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**Effectiveness Evaluation of Public - Private Partnership Railway
Infrastructure Construction Projects**

Master's Degree Final Project

Supervisor

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“Effectiveness Evaluation of Public - Private Partnership Railway Infrastructure
Construction Projects”

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Harrish Mohamed Siddique Kadar Mydeen. Viešojo ir privataus sektorių partnerystės geležinkelių kelių projektų efektyvumo vertinimas. *Magistro baigiamasis projektas*, vadovas dr. Rūta Rudžianskaitė - Kvaraciejienė; Statybos ir architektūros fakultetas, Kauno Technologijos Universitetas.

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Santrauka

Šiame magistro baigiamajame projekte nagrinėjamas viešojo ir privataus sektorių (VPSP) partnerystės geležinkelių kelių projektų efektyvumo vertinimas.

Atlikus užsienio mokslinių tyrimų analizę, nustatytos svarbiausios VPSP partnerystės geležinkelių kelių projektų efektyvumo vertinimo sritys: techninė, finansinė, ekonominė, socialinė ir poveikio aplinkai. Po atliktos išvardintų sričių analizės, nustatyti svarbiausi veiksniai. Išskirti daugiausiai įtakos turintys techninės vertinimo srities kriterijai: geležinkelio kelio ilgis, km; ar tai naujas geležinkelio projektas, ar tai geležinkelio kelio rekonstrukcijos projektas, keleivių skaičius. Finansinės vertinimo srities svarbiausi kriterijai yra projekto kaina, VPSP forma, projekto trukmė. Bilieto kaina ir kelionės laikas yra svarbiausi ekonomikos vertinimo srities kriterijai. Socialinei vertinimo sričiai įtakos turi šie kriterijai: ar geležinkelio kelio projektas svarbus regionui, projekto metu sukuriama vietų skaičius. Poveikio aplinkai vertinime išskiriami tokie kriterijai: keleivių saugumas, gyvūnų apsauga, augalijos išsaugojimas.

Remiantis parinktais kriterijais, sudaryta VPSP geležinkelių kelių projektų empirinių tyrimų duomenų bazė. Anketavimo metodu apklausti VPSP geležinkelių kelių ekspertai, kurie išsakė savo nuomonę techninių, finansinių, ekonominių, socialinių ir poveikio aplinkai kriterijų svarbą. Atliktas trijų geležinkelių kelių projektų daugiakriterinis vertinimas, apskaičiuojant projektų naudingumo laipsnį pagal artumo idealiam taškui metodą.

Harrish Mohamed siddique Kadar Mydeen. Effectiveness Evaluation of Public - Private Partnership Railway Infrastructure Construction Projects. *Master's Final Project* / supervisor assoc. prof. dr. Ruta Rudžianskaitė- Kvaraciejienė; Faculty of Civil Engineering and Architecture, Kaunas University of Technology.

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SUMMARY

In this thesis the research of criteria which is essential to improve the Public-Private Partnership (PPP) in Railway Infrastructure Construction Projects With the detail definition of different criteria like Technical, Financial, Economic, Social, Environmental area and what all kind of way it is used for improving the PPP structure and with the help of this criteria the database is created and this criteria show us how the different types of projects were constructed in past year and upcoming project in different countries how the government let the private sectors come into the projects, who supported them finically throughout the project. The calculations of this project were developed with the survey of online experts which were helpful in this thesis. Using the database and surveying with online expert's review data this thesis is concluded and priority of the answer is taken by surveying.

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List of Abbreviation

PPP	Public Private Partnership
IBRD	International Bank Development Association
FDI	Foreign Direct Investment
WB	World Bank
BOT	Build Operate Transfer
DBFO	Design-Build-Finance-Operate
DBFOM	Design Build Finance Operate Maintenance
EBRD	European Bank of Reconstruction & Development
EIB	European Investment bank
IFC	International Finance Corporation
NIB	Nordic Investment Bank
TBM	Tunnel Boring Machine
CP	Tunnel with Cross-passage
ES	Evacuation Shafts
HSR	high Speed Railway
CTRL	Channel Tunnel rail Link
LCR	London & Continental Railway
ASEAN	Association of Southeast Asian Nation
EU	European Union
SPV	Special Purpose Vehicle
BDRCI	Bharuch Dahej Railway Company
CPI	Consumer Price Index
GTHA	Greater Toronto & Hamilton Area
CBA	Cost Benefit Analysis
MCA	Multi-Criteria Analysis

Abstract

The aim of this thesis is to research the criteria which is essential to improve the Public-Private Partnership (PPP) in Railway Infrastructure Construction Projects and in this paper I have talked about the different criteria like Technical, Financial, Economic, Social, Environmental area it has been totally described with a definition of it and what all kind of way it is used for improving the PPP structure and I have created a database with using this criteria which show us how the different types of projects were constructed in past year and upcoming project in different countries how the government let the private sectors come into the projects, who supported them financially throughout the project. The calculations of this project were developed with the survey of online experts which were helpful in this thesis. Using the database and surveying with online expert's review data this thesis is concluded.

Introduction

The bank investment was equity created throughout a transport operation (Earle 2007). In public sector stockholders, the bank capitalizes mainly invest in private sector, it is also with business partners. The sponsors of funds in private sector can vary from 5 million euro to 250 million euro, the common total being 25 million euro. The methodology and tailored are key to wants by a personal investors the bank gives a helpful tendency to them. The bank finances privatizations and rearranges. It as well shackles with public services infrastructure that reinforces the private sector. In addition, unavoidable product or procedures because of their ecologically harmful nature or if opposing impact cannot be sufficiently relieved and the bank will not finance. To develop the basis of economic and technical aid for developing countries around the world the World Bank plays a vital role on it ^[1]. Be situated a bank within the wisdom. It is an entire from 2 select development establishments influenced by 185 member countries – the International Bank for Reconstruction and Development (IBRD) and thus the International Development Association (IDA). advantages from PPPs are usually earned in four main areas: within the implementation is within the additive potency of projects; implementation capacity; for the general public sector risk are decreased; and public funds for more uses for aggregation cash resources by unleashing scarce (Majamaa et al. 2008). The middle financial gain and responsible poor countries are taken care by International Bank for Reconstruction and Development emphases on, and International Development Association – on the poorest countries in the world ^[2]. PPP projects have some over-all requirements to become productive. The surgery project has got to deliver economic profit for the general public sector; the financial profit should be engaging for the private sector partner; there should be the optimum distribution of project hazard among the public and private partners, and, finally, the simplest worth for money ought to be earned. For the general public sector, accomplishment might be seen as distributing the foremost public infrastructure for very cheap rate to the users. After all, PPP projects could haven't only aids, however additionally censures for loss of management over budget, the concern of “privatization” of public services, anxieties over the privileges and advantages of workers, trying a lot of expensive, variations being expensive. Rendering to financial consultants, most PPP disappointments will be attributable to inadequate or non-existent viability studies, counting impractical forecasts and indeterminate public influence of funds. Other mutual reasons for PPP failure are subsequent (Cuttaree 2008) ^[3]

- Poor legal framework and enforcement;
- Weak institutional capability and PPP approach;
- Impractical income and cost assessments;
- Lack of detailed financial and economic analysis;
- Unsuitable sharing of risks;
- Lack of low-cost procurement;
- Public confrontation (willingness to pay not assessed). The upcoming applications of PPP projects should be done completely with different form of aspects because contribute the expansion of local economies. And a replacement methodology is required to change it.

1. LITERATURE REVIEW

1.1 What are Public Private Partnerships

A public-private partnership is a legally-binding contract among government and business for the ability of assets and also the delivery of facilities that allocates tasks and business risks among the varied partners [4]. In PPP procedure, the govt. remains actively involved throughout the project's lifecycle. The non-public sector is s in charge of the extra industrial functions like project vogue, construction, finance, and operations. PPPs take a diversity of forms, with varied degrees of public and private sector participation and loco-mote levels of public and private sector risk. In fact, risk transmission from the overall public to the non-public sector is a very important component of all PPPs the goal is to mix the most effective competencies of the general public and personal sectors for mutual profit. The Secretariat for the Committee on Infrastructure, Government of India's defines PPP as a project designed on a contract or concession agreement, between a Government or statutory object on the one aspect and a private sector company on the opposite aspect, for conveyance An infrastructure service on payment of user charges private Sector Corporation means that a company during which 51 or further of the assured and salaried up equity is possessed and practiced by a private entity. According to the world organization, PPPs, concern about the planning, financing, implementation and active public sector services and they can have three main characteristics viz.,

- A. future (sometimes up to 30 years) service provisions;
- b. The transfer of risks to the private sector; and,
- C. completely different sorts of long-term contracts immersed between legal entities and public authorities.

The globe Bank defines PPPs as long-term preparations during which the government's acquisitions services beneath a contract either directly or by sponsoring provides to customers. In different PPPs, the government tolerates substantial risks - as an example, by promising revenue or returns, on projects that sell on to customers [5].

1.2 PPPs provide an opportunity to

Increase service delivery by allowing each sector to try and do they are best; Improve cost-effectiveness by taking advantage of private sector innovation, expertise and agility; Increase

investment public infrastructure, PPPs decrease government's capital values, serving to bridge the gap among the necessity for infrastructure and also the Province's financial capacity; Decrease public sector risk by moving to the private partner those risks which will be managed by the private partner; Deliver capital projects earlier, creating use of the private partner's enlarged flexibility and admission to resources; create higher use of assets, private sector partners have the interest to use amenities absolutely, and to form the best of economic opportunities to maximise returns on their investments. Since 1990s the usage of Public-private partnerships (PPP) are popular in several countries. Several governments settle for that the participation of the private actors within the delivery of state infrastructure and services can rise quality and deliver higher worth for cash. It's wide supposed that collaboration between government and personal actors will generate higher results, PPP procedure could be a standard strategy utilised by government to inspire non-public participation in any public project operation procedure was established reciprocally of the favoured organisational models across European Economic Community countries, notably inside the united kingdom, where it has been used wide since the 1980s. Since its arrival, PPP procedure has gained the same profile to privatization. Though, in spite of its quality, this loosely spread conception of partnership remains inaccurate, with unseen process options. Consistent with Johannessen et al. (2013), the foremost aim of the operation procedure is to enlarge the vary of service suppliers on the way aspect ancient public sector monopolies and inject a quantity of dynamism, rise coverage, innovation, and efficiency and worth recovery. There are varied explanations of the PPP can originate, relying on the attitude. In domain PPP has been distinct as 'more or less stable patterns of social relations amongst reciprocally dependent on actors, that practise around a policy program and/or cluster to suggests that, and which are formed, maintained and completely different from a series of games, outlined PPP as a cooperation among public and private performers during which joint product and/or services are industrial and within which risks, prices, and profits are shared. Farlam (2005) [6] distinct PPP as a contract between a public sector and private party, where the private party adopts substantial money, technical and operational risk of the plans. 809 Zairol A. Auzzir Therefore, the main idea of the PPP should emphasis on the relation among public and private actors, and among governmental and business parties. Characteristics of PPP are recognized in some of the offered literature.

The primary characteristic is shared coordination. The important think should keep in mind for any partnership is Coordination and the public & non-public sectors should be synchronized.

The second characteristic is that the demand for a level of shared risk and profit. The profit distribution is not basically in term of economic profits. It should be that the private actors can get the financial profits and also the public actors can get acquainted social advantages.

The third characteristic of the ppp is an administrative arrangement among the partners to enhance the cooperation process. They are destined to shorten coordination and secure the shared risk and profits are managed by most partnerships are structured around administrative arrangements. According to Waddock (1991), this arrangement will take the shape of a casual project group, recently recognized consortiums or alternative hybrid administrative forms [7]. The entire assumption is that PPP recovers outcomes is based on the preceding definitions and characteristics of the PPP. However, before we are able to consent the belief, it is necessary to replicate the advantages of a PPP based on the results of previous studies. Numerous educational and non-academic articles, including government documents, state that PPP principals to the higher price for cash decide that the PPP improves potency and it leads to lower prices and delivers additional price to the actors' performance. These results square measure obtained since each of the involved actors has the associate inducement to boost their efforts to spice up the price of the merchandise or service that is being brought [8]. Another sometimes detected advantage of partnerships is that actors are able to understand higher, lots of innovative solutions by binding each other's data and skill. Mandell (2001) claims that PPP is a very important for all actors to induce higher, further innovative product and policy yields for advanced group problems. Disaster management is often known as a posh social group drawbacks a result of its frequency and severity to civilizations. India is the world's fourth major economy, based on buying power parity, and among the quickest rising, however, endures to face massive gaps in the demand and provide significant social and economic infrastructure and services. quick growing economy, enlarged industrial activity, accrued population pressure has directed to the larger demand for higher quality and a focus on water and sanitation services, sewerage and drain systems, solid-waste management, railways, roadways, airports, seaports, power offer and communication networks. Infrastructure block has been a thoughtful concern for foreign direct investment (FDI), as our elementary infrastructures are not almost like the standards gift within the participant countries; it's additionally affecting comprehensive growth in India (Agarwal, 2011). A

Public effort funding record of international projects among 1985 and 2004 shows that 1,121 PPP infrastructure methods (road, rail, airport, seaport, water, and building) on behalf of \$450.9 billion worth of investment, were sponsored and finished with the bulk of the project's existence in Europe,

Asia and also the region as shown in below chart:

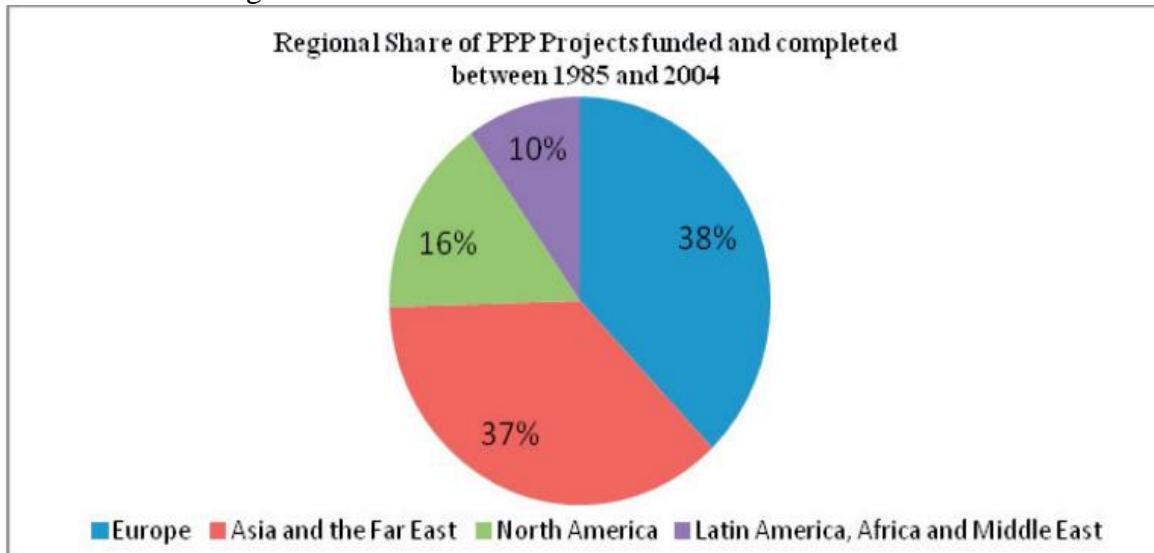


Figure 1 PPP Projects across the world (Agarwal, 2011) ^[9]

Emerging the infrastructure to a world category customary desires monumental investments, technological innovation, accomplished employees and outstanding project management. The central, state and native governments do not consume the capability, each in terms of amount and quality of workforce, to convey this immense quantity of infrastructure ^[9]. This understanding has carried along the public conjointly the private sector during an equally useful relationship within the sort of Public-private Partnerships [PPPs] conjointly known as PPPs to perform not only infrastructure projects however also encourage innovative methods for social growth. The involve allocation of valuable public possessions to the government is conveyance in private capital and skill of PPPs. PPPs play a major role in delivery private sector competition to public controls in infrastructure development and repair distribution and in consolidation the capitals of each public and private sectors to deliver quality public services. A PPP will be distinct to be the private sector construction and process of infrastructure, which might otherwise have been provided by the public sector. PPP projects have the subsequent characteristics viz. 287 Vinod N.

A. Private Partner delivers the planning, construction, funding and operation of the infrastructure, in reappearance for payments either from the public consumer or from the users of the infrastructure itself.

B. Public and private partners succeed through increased project and improved management utilization of resources by sharing risks

C. PPP schemes are generally supported a long bond to inspire innovations and low life cycle prices. (World Bank).

1.3 Distinction between Privatisation and PPP

Transformation of the Urban Rail Sector through PPP

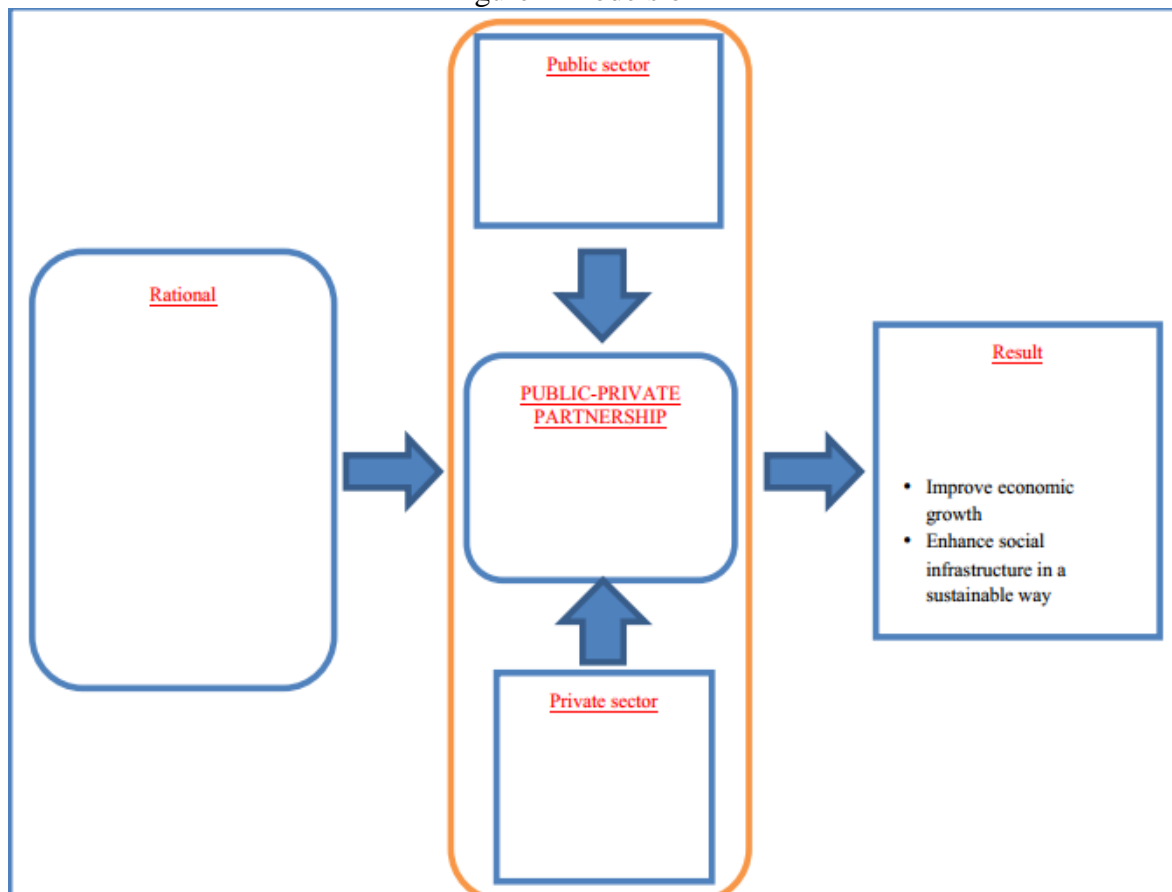
		INFRASTRUCTURE	
		Public	Private
OPERATIONS	Public	Public provision	Infrastructure maintenance and upgrading
	Private	Operating concessions Share issue privatisation	DBFO Share issue privatisation

Table 1 Transformation of the Urban Rail Sector through PPP [10]

1.4 COMMON FORMS OF PPP MODELS IN INDIA

Whereas the chosen sorts of PPP model is that the one during which the possession of basic quality leftovers with the public object throughout the contract dated and the project gets affected back to the public object on contract expiration, the ultimate conclusion on the shape of PPP is resolute exploitation the worth for cash Analysis.

Figure 2 Models of PPP



Source. **Zairol A. Auzzir and all (2014)** [11]

2. TECHNICAL ASPECT

The main compound of economic growth and development is well-organized rail transport. Rail transport will excite trade, link manufacture sites to regional market, indorse the national and cross-border combination of regions and facilitate access to the labour market, education and health services. When comparing Rail transport with road or air transportation it is typically additional energy capable. Investment in rail transport is consequently a major component of an occasional carbon transport set up. High-speed lines will supernumerary long-distance road or air transportation. To move high volumes off bulk merchandises from the centres of manufacture, like mining and agricultural areas, to ports and airports the Rail transport to an energy competent is suggested. PPPs in railways will bring probabilities for investment, functioning potency up-to-date and clean technology. PPP railway projects providing for a shared follow of rail methods may cause one ability gains and an increased profits basis for states and personal stockholders and create the investment in operation systems lots of engaging.

2.1 PROJECT IN INDIA

- 1) This is the project in India a state called Gujarat and the budget of it is 52 million euro and the project mechanism is BOT the length of it is 42km the project is under construction.
- 2) This is the project in India a state called Karnataka and the budget of it is 51million euro and the project mechanism is BOT the length of it is 183km the project duration is 1995 to 1999.
- 3) This is the project in India a state called Mumbai and the budget of it is 129million euro and the project mechanism is BOT the length of it is 508km the project duration is 2013-2015.

2.2 PROJECT IN EUROPE

- 1) This is the project in United Kingdom and the budget of it is 5.8billion euro and the project mechanism is DBFM the length of it is 109km the project duration is 2003-2007.
- 2) This is the project in Denmark and the budget of it is 2billion euro and the project mechanism is DBFM the length of it is 8km the project duration is 1991-2000.
- 3) This is the project in Netherlands and the budget of it is 6billion euro and the project mechanism is DBFM the length of it is 125km the project duration is 2000-2007.

2.3 PROJECT IN OTHER COUNTRIES

- 1) This is the project in Taiwan and the budget of it is 20million euro and the project mechanism is DBOFM the length of it is 339km the project duration is2000-2007.
- 2) This is the project in Canada and the budget of it is 20million euro and the project mechanism is DBFO the length of it is 20.5km the project duration is1992-2015.
- 3) This is the project in China and the budget of it is 6.1 billion euros and the project mechanism is BOT the length of it is 1072 km the project duration is1997-2001.

3. FINANCIAL ASPECTS

Table 2 PPP Financing PPP financing. Source: Rasa and all. (2010) [12]

PPP FINANCING		
Financial Institutions	Procurements rules	Form of PPPs
International Financial Institutions: EBRD (European Bank of Reconstruction and Development)	Competitive bidding process, but accepts negotiated procurement	All forms of PPP's with innovative formulas ("Municipal Support Agreements") instead of a direct guarantee
EIB (European Investment Bank)	Competitive bidding	No commercial risk: guarantee from eligible (AA rating) Commercial Banks Mainly O&M contracts
WB (World Bank)	Competitive bidding	All forms of PPPs (which does not include a sub-sovereign risk)
IFC (International Finance Corporation)	Competitive bidding	All forms of PPPs
NIB (Nordic Investment Bank)	Competitive and negotiated	
International Commercial Banks (Project finance)	Competitive bidding	Limited to BOT and concessions with some forms of sponsor's guarantee
National Commercial Banks	Competitive and negotiated	Flexible
Grants with co-financing	Competitive	If private sector involved: complex procurement

The bank's initial equity investment was created during a transport operation (Earle 2007). Despite its public sector stockholders, the bank capitalizes principally in private enterprises, often in conjunction with business partners. EBRD's funds in private sector projects vary from 5 million euro to 250 million euro, the average total being 25 million euro. The bank takes a useful methodology and tailors keys to the requirements of private investors [13]. The bank finances privatizations and rearranges. It conjointly chains public services and consequently the infrastructure that reinforces the private sector. In addition, the bank will not finance unavoidable product or procedures because of their ecologically harmful nature or if opposing impact cannot be sufficiently relieved. The World Bank plays a vital role in a basis of economic and technical aid to developing countries around the world. Be situated a bank within the wisdom. It is a complete from two choose development institutions influenced by 185 member countries – the International Bank for Reconstruction and Development (IBRD) and therefore the International Development Association (IDA). Benefits from PPPs are often attained in four main areas: additive efficiency in the implementation of projects; engaging implementation capacity; decreasing risk for the public sector; and collecting money resources by unleashing scarce public funds for further uses (Majamaa et al. 2008). The International Bank for Reconstruction and Development emphasizes on middle financial gain and responsible poor countries, and International Development Association – on the poorest countries in the world [14]. PPP projects have

some over-all requirements to become productive. The surgery project has to deliver economic profit for the general public sector; the financial profit should be engaging for the private sector partner; there should be the optimum distribution of project hazard among the public and private partners, and, finally, the simplest worth for money ought to be earned. However, the particular clarification of accomplishment differs among the partners and depends on their specific objectives. For the public sector, accomplishment could be seen as distributing the most public infrastructure for the lowest rate to the users. For the private sector achievement will be simply distinct as achieving an appropriate risk biased come back during a wise time-frame, and in some ways that the various user fees are additional for what was previously provided free by the public sector. After all, PPP projects could haven't only aids, however additionally censures for loss of management over budget, a concern of “privatization” of public services, anxieties over the privileges and advantages of workers, trying a lot of expensive, variations being expensive. Rendering to financial consultants, most PPP disappointments will be attributable to inadequate or non-existent viability studies, counting impractical forecasts and indeterminate public influence of funds. Other mutual reasons for PPP failure are subsequent (Cuttaree 2008):

Processing Re-write Suggestions Done (Unique Article)

- Poor legal framework and enforcement;
- Weak institutional capability and PPP approach;
- Impractical income and cost assessments;
- Lack of detailed financial and economic analysis;
- Unsuitable sharing of risks;
- Lack of low cost procurement;
- Public confrontation (willingness to pay not assessed). Thus, the future applications of PPP projects have to be assessed from completely different aspects so as to contribute to the expansion of local economies. A replacement methodology is needed; one that equilibria public and private benefits and reflects the broader implications of deliberate investments ^[15].

3.1 PROJECT IN INDIA

3.1.1 Dahej and Bharuch by Bharuch Dahej

A total of 16 trains run between Bharuch Junction and Dahej, together with 8 super quick trains. The quickest train from Bharuch Junction to Dahej is 12925 PASCHIM categorical that travels a distance of 218 km in exactly 3 hours and 9 minutes. The most on time train in this route is 11101 PUNE GWALIOR EXP that reaches Dahej with a mean delay of simply 5 minutes. The smallest amount prompt train during this route is 19061 RAMNAGAR categorical that reaches Dahej with a mean delay of 56 minutes. The minimum fare for trains from Bharuch Junction to Dahej is 2 euro in Second Seater (2S), 12 euro in 1st AC (1A), 6 euro in Second AC (2A), 3 euro in Sleeper (SL) and 5 euro in Third AC (3A) in general quota. Tatkal price ticket fare and premium tatkal fare during this route starts from 3 euro in Second Seater (2S), 15 euro in Second AC (2A), 4 euro in Sleeper (SL) and 10 euro in Third AC (3A). Vital railway stations during this route are Nabipur, Palej, Miyagam Karjan, Vadodara Junction, Samlaya Junction, Derol, Godhra Junction, Sant Road, Piplod Junction and Limkheda. Bharuch Junction has 2 stations particularly Bharuch Junction and Ankleshwar Junction whereas Dahej has 1 stations particularly Dahej.

3.1.2 Hassan-Mangalore

The Hassan and Mangalore has a total of 3 trains between them. The quickest train from Hassan to Mangalore is 16515 YPR KAWR EXPRES that travels a distance of 183 kilometre in exactly 6 hours and 25 minutes. The most on time train during this route is 16515 YPR KAWR EXPRES that reaches Mangalore Junction with a mean delay of just 0 minute. The smallest amount punctual train during this route is 16517 KANNUR EXP that reaches Mangalore Cntl with a mean delay of 2 minutes. The minimum fare for trains from Hassan to Mangalore is 4 euro in coach (CC), 5 euro in Third AC (3A), 2 euro in Second Seater (2S), 6 euro in Second AC (2A) and 2 euro in Sleeper (SL) normally quota. Tatkal price ticket fare and premium tatkal fare during this route starts from 6 euro in coach (CC), 9 euro in Third AC (3A), 2 euro in Second Seater (2S), 15 euro in Second AC (2A) and 3 euro in Sleeper (SL). Significant railway stations during this direction keep Sakleshpur, Subrahmanya Road, Yedamangala, Kabakaputtur and Bantawala. Hassan has 1 stations viz. Mangalore Junction and Mangalore Cntl is 2 specifically station of Hassan & Mangalore.

3.1.3) Mumbai-Ahmedabad

A total of 65 trains run among Mumbai and Ahmedabad, counting 1 duronto express, 1 shatabdi express and 15 different superfast trains. The reckless train from Mumbai to

Ahmedabad is 12009 SHATABDI EXP that journeys a distance of 493 km in exactly 6 hours and 20 minutes. The 11050 AHMEDABAD EXP in Ahmedabad Junction is the most prompt train in this direction with an everyday delay of simply 0 minute. The 19201 SC PBR EXP in Ahmedabad Junction is the smallest amount prompt train in this route with a standard delay of 2 hours and 10 minutes. The smallest amount charge for trains from Mumbai to Ahmedabad is 2 euro in Second Seater (2S), 6 euro in coach (CC), 15 euro in 1st AC (1A), 9 euro in first-class (FC), 12 euro in Second AC (2A), 3 euro in Sleeper (SL), 5.5 euro in Third AC (3A) and 8 euro in Third Economy (3E) in general quota. The cost is 2.5 euro in Second Seater (2S), 7.5 euro in palace car (CC), 15 euro in Second AC (2A), 4 euro in Sleeper (SL), 8.5 euro in Third AC (3A) and 12 euro in Third Economy (3E) this is the Tatkal price ticket fare and premium tatkal fare in this route start. significant railway stations during this route are Bhiwandi Road, Vapi, Valsad, Navsari, Surat, Ankleshwar Junction, Bharuch Junction, Vadodara Junction, Annand Junction and Nadiad Junction Mumbai has 12 stations specifically Mumbai Central Time, Thane, Andheri, Borivali, Mumbai Dadar West, Mumbai Dadar Central, Mumbai Central, Kalyan Junction, Vasai Road, Panvel, Lokmanya Tilak Term and Mumbai Bandra Terminus whereas Ahmedabad has 2 stations specifically Ahmedabad Junction and Sabarmati Junction.

3.2) PROJECT IN EUROPE

3.2.1 Oresund road-rail link

Oresund Bridge is one among the most important infrastructure projects in Europe, because it incorporates a full length of concerning 10 miles (16.4 kilometres), together with a 4-lane road and two train tracks. A bridge, a tunnel and one artificial that creates the affiliation between the two and it is more exalting is that the complete structure is formed. The border is located on the bridge at 5.3 kilometres (3.3 miles) from the Swedish aspect, however as supposed, due to the Schengen Agreement, drivers square measure able to pass freely. Crossing the bridge still remains a rich expertise. If you demand to try it just once, you have to pay 43 Euros for a car that processes up to 6 meters, whereas a bike desires a 23 Euros price ticket. Drivers of buses that exceed 9 meters have to be compelled to pay no less than 206 Euros per price ticket.

3.2.2 Liefkenshoek-Rail link Antwerp

The port of Antwerp is that the most significant port in Belgium with a complete financial gain in merchandise of 190 million annual tonnage duty and positive container traffic

estimates. The inevitable rate in freight transport is among 8%-15% by 2020. The port was helped by a standard railroad construction to the locality, inflicting cramming and delays. The new railroad would accommodate and agree for growth (Petit, 2008) because of this the Liefkenshoek tunnel project was planned to report this drawback. The Liefkenshoek Rail Link project is that the major Public-Private-Partnership (PPP) project in Belgium. Native railway was chosen to style, build, and finance and retain (a DBFM contract) the Liefkenshoek's porter binding with a complete worth of around 690 Million euros. The project contains two single-track tunnels of roughly 5,970m length each and with an inner diameter of 7.3m, designed by protect driving, further as various kilometres of tunnels by cut-and-cover with deep diaphragm and cement-bentonite walls. The complete project is split into 13 construction sections (KW) with an passage, the makeover of the present 30-year-old Beveren Tunnel, the initial shaft, two Tunnel Boring Machine (TBM) tunnels with cross-passages (CP) and evacuation shafts (ES), likewise because the finish ramp. Works started in November 2008. The important part was developed of the beginning shaft, as each TBMs be contingent this to stay in their time structure. The excavation for TBM No. 1 current in January 2010, whereas for the second, months later in March 2010 (Boxheimer & Mignon, 2009). Construction works were accomplished in Feb 2014 and therefore the railroad is functioning since 14 December 2014.

3.2.3 HSL-Zuid, Amsterdam-Belgium

Among the region Amsterdam and Schiphol, high speed trains perform on the present line. South of Schiphol the devoted high speed tracks initiate, paralleling the present railway line till Nieuw-Vennep. The road then twigs off eastward, remaining on the side of Roelofarendsveen and Hoogmade and incoming a tunnel east of Leiderdorp. This tunnel was made to guard the charm of the Groene Hart district. North of Zoetermeer the train line verdures the tunnel west of Hazerswoude-Dorp; it later passes to the east of Benthuizen, and on an raised track east of Zoetermeer, then rear on the surface among Berkel en Rodenrijs and Bergschenhoek, and later a tunnel, joins the present line again north of Rotterdam ^[16].

Trains run momentarily on prevailing tracks for a restricted kilometres afore getting into the high speed line again. The trains in Belgium, France and also the United Kingdom at Barendrecht the two tracks cross one another and also initiate left-hand consecutively. From currently the road runs next to the current railway further because the Betuweroute, remaining through the Hoekse Ward space, by passing Dordrecht. South of Dordrecht, the road runs next to the A16 state highway with a division encouraging off to the town of Breda.

South of Breda, the road once more trails the road towards Antwerp in northern Belgium. The HSL 4 which transmits on to Antwerp, with a current line from Antwerp to Brussels are attached in Belgian border.

Amsterdam-Rotterdam, 62 km, 0:43 (currently 0:58)

Amsterdam-Breda, 105 km, 0:59 (currently 1:44)

Amsterdam-Antwerp, 152 km, 1:10 (currently 2:00)

Amsterdam-Brussels, 199 km, 1:44 (currently 2:40)

Amsterdam-Paris, 492 km, 3:13 (currently 4:11)

On the domestic Intercity Direct services (Amsterdam - Schiphol - Rotterdam - Breda) all even NS tickets are valid. An addition (Dutch: toeslag) is required only for travel among Schiphol and Rotterdam. Thalys trains where hesitations are mandatory. Domestic tickets cannot be used on the international. The costs €2.30 (one-way, 2015)

3.3 PROJECT IN OTHER COUNTRIES

3.3.1 Taipei Kaohsiung-HS rail

Taiwan High-Speed Rail (also referred to as THSR, HSR, or Gāotíe) could be a high-speed line regarding 345KM long running lengthways the west coast of Taiwan from taipei Main Station within the north to Kaohsiung within the south. The road opened for provision in 2007, exploitation trains with a high speed of 300KM/H casing the journey in as short as 96 minutes. As of Dec 2015, tariffs have bated and 3 new stations were opened: Miaoli, Changhua, and Yunlin. Nangang Station is planned to open for HSR service on 1 July. The HSR is most often stated as Gaotie (pronounced Gāotíe) and is typically chosen a technique of transit for travellers to cross the island attributable to its ease and speed. Several peoples raise what quantity will the Taiwan High-Speed Rail HSR price. The price ticket of HSR from Taipei to Kaohsiung is NT\$1490. Concessions are accessible for senior citizens, children, there are many promotion for master cards through raises like primary bird sales once acquired before.

3.3.2 Parramatta Light Rail project in New South Wales

Passenger rail services enclosed by Sydney are provided by Sydney Trains. Sydney's residential district commuter rail service involves of a posh scheme of combined railway lines, of that maximum run through the town subversive. All city trains coaches' holds upto eight dual deck bearings with two crew associates on board - driver and guard. Charges are

calculated on the supply of distance travelled. The working hour of trains, begin from 4 am until around 1 am seven days every week with Nighttime ride bus services network throughout the night once trains do not seem to be working. Single and come back lightweight rail tickets are available in three zones, in Adult and Concession. Tickets are often bought on board from client service officers. The train tickets are valid for 2 hours from time of shopping for. Come back lightweight rail tickets are effective from the time of purchase till 4 am following day. The train ticket cannot break your trip with a lightweight rail paper price ticket. If you consent the light rail vehicle, your price ticket is not any longer valid. Business tickets are obtainable to kids 4–15 years as well as, students, pensioners and different concession cardholders ^[19]. Kids aged 3 or less travel free. You want to carry the precise concession card once you travel using a concession lightweight rail price ticket.

Ticket zones	Zone 1	Zone 2	Both zones
Adult single	\$3.80	\$3.80	\$4.80
Concession single	\$1.90	\$1.90	\$2.40
Adult return	\$5.20	\$5.20	\$6.40
Concession return	\$2.60	\$2.60	\$3.20

Table 3 Ticket Cost New South Wales ^[17]

3.3.3 Maryland Light Rail Purple line

Fares would be \$2 within the inaugural year – or, at least, that is what the state’s profits estimates are supported. They are going to upsurge over time with worth rises. Trains services will be running each 8 minutes on weekdays throughout a 90-minute morning peak and a two-hour evening rush. They might run each single ten minutes throughout mid-day and early evenings and each quarter-hour in early mornings and later at night. The working hour of train line, start by Bethesda and New Carrollton, the morning train time start from 5 a.m. and time of day. If the train is not on the time the companies would face money penalties.

4. ECONOMICAL ASPECTS

What economic theory ensures long-term ppp test for? The question is whether or not virtual worth movements (for sample, between listed and non-traded merchandises) are necessary in process equilibrium real conversation rate schedules. Assume we tend to write the log of the important exchange rate, q_1 , because the total of two apparatuses [18]:

$$q_1 = x_1 + y_1 \dots \dots \dots (1)$$

To reach at this breakdown, express the real exchange rate as the relative price of foreign goods:

$$q_1 = s_1 + p_1 - p_2 \dots \dots \dots (2)$$

λ

Where p_1 the log of the home country is value equal, p_2 is that the log of the foreign value equal and s_1 is that the log of the insignificant exchange rate. Assume that domestic t and foreign costs are weighted norms of listed and non-traded merchandises:

$$p_1 = (1-\pi) p_1^t + \pi p_1^n$$

Then x_1 and y_1 is defined by;

$$X_1 = s_1 + p_2^t - p_1^t \dots \dots \dots (3)$$

And

$$y_1 = \lambda (p_1^N - p_2^T) - \pi (p_1^N - p_2^T) \dots \dots \dots (4)$$

The 2 from of the law is one value for dealt product are stationary can virtually have any theory of international value resolve implies this aberrations. So, if the important t conversation rate is non-stationary, it should be as a result of, the relative rate of non-traded product, is non-stationary. The particular exchange rate within the long-term is qualified value of non-traded product contains a unit root and controls movements and below the null in tests of long-term ppp. It's this theory that has been excluded by unit root tests of the important exchange rate on 3 long term sequence. However, this new literature could have stretched the incorrect conclusion.

4.1 PROJECTS IN INDIA

4.1.1 Dahej and Bharuch by Bharuch Dahej Rail

Bharuch Junction (BH): The 64-km-long Bharuch-Dahej Rail passageway (BDRC) that passes through an aggressive trade zone within the state is wanting to prime 10 billion annual financial gain by the tip of the current fiscal. In next six months to grip bulk and container load but at present it is temporarily occupied on accumulation product shed amenities on the route that is inevitable to become sensible. Among April and November this year, we have excited regarding 4.92 million tonne load that has created the promoters a financial gain of 7.5 billion. Throughout 2012-13, we have a tendency to attain a financial gain of 8 billion, by loading 5.13 million tonne coal. To inevitable fetch of U.S we have a tendency to project a circulation of 7-8 million tonne by the tip of the current year. Over 10 billion financial gain,” Divisional Railway Manager, Vadodara, Naveen Kumar Shukla believed. Within the next few years, this line can move 18-20 million tonne traffic,” he added. The area, that is tipped to be one in all the key industrial zones within the state, has seen shrill growth within the earlier few years. The APSEZ and Dahej SEZ have each recorded a powerful development within the past two years. Dahej SEZ attained 1.4 Billion financial gain from transfers throughout 2012-13, associated to 8.6 billion crores throughout 2011-12.

4.1.2 Hassan-Mangalore

MANGALORE, JAN. 9. Broad gauge conversion of the Hassan-Mangalore railway line looks to be receiving the correct signals succeeding the event of the Hassan-Mangalore Railway Enlargement Company and therefore the can of the Karnataka Railway Infrastructure Growth Enterprise (K-RIDE) to issue cash for the immediate completion of the work. The line currently clearly options the projects like the Kottur-Harihar and Hubli-Ankola line, repetition of Bangalore-Kengeri, Kengeri-Ramnagaram, and Guntakal-Hospet lines, and Solapur-Gadag gauge conversion existence concerned below the K-RIDE. It is a cushy sign that the enterprise has set to share one-third of the value of the Hassan-Mangalore gauge conversion. The first projects was antecedently been signed is for specific special purpose vehicle by the shareholders' contracts in respect of K-RIDE and therefore the company. The opposite contracts for the corporation have conjointly been accepted by the Ministry of Railways. The country like Kodagu, Chikmagalur, and Hassan are the main occasional growing areas within 200 km. of the port. However as a result of the shortage of amenities for the mass posture of containerized occasional product, the entire container business goes to the Tuticorin and Chennai ports. The kanara Chamber of Commerce and

Trade has been insistent for completion of the broad gauge conversion for an extended time. The chamber estimates that the occasional business has the attainable of transporting 80,000 tonnes of the turn out a year from the port if the railway line is opened. The company like merchandise with foreign markets like light-weight machinery, auto parts, treated food and fruit pulp, and added cashew and tobacco product are locality in this line. With the Konkan Railway line passing through Kankanady, regarding 12 km. To improve the business the Mangalore railway station, the Hassan-Mangalore line replacement route from Bangalore to Mumbai and goa, the reasons behind it to cut back period of time. The period of time among Mangalore and Chennai distance will also be reduced by eight hours if Mangalore-Chennai trains are routed via Hassan and Bangalore. The project price that had been valued at 1.2 billion was committed to give two-thirds of its share by N. Yogish Bhat, MLA, of the govt. The Centre had already discharged its share of 400 million. The remainder had to incline by the user organizations and financial institutions.

4.1.3 Gandhidham- Palanpur Gauge Conversion

The Ministry of Railways can mark in with 1 Billion as 50 per cent tendency within the SPV, whereas the Gujarat Government can grip the steadiness 4 per cent. The budget 2 Billion can be offered by corporate and also the rest can originate within the loans, as said. the govt. obliged earlier cleared the complete estimates for the project at 3.4 billion however the finishing price of the project currently works resolute 4.5 billion, after accounting for funding cares and inflation, the authorised aforementioned. The project is predicted to be completed in three years. One by one from the Gandhidham-Bhildi-Palanpur link, the Gujarat Government is also aggressive for conversion of the Bhildi-Raniwara (150 km) track and growth of the Viramgam-Bhildi (157 km) link that might be part of Kutch and Saurashtra to the Jodhpur-Bhatinda link and provide a replacement access to north India for Gujarat. This is able to be the third parallel track to northern India from the west coast.

4.2 PROJECT IN EUROPE

4.2.1 Channel tunnel rail link CTRL

The edifice of Section 1 of the Station Tunnel Rail Link (CTRL) on stage and at a value somewhat below the target set within the 1998 reform was successfully completed by that London & Continental Railways (LCR) consistent with the report of National Audit Office's. The NAO statement highlights teachings for different by the success of drawing on the main points. Since the initial of Section 1, request for Eurostar has grown quickly, however

traveller incomes still continue well below forecasts. Additionally to an immediate grant of just over £2 billion, the Department for Transport imagines to lend LCR regarding £260 million to insurance the shortage among money needs and financial gain through to 2051, inside a variety among 0 and £400 million. Despite inferior than expected financial gain predictions, the inevitable loan is not way more than the quantity projected in 1998 as LCR effectively secured funds through dropping the interest prices on its debt. Future Railtrack Group's feet from the project, LCR was ready cut the value of assets from 8.9 per cent to a lot of positive interest rate of simply higher than five per cent.

4.2.2 Alice spring-Darwin rail

The Northern Territory in counterfeiting its own economic process and the project indicated the rising assurance, increasing tourism with the thousands of train buffs motion on the Ghan, initial up a trade route to the north, the passage to feed Asian smelters mitigating through an innovative port to act as a garage for the railway and opening up mineral shires. As a part of the Northern Territory Government is calculated land use plans, a crucial stretch of commercial land when the port and rail terminus was set apart for transport and provision accomplishments. The quick growth of the East Arm Business Park is because of the administration of the exploitation Corporation, And the port connect with railway freight merging yards and warehouses. Because of the investment in bulk minerals management services and enlargement of the Port there is unexpectedly fast development of the minerals trade has, in turn, quicker the recovery of land. The Austral-Asia project was nation-building, original in its flourishing transfer of hazard among government and therefore the private sector and flourishing in causal to the Northern Territory's economic process and growing independency. Its accomplishment and flourishing operation are the attention of a dream first expressed before European settlers raised the English flag on Darwin's tropical soil of a railway that would bond northern and southern shores, build a prosperous trade route with Asia and overcome the isolation of Australia's most sparsely settled lands.

4.2.3 Kokkola Ylivieska rail link

Our initial impartial was to fix the Budget, restore the health of the state economy and repair a \$30 billion structure backlog – these essential inefficiencies were hurting our nice state and striking our future in danger. Whereas talking these major significances, we have absorbed our attention on backup jobs growth, restoring quality services and shielding the vulnerable. Since the new Government was chosen, over 126,000 jobs are created. In accumulation to being the first state to check in to the National social insurance theme, we've pointedly accumulated the quantity of nurses, academics and police across the state, all whereas finance

in new hospitals and schools. we've conjointly cut taxes, enlarged protection for our native environment, and recognised over 10,500 further weekly transport services whereas institution work on many major transport projects, as well as the North West and South West rail links. I'm happy of what we've been able to succeed during a short area of your time with the help of sound economic management, they unlock \$20 billion in infrastructure backing for local and major roads and rail networks, schools, hospitals and water security by delivering on our clear set up for the longer term – a concept . As Leading, I am dedicated to creating an amendment and delivering real change, guaranteeing could be a stronger and better state for all, as well as our future generations.

4.3 Project in other countries

4.3.1 Transcontinental railway

The railway road was constructed because of a desire of a safer, cheaper, and faster manner of transportation to get to the west. If you traveling by wagon or boat, it might take you months to get there. Plus, there was the hazard of obtaining sick. A railroad might get you across the U.S. in an exceedingly week and was safer. The concept of a transcontinental Railroad was first believed concerning in 1830, attributable to the invention of the railway locomotive. The line of (Barter 42-44) was later discharged by Congress they could not agree on a route. Theodore Judah, a railroad surveyor, urged congress within the decade to make the continental Railroad along with his set up (Barter 44). Judah got financial provision from for state capital Merchants (Barter 45). Their names were, Collis P. Huntington, mark Hopkins, Leland Stanford, and Charles Crocker (Barter 45). These men would kind the Central Pacific Railroad and would future be called the, “Big Four” (Barter 45). This provision heartened Lincoln to conform to allow the Pacific Railway Act in 1862, permitting the structure of the transcontinental Railroad (Barter 47). Two railroads were chosen, the Central Pacific Railroad, controlled by Judah and therefore the “Big Four”, and also the Union Pacific Railroad, and measured by vice chairman Thomas C. Durant (Barter 47). The Pacific Railway Act conjointly definite that the track set, \$16,000 over flatland was offered by U.S. government for two railroads within the sort of pledges for every mile , \$32,000 for a lot of arduous land, and \$48,000 for the mountains (Barter 48). Because of shortage of labour (Barter 55) the initially work was slow thanks. Most of the men who were procurable did not need to depart the gold fields, although they did not get wealthy (Barter 56). Plus, nobody needed to swing an important hammer for an entire day (Barter 56). Even before construction

started, massive issues had already arisen (Barter 53). Judah and therefore the big Four did not see eye to eye on everything. The large Four just needed the money from structure the railroad, so that they did not need to devote plenty of cash. On the opposite hand, Judah needed to create the safest and best railroad that meant lots of cash (Barter 53). Judah got so annoyed that he offered to shop for the Central Pacific Railroad from them but it was negotiated, however the large Four would not budge, that they declined to try to do (Barter 54). Sadly, Judah's arrangement never became reality; Judah caught yellow fever over the Isthmus of Panama. He died on November 2, 1863. This was a main turning point as a result of with Judah out of the method, the large Four were absolute to do anything. First, they had to solve their huge drawback, finding labour. Charles Crocker was appointed to search out low-cost, reliable labour.

4.3.2 Wuzhong - Zhongwei section

The conservation of an uninterrupted amount of peace and steadiness throughout that the distinct Member Countries are able to distillate on encouraging fast and constant economic growth and innovation is the reasons the main reasons for success of Association of Southeast Asian Nations. The dynamism of the Southeast Asian economies is roughly several countries would really like to achieve for themselves. At an average annual rate of 7.0 percent for concerning 25 years from 1970 to 1995, ASEAN's GDP has created. Today, Southeast Asia includes a total market of concerning 500 million people and a combined GDP of over US\$ 700 billion ^[19]. Through its combined trade worth, ASEAN is the fourth biggest mercantilism entity within the world once the EU Union, the US and Japan. The broader of East Asian region that is at hand economic parity with the North American region and also the European Union fits in ASEAN. Whereas the combined gross domestic product of East Asian countries was only four percent world gross national product in 1960, it completely was 25 percent in the course of 1992 and is projected to be 33 percent obtainable 2010. East Asian central banks presently clutch to 45 percent of the world's foreign reserves. In summary, ASEAN's economic cooperation intimate with two stages: - the first stage covers the first 25 years of ASEAN's existence, an amount once the ASEAN countries set down the foundations of cooperation and grow into oriented with each other and opened modest economic cooperation programs ^[20]. -The second stage began at the Singapore Conference of 1992, throughout that ASEAN launched the CEPT for AFTA encouraging the entire ASEAN region as a modest international production base for each native and foreign investors. In initiating and building

regional economic linkages, participating a number of the foremost dynamic economies within the world was smartly concerned ASEAN. The next stage are going to be the execution of ASEAN's further assurance to move towards nearer unity and economic integration whereas highlight property and equitable growth.

4.3.3 Finch West LRT

High Capacity

The projected ridership of the Finch West LRT passageway is 2,800 passengers per hour within the peak track by 2031. The quantity of an LRT is 15,000 passengers per hour per direction. LRT cars will be detached or added easily, therefore providing the pliability to accommodate ridership demands.

Reliable

The Finch West LRT can carry passengers in devoted right-of-way transit lanes distinct from regular traffic, yet as precedence signalling at intersections. The Finch West LRT is dependable which travel times are additional bound they are two mechanisms make them sure.

Convenient

The Finch West LRT can have 18 stops through northwest Toronto, count a subversive interchange station at Keele Street. It will have quick transit connections: Finch West Station to the new Toronto-York subway extension ^[21].

Accessible

The Finch West LRT can have various entrances and low floors to safeguard quick and offered boarding. Additionally, every vehicle can use the fast proof-of-payment system.

Proven Technology

LRT may be an established technology that has used everyplace the globe, count cities with variable temperatures like Edmonton, city and metropolis.

5. SOCIAL ASPECTS

Views of PPP project members In Europe, PPP projects have a good impact on the expansion of infrastructure, chiefly within the transportation sector. Until 2008, infrastructure projects expression investment of over 200 billion euro. It is deliberate that in consequent 5 years PPP projects introduced by transport, health care, science, environmental protection, and different public sectors can raise investment within the total of over 100 billion euro. Since PPP projects are applied as a region of the national strategy goals of the countries, the effective execution of the Rasa Apanavičienė, Rūta Rudžianskaitė-Kvaraciejienė 357 projects could be a question of dynamic position to the expansion of the countries' economy^[22]. PPP structures are a lot of advanced than traditional public gaining. Because of the amount of parties concerned and also the mechanisms wont to share the risks the quality is good. Public-Private Partnership (PPP) constitutes a constant cooperative effort among the public sector (government agencies) and private enterprises to achieve a standard objective (e.g., infrastructure project) whereas they follow their own individual interests (Queiroz 2007). Therefore, private units ask for collaboration with public sector so as to enlarge their business and rise profits. Public sector users settle for higher quality amenities or a lot of required wealth projects that are brought by deploying private funds this is due to setting out of PPP projects. Stockholders are principally disquieted with the financial scale of the project; thus, they reasonably measure the advantages and potentials of the private and public sectors. The PPP project finance of totally different monetary establishments have precise. The EU Investment Bank, the EU Bank for Reconstruction and Growth and also the World Bank is that the major international financial establishments within the EU region. Transport sector accounts for roughly 80% of all PPP schemes supported by the EIB with the remaining 200% supporting health, science, energy, water, and waste material sectors. A high-speed rail the Netherlands, roads in France and Spain, and bridges and tunnels in France and Greece is due to flagship projects within the transport sector supported by the EIB. The EIB has conjointly participated in different PPP projects, like water and environmental

Protection projects in Bulgaria, Netherlands, and Spain; health PPP projects in Italy, France, Spain, and also the Britain; and education PPP projects in Ireland and also the UK. The UK, Spain, Portugal, and Greece share one third of the EIB's PPP project portfolio. France, Germany, Italy, Poland, and Turkey ask for wider cooperation with the EIB to rise the amount of public investment financed by PPP^[23]. The EIB has participated over 25 billion

euro within the region. Generally, but not entirely, EIB PPP projects contain a project finance-style loan to a private sector Special Purpose Vehicle (SPV) that has been created to undertake the project (Thomson and Goodwin 2005). The EIB would like the third-party assurances for the EIB's loan, a minimum of during the periods of high risk (construction). The EU Bank for Reconstruction and Development uses the tools of share to assist construct market economies and democracies in countries from Central Europe to Central Asia. The EBRD is the major single shareholder within the state and mobilises vital foreign direct quality on the far side its own funding ^[24]. The EBRD, possessed by 61 countries and two intergovernmental organizations, aims to substitute the evolution from centrally planned to promote economies in 29 countries from Central Europe to Central Asia (EBRD Annual Report 2007: Review 2008). Financing PPP funding money establishments Procurements Rules sort of PPPs International money Institutions: EBRD (European Bank of Reconstruction and Development) EIB (European Investment Bank) WB (World Bank) International Finance Corporation (International Finance Corporation) NIB (Nordic Investment Bank) Competitive bidding process, however receives negotiated procurance Competitive bidding Competitive bidding Competitive bidding Competitive and negotiated All sorts of PPP's with innovative formulas ("Municipal Support Agreements") rather than an immediate guarantee No industrial risk: guarantee from eligible (AA rating) business Banks in the main O&M contracts All sorts of PPPs (which does not embrace a sub-sovereign risk) All sorts of PPPs International industrial Banks (Project finance) Competitive bidding restricted to bot and concessions with some sorts of sponsor's guarantee National industrial Banks Competitive and negotiated versatile Grants with co-financing Competitive If private sector involved: complicated procurance The bank's 1st equity investment was created during a transport PPP (Earle 2007). In spite of its public sector shareholders, the bank participates in the main in private initiatives, sometimes along with industrial partners. EBRD's assets in private sector projects vary from 5 million euro to 250 million euro, the representative amount existence 25 million euro. The bank receipts a stretchable methodology and tailors explanations to the necessities of personal investors. The bank finances denationalisations and restructures. The private sector was also supported by civic services and also the infrastructure. Additionally, the bank might not finance bound product or strategies because of their ecologically harmful nature or if adverse influence cannot be sufficiently relieved. The World Bank may be an important supply of economic and technical support to developing countries round the world. Therefore is not a bank within the sense. It is created

of two exclusive growth establishments owned by 185 member countries – the International Bank for Reconstruction and Development (IBRD) and therefore the International Development Association (IDA). Aids from PPPs may be achieved in four main areas: accumulative competency within the implementation of projects; enhancing execution capacity; reducing risk for the public sector; and mobilizing money capitals by final decision scarce public funds for different uses (Majamaa et al. 2008). The International Bank for Reconstruction and Development focuses on middle financial gain and responsible poor countries, and International Development Association – on the poorest countries within the world. PPP projects have some general needs to become productive.

5.1 Project in India

5.1.1 Dahej and Bharuch by Bharuch Dahej

The company was accomplishment and welfare are dependent it is idea of company Social Responsibility (CSR) of a corporation originates from the axiom. For the society to succeed, businesses should turn out occasions for growth and development of sections of society, and contribute to property. Bharuch Dahej Railway Company Ltd. (BDRCL) have trusts in making an optimistic modification to the society, and involve in CSR activities reliable with its capability therefor. The Policy aims at addressing one or a lot of between the goals of: nurturing socio-economic progress arrangements for capability building, living creation, quality education, and direction of individuals, etc., with the primary objective of confirming that benefits reach the targeted recipients. The strategy of the corporate for execution of the CSR activities are going to be so orientating on determine and verbalize projects in response to the requirement of society, set up transparent observation mechanism, and obligate total involvement to induce needed leads to a time certain manner. This CSR Policy shall be effective from the date of endorsement of the Board of administrators of the corporate.

5.1.2 Gandhidham- Palanpur Guage Conversion

In direction to widget the Gandhidham - Palanpur rail section, KRC should undergo into distinct bonds with the Investors, Ministry of Railways, and Western Railways and with the Bankers. A passing outline of all the contracts are nominal below. A note of Sympathetic was pass in into on 3rd Jan 2004 among GOG, KPT, MPSEZ and MOR for execution Gauge Conversion Project of Gandhidham - Palanpur MG rail track complete a SPV. so as to require over the responsibility & funding for execution the project, a Shareholders' Contract was

entered among RVNL, GoG, KPT, MPSEZ and KRC on 22nd April 2004. Under the development Covenant signed amid KRC and WR on 6th October 2005, the latter has been chosen as the Engineering, getting and Construction (EPC) Intervention for the road and trustworthy with the development work. Beneath the Franchise Arrangement entered among the MOR and KRC on 8th November 2005, the MOR has approved a franchise to KRC for a retro of 32 years to appliance conversion of the prevailing MG line among the Palanpur and Gandhidham into a BG line, and assume its operation and conservation throughout the amount. KRC had engaged Loan documents & acknowledged debt from Orient Bank of Commerce and United Bank for Rs.200 Crores and Rs.100 Crores correspondingly for enjoying the PNU-GIM discovered inside the year of 2005-06. Under the Processes and Maintenance Settlement entered among the KRC and WR on twenty first August 2007, KRC has constricted with WR to perform the product train services and undertake the preservation work till the tip of the franchise quantity. For calculation of operation & maintenance (O&M) costs, raising & realizing the bills and modifications of assigned Earnings on KRC section, a Joint Procedure Order (JPO) is being performed among the WR & KRC and conjointly a similar is in progressive stage.

5.1.3 Mumbai-Ahmedabad Line

The possessions of economic difficulty, struggle, and disaster and are regularly visible to the danger of even profounder economic condition through Penurious people in rising countries are preponderantly. Moreover, developing wealth gaps are a threatening think about societies. Serving individuals to flee economic condition and lead healthy, educated lives could be a dynamic task not just for the expansion of developing countries however conjointly for the constancy of the international community. To cut back poverty, service occasions should be extended through even-handed growth that offers correct thought to impoverished members of society, and public amenities like education and tending should be improved. New JICA can deliver support for human possessions growth, capability building, policy and institutional enhancements, and facility of social and economic infrastructure, thereby looking sustained economic condition discount through even handed growth ^[25]. The advance of economic process causes an increase in many cross-border hazards and exposures many of us in rising countries to civil strife, disasters, poverty, and different humanitarian intimidations. The thought of human safety places individual groups of people at its essential, seeking to safeguard them from terror and want: concern of belongings like battle, terrorism,

disaster, environmental annihilation, and communicable disease, and want within the face of economic condition and in social services and structure. By upsurge people's skills to address these concerns themselves, this procedure purposes to generate values throughout which they will take pride. In mandate to guard the pathetic members of civilization from these numerous intimidations, New JICA can provision labours to bolster social and institutional capability and to rise people's power to wear down intimidations themselves.

5.2 PROJECT IN EUROPE

5.2.1 HSL-Zuid, Amsterdam-Belg

Fast, comfortable, secure and accessible transport of passengers on the HSL Zuid. Optimum integration with different modes of transport like the bicycle, car, airplane, standard train, bus, tram, and metro. A high quality of service adequate the other high speed train lines in Europe. The product and also the organization are glad and actuated workers who are pleased with it.

5.2.2 Kokkola ylivieska rail link

These are impacts that may be quantified and verified by freelance observers, like changes in population size or composition, working patterns, within the standard of living or in health and safety. These are impacts that occur “in the imagination” or emotions of individuals, like negative public attitudes, psychological stress or reduced quality of life. As one cannot promptly quantify perceptions or emotions can be sort of impact is way harder to spot and describe.

5.2.3 liefkenshoek-Rail link Antwerp

Employing several hundreds of people daily for the construction of the new link since 12 November 2008 is also an important economic and social impact (Port of Antwerp, 2012).

5.3 Project in other countries

5.3.1 Transcontinental railway

Essentially, resistance differs between vehicle's contact point and surface of roadway. Metal wheels on metal rails have a significant advantage of overcoming resistance compared to rubber-tired wheels on any road surface (railway – 0.001g at 10 miles per hour (16 km/h) and

0.024g at 60 miles per hour (97 km/h); truck – 0.009g at 10 miles per hour (16 km/h) and 0.090 at 60 miles per hour (97 km/h)) [26]. In terms of cargo capacity combining speed and size being moved in a day human – can carry 100 pounds (45 kg) for 20 miles (32 km) per day, or 1 mi/day (1.5 km/day) horse and wheelbarrow – can carry 4 mi/day (5.8 km/day) horse cart on good pavement – can carry 10 mi/day (14 km/day) fully utility truck – can carry 20,000 mi/day (29,000 km/day) long-haul train – can carry 500,000 mi/day (730,000 km/day) Most trains take 250–400 trucks off the road, thus making the road more safe.

5.3. 2 Maryland Light Rail Purple line

Revenue projections for regions were established discrimination numerous sets of statistics from the authorized government and private sources. Among the most information sets are: historic 1969-2008 Bureau of Economic Analysis information on per capita financial gain by county¹²; data on the average manage financial gain and households by county and census tract from U.S. Census knowledge and Applied Demographic Solutions; U.S. Census Yankee Community Survey knowledge on combination manage financial gain and variety of manages by county¹³; MWCOG and BMC population and household projections by TAZ. Bureau of Labour Statistics consumer price index (CPI) knowledge was wont to bring historical average manage financial gain information from current into constant 2014\$.

5.3.3 Finch West LRT

Metrolinx is devoted to creating the services it provides totally accessible to individuals with disabilities through the help of a the regional transit authority for the Greater Toronto and Hamilton area (GTHA), It additionally strives to line a decent example as a pacesetter within the space of accessibility for the complete transportation trade – each as an leader of selection and as a supplier of transit services. The Big Move, Metrolinx’s arrange for transportation within the Greater Toronto and Hamilton area (GTHA), addresses universal access mutually of ten key methods. In its activities, Metrolinx aims to supply a similar level of service for all individuals in an integrated surroundings, to the best degree potential. Metrolinx, as well as its 3 operative divisions, GO Transit, Union Pearson categorical (formerly ARL), and PRESTO, is committed to making sure that services and activities are accessible to individuals with disabilities, well earlier of the regulative point in time of 2025.

6. Environmental Aspects

As presented in Legislative Assessment, a government could adopt to pass a PPP law or a concession law for a numeral of explanations, like to provide importance to a procedure of aborning, exploit and finding out PPP projects which will take precedence over subdivision laws, or to begin a transparent institutional define for developing, getting and execution PPPs. As given in Legislative Assessment, a government might adopt to pass a PPP law or a concession law for a numeral of explanations, wish to offer importance to a procedure of nascent, exploit and checking out PPP projects which is able to take precedence over subdivision laws, or to start a clear institutional outline for developing, obtaining and execution PPPs. operation laws can also be cast-off to close openings at intervals the laws of a bunch country might need to permit for effective infrastructure PPP projects, like allowing the funding of scanty rights to creditors and rigorous open and truthful getting processes. These changes is additionally alive in sector-specific law, or at intervals the case of gaining, a sale or competition law, or the desire be anxious throughout a general enterprise or operation law. This computing device contains links to leadership on drafting PPP/ Concession laws and example enacted PPP laws. whereas super vision and examples are going to be useful, in each PPP/ concern law needs wakeful drafting to be reliable with the host country's prevailing laws..

While super vision and examples will be beneficial, in every PPP/ concern law desires wakeful drafting to be reliable with the host country's prevailing laws. Legal draftsmen need to strike a balance among setting ground rules that inspire transparency and grand general boundaries that will delay bidding groups from accomplishing price for cash or sensible solutions when bidding out PPP projects.

The public-private partnership (PPP) model are effectively applied in many countries infrastructure projects. The preparation of PPP infrastructure construction projects continually starts with due conscientiousness, that is the most vital for the private capitalist, and also the valuation of public needs and welfares in terms of enduring growth, that is the most vital for the public sector. Active PPP infrastructure construction projects essential make sure an entire positive result for each private partner and also the public sector. Therefore, the success of PPP infrastructure construction projects is measured in 2 ways: in terms of the private partner and in terms of the public sector.

The goal of this study paper is to form the procedure for the calculation of PPP vehicle road infrastructure construction projects that will qualify to forecast the effectiveness of upcoming projects consistent with the planned initial project information [27].

The awareness of public transport projects, at urban level, have enlarged within the last years. Even though there is a neighbourhood acuity that transport generates several profits, the sensation is that they are still poorly implicit. The standard techniques of facilitate measure have their heritages in theory, role an incomplete empathetic regarding the native societies' remark of the value of transport. Thus, there is a requirement to enhance a brand new approach so as to measure the socioeconomic possessions and impact fashioned by transport investments in urban areas. The transport analysis literature studied (Leleur 1995, Turró 1999, Sugden and Williams 1978, Layard and Glaister 1996, Pearce and Hett 1999) some refer instead to ex ante analysis, intermediate analysis and ex post analysis was studied by the transport analysis literature. Here, there will be well-known of an ex post analysis, as a consequence of this might be the sole one that contains actual statistics and it ought to regulate in facilitate, the exogenous deviations and together the endogenous ones created the policy intervention. The transport investments assessing in 2 main techniques: cost-benefit analysis (CBA) and Multi criteria Analysis (MCA) Here, there will be well-known of an ex post analysis, as a consequence of this could be the only one that contains actual statistics and it should regulate in help, the exogenous deviations and conjointly the endogenous ones made the policy intervention. Cost-Benefit Analysis associates prices and aids of an alternate and uses monetary values to portion all the consequences [28]. It appears to be a lot of impartial than MCA, however it does not absorb those private property that cannot be monetized. In short, CBA is not acceptable to modify our tough, as a result of most environmental and social effects are difficult to legalize and cannot be concerned within the line of attack On the other hand, the Multi-criteria Analysis calculates in unison the success of some goals by measuring every impacts, quantitative and qualitative, not essentially in money terms. The tactic for computing the standards has somehow a selected component, but it permits the consolidation of quantitative and qualitative indicators. The method for computing the standards has somehow a specific element, however it permits the consolidation of quantitative and qualitative indicators. It is value to mention the multi-criterion decision-making theme ELECTRE (Elimination ET Choix Traduisant la Réalité). It had been thought of by Bernard Roy (Roy, 1991) in answer to dearth of prevailing deciding answer ways. ELECTRE is highlighted by 2 main conceptions: thresholds (of indifference and partiality)

and outranking associations; that is, ELECTRE seeks to create an outranking relation exploitation place to begin. The scheming of transport resources below the impartial of ecological development valid system of MCA. In spite of its goodness, the strategy ELECTRE will not be caudated within the enlargement of a technique for the valuation of economic, social and environmental properties of rail urban projects. At this time, there is essential to form a review of the result assessment procedures inside the EU Union, so as to check that one among transport projects, at urban level, have amplified their interest within the last years. Even if there is a neighbourhood discernment that transport makes several advantages, the sensation is that they are still poorly implicit. The standard approaches of profit measuring have their roots in theory, contribution a partial sympathetic concerning the native societies' awareness of the worth of transport. Thus, there is a necessity to develop a brand new approach so as to measure the socioeconomic possessions and influence made by transport funds in urban areas. In this stage the European Union should take a decision about the existing methodologies in to give a proper and successful urban transport project.

6.1 Projects in India

6.1.1 Dahej and Bharuch by Bharuch Dahej

This is the project in India from the city of Gujarat which has a length of a road 42KM and the passenger safety in this rail is maximum, while constructing the railway track the designer should always keep in mind about the forest or fields because of animals which live there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

6.1.2 Mumbai-Ahmedabad Line

This is the project in India from the city of Mumbai which has a length of a road 508KM and the passenger safety in this rail is Minimum, while constructing the railway track the designer should always keep in mind about the forest or fields because of animals which live there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

6.1.3 Hassan-Mangalore

This is the project in India from the city of Bangalore which has a length of a road 183KM and the passenger safety in this rail is Minimum, while constructing the railway track the designer should always keep in mind about the forest or fields because of animals which live

there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

6.2 Projects in Europe

6.2.1 HSL-Zuid, Amsterdam-Belg

This is the project in Netherlands from the city of, Amsterdam which has a length of a road 125KM and the passenger safety in this rail is maximum, while constructing the railway track the designer should always keep in mind about the forest or fields because of animals which live there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

6.2.2 perpignan-Figueras

This is the project in France from the city of, perpignan-Figueras which has a length of a road 175KM and the passenger safety in this rail is maximum, while constructing the railway track the designer should always keep in mind about the forest or fields because of animals which live there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

6.2.3 Oresund road-rail link

This is the project in Denmark from the city of Oresund which has a length of a road 8KM and the passenger safety in this rail is maximum while constructing the railway track the designer should always keep in mind about the forest or fields because of animals which live there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

6.3 Projects in other country

6.3.1 Channel tunnel rail link CTRL

This is the project in Australia which has a length of a road 107KM and the passenger safety in this rail is maximum, while constructing the railway track the designer should always keep in mind about the forest or fields because of animals which live there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

6.3.2 Wuzhong - Zhongwei section

This is the project in China from the city of Wuzhong - Zhongwei which has a length of a road 190KM and the passenger safety in this rail is Maximum, while constructing the railway track the designer should always keep in mind about the forest or fields because of animals

which live there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

6.3.3 Maryland Light Rail Purple line

This is the project in America which has a length of a road 26KM and the passenger safety in this rail is maximum, while constructing the railway track the designer should always keep in mind about the forest or fields because of animals which live there, there should be at least a cautions board in animal crossing zones or Electric fence and so on to protect them.

7. Expert evaluation ranking method

When planning the research, it is important to determine the required minimum number of tests to be able to make statistically significant conclusion. Therefore, determining whether the respondents questioned the appropriate points. Selecting a formula, where a known population size N is calculated as to take (1):

$$n \geq \frac{1}{v^2 + 1/N} \quad (1)$$

V-delta (or formula V), - sampling error, i.e., the size of the error in the survey given numbers (percent), and indeed in reality, e.g. delta =10%. Or delta=0.1.

N-is the population size, 50.

$$n \geq 33.3$$

- The criteria priority sequencing technique was used for surveying
- It was determined required minimum number of tests. It was – 33, 3.
- Responses received were processed using expert evaluation ranking method.

Table 4 Ticket Cost New South Wales

Experts	C1 - Length of Railway, km	C2 - Number of passengers	C3 - New railway Projects	C4- Reconstruction of the railway projects
E 1	1	4	2	3
E 2	1	4	2	3
E 3	1	3	2	4
E 4	1	4	2	3
E 5	1	4	2	3
E 6	1	4	2	3
E 7	1	3	2	4
E 8	1	4	2	3
E 9	1	4	2	3
E 10	1	3	2	4
E 11	1	4	2	3
E 12	1	4	2	3
E 13	1	3	2	4
E 14	1	4	2	3
E 15	1	3	2	4
E 16	1	4	2	3
E 17	1	4	2	3
E 18	1	4	2	3
E 19	1	3	2	4
E 20	1	4	2	3
E 21	1	3	2	4
E 22	1	4	2	3
E 23	1	4	2	3
E 24	1	3	2	4
E 25	1	3	2	4
E 26	1	4	2	3
E 27	1	4	2	3
E 28	1	3	2	4
E 29	1	4	2	3
E 30	1	4	2	3
E 31	1	3	2	4
E 32	1	4	2	3
E 33	1	4	2	3
E 34	1	3	2	4
E 35	1	4	2	3
Sum	35	128	70	117
The priority row	1	4	2	3

Table 5 Financial Assessment Area

Experts	C1- Project cost, EUR	C2 -Construction duration	C3 -Form of PPP
E 1	1	2	3
E 2	1	3	2
E 3	2	3	1
E 4	1	2	3
E 5	1	2	3
E 6	1	2	3
E 7	1	3	2
E 8	1	3	2
E 9	1	2	3
E 10	1	3	2
E 11	1	3	2
E 12	1	2	3
E 13	1	2	3
E 14	1	3	2
E 15	1	3	2
E 16	3	1	2
E 17	1	2	3
E 18	1	2	3
E 19	1	3	2
E 20	1	2	3
E 21	1	3	2
E 22	1	2	3
E 23	1	2	3
E 24	1	2	3
E 25	1	3	2
E 26	1	3	2
E 27	1	3	2
E 28	1	3	2
E 29	1	3	2
E 30	1	2	3
E 31	1	3	2
E 32	1	3	2
E 33	1	3	2
E 34	1	2	3
E 35	1	2	3
Sum	38	87	86
The priority row	1	3	2

Table 6 Economical Assessment Area

Experts	C1- Ticket Cost, EUR	C2 - Travelling Time
E 1	1	2
E 2	1	2
E 3	1	2
E 4	1	2
E 5	1	2
E 6	1	2
E 7	1	2
E 8	1	2
E 9	1	2
E 10	1	2
E 11	1	2
E 12	1	2
E 13	2	1
E 14	2	1
E 15	2	1
E 16	1	2
E 17	1	2
E 18	2	1
E 19	2	1
E 20	1	2
E 21	1	2
E 22	1	2
E 23	1	2
E 24	1	2
E 25	1	2
E 26	2	1
E 27	2	1
E 28	2	1
E 29	2	1
E 30	1	2
E 31	2	1
E 32	2	1
E 33	2	1
E 34	1	2
E 35	1	2
Sum	47	58
The priority row	1	2

Table 7 Social Assessment Area

Experts	C1- The railway Project is important	C2 - Workplaces created during the project
E 1	2	1
E 2	1	2
E 3	1	2
E 4	1	2
E 5	1	2
E 6	2	1
E 7	1	2
E 8	1	2
E 9	1	2
E 10	1	2
E 11	2	1
E 12	2	1
E 13	1	2
E 14	1	2
E 15	2	1
E 16	2	1
E 17	1	2
E 18	2	1
E 19	1	2
E 20	1	2
E 21	1	2
E 22	1	2
E 23	1	2
E 24	1	2
E 25	1	2
E 26	1	2
E 27	1	2
E 28	2	1
E 29	1	2
E 30	1	2
E 31	1	2
E 32	1	2
E 33	1	2
E 34	1	2
E 35	1	2
Sum	43	62
The priority row	1	2

Table 8 Environmental Assessment Area

Experts	C1- Passengers Safety	C2 -Keeping Animals	C3 -Storage plants
E 1	3	1	2
E 2	2	3	1
E 3	2	3	1
E 4	1	2	3
E 5	1	2	3
E 6	1	2	3
E 7	1	2	3
E 8	1	3	2
E 9	1	2	3
E 10	1	3	2
E 11	2	3	1
E 12	1	2	3
E 13	1	2	3
E 14	1	3	2
E 15	1	3	2
E 16	3	1	3
E 17	1	2	3
E 18	1	2	3
E 19	2	3	1
E 20	1	2	3
E 21	1	2	3
E 22	1	2	3
E 23	1	2	3
E 24	1	2	3
E 25	1	3	2
E 26	1	3	2
E 27	1	3	2
E 28	1	3	2
E 29	1	3	2
E 30	1	2	3
E 31	2	3	1
E 32	1	2	3
E 33	1	2	3
E 34	1	2	3
E 35	1	2	3
Sum	44	82	85
The priority row	1	2	3

Figure 3 Technical Assessment Area

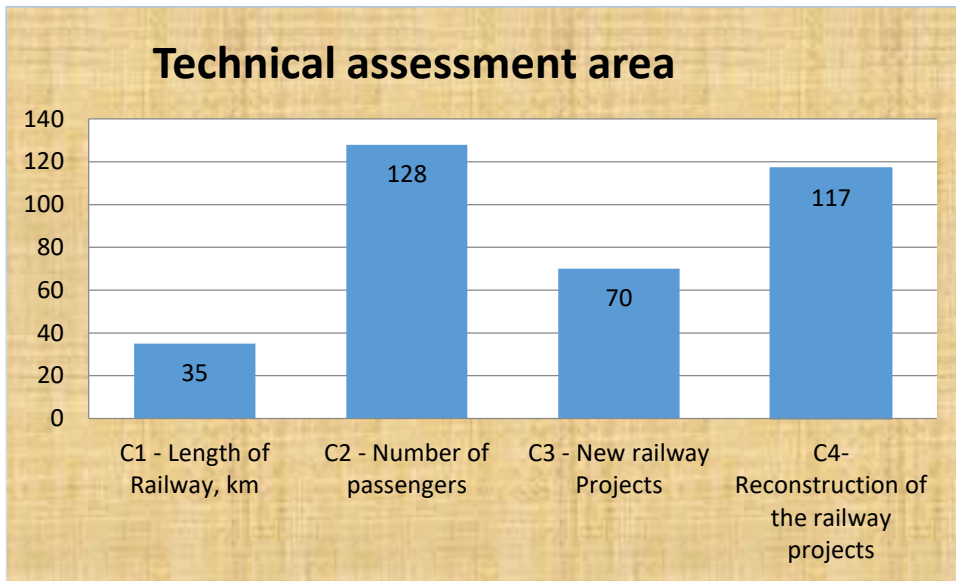


Figure 4 Technical Assessment Area

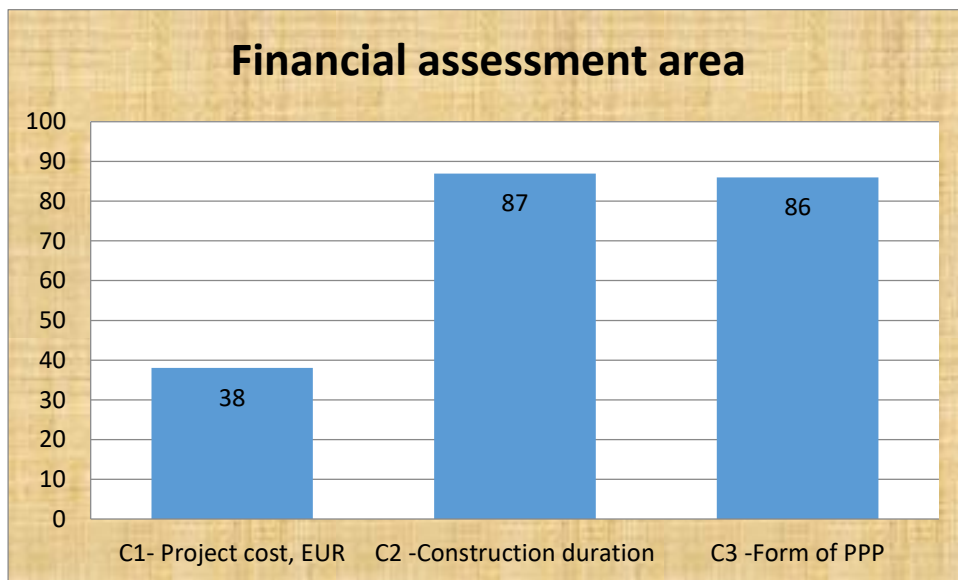


Figure 5 Economical Assessment Area

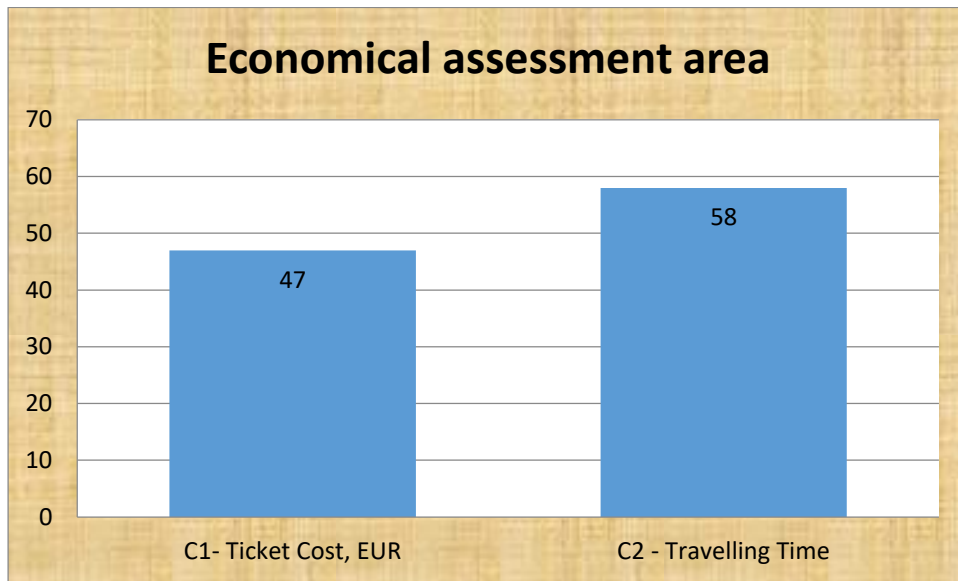


Figure 6 Social Assessment Area

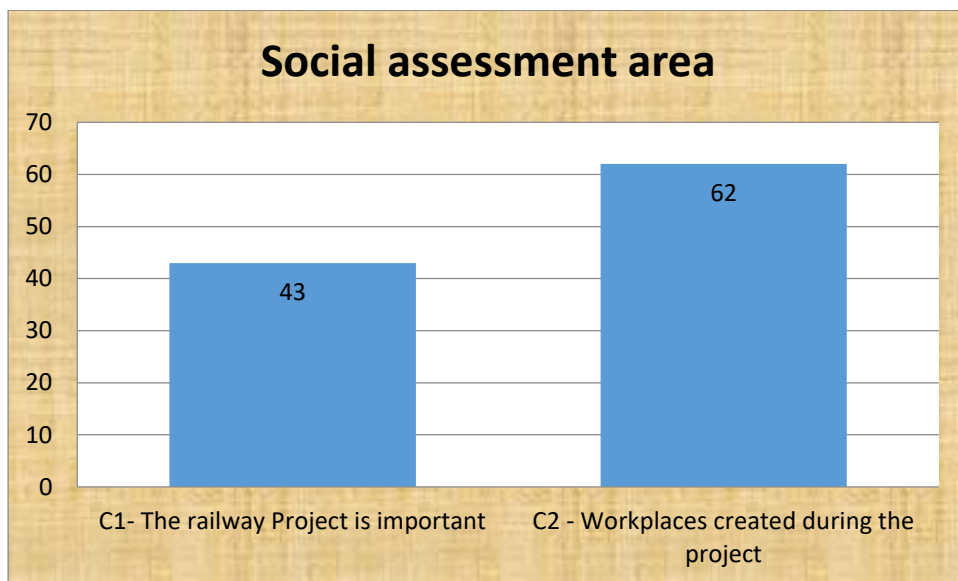
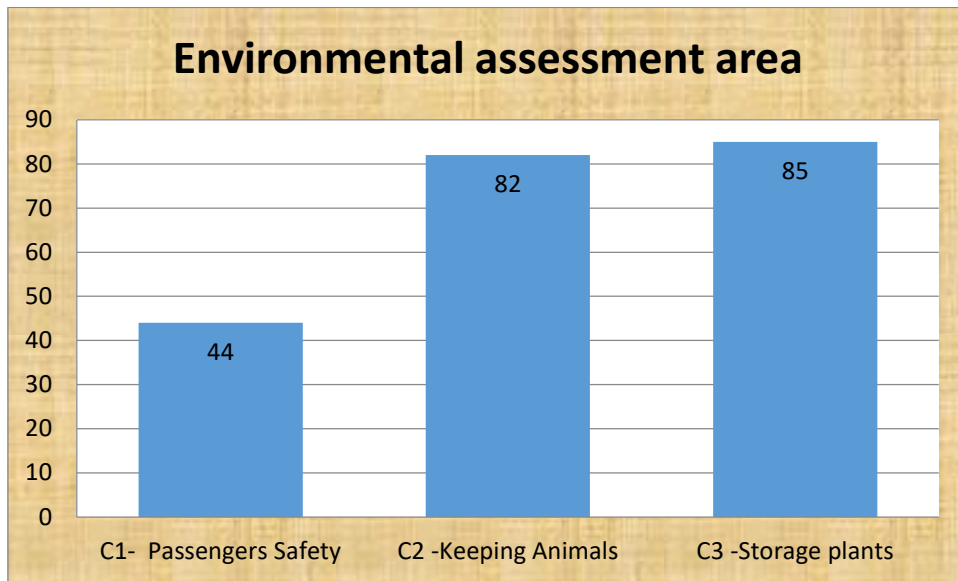


Figure 7 Environmental Assessment Area



Proximity ideal point method

The engineering solutions multicriteria evaluation method is - generalized complex criterion forming the basis of the comparison of options deviation from the so-called ideal, consisting of the best options for the relevant criteria.

In this method and K Kbit criteria should take into account the fact that each version of the decision criterion utility function monotonically increasing or monotonically decreasing, that is any higher value of the indicator is always better or worse at a lower rate for the same value. It depends on whether the utility function is increasing or decreasing.

Table 9 Initial alternative solutions matrix P

Project	Criteria				
	C1	C2	C3	C4	C5
1	183	5100	0.0327	10	9
2	109	5800	0.055	9	10
3	107	1300	0.056	10	9
optimality of criterion	max	min	min	max	max
a+	183	1300	0.0327	10	10
a-	107	5800	0.056	9	9
	56819	61340000	0.00723029	281	262
square root	238.3673635	7831.9857	0.08503111195	16.76305461	16.18641406
x11	0.7677225493	0.651175857	0.3845651227	0.5965499863	0.5560218569
x21	0.4572773654	0.7405529354	0.6468220718	0.5368949876	0.6178020632
x31	0.448886955	0.1659860028	0.6585824731	0.5965499863	0.5560218569

Table 10 .Normalized matrix

Project	Criteria				
	C1	C2	C3	C4	C5
1	0.767723	0.65117586	0.384565	0.59655	0.556022
2	0.457277	0.74055294	0.646822	0.536895	0.617802
3	0.448887	0.165986	0.658582	0.59655	0.556022
optimality of criterion	max	min	min	max	max
q	0.25	0.25	0.2	0.15	0.15
a ⁺	0.767723	0.165986	0.384565	0.59655	0.617802
a ⁻	0.448887	0.74055294	0.658582	0.536895	0.556022

Table 11 Weighted normalized matrix

Project	Criteria				
	C1	C2	C3	C4	C5
1	0.191931	0.16279396	0.076913	0.089482	0.083403
2	0.114319	0.18513823	0.129364	0.080534	0.09267
3	0.112222	0.0414965	0.131716	0.089482	0.083403
optimality of criterion	max	min	min	max	max
a ⁺	0.191931	0.0414965	0.076913	0.089482	0.09267
a ⁻	0.112222	0.18513823	0.131716	0.080534	0.083403

Table 12 The distance between the real and the ideal version of the positive

	Criteria				
	C1	C2	C3	C4	C5
L ₊₁	0.00	0.12	0.00	0.00	0.01
L ₊₂	0.08	0.14	0.05	0.01	0.00
L ₊₃	0.08	0.00	0.05	0.00	0.01
a ⁺	0.08	0.00	0.00	0.01	0.01

Table 13 The distance between the real and the ideal version of the negative

	Criteria				
	C1	C2	C3	C4	C5
L ₋₁	0.08	0.02	0.05	0.01	0.00
L ₋₂	0.00	0.00	0.00	0.00	0.01
L ₋₃	0.00	0.14	0.00	0.01	0.00
a ⁻	0.00	0.14	0.05	0.00	0.00

Ideal positive difference (distance) L_+ between real and ideal a_i positive + setting

L ₊₁	0.19
L ₊₂	0.19
L ₊₃	0.05

Ideal negative difference (distance) L_- - between the real and ideal a_i negative a - Setting

L-1	0.21
L-2	0.21
L-3	0.06

The relative proximity of the ideal alternatives compared $K_-(bit, i)$ Determination

$$K_{bit,1} = \frac{L_1^-}{L_1^+ + L_1^-} = \frac{0,21}{0,19 + 0,21} = 0,52226$$

$$K_{bit,2} = \frac{L_2^-}{L_2^+ + L_2^-} = \frac{0,21}{0,19 + 0,21} = 0,52254$$

$$K_{bit,3} = \frac{L_3^-}{L_3^+ + L_3^-} = \frac{0,06}{0,05 + 0,06} = 0,58164$$

Kbit ₁	0.522259
Kbit ₂	0.522539
Kbit ₃	0.581639

Given the $K_-(bit, i)$ calculations, we compared a number of variations of priorities

$$A_3 > A_2 > A_1$$

Degree of performance.

We compare our question option with an ideal option value

N_1	89.79078
N_2	89.83892
N_3	100

$$N_1 = \frac{K_{bit,1}}{K_{bit,max}} \cdot 100\% = \frac{0,522}{0,581} \cdot 100\% = 89.79\%$$

$$N_2 = \frac{K_{bit,2}}{K_{bit,max}} \cdot 100\% = \frac{0,523}{0,581} \cdot 100\% = 89.84\%$$

$$N_3 = \frac{K_{bit,3}}{K_{bit,max}} \cdot 100\% = \frac{0,581}{0,581} \cdot 100\% = 100\%$$

CONCLUSION

- Many countries in the world regard the PPP as an important tool to attract additional financial resources for high priority investments such as transport infrastructure. PPP is an important tool the implementation of rail projects so that the government does not have sufficient funds for these projects.
- The objective of this report is to study the financial and technical parameters of various PPP railway project across the world and analysis the various PPP parameters like technical, financial, economical, social and environmental.
- The analysis of major PPP rail project evaluation areas: technical, financial, economic, social, environmental, and set criteria for these areas.
- Following a technical assessment criteria estimates obtained a series of priority criteria: Length of Railway, km; New railway Projects, Reconstruction of the railway projects, and Number of passengers.
- Following a financial assessment criteria estimates obtained a series of priority criteria: Project cost, EUR, Form of PPP, Construction duration.
- Following an economical assessment criteria estimates obtained a series of priority criteria: C1- Ticket Cost, EUR, and Travelling Time.
- Following a social assessment criteria estimates obtained a series of priority criteria: The railway Project is important, Workplaces created during the project.
- Following an environmental assessment criteria estimates obtained a series of priority criteria: Passengers Safety, Keeping Animals, Storage plants.

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