategy reflects the preferences of the Government of Pakistan, as stated in several medium and long-term plans and policies of the government. Transport has a role of encouraging progressive change regarding economic development, conserving the environment, and attaining social equity. This involves stimulating the

nation in the direction of higher competitive creativeness, following the preferences of the fiscal activity and related employment, and improving regional trade possibilities; while simultaneously attending to individual's and communities' desire for security, inclusion, and greater social equality. The Policy utterly maintains these preferences and these advantages can become a reality by means of this Master Plan (Government of Pakistan 2018) .

The study discusses the consideration of social impact when transport structure is planned in the projects. When we look beyond the success of rail link in south-wets of Sydney, a positive change is observed at a metropolitan scale, although negative impacts are noted at local levels. Decision-makers utilize the follow up of Environmental and Social Impact Assessment (ESIA) in managing the environmental and social impacts in major projects. Governance challenges and practical barriers are observed in an example of south-west rail link of Sydney. The management and planning of urban transport infrastructure and urban development are highly influenced by these barriers (Mottee et al. 2020).

For gathering financial sustainability in public transport system, it is essential to consider the cost that is paid by users for maintenance and operation. Metro station of Qatar is considered in the current research for revealing customer's reservation for the cost. Willingness to pay the services of maintenance and operation is assessed as a purpose of the research to get better understanding of user's preference. Focused group conversations and informant meetings were used as a mean of collecting Primary data while Secondary data was collected from the contracts, transaction recording, work statement, activity report and account books provided by the local rail committees. An investigation was applied to more than 1000 customers through text-format questions and a regression model of Poisson was utilized for evaluations of considerations which were affecting every higher value. Customer prices for reservation per train journey and per month were revealed in the output. The decisive considerations in the study elicits that customer reservation price is linked with the possibility of using other rail stations and to the degree to which the MRO service can exclude paying consumers. The research provides significant outputs for setting up adequate and reasonable fares for the competent rail systems in Qatar (Larumbe 2021).

Getting to know the price that users assign to maintenance, repair and operations (MRO) has arisen as an essential consideration in gathering financial sustainability for metro public transport systems. The current research reveals customer reservation price for MRO in the main metro stations in Qatar. The purpose of the present work is to assess the willingness to pay for MRO services in eight metro stations in Doha in order to have a better understanding of user preferences. Qualitative research was carried out employing primary and secondary source of information. Primary data was collected by means of a mixture of data accumulation approaches: key informant meetings and focus-group conversations. Secondary data was collected from the account books, contracts, recordings of trans-actions, statements of work and activity reports given by the local rail committees. A stated preference investigation was applied through open text format questions to more than 1000 customers, and a Poisson regression model was used to evaluate the considerations affecting every higher value. Outputs reveal normal customer reservation prices per month and per train journey. The results also indicate a significant willingness to pay differential among the studied railway stations. The study of the decisive considerations elicits that the degree to which the MRO service can exclude paying consumers, the attending of rail conferences and the possibility of using another rail station are related with the customer reservation price. The outputs of this research are significant for railway public authorities willing to set up reasonable, adequate and realistic fares that support fund competent railway systems in Qatar.

CHAPTER 3

METHODOLOGY

The study will follow a qualitative research design to explore the dimensions of Consumers' Amenities' Valuation (CAV) as it is evolving under changed socio economic dynamics affecting the sociological reach of the socio-economic mega projects. This chapter presents the identified subject study population. It describes in detail the identified population along with the adopted sampling techniques. Further, it highlights the method of data collection and analysis followed by the processes and techniques by which the data has been put to test to validate the research.

The focus of the study research methodology is on executing objectivity. The study will explore, describe – using the interview transcribed text, examine, understand, explain, and tell the inferences inferred through the human experience non-numeric data evaluation process. The mode of inquiry thus be inductive operated through exploring research gap through open ended research questions from a smaller number - 08 interviewees in this case, of participants.To collect data, the study uses Convenience sampling, semi structured questionnaire, focused group discussions, transit walk general observation techniques, interviews of the target sections of population benefitting from the project. The study observes exploratory research and narrative technique. The interviews are audiorecorded (with the permission of interviewee) for dependability and originality of data for processing. The data is analysed through using the qualitative data analysis tool and software NVivo.

3.1 Research Method and Design

The Qualitative research is a road map to innovation, imbedded in quality whereas the quantitative research is the statistics and its analysis. Qualitative research starts with man and quantitative research eliminated the human factor (Newman 2013). The use of qualitative is recommended for researches in which the research intends to explore the different varieties of unique human lens. This usually is perceived to encounter the huge literature gap. This approach to an identified problem results in the development of exploratory questions. These questions are designed to explore the different versions and perceptions of the individuals involved.

The social sciences research studies adopt qualitative research design. The researcher design open-ended questionnaire and conduct semi-structured interviews. This is to customize the design of the research to suit the inclusive and comprehensive nature of the study. This approach helps the researcher to reconnoiter and encode the individual insights and behavior in a natural setting of phenomenon (Creswell & Poth, 2017). The vogue in trade in this domain are the five approaches to qualitative inquiry i.e.

- The narrative approach to research inquiry explores the life of an individual as its research focus. It is telling stories of individual experiences in a narrative style. The situation is reviewed in detail as per the subjects and the subjects narrate them as the obstacles or opportunities occur – the course of events.

- Phenomenological Research inquiry focuses to understand the essence of the experiences and while addressing the research problem it describes the essence of a lived phenomenon.

- The grounded theory research inquiry is structured to build/develop a theory grounded in data from the field and while addressing the research problem it grounds a theory in the views of the participants. Explaining events through the lens of a theory.

- The ethnographic Research inquiry focuses to describe and interpret a culture – sharing group and while addressing a research problem it describes and interprets the shared patterns of culture of a focus group.

- The case study research approach to inquiry focuses to develop an in depth description and analysis of a case or multiple cases and while addressing a research problem it provides an in depth understanding of a case or case.

The subject study focus is Orange Line Metro Train consumers' perspective about the valuation of the project amenities as identified in PC 1 justification, scope and objectives: and how it affects the project sociological reach (PMA, 2015). The study relies on their user experiences and narratives so a phenomenological approach complements its qualitative research design that is structured around probing into the consumers perceptions through their live experience of the customer amenities as provided on site and as the consumer reflects these amenities are responding to his and greater population needs. The study thus identifies the impediments to the projects sociological needs. To justify the selection of approach the below appended is a table that enlist the five qualitative approaches to Inquiry.

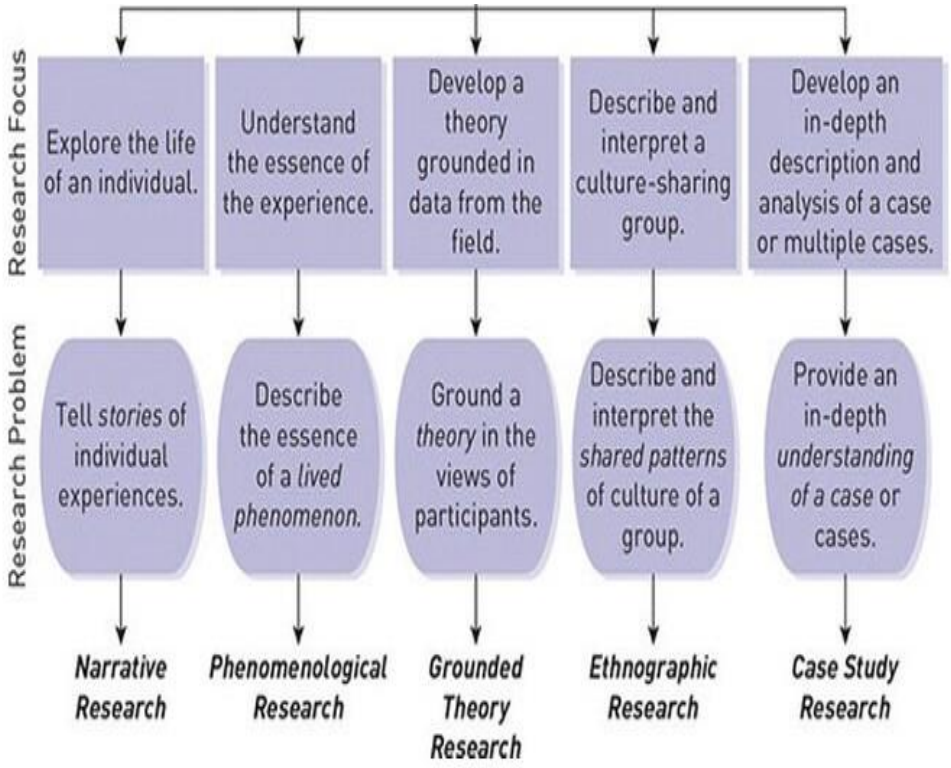

Figure 3.1: Five Qualitative Approaches to Inquiry

3.2 Population

Target population of current study is the daily users/consumer of the integrated mass transit mage project of orange line metro train (OMLT). The common characteristic of the selected sample is

- The participants are regular/daily commuters of OMLT.
- The participants used public or private local transport.
- The participants are all educated between the demarked levels of education i.e. School to doctorate level
- The participants were 16 yrs. and above.
- The participants are in to some specified term service bond.

3.3 Sampling Method

Since an organized and structured approach in sample selection is the backbone of the logically grounded extraction of themes to be explored and to facilitate and standardize the selected research inquiry approach. Thus, a purposeful sampling was applied for the identification of participants. Considering the sample size of 5 to 25 as recommended number of sample size, 08 OMLT commuters were interviewed with open-ended questions (Creswell & Poth, 2017). The interview design was semi structured. A rigorous exercise was generated to get insights of the participants perceptions of the consumers' amenities objectified in the project appraisal. What are the experience of participants of these amenities, and how these amenities can be customized to best suit the consumer? The further probe was on how participants perceives it to be of a better composition for constructivist sociological absorption and reach with public mass.

3.4 Ethical Considerations

In connection to the ethical considerations for the proceedings of research qualitative inquiry design the researcher, ensured participants are approached and apprised on the following:

Table 3. 1: Approach and Appraisal

S#	Approach	Appraisal	
1.	Participants are approached on random selection based on researcher's observation.	The participants are apprised that their participation is strictly on voluntarily basis.	Objectivity
2.	Participants are invited to respond to the interaction on voluntarily basis.	The participants are presented with consent form. They are apprised of the mandatory requirement to fill and sign a consent form prior to interview.	Qualitative Inquiry
3.	The participants are approached in person.	The minimum and maximum time durations of interview	
4.	Participants are approached for their consent for interview.	The interview is recorded in full length.	Transferability
5.	The participants were approached on a flexible model of interaction.	The interviewee and the researcher can mutually decide as to the comfort and feasibility of time and space for a detailed recorded interview.	Phenomenological Design
6.		The participants will share a working phone number for liaison for the interview time and site.	Objectivity
7.		The participant identity is subject to no disclosure and confidentiality	

The researcher abide by in letter and spirit, the Bahria University Research Approval committee promulgated criteria and protocols while preparing the questionnaire and conducting the interviews. The consent form is attached at Annex-A and the questionnaire at Annex-B.

3.5 Informed Consent

The researcher ensured the receipt of all the participants' consent forms duly read and signed before the interview. The consent form is designed in lieu to the criteria set by Bahria University. The interviews were in accordance to the predefined feasibility communicated by the interviewee conducted in public facilities. The strategic emphasis was on rapport building so the interviewee is comfortable and may pool in fruitful discussion. The interviews were semi structured and preceded by short interactive sessions. That also helped in making the questionnaire statements more clear, concise, and appropriate to the purpose.

3.6 Confidentiality

The interviews were audio recorded and tagged with some written notes. They were given access for post interview reflections if they feel they missed out at something and may be were not very responsive so this resulted in a sustained interaction around the subject. They could include reflections from other peoples shared experiences. The rapport building had a strong component of confidentiality of their identity, personal and contact details. The protocols were ensured, repeatedly and loudly communicated. The research design allowed the use of name instead of ID as the sample population is connected to different area of Lahore, are gender diverse, and belonged to different trades.

3.7 Geographic Location

The respondents are from diverse geographic locations of the city Lahore spread along the length of OMLT route. They came daily enroute form different stations of OLMT to their destinations.

3.8 Data Collection

Semi structured interviews were conducted on a set of questions developed in preview of the research questions and the prelude meeting and talks with the interviewee. The interview lasted for the aggregate ratio of 30 minutes to 60 minutes. The rapport building with the interviewee with more focused reflections from the interviewee. They were made comfortable with the purpose of the research through strongly projected only academic interest and cognitive assimilation and communicating of the same by sharing the experience of what related and shared condition. The strongest breakthroughs came when the researcher made sure that the first talk with the interviewee ensures the identification of his preferred identity and recognition of the same. This resulted in the success with two female transgender.

3.9 Instrumentation

Instrumentation is critical to determine the variables or items and points of interest in the data collection. The instrumentation process was adopted through conducing the prelude interaction of at least good 15 minutes and different periodic interactions intentionally generated through establishing a comfortable and recurrent communication with the interviewees to get their good reflections and thus incorporate all in the questionnaire to make it is comprehensive and concise whole. So once the interviewee sits for the interview a streamed discussion is resulted.

One great benefit of the same is the interviewee is well set in the framework of interview of composure and in comfort and is self-motivated to respond. The flow of the questions then help avoid any interruptions in the rhythmic response proceeding.

Including 06 questions on demographic details a good number of 42 questions were formed to probe the perceptions and reflections of the OMLT consumers through different dimensions. Getting the interview in comfort with the long series was also the part of the instrumentation process.

The interviewees were met at random on different stations of OMLT. A preliminary talk was generated to get their interest to the topic. A pretexted draft of personal and project intro was shared during the discussion. The exercise was quiet critical since owing to time and space the exercise was quite difficult thus travelling along the potential interviewee was one viable option. The generalized characteristic of public using the OMLT is identified as the prospect sharing of contact numbers and then responding to the same within the gender blocks at the ration of male 100%, female 60% and others 50%.

3.10 Validity and Reliability

What is research without instrumentalized validity and reliability? Nothing! Thus the paramount objective of research can serve only in condition if structured and strategic efforts are made ensuring validity and reliability of the research. The importance of developing clear concise and focused questionnaire and tests is part of structuring the research design to visible validity and the rapport building. Important is the strategization of the approach through careful observation generation in the prelude meetings and establishing a synchronized pattern of communication and response between the identified priority patterns of the interviewees and the questionnaire designed:. This is to be done all the time keeping in strict considerations the mandate of the research and make all the data shared to channelize to the research concerns on table.

The use of qualitative data analysis tools further help in objectifying the research data analysis and result producing process. A relative ration on the sync between the mind and machine processing the same data where may identify some new and previously may be ignored, due researchers own cognitive structure also generates validation of the processes through highlighting share patterns of mind and machine evaluation process of the data.

3.11 Data Analysis

The interviews were transcribed using Microsoft word office 2016. Keeping in view the research questions, the process of identifying and coding new/ current trends was adopted the knowledge derived was then analyzed through Nvivo analysis tool. The transcribed interviews were then uploaded in Nvivo sources folder the demographic details were recorded on the Microsoft Excel 2016 and the same was then sync with the uploaded cases so. Cases and case classifications were generated. Then the coding process started. Nvivo have both the automatic code generation and manual code generation functions. The coding process resulted is generation of a nodes and themes book. The same is presented at data analysis chapter. The review i=of the nodes and themes and pattern resulted in the required appropriations thus the data analysis include the appropriations that included reductions, and thematic analysis and through study of

qualitative data (Creswell 2011, Moustakas 1994). Thus the quantitative data analysis is used to evaluate data inductively. The codes are used to evaluate and generate patterns. So the data is search continuously for fresh understandings and insights on the phenomenon.

3.12 NVivo Terminologies

The researcher use the multi coding projects data analysis Nvivo 11 plus version and used different working tabs for uploading and processing the data as follows:

Table 3. 2: Nvivo Terminologies

NPO	Working Tab	Function
1.	Sources	Where the project materials are docked, Interviews, videos, audios, pictures pdfs,
2.	Nodes	The anchor, parent, child and sibling node are created to through the process of coding references and subsequently these develop into Project frame work and themes.
3.	Queries	Here is stored all the data generated using query tan in tool bar
4.	Reports	Reports folder is where all the coding summary by nodes/ source/ classification and node structure summary Project report summary are generated and stored
5.	Maps	Mind map, Project map, and concept maps are and different hierarchies created are created and stored
6.	Folders	Here all the folders listed above are placed plus results, extracts, map, annotations, memo links, search folder, case/ source classifications nodes , classification, sentiments, frame work matrices etc are.

3.13 Summary

This chapter discusses in detail the process of selecting the research methodology, and validating the appropriation of the research design. Through ensuring objectivity of both processes and design of the research. Identifying the respondents, approaching them in person building rapport, generating instrumentation and validating the research with clear concise and objectified test and questionnaire. The one other very important factor was of establishing the rational of the interview that was to evaluate the information, perceptions and prioritization patterns of the OMLT consumers' valuation of Amenities (CAV).

CHAPTER 4

RESULTS

The purpose of the qualitative study designed on the phenomenological approach was to explore the information, perceptions and priority patterns of the OMLT service consumer on the research objectives of consumers' amenities valuation (CAV). The second objective was to identify the internal and external instigating factor sociological design that impact the reach of the OMLT both negatively and positively. The sample selection was made from a diverse geography of location, age, gender, trade and disciplines.

The study contributes in determining the consumers' amenities' valuation (CAV) and the factors affecting their valuation both at internal and external patterns of sociological design. The results of the study are presented in this chapter. A brief overview of the results is the study

- Validates the point highlighted in the project appraisal as valid points for policy concern on sociological needs and consumer facilitation.
- High lights the agreed need for expanding the project by adding new routes and resources for efficient operation
- The communication gap present on the extended amenities and consumer right to the same.

- Systematic revisions on resources reinforcement and relocation. For enhanced connectivity and accessibility of the services to a greater population.
- The need for consumer education through organized awareness campaigns.
- The insistence on completing the reference projects and strategic synthetization of policy decisions to a bettered of national cause and workable diplomacy at international fronts.
- Policymaking on developing economic hubs else the pre-set cosmopolitan centres and on diverting the migrating population flow to new epicentres to channelize the challenges of rapid urbanization.

4.1 Pilot Study

A pilot study was conducted to identify the operations and procedures in place to make the consumers' amenities' as outlined in project scope and operational design. The resources of the pilot study were informed that their personalized responses will not be made the part of the study. The focus was how the operations and procedures in place to make the consumers' amenities' are sustainably developed and strengthened through periodic evaluations – if any such process was in places. The two important incidents were reported and in complete confidence of identity confidentiality of both station and staff one incident in which one suddenly ailing male passenger fell of the stair case side wall due its low elevation and died on spot. Was made a part of the study. The second incident was of the mob attacks during TLP priest on Khatme Nauwat and Salahudin stations. Causing quite chaos and cost due absence of infrastructure to operate according to security protocols. The non-consideration of special needs in operational resources designs and observing a decentralized culture making the amenities available to a great length noisy to consumer approach and silent to consumer awareness three persons from OMLT syatem were taken on boards. The one was a reference to the remaining, out of the two one person responded to practical lengths and the inside learning process remained of sustained presence, so continuously the data collected was revisited for new reflection and deeper penetrations.

4.2 Data Collection

Semi structured interviews were conducted on a set of questions developed in preview of the research questions and the prelude meeting and talks with the interviewee. The interview lasted for the aggregate ratio of 30 minutes to 60 minutes. The rapport building with the interviewee with more focused reflections from the interviewee. They were made comfortable with the purpose of the research through strongly projected only academic interest and cognitive assimilation and communicating of the same by sharing the experience of what related and shared condition. The strongest breakthroughs came when the researcher made sure that the first talk with the interviewee ensures the identification of his preferred identity and recognition of the same. This resulted in the success with two female transgender.

The instrumentation process was adopted through conducing the prelude interaction of at least good 15 minutes and different periodic interactions intentional generated through establishing a comfortable and recurrent communication with the interviewees to get their good reflections and thus incorporate all in the questionnaire to make it is comprehensive and concise whole. So once the interview ee sits for the interview a streamed discussion is resulted. One great benefit of the same is the interviewee is well set in the framework of interview of composure and in comfort and is self-motivated to respond. The flow of the questions then help avoid any interruptions in the rhythmic response proceeding. Including 06 questions on demographic details a good number of 42 questions were formed to probe the perceptions and reflections of the OMLT consumers through different dimensions. Getting the interview in comfort with the long series was also the part of the instrumentation process.

The interviewees were met at random on different stations of OMLT. A preliminary talk was generated to get their interest to the topic. A pretexted draft of personal and project intro was shared during the discussion. The exercise was quiet critical since owing to time and space the exercise was quite difficult thus travelling along the potential interviewee was one viable option. The generalized characteristic of public using the OMLT is identified as the prospect sharing of contact numbers and then

responding to the same within the gender blocks at the ration of male 100%, female 60% and others 50%.

To achieve the paramount objective of research can serve only in condition if structured and strategic efforts are made ensuring validity and reliability of the research. The importance of developing clear concise and focused questionnaire and tests is part of structuring the research design to visible validity and the rapport building. Important is the strategization of the approach through careful observation generation in the prelude meetings and establishing a synchronized pattern of communication and response between the identified priority patterns of the interviewees and the questionnaire designed:. This is to be done all the time keeping in strict considerations the mandate of the research and make all the data shared to channelize to the research concerns on table.

The use of qualitative data analysis tools further help in objectifying the research data analysis and result producing process. A relative ration on the sync between the mind and machine processing the same data where may identify ome new and previously may be ignored due researchers own cognitive structure also generates validation of the processes through highlighting share patterns of mind and machine evaluation process of the data.

4.3 Sample Profile

In lieu to the research validity and application the study followed a systematic sample selection and stayed focused on generating a diverse population group. Inclusivity was the agenda and scope was the coverage of 27km long route through random selection for dependable representation of geographically stretched consumer opinion. Thus a careful sample selection from diverse gender, profession, age, interest, and experience and location groups was made. The selected population sample ranged in

- Genders male member 03, female member 03 and transgender 02.
- The professional and occupational association ranged within public, private and semi government domains.
- Age ranged from 22 to 46.
- Education Graduation to Masters of Philosophy
- Occupation responsibility ranged from trainee to senior mid-career professional
- Professional experience ranged from 0 to 16 years
- Departmental association ranged in 06 very important disciplines i.e. education, technical, financial, administrative and customer care.

Following diagrams of directed matrix of sample gender diversity and sample hierarchal analysis of sample demographic are generated at Nvivo gives a clear representation of the above billeted characteristics.

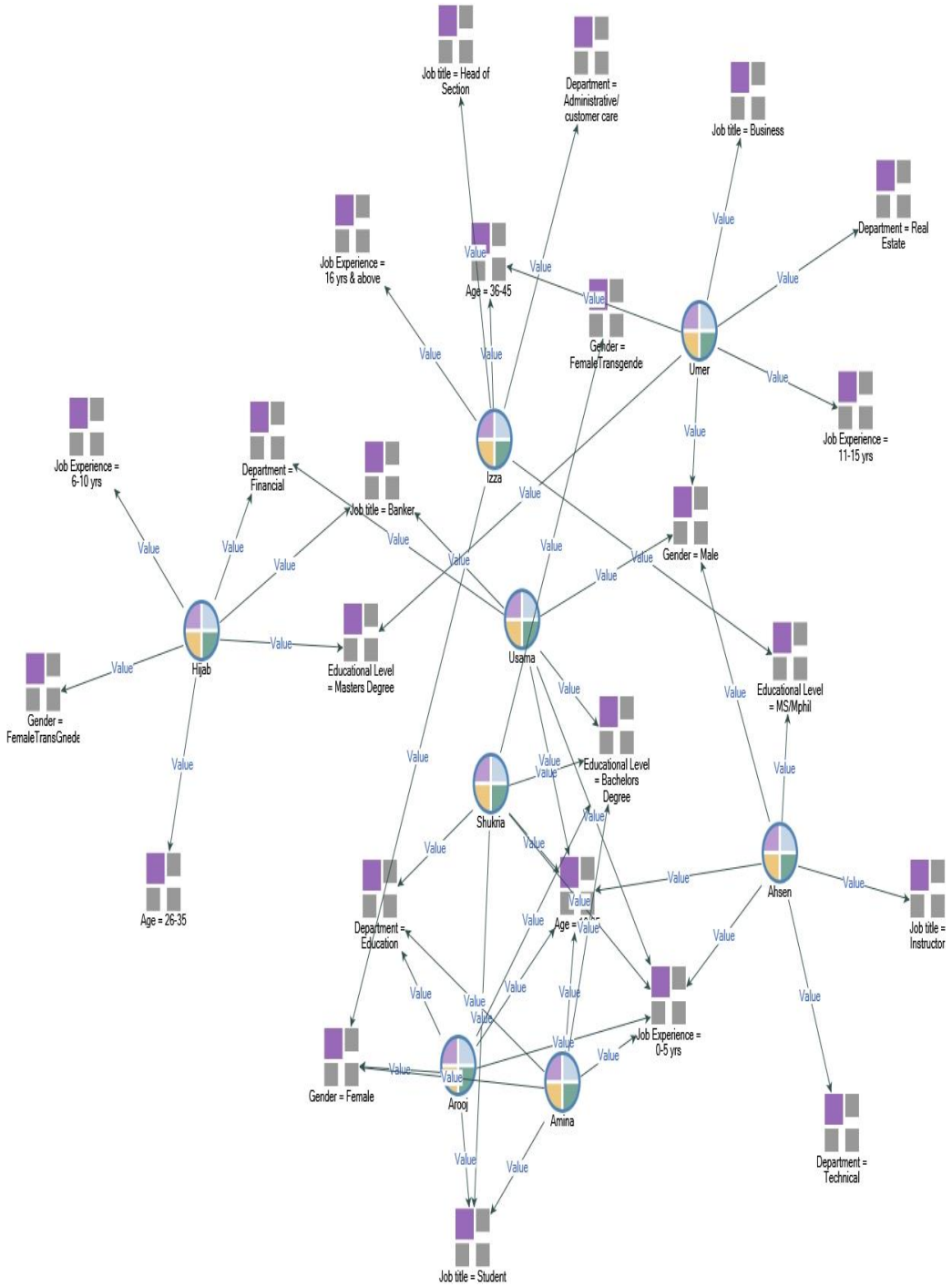

Figure 4. 1: Directed Matrix of Sample Gender Diversity

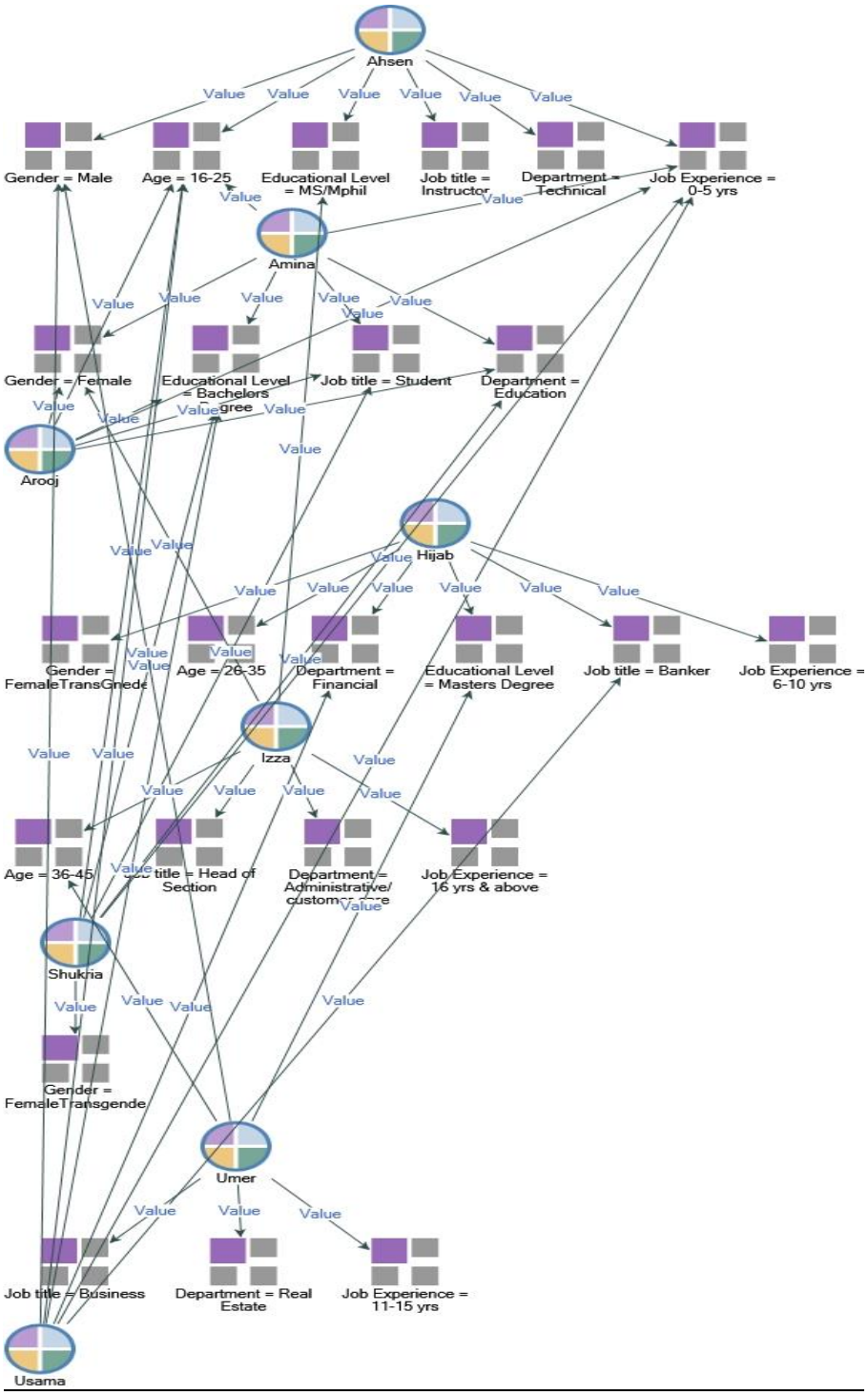

Figure 4. 2: Sample hierarchical Analysis of Demographics

4.4 Core Themes and Patterns

The recorded interview once transcribed the process of coding starts. The careful observation of the Interview transcriptions results in identification of words and phrases and these word clusters then help in identifying nodes. The references then are coded at different nodes and the clustering of maximum references i.e. excerpt coded out of a case transcribed on different nodes start developing a hierarchy. This hierarchy establishes themes and become the parent/caption and child nodes under the anchor nodes. These become themes and patterns and emerge as the research design. This finally develop a project concept map in the framework development. This is importance to understand how the project map emerges out of that coding matrix Appended below is a code matrix coding diagram generated at Query in Nvivo.

The tree representation of the data is generated at Microsoft Excel using Excel sheet generated at Nvivo. The tree represents the structural hierarchy of the identified node evaluated at demographic clusters. It represent the emerged hierarchy of themes and patterns them to help in making effective insertion and research. It allows a provision of flexible mobility of data

The next figure is of a pareto graph of coding matrix. This representation is used to identify the area of focus through the ordered frequency counts of value at different nodes. This process identify the most common responses among the respondents by assessing the cumulative line.

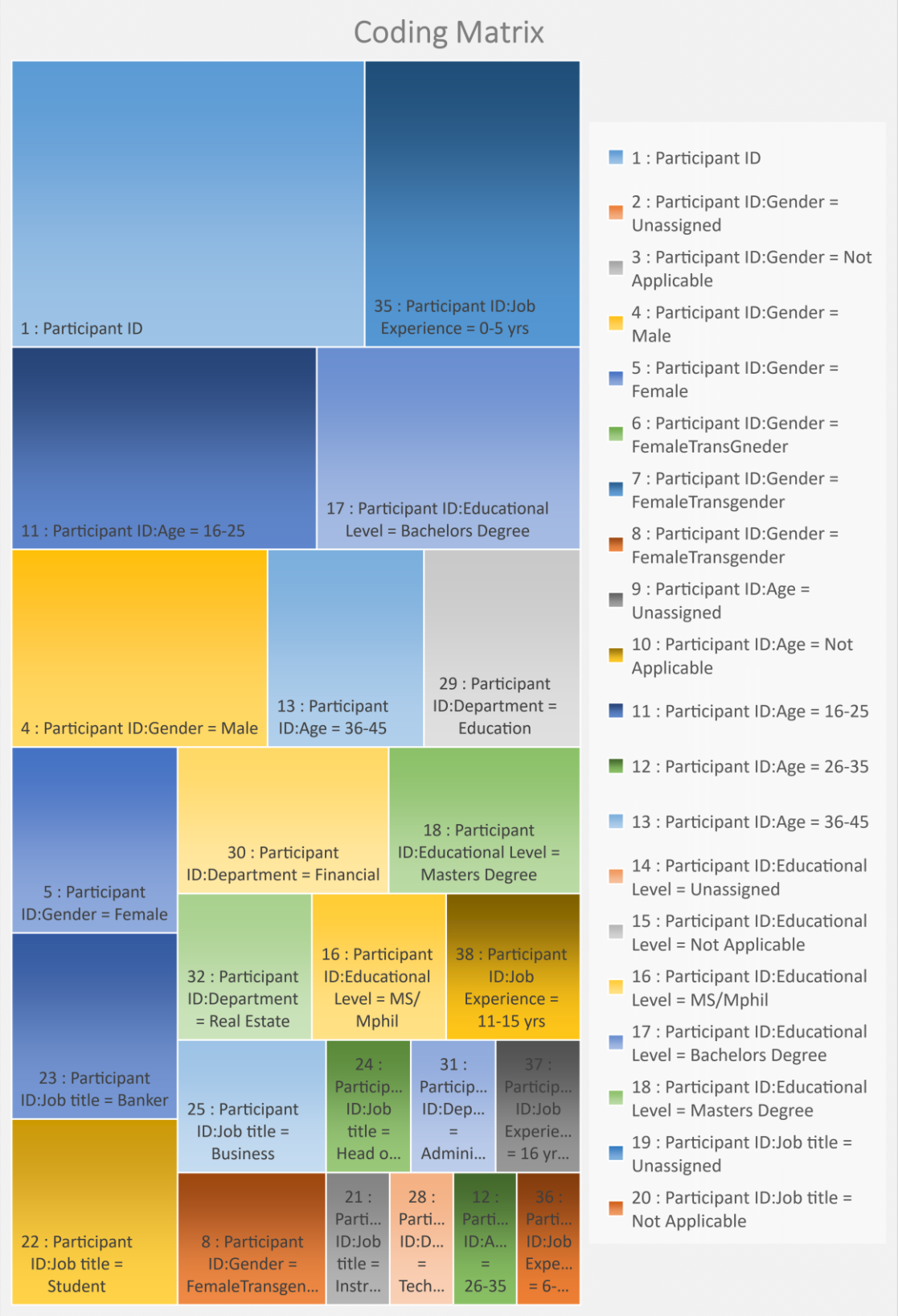

Figure 4. 3: Coding Matrices Tree representation

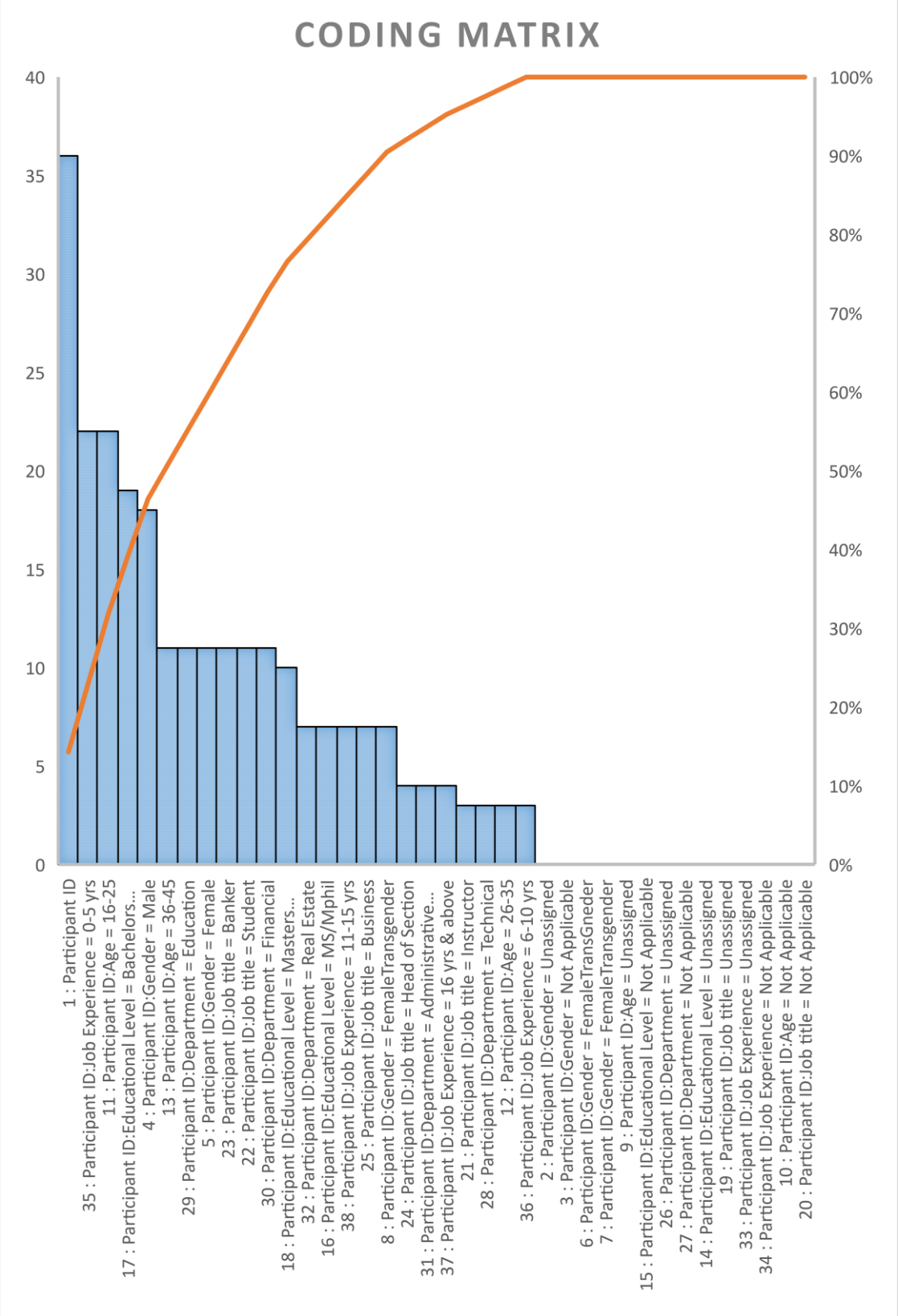

Figure 4. 4: Pareto graph of coding matrix

4.5 Nodes Themes and Patterns

The next important step in this study was to analyze the data and then draw conclusion and findings from it by considering main aim of study. Interviews were conducted along the route areas of 27 km of the OMLT in order to collect the view point of daily/ regular commuters / consumers with complete and unbiased results. After the collection of data from daily/ regular commuters / consumers, audio recorder interviews data was transcribed and nodes were generated with the usage of Nvivo, of deep analysis and expert judgement. The core nodes and themes identified in this study are appended in a tabular form generated at Nvivo code book generation. These themes

One important factor of Nvivo process analysis was the Text Query search. The text query search formed the basis that structured the process of logicalization and validation of the process of identifying and coding the nodes, built themes, and identify patterns among the responses of interviewees. The importance of the process of appropriation and reducing data is critical to ascertain the clarity and focus dimension of the research results. Thus process of appropriation and reducing data was adopted for thematic analysis and to evaluate the qualitative data inductively.

Some Examples of the Text Query search that structured the process of identifying and coding the nodes, built themes, and identify patterns are on the following pages. A process of appropriation and reducing data was adopted for thematic analysis and to evaluate the qualitative data inductively.

The result show close correspondence in the ideas discussed by different participants. For example every participant mentioned an incident of health hazard on board. Some of them highlighted the hazards happening without due notice of the operational staff. One member did mention that comfort is a phenomenon similar to independence but ruling the decision making process of personal commute and that too without carrying the burden of an asset on road & commuting with highly economic investment. On the following pages are the Nvivo generated nodes, themes, and patterns book and four word text query examples.

Table 4. 1: Code Book Nodes Themes and Patterns Nvivo Output

Name	Description
Consumers' Amenities Valuation (Anchor Code RQ2)	How the consumers determine the criteria of valuation of amenities and soft factor values?
Comfort	All instances where respondents discussed comfort in a journey
Economy	All the instances that are influencing consumer economic prioritization.
Efficiency	all instances where respondents discusses what makes journey efficient
Information	All the instance where information matrix (access & gap) is shaping consumer response and decision making
Quality Uplift	Instances where respondents highlighted there perspectives and concerns on quality
Safety	All instance where the respondents discusses about a safe journey
Policy Considerations	All the instances where the respondent has discussed policy decisions
National Policy consideration	All the instances where the respondent has discussed policy decisions
Sociological Impediments(Anchor Code for RQ 1)	Which sociological issues impede the project sociological reach and Why?
Accessibility	All instances where respondents has discussed the accessibility and connectivity proposition of OMLT route
Emergency Cases	All the instances where respondents shared reflections of some notable incidents
Feedback	All the instances where the respondents referred to feedback or was inferred on feedback
Indifferent approach	Instances where respondents shows indifference to asked probabilities
Environment	All instances where respondents discuss the natural environmental concerns.

Name	Description
Traffic Loads	All instances where the respondent discuss impact and reason on traffic loads
Travel Stereotypes	All instances that categorise Public Transport as a second rated option, and a proposition for the unprivileged.
Urbanization	Instances where respondent discusses the factors related to urbanization
Location	The area of residence of the respondent and the opportunities harboured of OMLT route location

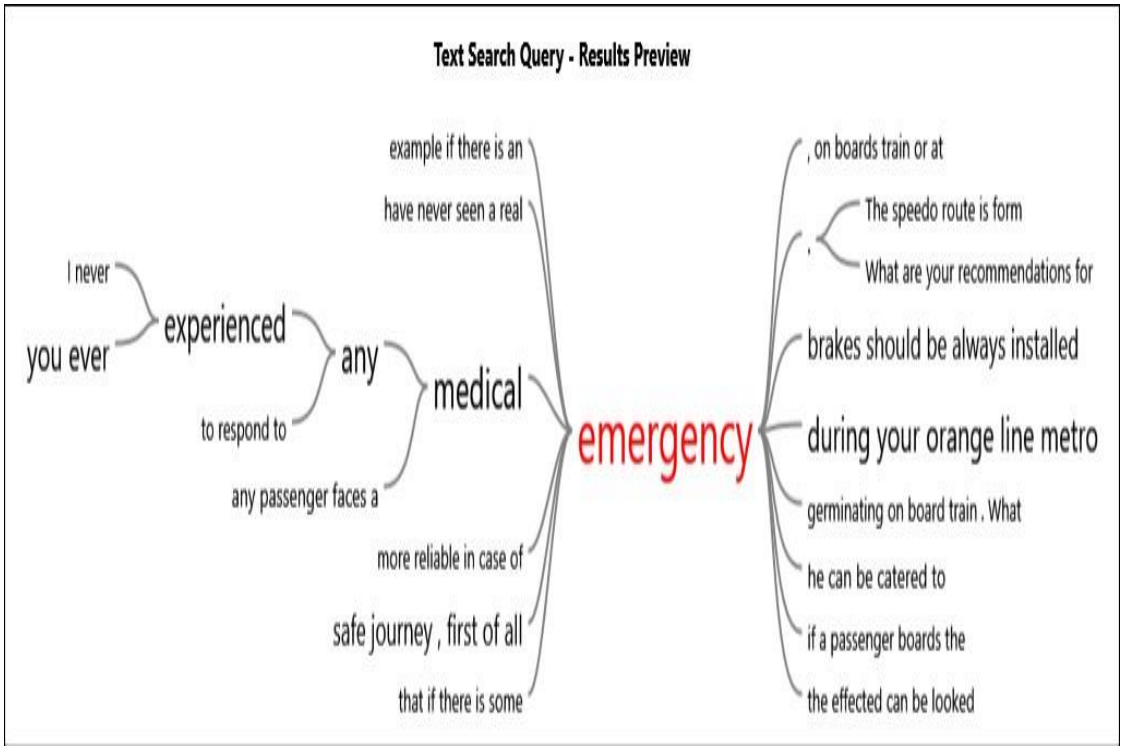

Figure 4. 5: Word Tree - Emergency

Some Examples of the Text Query search that structured the process of identifying and coding the nodes, built themes, and identify patterns are on the following pages. A process of appropriation and reducing data was adopted for thematic analysis and to evaluate the qualitative data inductively.

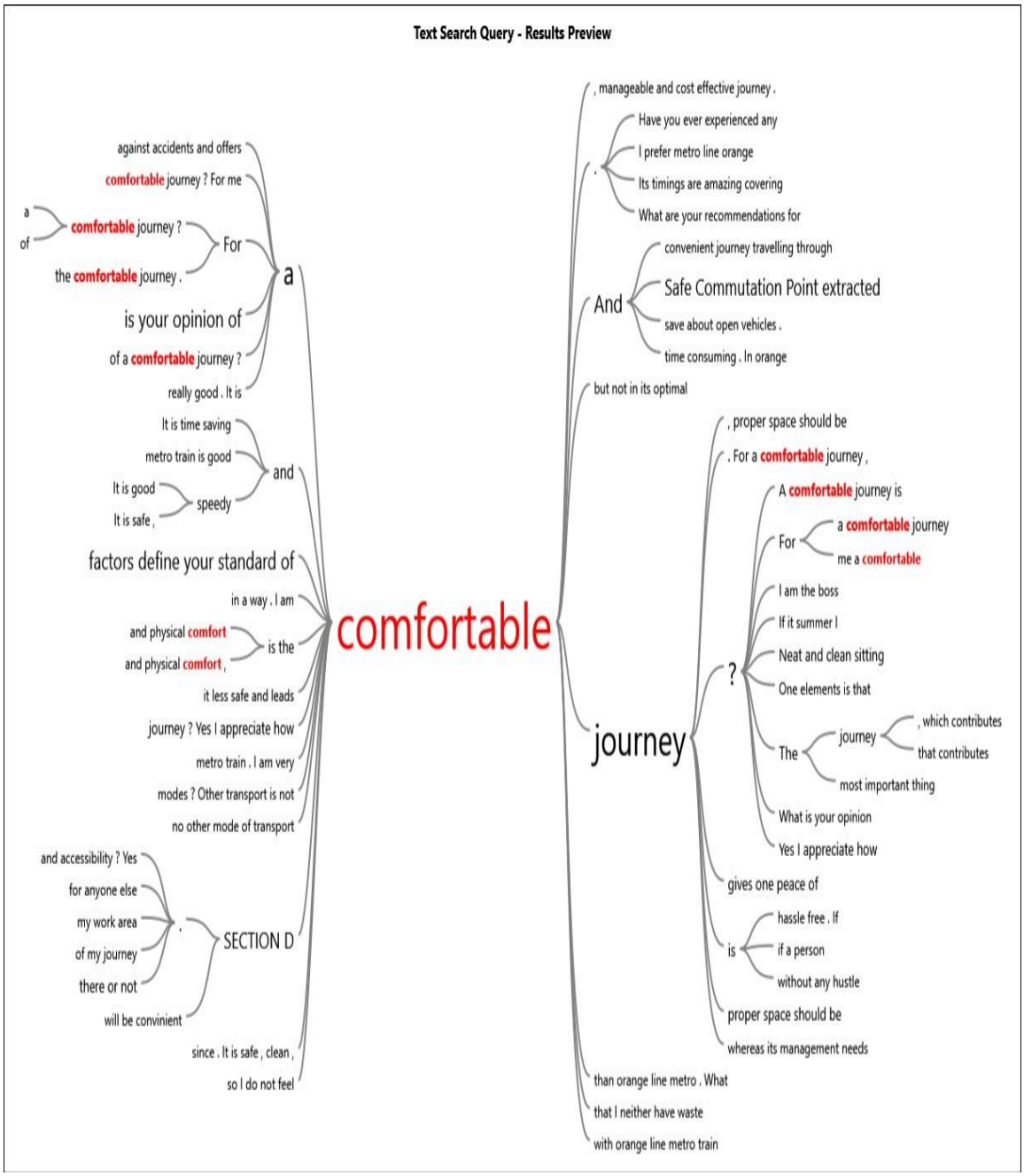

Figure 4. 6: Word Tree - Comfortable

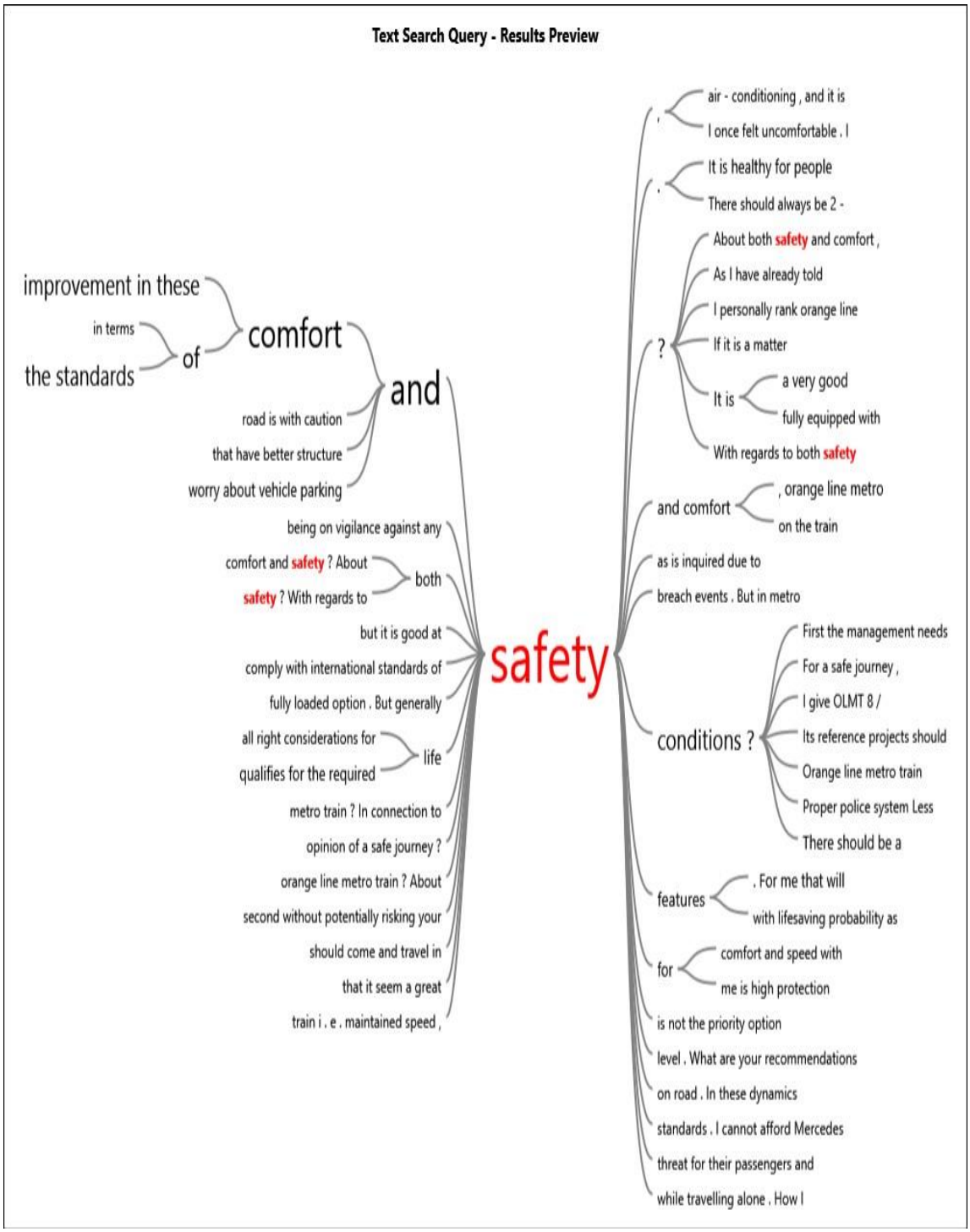

Figure 4. 7: Word tree Safety

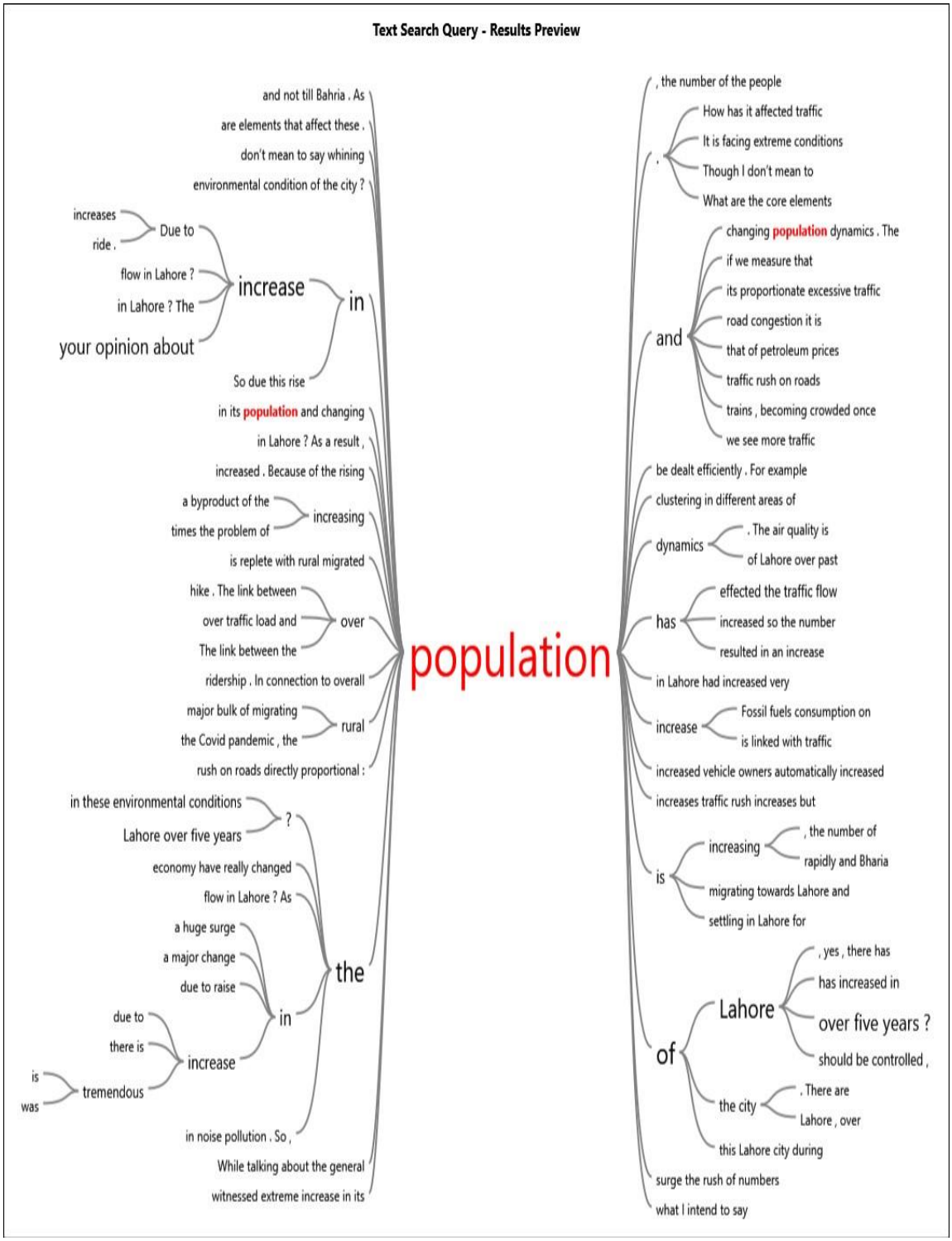

Figure 4. 8: Word Tree Population

4.6 Data Analysis

The next important step in this study was to analyse the data and then draw conclusion and findings from it by considering main aim of study.

Eight interviews were conducted from different stations areas in order to collect the view point of local residents with complete and unbiased results. After the collection of data from local residents, data was transcribed and nodes were generated with the usage of deep analysis and expert judgement. Major nodes generated from all these nine interviews are explored comparatively in the below two diagram as how two different respondent response cluster around an identified node.

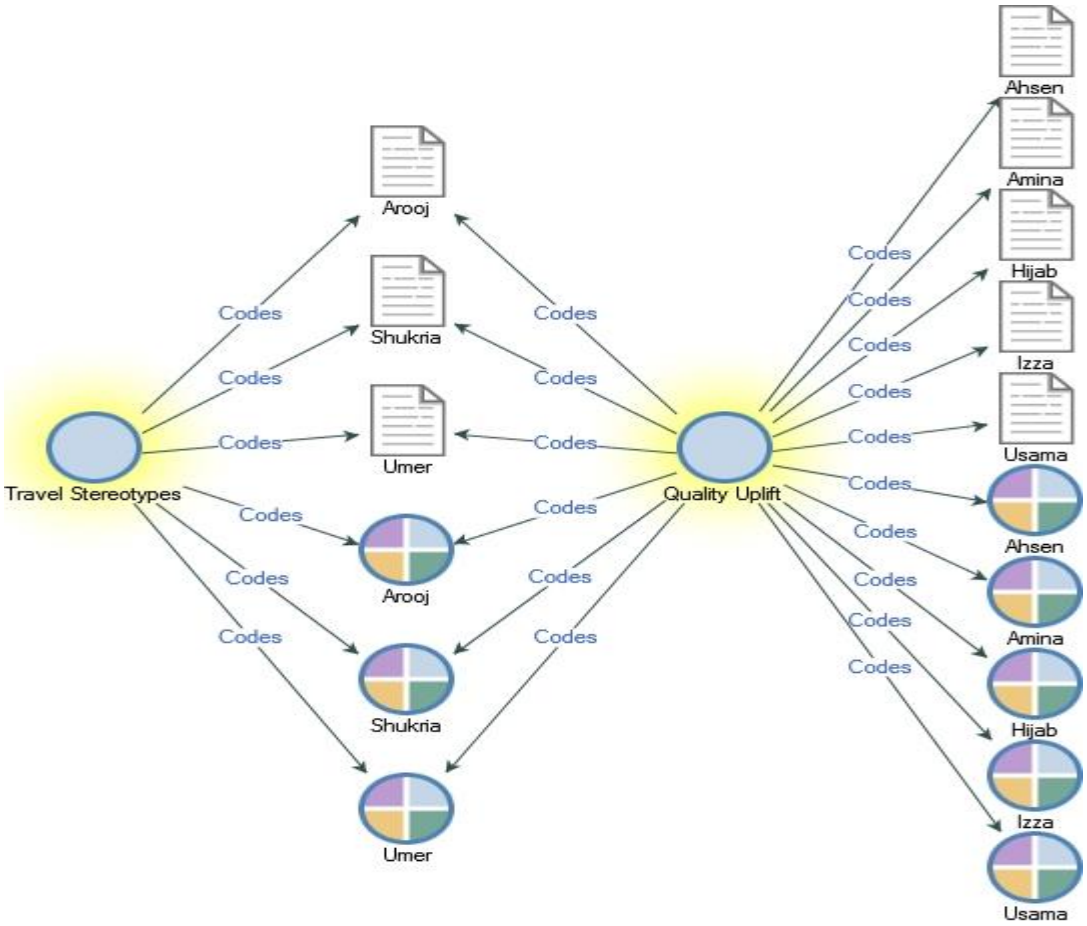

Figure 4. 9: Participants Perception of Sociological Impediments and Consumer amenities Comparison diagram at thematic nodes Travel Stereotypes and quality Uplift

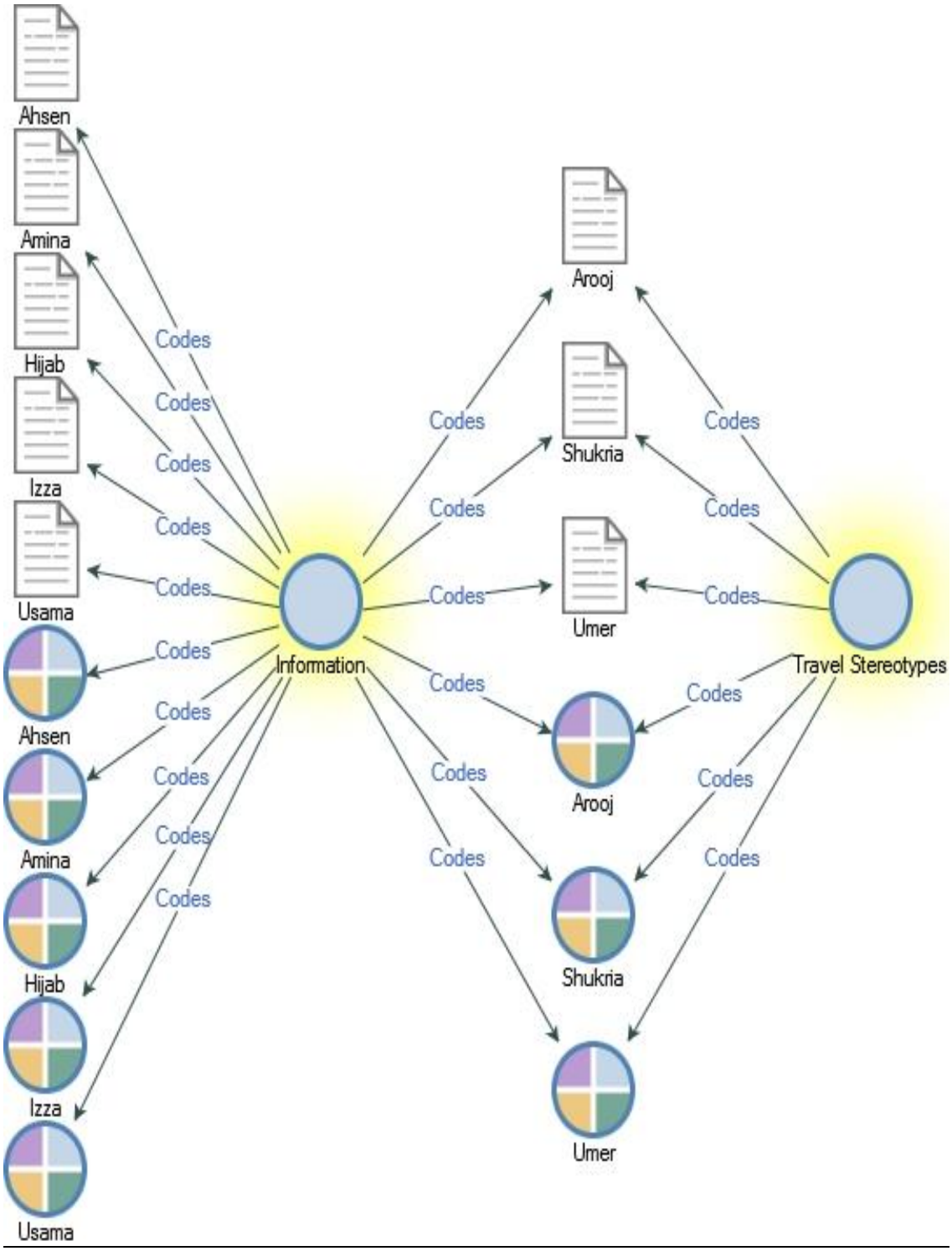

Figure 4. 10: Comparison Diagram of nodes Information and travel stereotypes.

The below figure of coding matrix query represents that how participants attitude towards different CAV affects project reach along with the ifs and buts of buts of sociological impediments and policy gaps.

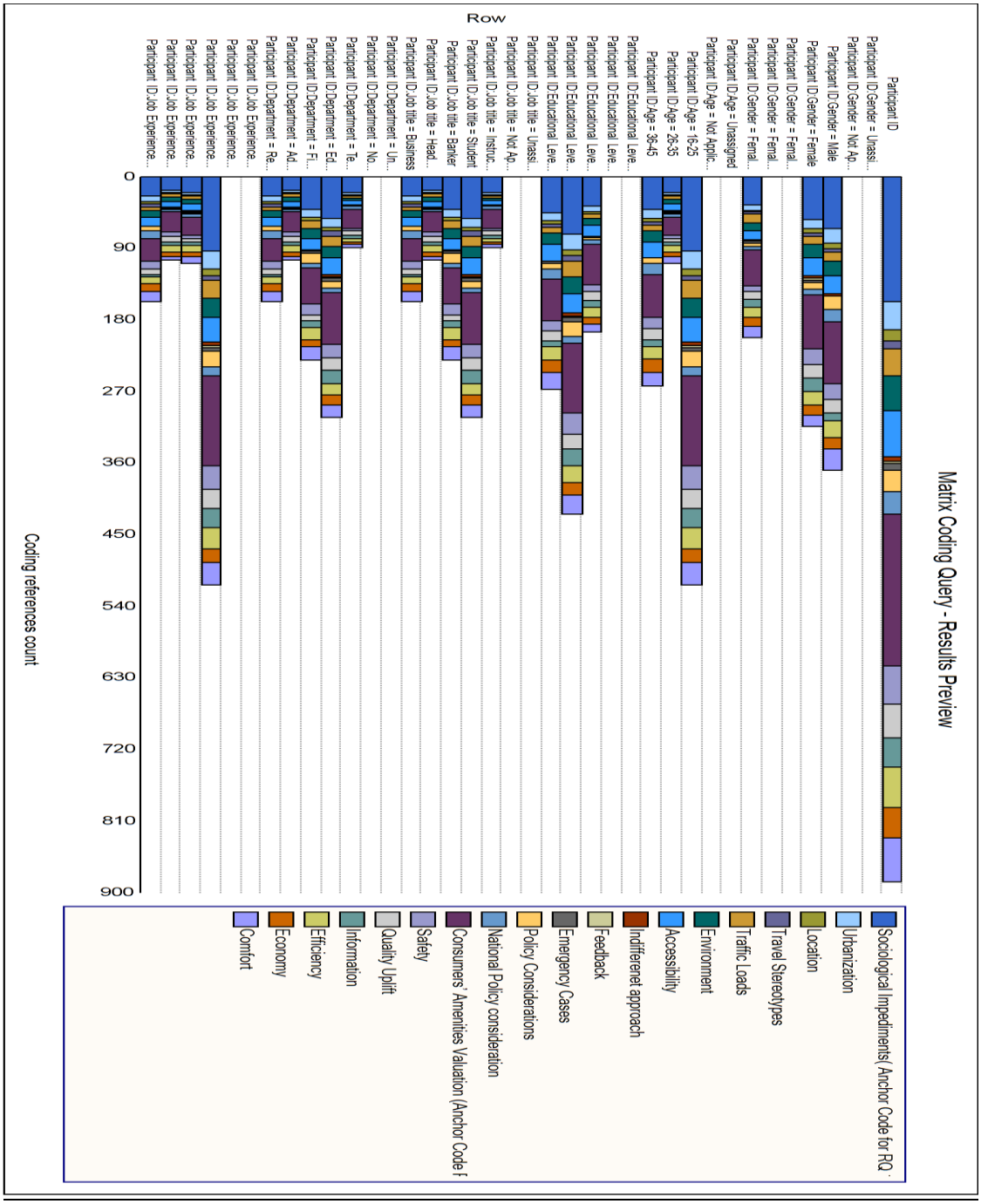

Figure 4. 11: Respondents Consumers' Amenities Perception

The below figure is a tree representation of nodes compared by coding reference that how participants attitude towards different CAV affects project reach along with the ifs and buts of sociological impediments and policy gaps

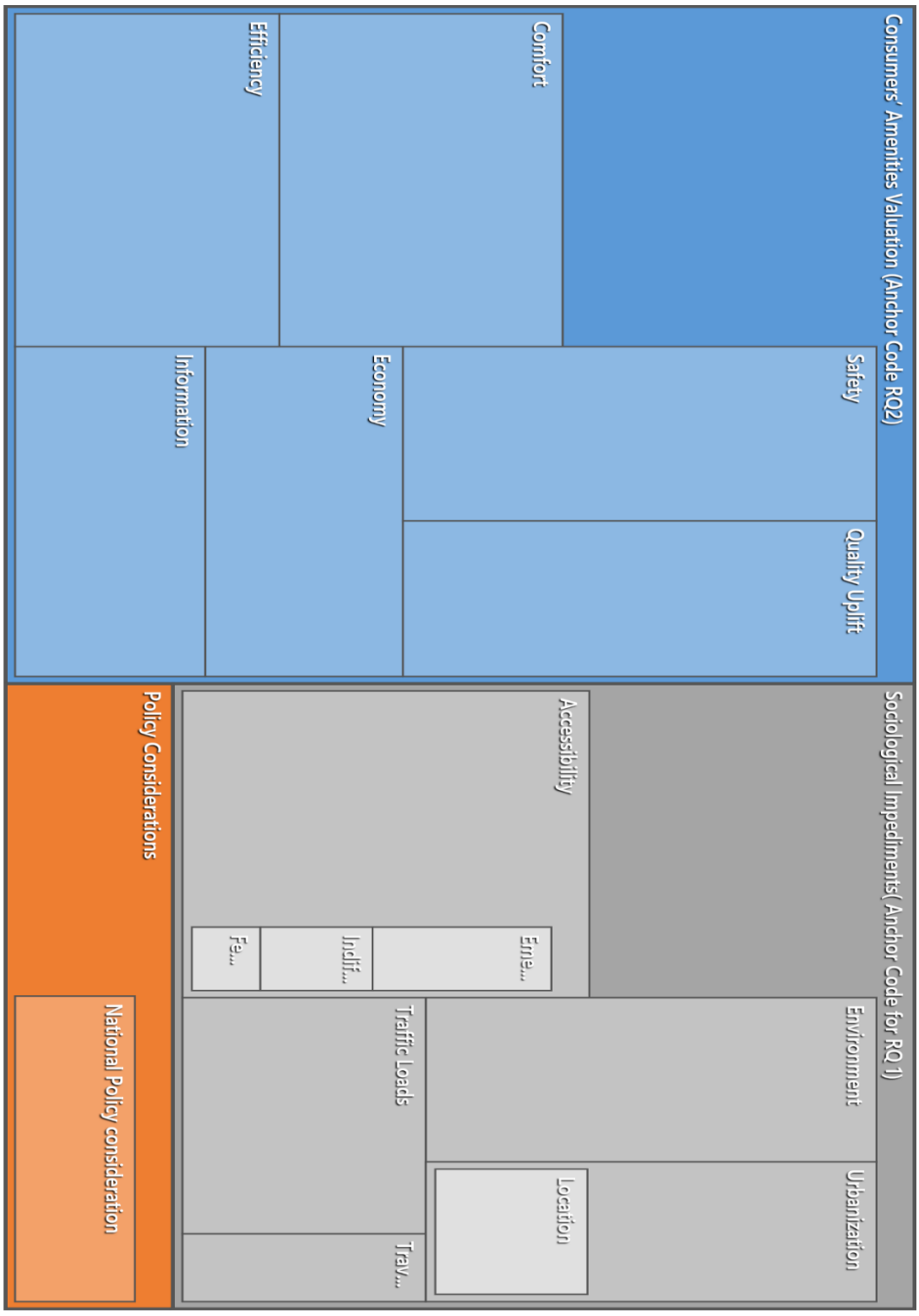

Figure 4. 12: Nodes compared by number of coding Reference

The below figure is a tree representation of sources compared by coding reference that how participants attitude towards different CAV affects project reach along with the ifs and buts of sociological impediments and policy gaps

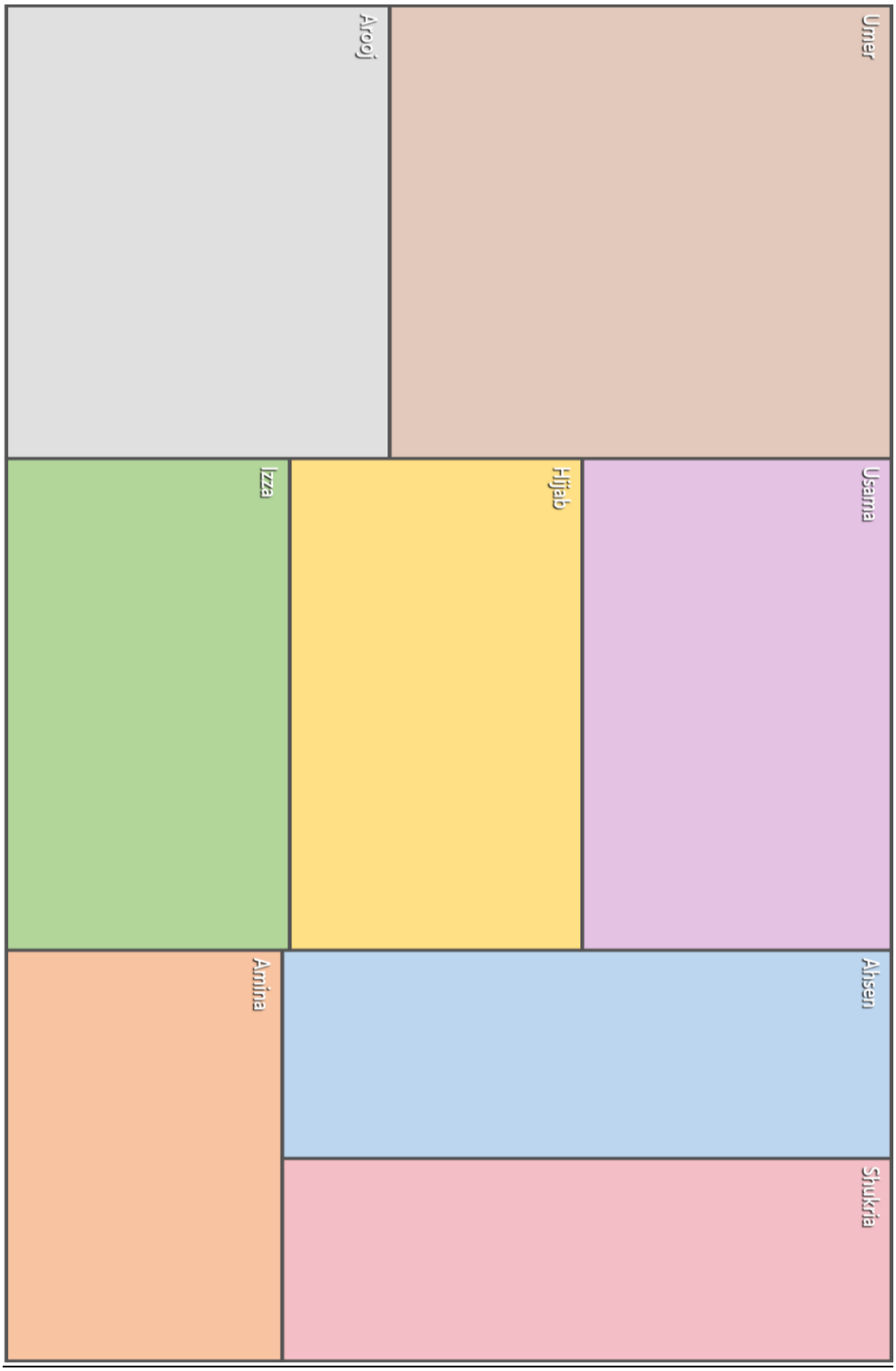

Figure 4. 13: Sources Compared by numbers of coding reference

The below figure is a Sunburst representation of sources compared by number of coding reference at node policy making that how participants attitude towards different CAV affects project reach along with the ifs and buts of policy gaps references coded at the node impediments and policy gaps

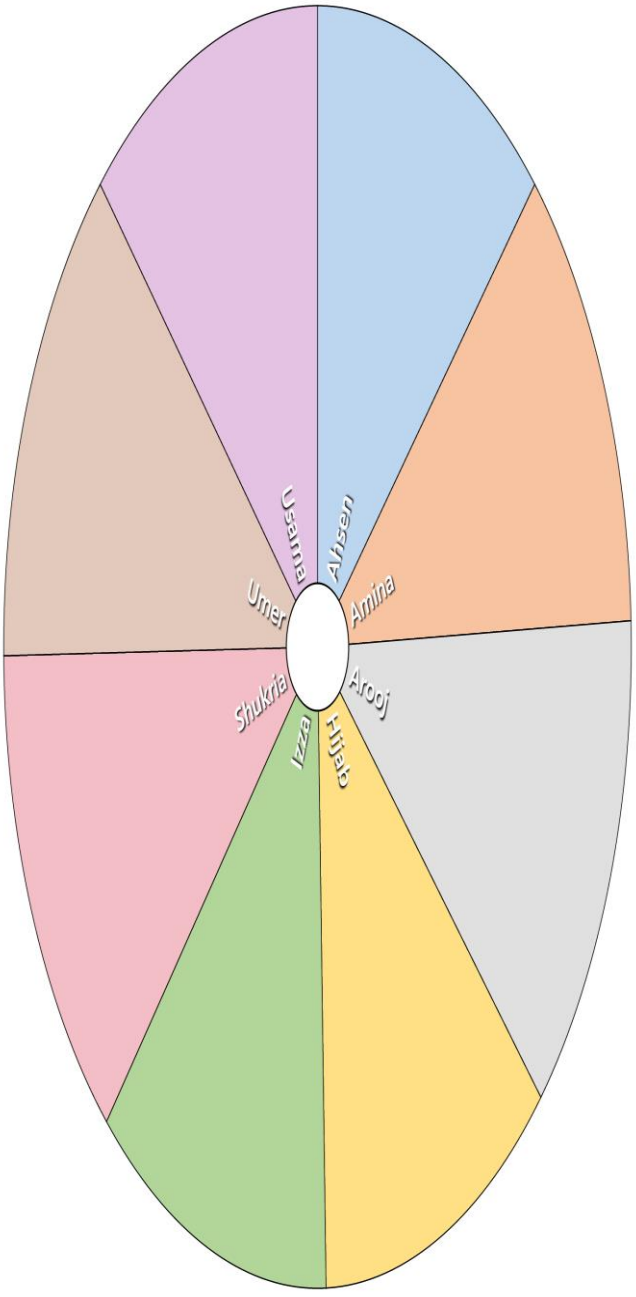

Figure 4. 14: Sources Compared by numbers of coding reference on Policy Considerations Sunburst

The below figure is a tree representation of sources compared by number of coding reference at node policy making that how participants attitude towards different CAV affects project reach along with the ifs and buts of policy gaps references coded at the node impediments and policy gaps

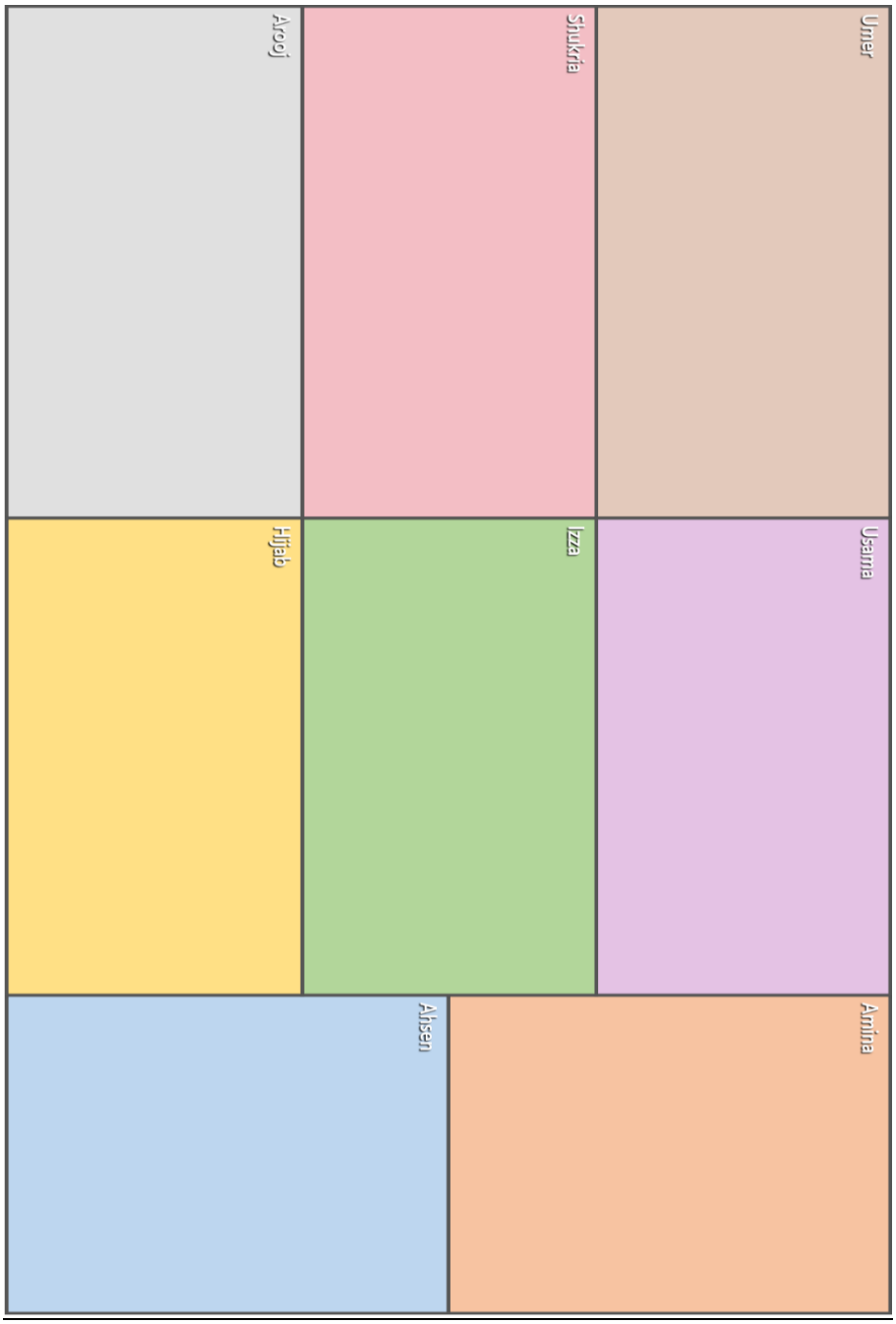

Figure 4. 15: Sources Compared by numbers of coding reference on Policy Considerations

The below figure is a Sunburst representation of sources compared by number of coding reference at node policy making that how participants attitude towards different CAV affects project reach along with the ifs and buts of policy gaps references coded at the node population challenges.

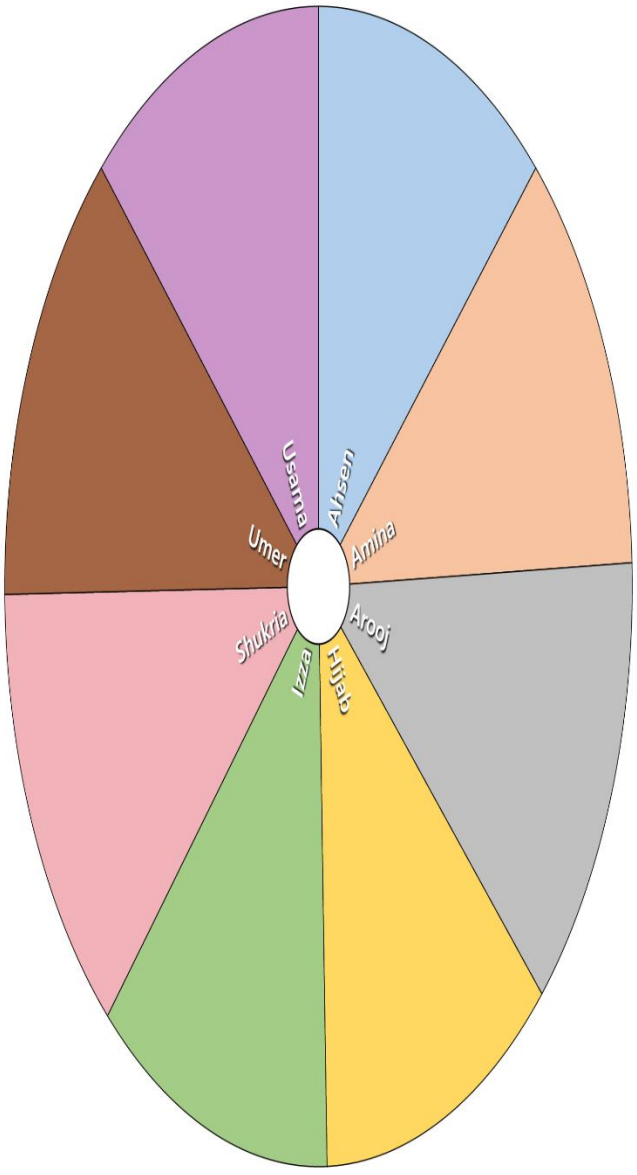

Figure 4. 16: Sunburst diagram of Sources Compared by numbers of nodes coding at impact of Population

. Major nodes generated from all these nine interviews are explored comparatively in the below two diagram as how two different nodes are reference coded at different respondents. See response cluster around an identified node.

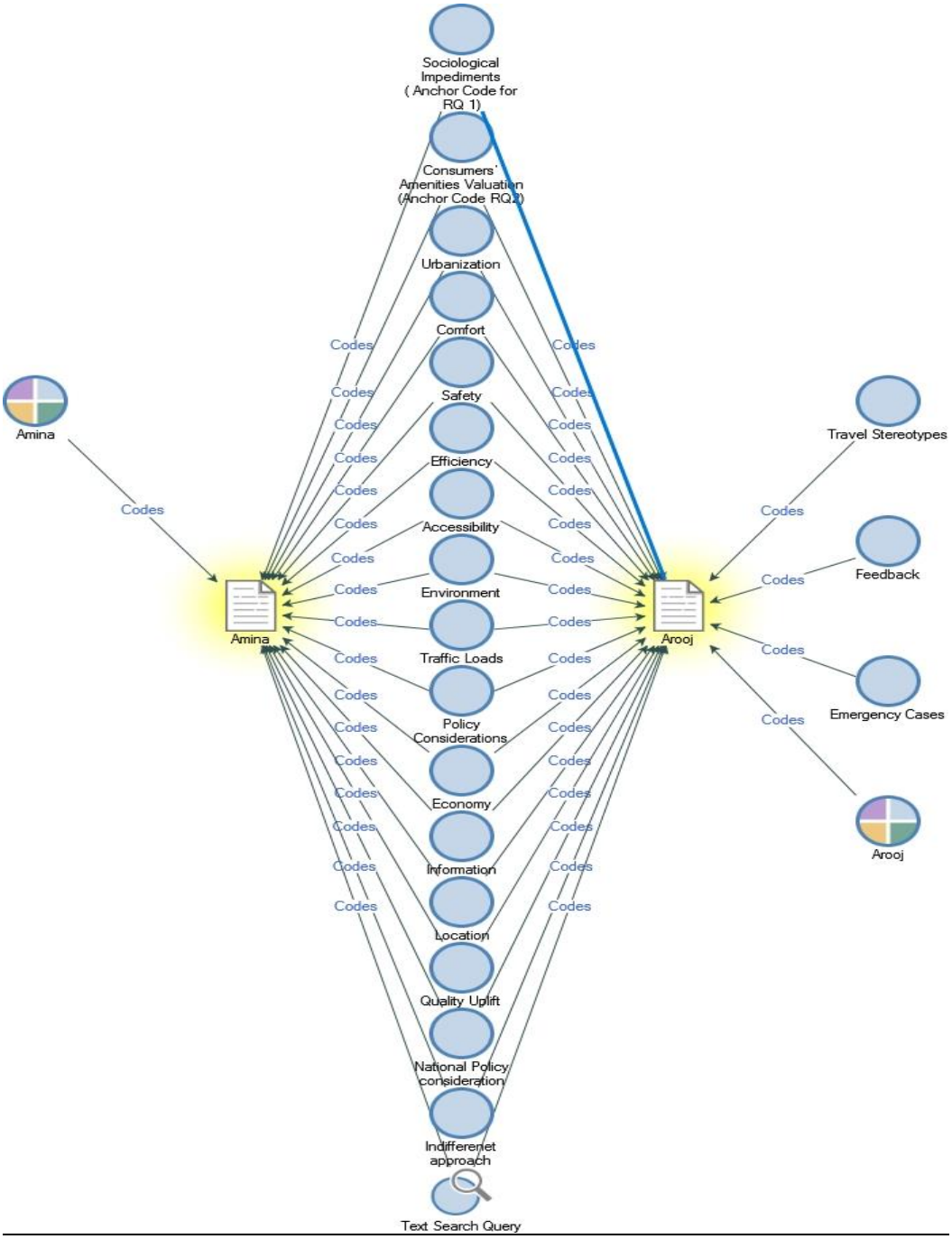

Figure 4. 17: Comparison Diagram of Sources coded

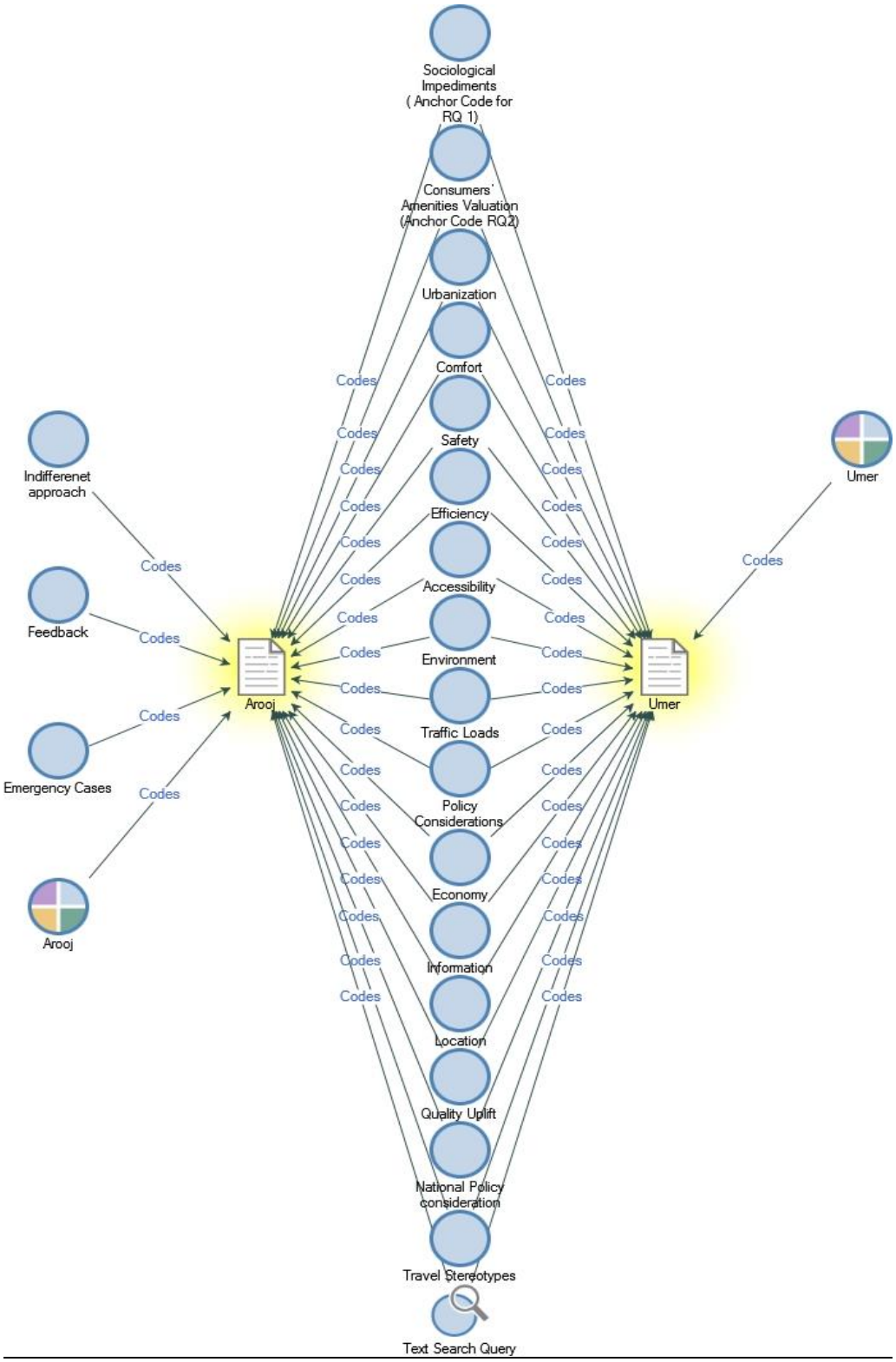

Figure 4. 18: Comparison Diagram of Sources coded

Major nodes generated from all these nine interviews are explored comparatively. Below is yet another diagram as how two different nodes are reference coded at different respondents. See response cluster around an identified node

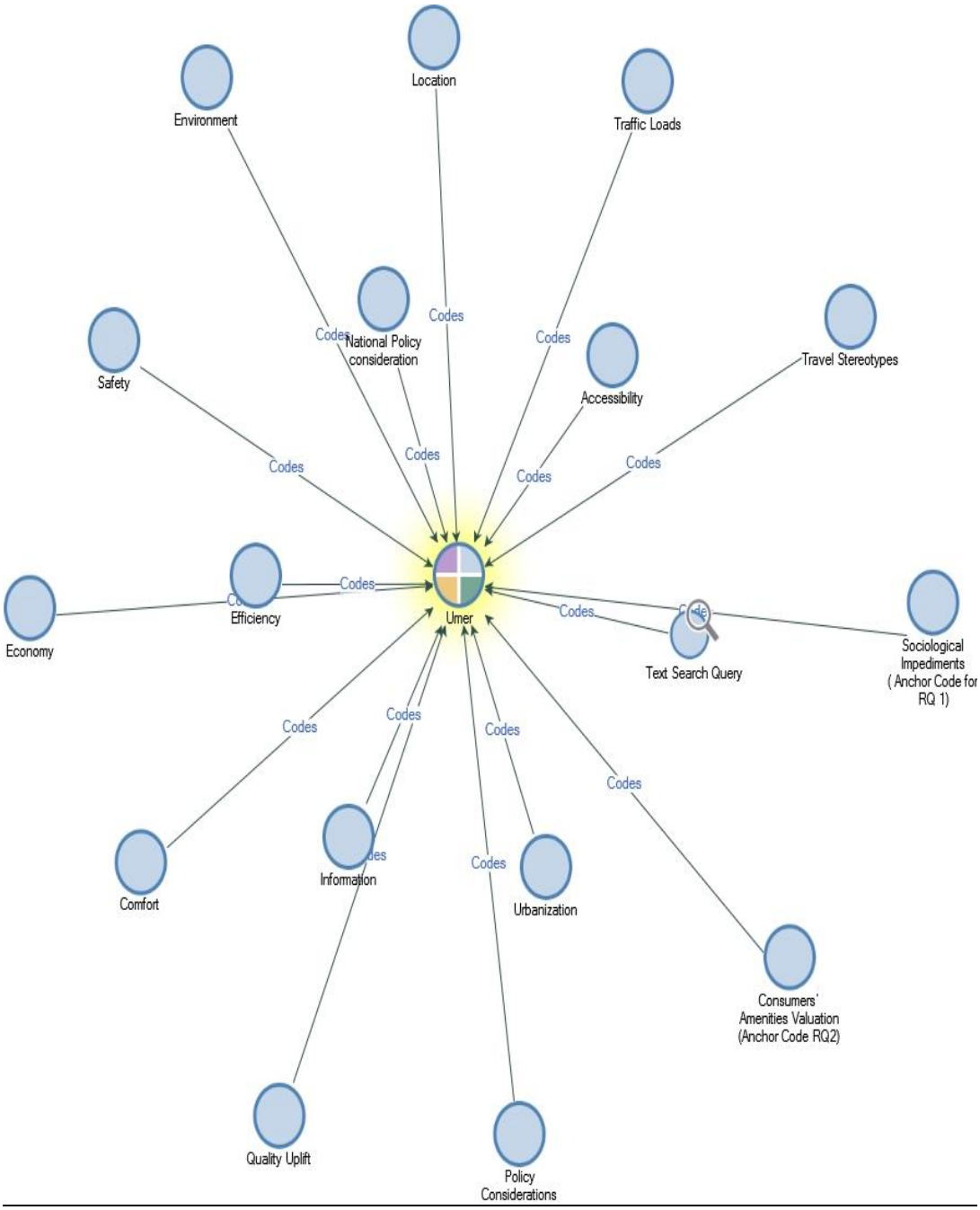

Figure 4. 19: Comparison diagram of nodes connected to a source

4.7 Demographic Analysis

Following map of demographic of sample gender diversity and sample hierarchal analysis of sample demographic are generated at Nvivo gives a clear representation of the above billeted characteristics.

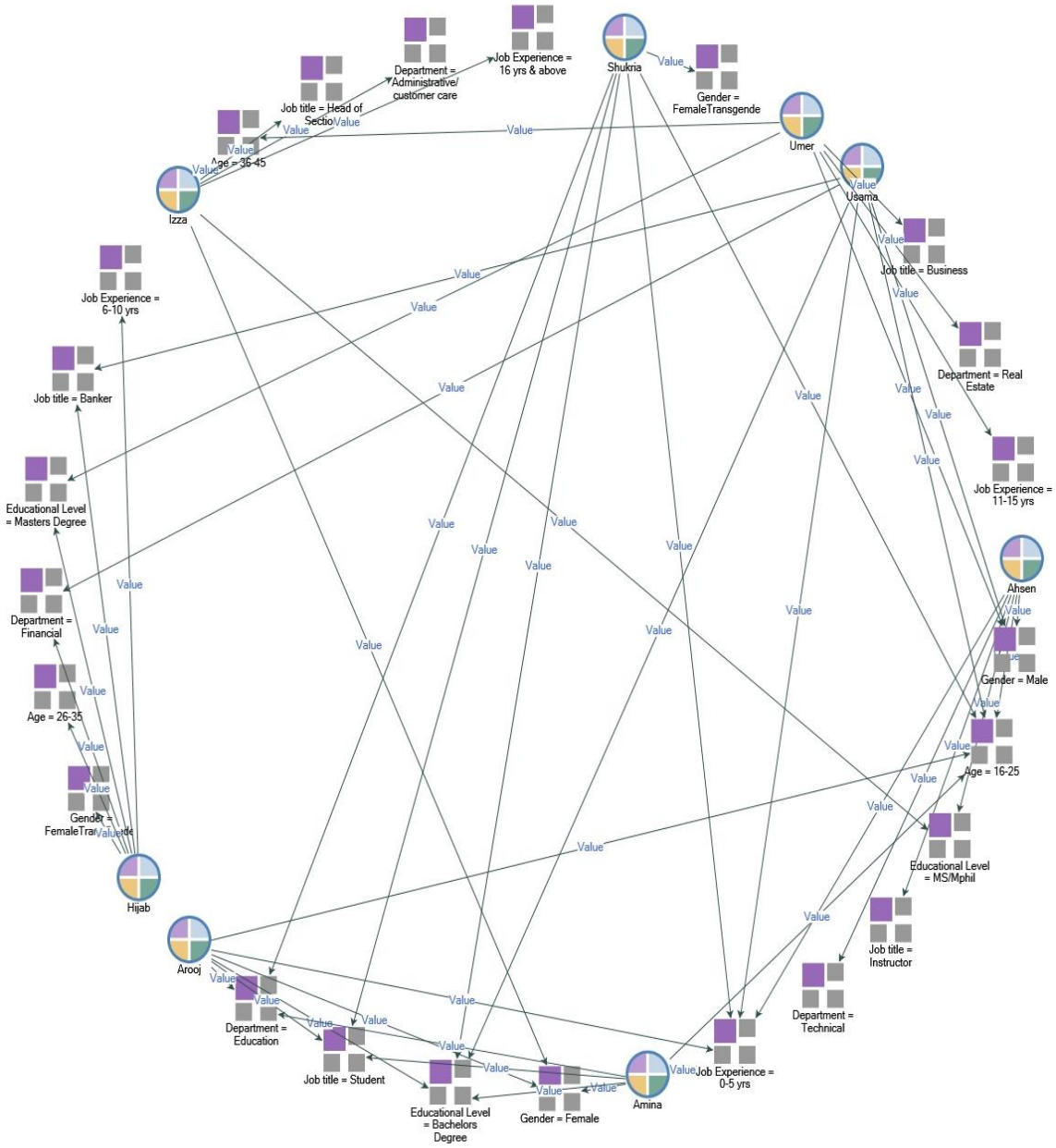

Figure 4. 20: Demographic Dynamics on Gender, Age, Trade, Discipline and Experience

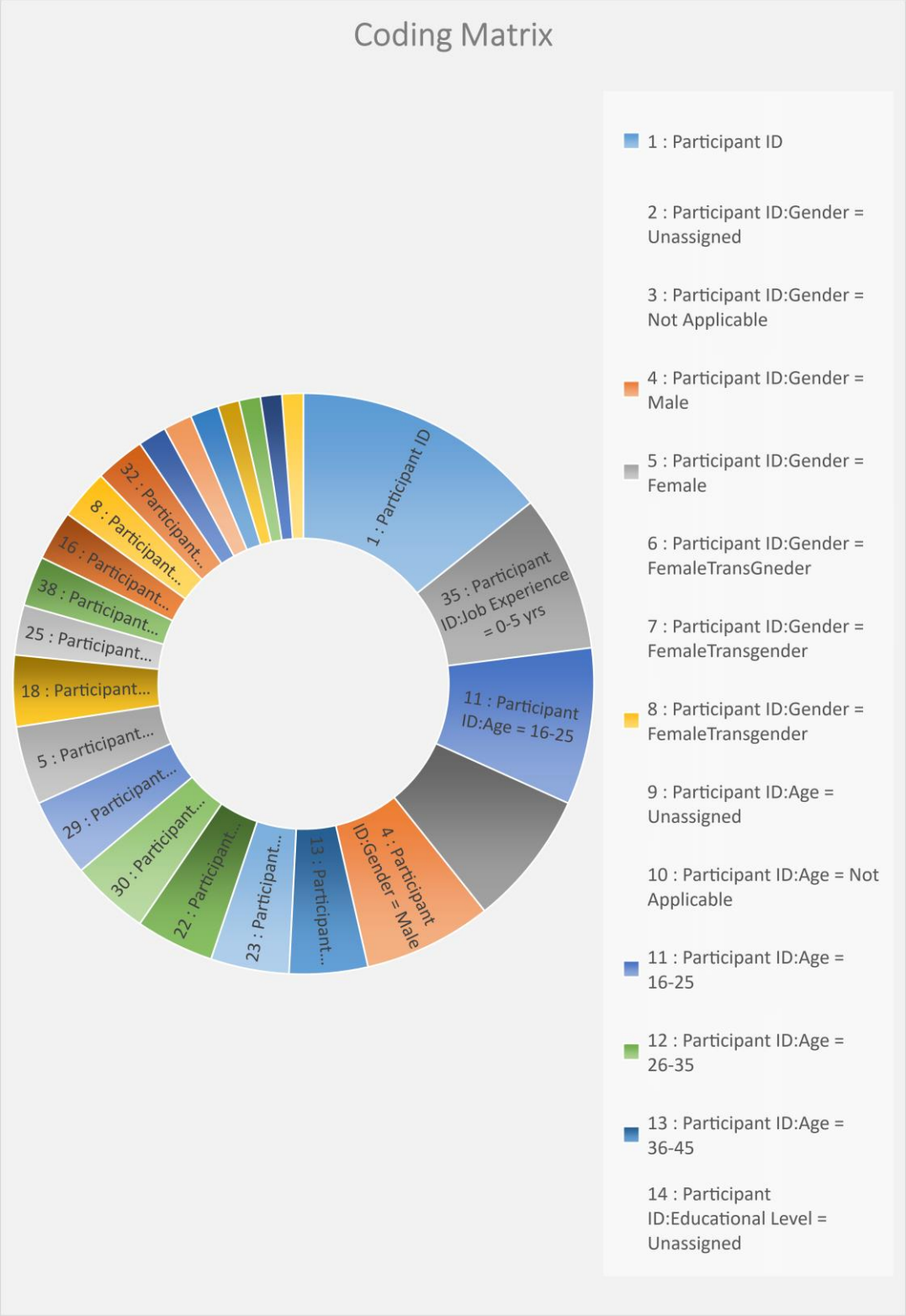

Figure 4. 21: Coding Matrix Sunburst

Nodes generated from transcribed interviews are explored individually: as to how gender clusters at demographics, comparatively in the below diagram interact. How a node is reference coded at different respondents. See response cluster around an identified node

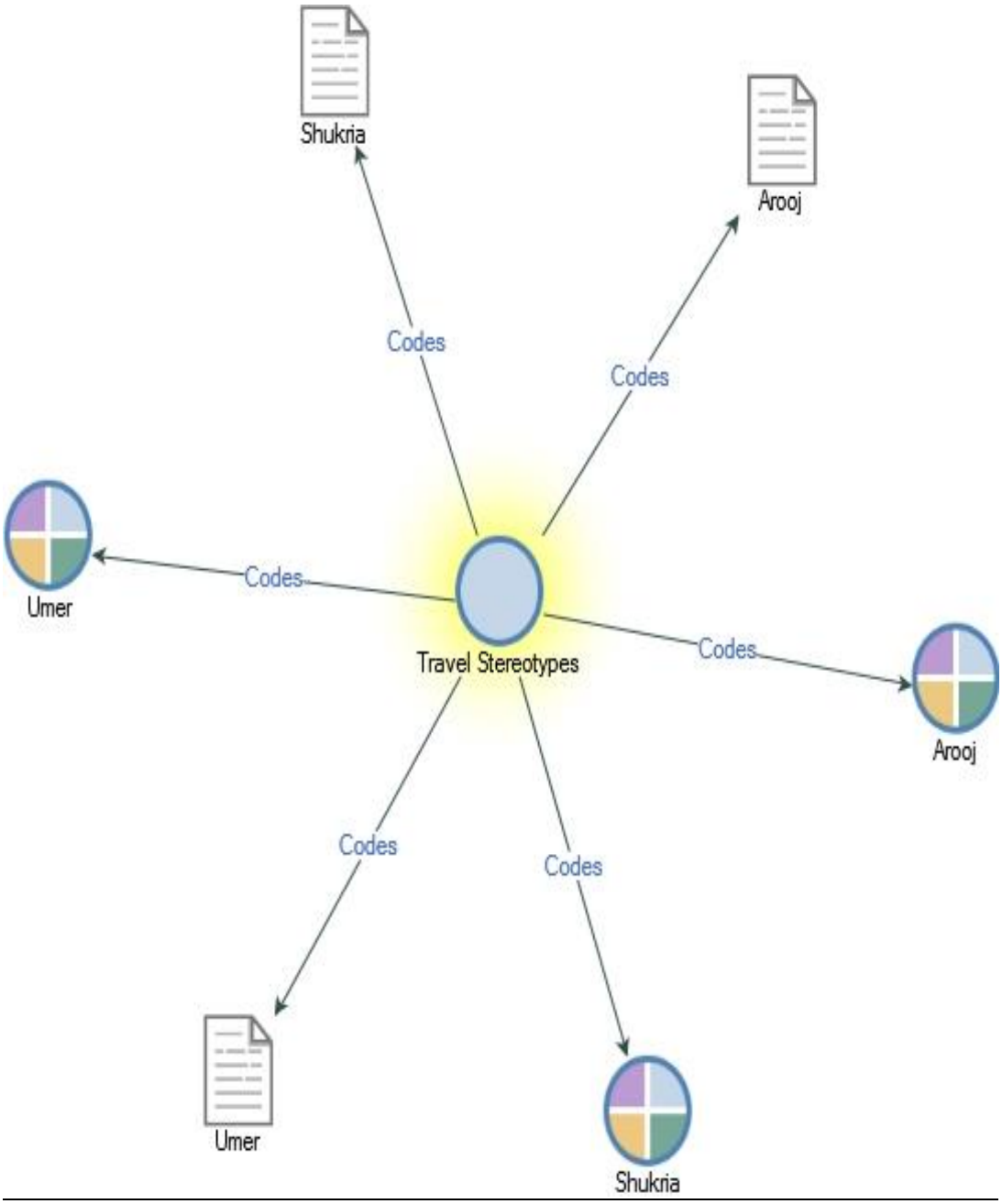

Figure 4. 22: Comparison diagram of sources Gender base connected to a node

4.8 Frame Work

The data interpretation's is finalized with framework generation. This tabular formation of the framework is generated at Nvivo at framework matrices. This is cross tabulating of the qualitative data.. It enables researcher to view cases by codes and auto summarize them to match the references across. .The framework matrices are used to generate summaries manually written based on the content within the files the researcher is looking at. This is specific methodology used for only small groups and support the framework analytical approach

4.9 Project Frame Work

Table 4. 2: Project Frame Work Matrix Table Nvivo Output

	A : Consumers' Amenities Valuation (Anchor Code RQ2)	B : Policy Considerations	C : Sociological Impediments(Anchor Code for RQ 1)
1 : Ahsen Gender = Male Age = 16-25	Yes. OMLT saves our time, since it's departure and arrival is properly scheduled. The lack of traffic makes it very convenient for ordinary citizens. Lahore is plagued by overpopulation. It has led to more environmental damage, pollution, and wastage of time when people are stuck in traffic for hours. With the start of orange line	They should cover as many areas as possible for the ease ofresidents. Public convenience should be the utmost priority. They should be safe and affordable.	I live in Icchhra, Lahore OMLT saves our time, sinceit's departure and arrival is properly scheduled. The lackof traffic makes it very convenient for ordinary citizens. Lahore is plagued by overpopulation. It is very difficult to travel within Lahore due to traffic issues on all main avenues. It has led to more environmental damage, pollution, and wastage of time when people are stuck

2 : Usama Gender = Male Age = 16-25	Yes, I am Using since 2 years Other transport is not comfortable and time consuming. In orange line metro train it is easy to travel and it also saves time because it has a dedicated route it own special route so it saves time since there is no traffic over it. That is why it is beneficial for me. The other public transport we have is in its same shabby and vulnerable condition since long. In addition, it seems that it will just fall	Post covid19 people are travelling from rural areas towards Lahore that is why there is increase in the population. I think feeder routes should be added. By adding, more feeder routes there will be speedo buses on those routes where these were not before and on those routes where there is already speedo bus on feeder routes the number of buses is less. Since there is tremendous increase in the population and if we measure that	Do you use public transport?Yes I do very frequently Do you use Orange Line Metro Train for daily commutation while travellingto your work/ job place? Yes, I am Using since 2 years Other transport is not comfortable and time consuming. In orange line metro train it is easy to traveland it also saves time because it has a dedicated route it own special route so

	A : Consumers' Amenities Valuation (Anchor Code RQ2)	B : Policy Considerations	C : Sociological Impediments(Anchor Code for RQ 1)
3 : Umer Gender = Male Age = 36-45	Yes I frequently use this public transport. As I have totravel from Shalimar to Bahria town. However, it does not go to Bahria. Though its access is limited yet it is an ease to ravel in comfort till Thokar and then use private transport on routeto Bahria. It is quiet time efficient. Even though I have my personal transport available, yet for me it is convenient to travel through metro line orange train. Since Lahore has become overtly populatedand its roads are very	The speedo route is form Thoker till only bypass and not till Bahria. As populationis increasing rapidly and Bharia is an extension of Lahore so a feeder route to cover this distance with speedo service will serve us consumers. It will serve not only us but also the purpose for which this service is developed. Because the morethe passengers travel throughthis service in comfort the better, it serve its purpose. So I suggest that the feeder route be provided in extended areas of Lahore to	Where do you live? I live in Shalimar and have business in Bahria town Do you use public transport? Yes, I frequently use this public transport. Yes I frequently use this public transport. As I have totravel from Shalimar to Bahria town. However, it does not go to Bahria. Though its access is limited yet it is an ease to ravel in comfort till Thokar and then use private transport on route to Bahria. It is quiet time efficient.
4 : Amina Gender = Female Age = 16-25	Not daily, but I travelled by OLMT for more often you can say its a 60% on metro and 40 % personal vehicle. OMLT saves our time, sinceit's departure and arrival is properly scheduled. The lackof traffic makes it very convenient for ordinary citizens. With the start of orange line metro train operation, do you think there is uplift in the level of public transport service? Yes, OLMT is a very beneficial initiative which	There should be a connectivity between major hospitals and OLMT so that if any passenger faces a medical emergency he can becatered to in due time. There should also be a 1122 desk for immediate help. There should be more feeder routes that can connect the OLMT main route to the expansion communities of Lahore. Some small patches are left abandoned, e.g. fromMuslim Town Underpass onwards, they should also beincluded in the route. This way the student of PU and	Where do you live? I live in Baghbanpura, Lahore. Do you use public transport? Yes, being a student, I do use public transport every once in a while. OMLT saves our time, since it's departure and arrival is properly scheduled. The lack of traffic makes it very convenient for ordinary citizens. Lahore is plagued by overpopulation. It is very difficult to travel within

	A : Consumers' Amenities Valuation (Anchor Code RQ2)	B : Policy Considerations	C : Sociological Impediments(Anchor Code for RQ 1)
5 : Arooj Gender = Female Age = 16-25	Before this, I had never travelled by a public transport. When OLMT was inaugurated, I thought it would be safe. And I started travelling through orange linemetro train; and it has been a pleasant experience ever since. It is safe, clean, comfortable and convenient journey travelling through Orange Line metro train. It environment is really good. THEREFORE, I had no issues travelling through orange line metro train. One can easily adjust into its environment.	As for the system to register, record, or complaint where you could report that one such person is bothering you and making you uncomfortable. We used to travel in women side and he would maneuver this way that he would board the train from women side. Usually the station management board and check the train at station to verify that no male is getting to female side but unfortunately during those days no such watch was operative for do not know what reason. It is not a procedural routine obligatory for the staff but they do it out of courtesy they do it for women comfort. Or sometimes some	Where do you live? I live in near Thokar Niaz Baig, Raiwind road, Lahore. Do you use public transport? Yes. If it is in connection to transport then I need to reflect as since the increase in the petroleum prices the use of public transport has immensely increased as compared to the earlier figureof daily riders of the orange line metro train. So raise in petroleum is responsible for raise in overpopulation in orange line metro train
6 : Izza Gender = Female Age = 36-45	Yes I use orange line train for travelling purpose . But along with this I also travel by Speedo bus because orange line metro is interlinked routes. It is not directly approachable so I have to travel by other modes of transport as well. Although I prefer personal transport over public but because of increasing inflation it is impossible for middle class to afford petrol.It has reasonable fare so that's why I prefer it. One of the major differencei the environment Hygiene	For a safe journey, first of all emergency brakes should be always installed there . Special staff should be appointed to facilitate passengers . All health protocols should be promotedin order to reduce the risks ofdiseases in people . Police , and civil forces should be there to protect the passengers from any kind of mishap. Routes should be linked with health care centers. Rs.id you ever face any uncomfortable experiencewhile travelling through orange line metro train?	Where do you live? Raiwand Road Do you use public transport? Yes, I use it off and on. Yes I use orange line train for travelling purpose . But along with this I also travel by Speedo bus because orange line metro is interlinked routes. It is not directly approachable so I have to travel by other modes of transport as well. Although I prefer personal transport over public but because of increasing
	A : Consumers' Amenities	B : Policy Considerations	C : Sociological

	Valuation (Anchor Code RQ2)		Impediments(Anchor Code for RQ 1)
7 : Shukria Gender = FemaleTransg...	As compare to other modes of transport, orange line metro train is better. It provides both mental and physical comfort. Secondly, its hygiene conditions are remarkable as compare to other modes of transport. Its quality is excellent and it saves my time. I can reach tomy destination in the accurate time. Whereas whiletravelling by other vehicles my time is wasted because ofheavy flow of traffic. We cantravel comfortably in orange line metro train in the harsh weather. In addition, the fare	Physical environment of Lahore Is badly polluted. Lahore has been declared as the most polluted city in the world. Smog is effecting the city badly. A large number ofcars, buses, bikes etc. is adulterating the city. This environment is causing manyhealth issues as well. Routes should be interconnected so that no onewould face any kind of difficulty. Areas, which are hubs of business, education and health, should be interconnected to facilitate the passengers Without	Where do you live?Sabzazar Lahore Do you use public transport? Yes, I use public transport As compare to other modes of transport, orange line metro train is better. It provides both mental and physical comfort. Secondly, its hygiene conditions are remarkable as compare to other modes of transport. Its quality is excellent and it saves my time. I can reach to my destination in the accurate time. Whereas while travelling by other vehicles
8 : Hijab Gender = FemaleTransg...	Yes, I use because that is the most convenient way of traveling to far away from work place. Orange line train have more fast service than other public ones. Routes are assigned and it does not have to stopbecause of traffic. As a result, population increased vehicle owners automatically increased which affected the flow of traffic in Lahore and createdfuss. Yes, public transport service	Orange line metro train could get better with proper supervision of security and check and balance of boadingpassengers. The connectivity of healthy and educational institute main routes of city and feeder routes of train shouldbe the main concern of any project. For me comfort is a peace ofmind	Where do you live?Near Thoka. Do you use publictransport? Yes, I use them sinceI have started my jobI have been using orange line metro train. Yes, I use becausethat is the most

4.10 Project Map

The project map is generated using Nvivo function of project maps

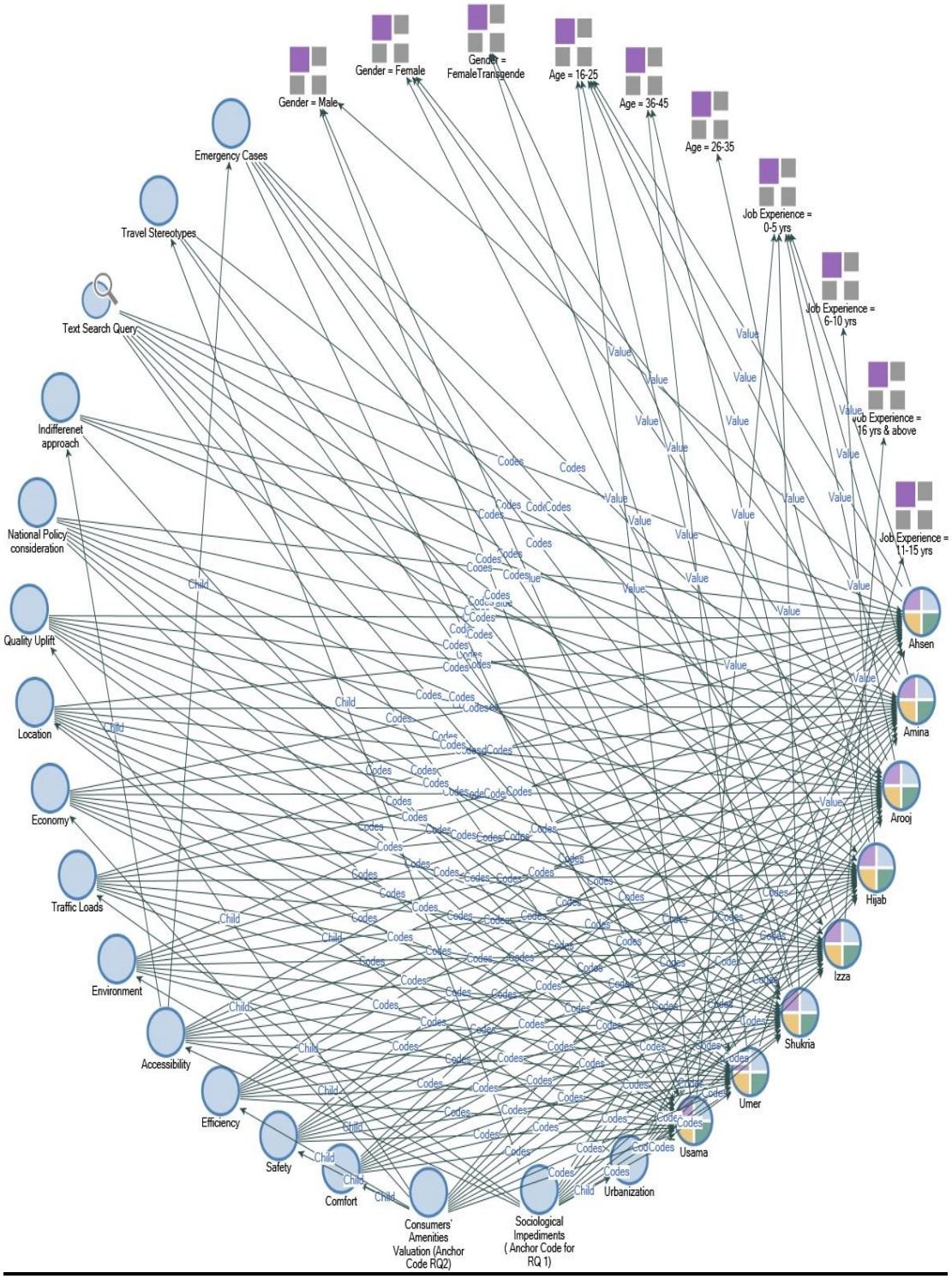

Figure 4. 23: Project Map

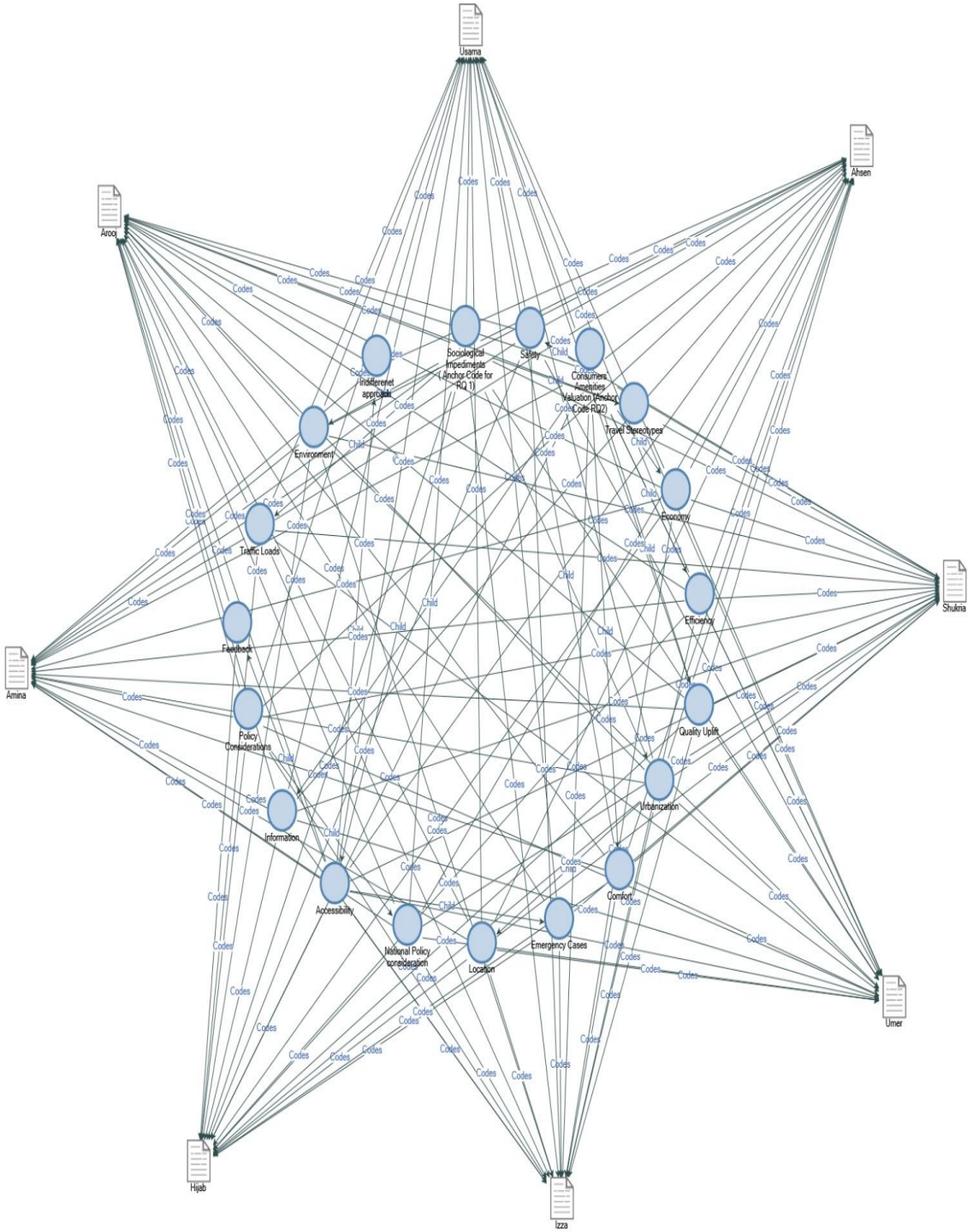

Figure 4. 24: Project Map

Nodes generated from transcribed interviews are explored individually as to how gender cluster at demographics comparatively in the below diagram a node is reference coded at different respondents. See gender response cluster around an identified node in the two appended below figures.

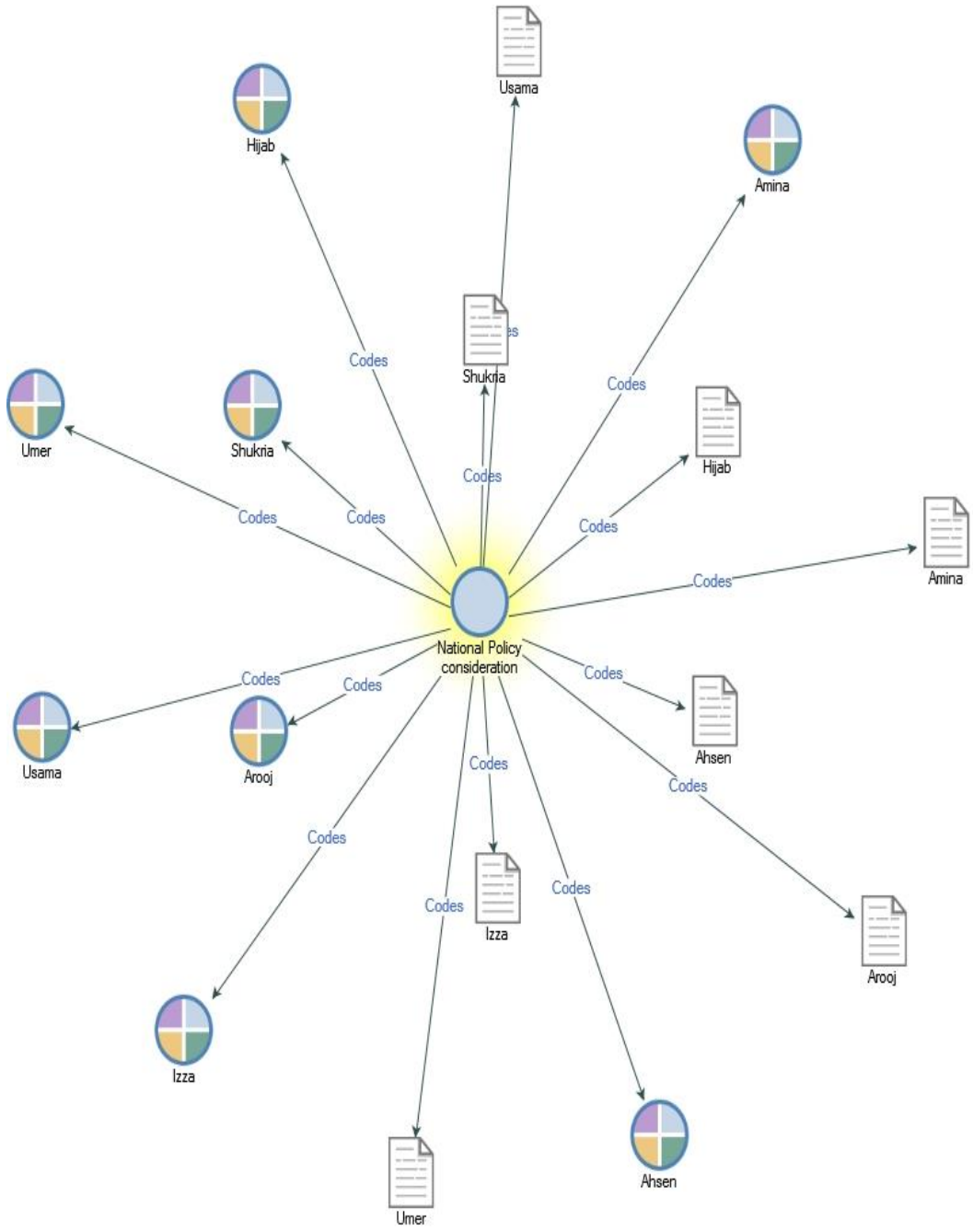

Figure 4. 25: Explore Diagram of Anchor Node Policy Consideration

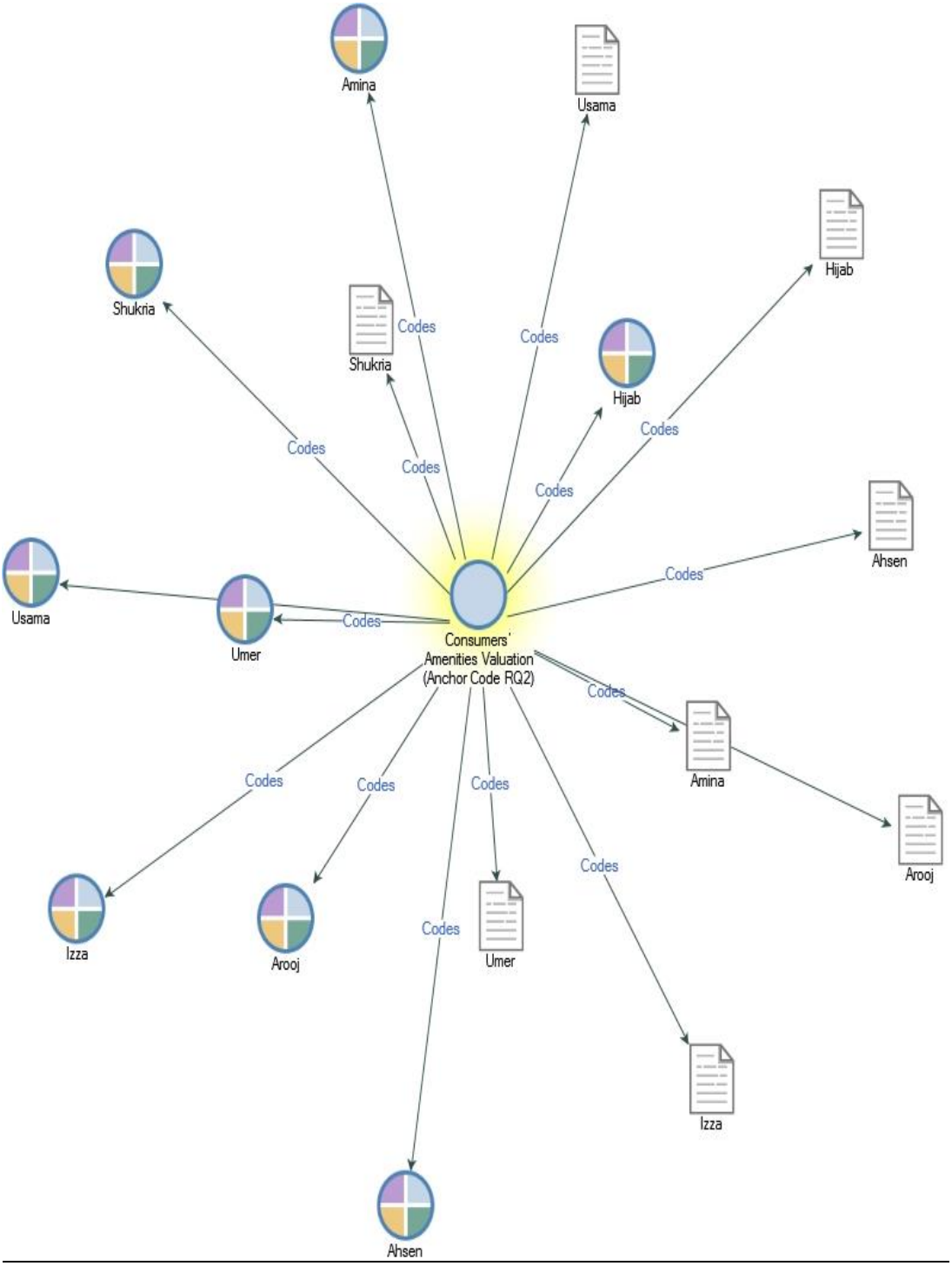

Figure 4. 26: Explore Diagram of Anchor Code Consumer Amenities' valuation

4.11 Word Cloud

Nvivo generated Word could is presented as an academic delicacy tp reflect the most frequently used words in the interviews by the interviewees.

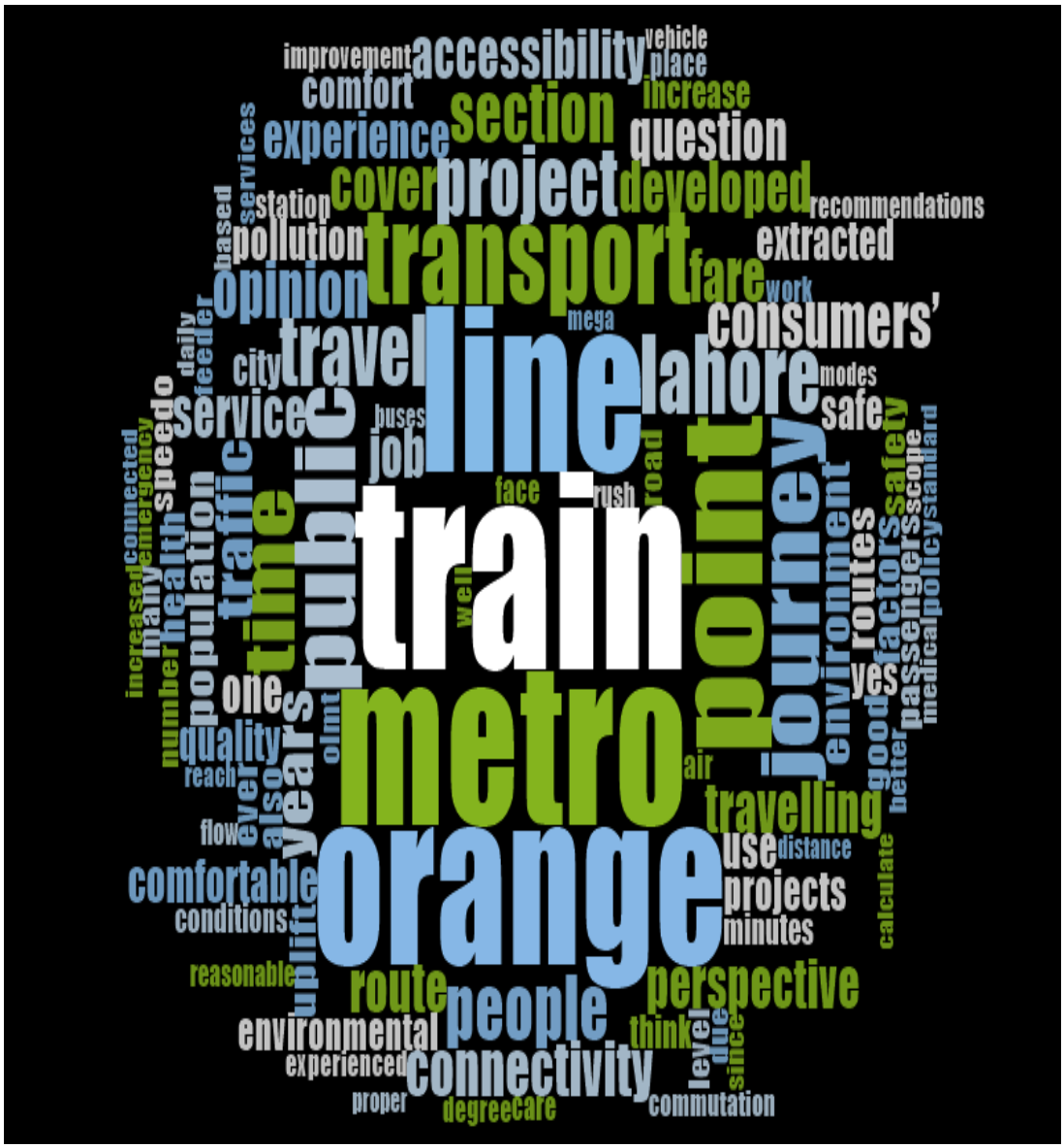

Figure 4. 27: Word Cloud

4.12 Summary

This chapter is a detailed presentation of the data analyzed and finding of the research. After the interviews. The consumers' amenities valuation (CAV) was explored demarking all the areas that are of sociological impediments and all areas in need of policy considerations and communication gap bridging. A map of from now to then is devised. All these points were further clustered on with negative and positive and the result emphasized the need for a constructivist approach at proactive active dynamics.

CHAPTER 5

SUMMARY, CONCLUSION RECOMMENDATIONS

The study explore the respondents' information, perception, experience, expectations, illusions, disillusion and consideration of what to be and should be. on consumer amenities: based on which the project economic appraisals of huge costs are usually justified. This chapter jots down the summary of the procedure adopted to go about the whole scheme of the designed research the researcher's evaluation review analysis, and presentation of the results, and research conclusions.

5.1 Research Study Overview

Eight consumers of the OMLT services were interviewed. They belonged to the areas stretched alongside train route for Ali town to Dera Gujran.. the interviews were audio recorded. The interviewee's convenience in terms of time, space and site was of high consideration. The interview duration varied based on the interviewee's response pace, interest and elaborations. The time length varied between 30 minutes to an hour on average. They were briefed about the nature of the interviewee query and research purpose. All the participants were apprised on the confidentiality and anonymity of their personal details, contacts and content and were asked to sign an informed consent form. Before the conduct of the interview. The respondents shared their experiences voluntarily.

They responded to the interview questions. (Ref. Appendix A) They shared their experiences with regard to public services in the mass transit sector recent developments and their respective of in particular on to the subject of consumer's amenities as documented in project appraisal. The respondents' responses were recorded in their preferred language. The recorded interviews ere transcribed in Micro soft Word 2016 and 2010). The written text was run and analyzed in Nvivo Qualitated Software.

In the result of literature review a frame work was devised including the three critical aspects of transport economics i.e. human behavior, public spaces and transport infrastructure as identified transport studies. Within these three domains is centered the study of system of transport, spaces, and human and therein it, evolves the policy of physical and social environment

In connection to evaluate the OMLT project the study concentrate the focus onto the study of the relation between project reach and environmental and social assessment how is effected at the gaps in empirical sociological impediments lens. The scope of the study is thus precisely diagramed at stacked venn diagram. The study then furthers the scope paradigm approach in the following illustration.

The segmented pyramid is used to present how the CAV is interconnected with the Project political success, transport economics/ economists (TEE) and project sociological reach (PPS). A three cone and chalice structure is used where CAV is centered at heart and provides a strong base to the transport economists to win huge investment proposals and strategize project political unit return success (PPS) measure. The tope cone is of project reach (PSR) and reflects that how the CAV dealt at the Project political justification and transport economists project appraisal directly impact the project reach. CVA and Project reach create a diamond potentially capacitated at carving the desired sociological project reach and deliver sustained quality. The next follows a framework model.

This framework is used with a unique approach where the changes created at segmented pyramid CAV and corresponding three cones are further analysed within the framework of transport infrastructure, Public space – the OMLT stations, paths, parking places, business sectors, services sector, religious, archeological, historical and recreational places claimed to be impactfully connected and made accessible by the OMLT as per PC1.

5.2 Limitations of the Study

Since one important area demarked to build further studies on is the points documented under the heading of limitations of the study (Creswell 2011). The factors that outline and bring to light these shared concerns are of structural design. The important factors that affect the reliability of the research are the selected research methodology and the sample selection. Thus, due considerations were made to make the dependable model of research. The sample selection was made along the length of the 27 km long routes. The due representation is given to the most populated areas of Lahore i.e. Salamt pura , dera Gujran, Ichra,, Thokar niaz baig and Sabzazar as well as the recently populating extensions Ali Town, Bahria, Rehman Gardens of the city. The minimum education level of the interviewee selected for data analysis is graduation. Thus, critical thinking and learned approach to feasibilities surrounding the travel lines was gauged at mature probability level of amenities' understanding and concerned approach of the interviewee. Due gender representation, 2.Lahore OMLT traveler's consumer community was also ensured. Given the 8 numbers of the interviewee can be bifurcated as male 3, female 3 and transgender 2.

Yet it is a fact that the good number of areas still are unrepresented. Moreover, limited time can be categorized as yet another limitation. Last but not the least as a functional aspect of the phenomenological study design that invites and empowers the researcher to discover and share information derived from 'the understanding and meaningful concrete relations implicit in the original transcription of experience in the context of a particular situation' (Moustakas, 1994). Thus the missing part of sample area representation may further add to future studies.

The unavailability of the modern day software as in case of this study the software Nvivo creates a discouraging environment. The hard toiling at trial versions makes it even tougher and limit the researcher's academic mobility and inductive exploration. The manual skill do deliver yet the objectivity of the study stay at stake. A good hand at both with understanding of exploring data at AI automated and manual method will help develop a very selectively explored field of theory development through inductive enquiry.

5.3 Conclusion

The research findings in current investigation exhibit that OMLT consumer faced a lot of issues due to the current compromised status on route infrastructure connectivity. The rising population is pressing hard on the resources enroute. Because of increased extensions of organized habitates the population is bound to raise even to new and massive count. Many routes ae yet in the waiting for speedo fleet to connect the relatively recent extension s of the city Lahore at the 360 degree. The resources are where depreciating and operated in minus counts of feeder route buses; to keep the feeder routes running for connectivity to Mass Transit metro system will be the meta objective concern of the futuristic policy decisions. Thus to address the massive urbanization the need is to start and run new feeder routes and to reinforce the existing one. Thus commissioning of more speedo buses and feeder routes is in call.

The existing infrastructure and service delivery is facing certain pitfalls due to communication gap between the services made available and consumers. The gap is in need to be built on two discreet dimensions i.e. first, the services and amenities are available but the consumer has little or no knowledge of it: second the intentional bypassing of the available amenities either due to the sociological taboos attached or the procedure is hassled or noisy or involve too many steps.

The decentralized administrative and operational structure OMLT stations needs a rigorous review after the recorded attacks on the Khatme Nabuwat and SalahuDin stations during TLP rally. The fall of man off the stairs sidewall due its technical non considerations of the probability of the falling off the passages and Chipping off roof ceilings are calling in for technical revisions in civil structure design material and maintenance.

5.4 Policy Recommendations.

According to the findings of the inductive enquiry with concentration of references coded at identified nodes following recommendations based on inferences from data analysed are penned down for future policy consideration at Transport economists in the domain of policy of physical and social environment. The results validate the points highlighted in project appraisal as valid points for policy concerns on sociological concerns and consumers' facilitation. It also highlights the agreed need for expanding the project by adding new routes and resources for efficient operation. The communication gap present on the extended amenities and the consumers' right to the same is emphasised. It is also documented that the absence of integration mechanism for the adjacent health facilities to the nearest OMLT stations. The need for systemised revisions on the resources reinforcement and relocation for enhanced connectivity and accessibility of the services to a greater population is mandated. The need for consumer education through organised awareness campaigns is proposed. The insistence on completion of reference projects and strategic synthetization of policy decisions to a bettered of National cause and workable diplomacy at international fronts is out lined as the need of the hour. Last but not the least was the need of policy making on the development of economic hubs else the pre-set cosmopolitan centres and on delivering the migrating population flow to the new epicentres to channelize the challenges of rapid urbanization.

Thus a synthesized conclusion in the form of recommendations is appended below.

1. Systemized urban planning is the dire need in the current situation to manage the urban population flow.
2. The estimated probability of population growth and migration to urban hubs require strategic planning on demographic engineering and channelization of the contemporary current of migrating populace flow. The policy considerations are raised onto the development of new purpose build potential economic hubs and urban centres with good absorption of populace mas.

3. Policy decisions are needed onto the subject of traffic flow especially in connection to high trend of personal vehicle commute: the import of reconditioned vehicles: import of luxury vehicles: and the local market production of fuel non-efficient vehicles.
    a. To manage traffic flow
    b. To control fossil fuel consumption.
    c. To channelize the potential resource allocation
4. Integration mechanism for adjacent health facilities to the nearest OMLT stations.
5. A Project Management Office is proposed at provincial level to look after the public, policy and provincial government interest and to manage the social action plan of the Mega Projects on the subject of sociological delivery of OMLT.

5.5 Future Study Recommendations

Since the subject under discussion has rarely been explored from consumers' perspective thus the study can be furthered in a constructive way in many futuristic researches. In particular I would prefer to mention three of these.

1. Comprehensive frame work, policy and approach revision of economic engagement with the mega financer of transport infrastructure projects in Pakistan: with a critical and comparative analysis of the interest rate of return ratio decided on agreed projects: being the world lead proprietor of the mass transit projects how come the deals with other potential partners/customers with stronger economies, are relatively more feasible, of less interest rations and easy payoff plans then our state that is in an economic fix for quite long and considered the most potential partner – at least at our in-house national narratives of socio economic development.
2. OMLT consumer feedback system operation and effectivity with emphasis on potential revisions in the feedback mechanism

3. OMLT consumers' amenities awareness systemized campaigns planned on strategized structural approach run through organization itself.

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5.6 Summary

The research findings are in detail discussed in this chapter. Further recommendations for policy research and provisions at organizational, provincial and national level are outlines based on identified factors reiterated by approx. every participant of the study.

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Appendix: A

Questionnaire:

Semi-structured questionnaire for consumers' amenities valuation of Orange Line Metro Train Project.

SECTION A
DEMOGRAPHICS

1. **Gender**				
	Male		Female	
2. **Age**				
	16-25 years		26-35 years	
	36-45 years		46 and above	
3. **Education Level**				
	School Level		High school/Associate diploma	
	Bachelor's degree		Master's degree	
	MS/MPhil		Doctorate degree	
4. **Job Title**				
	Administrative Officer		Head of Section	
	Instructor		Others_____?	
5. **Department**				
	Administrative/Customer care		Financial	
	Technical		Others_____?	
6. **Job Experience**				
	0-5 Years		6-10 Years	
	11-15 Years		16years & above	

SECTION B
Urbanization
Justification for project valuation of customer amenities for project appraisal

Point extracted from Project Scope in PC-1 point 6)

Question 1 to 7 are developed to cover consumers' perspective on this point

1) Where do you live?
2) Do you use public transport?
3) Do you use Orange Line Metro Train for daily commutation while travelling to your work/ job place?
4) What is the difference between your experience of Orange Line Metro Train and other public Transport modes?
5) What is your opinion about increase in population of Lahore over five years?
6) How it has effected traffic flow in Lahore?

SECTION C
Reliable And Fast Commutation

Point extracted from PC -1 point 6 Scope description

Uplift in public transport Service and Quality

Question 7 to 13 are developed to cover consumers' perspective on this point

7) With the start of orange line metro train operation, do you think there is uplift in the level of public transport service?
8) What is your opinion about uplift in the quality of public transport service?

9) What factors determine this uplift?

10) Have you ever experienced any delay in schedule while travelling through orange line metro train?

11) Can you exactly calculate your work/job place travel time?

12) What factors determine and effect this calculation?

13) While deciding for a job joining or job switching matter do you consider orange line metro train connectivity and accessibility?

SECTION D
Comfortable And Safe Commutation

Point extracted from PC -1 point 6 Scope description

Uplift in public transport Service and Quality

Question 14 to 21 are developed to cover consumers' perspective on this point

14) What is your opinion of a comfortable journey?

15) What factors define your standard of comfortable journey?

16) What is your opinion of a safe journey?

17) What factors define your standard of a safe journey?

18) Did you ever face any uncomfortable experience while travelling through orange line metro train?

19) Did you ever face any unsafe experience while travelling through orange line metro

train?

20) How do you rank your orange line metro train journey experience on the standards of comfort and safety?

21) What are your recommendations for improvement in these comfort and safety conditions?

SECTION E
Low Cost Economical Journey

Point extracted from Project Objective in PC-1 point 5

Question 22 to 24 are developed to cover consumers' perspective on this point

22) What is your opinion of orange line metro train fare?

23) What do you think of initial flat fare policy of orange line metro train?

24) What do you think of the current distance based fare policy?

SECTION F
Environmental Concerns

Point extracted from Project Objective in PC-1 point 5

Question 25 to 29 are developed to cover consumers' perspective on this point

25) What is you view about the physical environment of Lahore?

26) What is you view about the air Quality of Lahore?

27) What are the core elements contributing to the current environmental condition of the city?

28) How does orange line metro train contribute/serve to this factor?

29) What are your recommendations for improvement in these environmental conditions?

SECTION G
Accessibility and Connectivity Of Social Services Sector

Point extracted from Project Benefits of the Project and Analysis in PC-1 point 11 Annex D

Question 30 to 34 are developed to cover consumers' perspective on this point

30) What is your opinion about the connectivity and accessibility of educational institutions with orange line metro train route?

31) What your opinion is of religious, historical/archeological and recreational places connectivity and accessibility with orange line metro train route?

32) What your opinion is of hospitals & dispensaries connectivity and accessibility with orange line metro train route?

33) Have you ever experienced any medical emergency during your orange line metro train journey?

34) What are your recommendations for improvement in connectivity and accessibility about services?

SECTION H
Important considerations

Question 35 & 36 are developed to cover consumers' perspective on this point

35) Do you know about other such mega projects?

36) What is needed the most while deciding about such projects?

\

Appendix: B

BAHRIA UNIVERSITY LAHORE CAMPUS

Research Interview/Questionnaire Consent Form

I,_____(real name not compulsory), understand that I am being asked to participate in aninterview which is the part of research work of Nudrat Bano, Enrollment Number 03-398212-049, Student of Bahria University. She is pursuing Masters of Science in Project Management (MSPM) degree. It is my understanding that this survey/questionnaire is designed to gather information about the following subject of research:

"POST PROJECT EVALUATION OF OLMT: A CONSUMERS' PERSPECTIVE"

I have been given some general information about this research work and the types of questions I can expect to answer. I understand that the survey interview/questionnaire will be conducted in person and would be audio recorded by Ms. Nudrat Bano. I am well aware of the need of this recording and allow the researcher to get an audio recording if she keeps it secure and anonymous.

I understand that my participation in this project is completely voluntary and that I am free to decline to participate, without consequence, at any time prior to or at any point during the interview. I understand that any information I provide will be kept confidential, used only for the purpose of completing this research work, and will not be used in any way that can

identify me. All survey/questionnaire responses, notes, and records will be kept in a secured environment.

I understand that the results of this interview will be used exclusively in the research thesis of Ms Nudrat Bano and none of the information I provide will be published with any of my details, in any form, in any journals or conference proceedings.

I also understand that there are no risks involved in participating in this activity, beyond those risks experienced in everyday life.

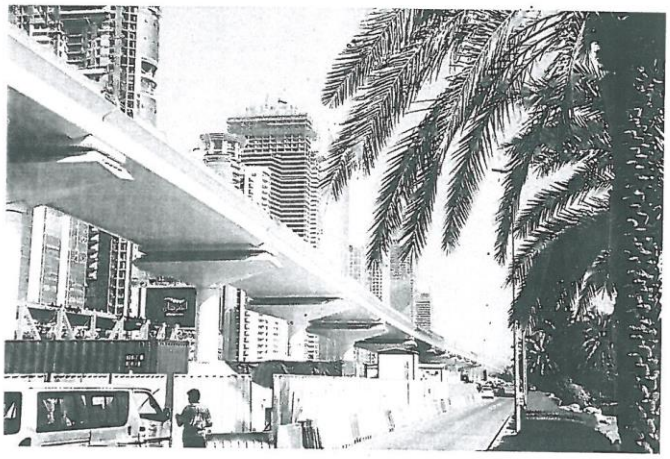
I have read the information above. By signing below and returning this form, I am consenting to participate in this survey/questionnaire project.

Date:_____ Signature: _____

ANNEX-C

THE PUNJAB METROBUS AUTHORITY (PMA)
GOVERNMENT OF THE PUNJAB

LAHORE ORANGE LINE METRO TRAIN PROJECT
(FROM ALI TOWN TO DERA GUJRAN)



PC-I
(USD 1.626 Billion)
(Rs. 162.628 Billion)

April 2015

NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD.
NESPAK House, 1-C, Block N, Model Town Extension, Lahore.

NESPAK

LAHORE ORANGE LINE METRO TRAIN PROJECT

TABLE OF CONTENTS

ITEM		DESCRIPTION
1.	PROJECT DIGEST	
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	ANNEXURE – C	Engineer's Estimate
	ANNEXURE – D	Environmental Impact Assessment
	ANNEXURE – E	Economic Analysis
	ANNEXURE – F	Drawings
	ANNEXURE – G	Schedule M – Scope of Works

PROJECT DIGEST

GOVERNMENT OF PAKISTAN
PLANNING COMMISSION
PC- I FORM
(INFRASTRUCTURE SECTOR)

1.	**Name of project** • Scope of works	Lahore Orange Line Metro Train Project As given in Schedule M attached as Annexure G.
2.	**Location**	
	• Provide name of the district/province	District Lahore/ Punjab
	• Attach a map of the area, clearly indicating the project location	Attached as Annexure A
3.	**Authorities responsible for**	
	I. **Sponsoring Agency**	Transport Department Government of The Punjab
	II. **Implementing Agency**	Punjab Metro Bus Authority (PMA) Government of The Punjab
	III. **Execution Agency**	Lahore Development Authority (LDA)
	IV. **Operation and maintenance**	Punjab Metro Bus Authority (PMA)
	V. **Concerned Federal Ministry**	N/A
4.	a) **Plan provision**	
	• If the Project is included in the medium term/five year plan, specify actual allocation.	N/A
	• If not included in the current plan, what warrants its inclusion and how it is now proposed to be accommodated	PMA/GoPb realize the importance of resolving public transport issues in Lahore, and their obligation to provide safe, efficient, comfortable and affordable transport to the public. Accordingly, a dedicated 27 Km long two-lane corridor for Metro bus system (MBS) was designed, constructed, and the MBS was made operational along the Priority Line-1 (Green Line) in February 2013. The PMA/GoPb, in their pursuit to achieve the complete objectives, intend to construct Priority Line-2 (LRMTS Orange Line) which consists of approximately 27.1 KM stretch that runs through the heart of Lahore along Multan Road, McLeod Road, and GT Road.

- If the project is proposed to be financed out of block provision, indicate; YES

Total block Provisions	Amount proposed for this project
	USD. 1.604 Billion Rs. 160.395 Billion

1 USD = 100 PKR

5. **Project objectives**

- The objectives of the sector/sub sector as indicated in the medium term/five year plan be reproduced. Indicate objectives of the project and develop a linkage between the proposed project and objectives.

Since last two decades, several transport studies of Lahore have been carried out, funded by either international loans or local budget plans.

The GoPb has initiated a strong commitment to develop and improve its public transport by implementing the Lahore Rapid Mass Transit System (LRMTS) on the following four corridors of Lahore city.

Green Line: Ferozpur Road (Kahna to Shahdara) 27 km {Completed}

Orange Line: Multan Road – GT Road (Ali Town to Dera Gujran) 27.1 km {Proposed}

Blue Line: Jinnah Hall to Green Town, 20 km {Future}

Purple Line: Data Darbar to Airport, 19 km {Future}

The concept of LRMTS is a rapid mode of transportation that can provide safe, reliable, comfortable and efficient public transport system. Rapid Mass Transit Systems have been implemented in several cities throughout the world as a low cost transport system of moving people quickly and efficiently.

Lahore Orange Line Metro Train offers well organized, effective way of transportation to the public providing a high quality transportation services and also improves job access. The LRMTS Orange Line will improve the efficiency and effectiveness of the region's current transit system. Currently many major cities all over the world use Metro rail

system. For instance Shanghai in China, Tokyo in Japan, Dubai in UAE, Istanbul in Turkey and Los Angeles in USA are the main cities that enjoy its benefits.

The LRMTS Orange Line will also reduce traffic load on adjacent roads along the key roads, reduce traffic jams and noise & air pollution. The design capacity of the system is 30,000 persons/ hr.

- In case of revised projects, indicate objectives of the project if different from original PC-I

N/A

6. **Description and Justification of project** (enclose feasibility study for projects costing Rs. 300 million & above).

- Describe the project and indicate existing facilities in the area and justify the establishment of the project.

The overall objective is to prepare 27.1 Km long elevated mass transit project in Lahore aimed to facilitate commuter's movement in the city. Out of the total sections length of the 27.1 Km, elevated viaduct is of 25.4 Km length while 1.7 Km is in cut & cover. There are 24 elevated and 02 underground stations. A depot and one stabling yard is provided at the two end points.

The existing traffic system requires a major uplift in level of service and quality in the wake of increasing demand owing to rapid growth of urban population. The overall objective of this project is to provide a reliable fast mode of communication of commuters and improve the efficiency of traffic flow.

- Provide technical parameters i.e. input and output of the project. Also discuss technological aspect of the project.

Elevated Structure of LRMTS Orange Line

The proposed elevated structure of LRMTS Orange Line Metro Train will consist of mainly short spans typically 30m long simply supported on single piers and typically formed in the central median of the right of way, with a multiple pile foundation system. The U-shaped viaduct system is proposed for the elevated structure of the project.

	Elevated Stations The design of Orange Line Metro stations will take into consideration the passenger forecasts and the resulting entrance and exit requirements. Elevated stations shall be generally 6m away from the existing building facades and will be within right of way with access at the two sides of the road. **Underground stations** There will be two (2) underground stations along the route of Orange Line Metro proposed near Anarkali and GPO Chowk. **Cut & Cover Section** The cut & cover section will be 1.7 Km long that includes two approaches and box type underground section.
• Provide details of civil works, equipment, machinery and other physical facilities required for the project.	Refer Annexure - C for details of civil works. Resources for construction are to be arranged by the contractors.
• Indicate governance issues of the sector relevant to the project and strategy to resolve them.	--
Transport & Communication	
• Provide technical parameters i.e. selected design features and capacity of the proposed facilities alongwith alternates available.	Refer above Point-6 and Annexure - C
• For roads, provide information regarding lane width, geometric and pavement design including formation width, pavement width.	Refer Annexure - F
• Land classification for bridges and culverts.	---
• Thickness/width of road way on bridges and culverts	Refer Annexure - F
• Design speed, traffic capacity of road in terms of passenger car units per day.	For traffic details refer Annexure - B
• Saving in distance for diverted traffic. Average daily traffic of motor vehicles by category as well as the car units be provided.	Refer Annexure - E

• In case of improvement within the urban area, separate traffic counts within that area should be given. Brief information regarding traffic and pavement width etc. in adjoining section should also be given.	Refer Annexure - B
• For bridges provide location, total length of bridge, number of spans with length of each span, width roadway and footpath, type of sub and super structure and load classification.	Refer above Point - 6 & Annexure – F
7. Capital Cost Estimates	
• Indicate date of estimation of Project cost.	April 2015
• Basis of determining the capital cost be provided. It includes market survey, schedule rates, estimation on the basis of previous work done etc.	Civil Work estimate has been prepared on the basis of market rates displayed on FD web site for 1st biannual 2015. The E&M work estimates are as per Chinese Contractor.
• Provide year-wise estimation of physical activities	

Year no.	Duration	Description
1st year	July 2015 to Dec 2015	Design of Civil works.
2nd year	Jan 2016 to Nov 2016	Construction of Civil work.
3rd year	Dec 2016 to Sep 2017	E&M works

8. Annual Operating Cost	
• Item-wise annual operating cost based on proposed capacity utilization be worked out for 5 years and sources of its financing.	Source of financing will be provided by Government of Punjab.
9. Demand and supply analysis	
• Existing capacity of services and supply/demand.	Refer Annexure – E
• Project demand for 10 years.	-do-
• Capacity of the projects being implanted in public/private sector.	-do-
• Supply-demand gap.	-do-
• Designed capacity and output of the proposed project.	-do-

10. Financial Plan

Sources of Financing

a) Equity

Indicate the amount of equity to be financed from each source.

Sponsor's own resources	N/A
Federal Government	--
Provincial Government	--
DFT's / banks	--
General public	--
Foreign public	--
NGO's / benefits	--
Others	--

b) Debt / Loan

- Indicate the local & Foreign debt/loan, interest rate, grace period and repayment for each been separately. The loan repayment schedule be also annex.

Foreign Loan by Exim Bank of China
Interest Rate = 3%
Return Period = 20 years

c) Grants — N/A

d) Weighted cost of capital — N/A

11. Benefits of the project and analysis

- Financial — Refer Annexure - E
- Economic — Refer Annexure - E
- Social — The construction of the project will create employment opportunities during and after the completion of project owing to construction activity and better business environment afterwards
- Environmental — Refer Annexure – D

Economic Analysis

- Provide taxes & duties separately in the capital and operating cost — Refer Annexure - E
- Net present value (NPV) and benefit cost ratio BCR) — NPV = 241.99 Million USD, B/C = 1.16:1
- Economic Internal Rate of Return (EIRR) — 13.60%

Financial Analysis (with-assumptions)

- Net present value (NPV) and Benefit Cost Ratio — NPV = -100.27 Million USD, B/C = 0.94:1

	• Financial Internal Rate of Return (FIRR) • Payback period	11.59% 14.72 years (including 02 years construction period)
	Sensitivity analysis	
	• Impact of delay on project cost and viability	For 5 years Delay EIRR = 13.21% For 10 years Delay EIRR = 12.34%
	Employment Analysis	
	• Employment generation (direct and indirect)	N/A
12.	**Implementation Schedule** • Indicate starting and completion date of the project. (Design & Construction) • Item-wise/year-wise implementation schedule in line chart correlated with the phasing of physical activities.	Design = 06months Construction= 21months To be arranged by the contractor
13	**Management Structure and Manpower Requirements** • Administrative arrangements for implementation of project.	Punjab Metro Bus Authority (PMA), Government of Punjab / LDA Manager Admin 01 No. Office Engineer 01 No.
	• The manpower requirements by skills during execution and operation of the project be provided.	Soil Engineer 01 No. Design Engineers 02 Nos. Civil Engineers 05 Nos. Electrical Engineers 02 Nos. Mechanical Engineers02 Nos. Service 05 Nos. Skilled 50 Nos. Unskilled 75 Nos.
	• The job description, qualification, experience, age and salary of each post be provided.	--
14	**Additional project/decision required** • Indicate additional projects/decision required to optimize the investment being undertaken on the project.	--

15 Certificate

- The name, designation and Phone # of the office responsible for preparing and checking be provided. It may also be confirmed that PC-I has been prepared as per guidelines issues by the Planning Commission for the preparation of PC-I for Infrastructure Sector projects.

- The PC-I along with certificate must be signed by the Principal Accounting Officer to ensure its ownership.

i) Managing Director
Punjab Metro Bus Authority (PMA)
Phone No. +92 42 9923 2540

Prepared by

(Salman Hafeez)
Project Manager
NESPAK

Checked by

(Muhammad Ozair Shah)
General Manager (Operations)
Punjab Metrobus Authority

Forwarded by

(Sibtain Fazal Halim) 24.4.15.
Managing Director
Punjab Metrobus Authority

Approved by

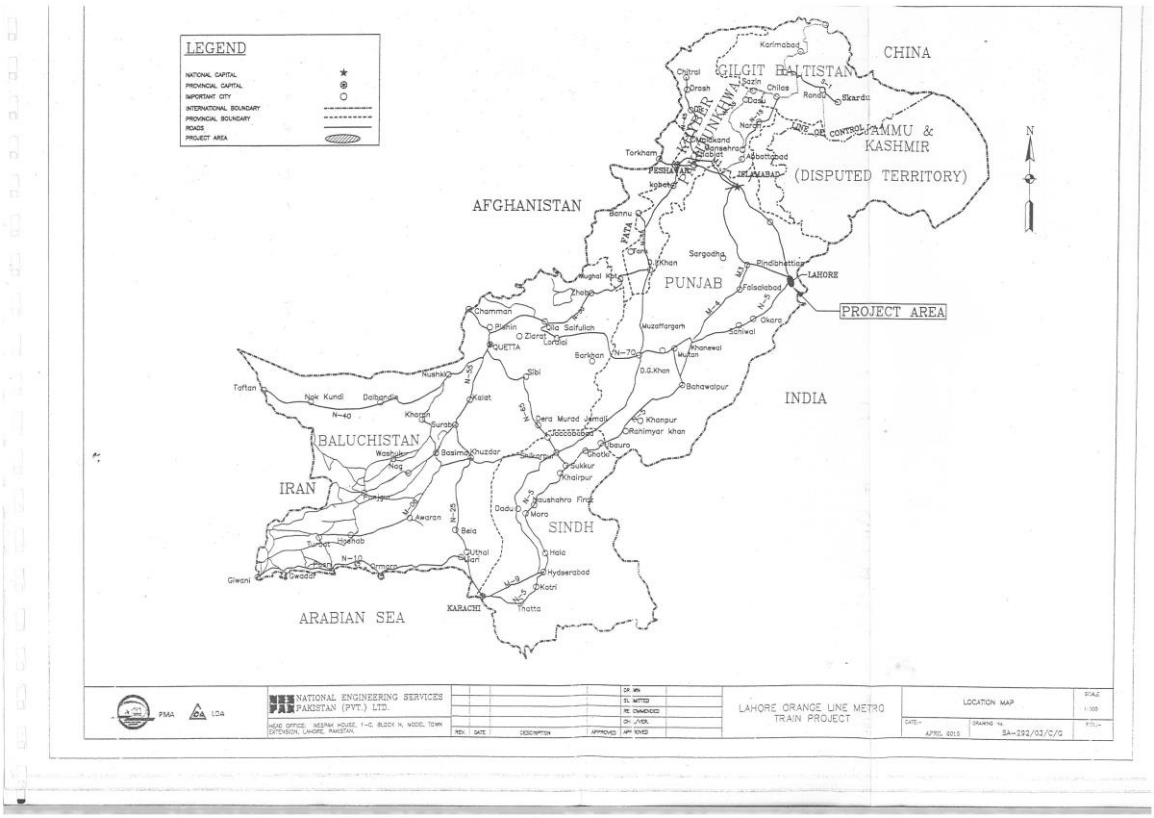
Secretary
HUD and PHE Department
Government of Punjab
27.4.2015

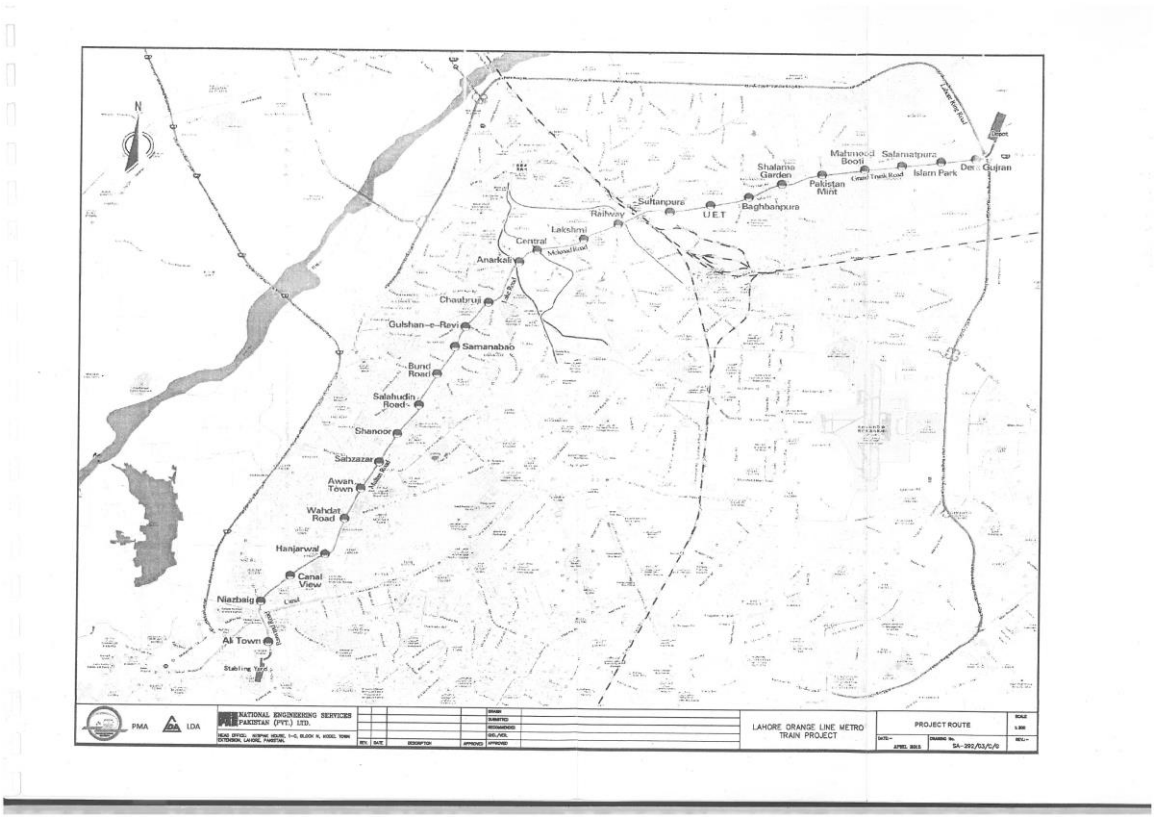
27/4/2015 Secretary
Transport Department
Government of Punjab

(MUHAMMAD IRFAN ELAHI)
CHAIRMAN, P&D BOARD

ANNEXURE – A

LOCATION MAP


LEGEND
NATIONAL CAPITAL
PROVINCIAL CAPITAL
IMPORTANT CITY
INTERNATIONAL BOUNDARY
PROVINCIAL BOUNDARY
ROADS
PROJECT AREA
CHINA
GILGIT BALTISTAN
AZAD JAMMU & KASHMIR
(DISPUTED TERRITORY)
AFGHANISTAN
PUNJAB
PROJECT AREA
INDIA
BALUCHISTAN
IRAN
SINDH
ARABIAN SEA
ISLAMABAD
PESHAWAR
LAHORE
KARACHI
QUETTA
NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD.
LAHORE ORANGE LINE METRO TRAIN PROJECT
LOCATION MAP
APRIL 2015
SA-232/03/C/G


N
Ferozepur Road
Mahmood Booti
Salamatpura
Shalamar Garden
Pakistan Mint
Grand Trunk Road
Islam Park
Dera Gujran
Sultanpura
UET
Baghbanpura
Railway
Lakshmi
Central
Anarkali
Mcleod Road
Chauburji
Gulshan-e-Ravi
Samanabad
Bund Road
Salahudin Road
Shanoor
Sabzazar
Awan Town
Wahdat Road
Hanjarwal
Canal View
Niazbaig
Canal
Ali Town
Stabling Yard
PMA
LDA
NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD.
LAHORE ORANGE LINE METRO TRAIN PROJECT
PROJECT ROUTE

Nudrat Bano

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