

ROAD AND TRANSPORTATION MASTERPLAN

PALESTINE

TA 2012013 PS 00 F10

VEconomic Model and Transport Demand Analysis

SEPTEMBER 30,2016



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1 Introduction

This chapter is aimed to display the method and findings regarding the transport demand forecast for predefined future scenarios. Transport demand forecast addresses both freight and passenger transport during the Master Plan timeframe, around 30-years from now (year 2045). The main steps taken for calculating said estimates is summarized below:

- Analysis of Available Data
Analysis of the time series of GDP, expenditure shares, population, GDP per capita, etc. with the aim to better define the economics and demographics of the current situation in the base year.
- Macroeconomic Model
Estimates of GDP projections for the next 30 years and its subdivision in expenditure shares (with a particular focus on import and export percentage shares) both at national and regional level (West Bank and Gaza Strip).
- Sector Model
Estimates of sector shares of GDP in order to quantify the sector shares of transport freight flows of West Bank and Gaza Strip (at regional and national level).
- Internal/ Domestic Flows Model
Estimates of growth factors of internal transport flows.
- International Freight Flows Model
Forecast of import/export freight traffic volumes.
- International Passenger Model
Estimates of passenger flows from/to countries abroad.
- Transit Model
Estimates of possible transit flows for estimating through- traffic that eventually affects the Palestinian transport network.

2 Transport Demand Forecast Model

2.1 Main Assumptions

The transport demand forecast model is based on demographic changes, mainly population growth, population redistribution, etc. and on GDP evolution in expenditure components, mainly consumption, investment, import and export, over the next 30 years. All data regarding GDP, from demand and supply perspectives, are collected and analyzed. Demographic developments are based on the “Analytical Studies on Population Growth Estimates: Palestine 2025 and Palestine 2050” Report published by the National Spatial Planning Unit in February 2012. In the mentioned report, demographic changes and population growth figures are provided from year 2012 till 2050, including variable scenarios related to different provision scenarios of returning Palestinians from abroad and internal migration between West Bank and Gaza Strip. Additional and support data is received from PCBS, mainly regarding population distribution in different districts (the same are used for macroscopic traffic modelling). Historical data related to GDP development over the past decades is used for reference however not for constructing growth trends.¹ GDP development provisions are based on an optimistic scenario in which growth is regularly positive and ascending. It is noteworthy

¹Due to the fluctuating economical figures in the past decade influenced heavily by the recent uprising and tensions.



that all provisions beyond 15 years from the base year are to be considered indicative and follow a standard growth rate.

2.2 Macroeconomic Model

2.2.1 Collected Data

Data is based mainly on PCBS findings and results of the “Consultancy Services for the Preparation of Analytical Studies on Population Growth Estimates: Palestine 2025 and Palestine 2050” report published by the National Spatial Planning Unit in February 2012. Data is mainly based on:

Palestinian Central Bureau of Statistics:

- GDP at constant prices (time series for years 1994-2013)
- GDP at current prices (time series for years 1994-2013)
- GDP by sector (time series for years 1994-2013)
- GDP by expenditure (time series for years 1994-2013)
- GDP per capita (time series for years 1994-2013)

National Spatial Planning (above referenced study):

- Population in West Bank and Gaza Strip (2012)
- Fertility rates in West Bank and Gaza Strip (2012 till 2050)
- Growth Expectancy in West Bank and Gaza Strip (2012 till 2050)
- Net external immigration scenarios in West Bank and Gaza Strip
- Net internal immigration scenarios in West Bank and Gaza Strip

2.2.2 Analyzed Data

The following tables and figures show all the analyzed data from 1994-2013:

- Total population in West Bank and Gaza Strip (values and yearly growth rates)
- Total GDP (current and constant prices) and yearly growth rate
- GDP divided into West Bank and Gaza Strip (values and shares)
- GDP expenditure shares % (Consumption, Investment, Exports, Imports)
- GDP expenditure shares % divided into West Bank and Gaza Strip

Tab 1. Population Growth Provisions

Year	Population (.000)	Yearly Growth Rate (%)
1994	2,481	
1995	2,598	4.7
1996	2,722	4.8
1997	2,852	4.8
1998	2,981	4.5
1999	3,100	4.0
2000	3,205	3.4
2001	3,292	2.7
2002	3,364	2.2

2003	3,427	1.9
2004	3,490	1.8
2005	3,560	2.0
2006	3,639	2.2
2007	3,725	2.4
2008	3,818	2.5
2009	3,914	2.5
2010	4,013	2.5
2011	4,114	2.5
2012	4,219	2.6
2013	4,326	2.5

Figure 1. Population in West Bank and Gaza Strip (1994-2013)

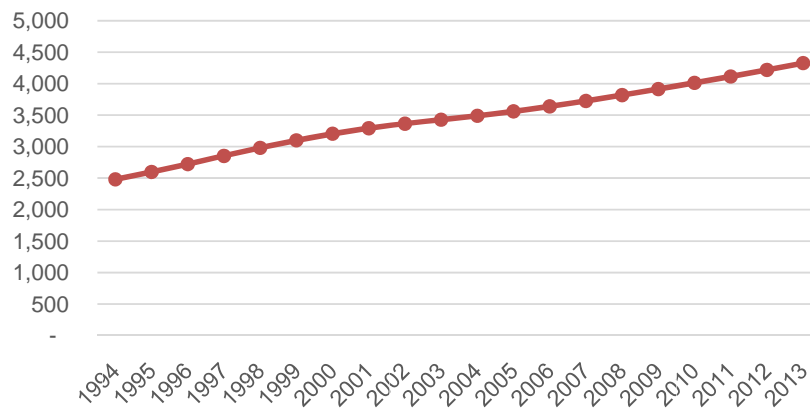
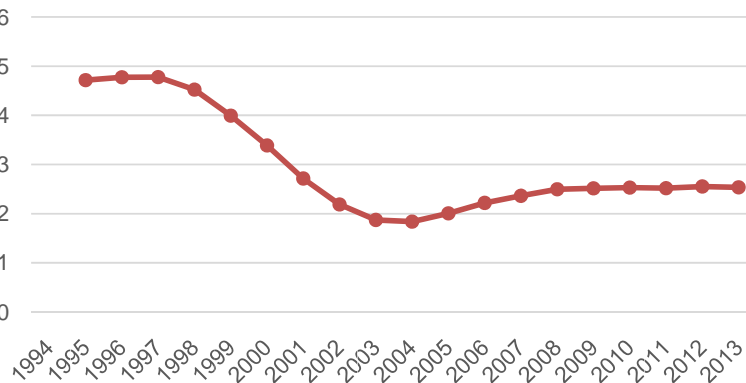


Figure 2. Population in West Bank and Gaza Strip: Yearly Growth Rate (%)





Tab 2. Observed GDP Year 1994 - 2013 (Current and Constant Values 2013) and Yearly Growth Rate in USD

Year	Observed GDP (m) 2004 prices	GDP Current prices	Observed GDP (m) million 2013 prices	Observed Growth rate (%)
1994	3,080.7	2,843.3	5,140.4	
1995	3,300.0	3,282.8	5,506.3	7.12
1996	3,340.1	3,409.6	5,573.2	1.22
1997	3,830.0	3,759.8	6,390.7	14.67
1998	4,379.0	4,067.8	7,306.7	14.33
1999	4,741.6	4,271.2	7,911.8	8.28
2000	4,335.9	4,313.6	7,234.8	- 8.56
2001	3,932.2	4,003.7	6,561.2	- 9.31
2002	3,441.1	3,555.8	5,741.8	- 12.49
2003	3,923.4	3,968.0	6,546.5	14.02
2004	4,329.2	4,329.2	7,223.6	10.34
2005	4,796.7	4,831.8	8,003.7	10.80
2006	4,609.6	4,910.1	7,691.5	- 3.90
2007	4,913.4	5,505.8	8,198.4	6.59
2008	5,212.1	6,673.5	8,696.8	6.08
2009	5,663.6	7,268.2	9,450.2	8.66
2010	6,122.3	8,913.1	10,215.6	8.10
2011	6,882.3	10,465.4	11,483.7	12.41
2012	7,314.8	11,279.4	12,205.4	6.28
2013	7,477.0	12,476.0	12,476.0	2.22

Figure 3. Observed GDP (m) 2013 prices

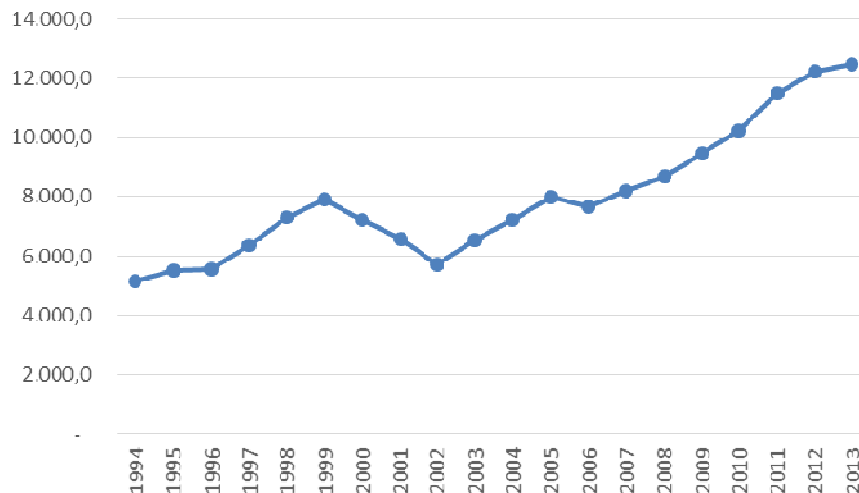
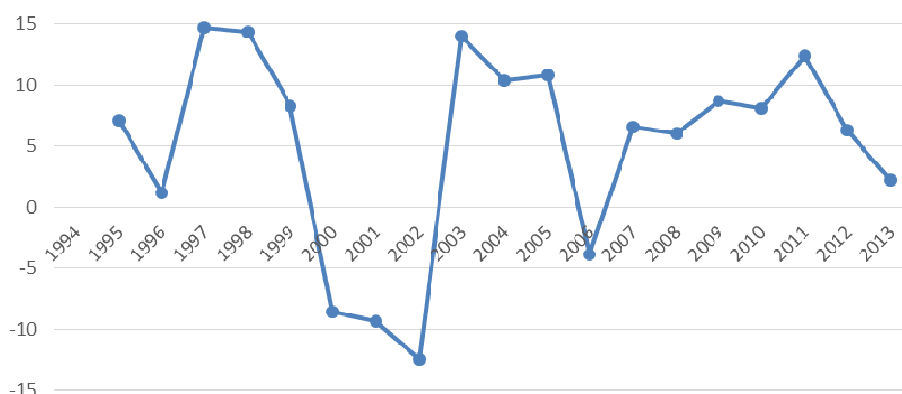


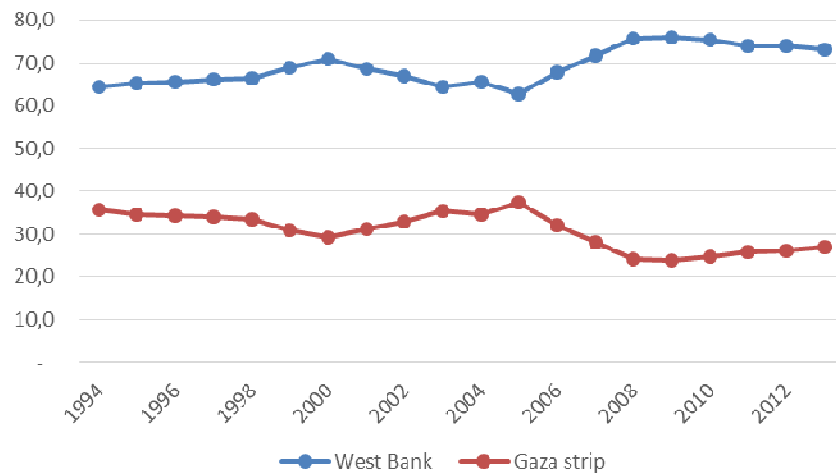
Figure 4. Population: Yearly Growth Rate (%)



Tab 3. GDP in West Bank and Gaza Strip (constant values in USD Year 2014)

year	Palestine	West Bank	Gaza strip	West Bank	Gaza strip
1994	5,140.4	3,305.8	1,834.6	64.3	35.7
1995	5,506.3	3,602.0	1,904.4	65.4	34.6
1996	5,573.2	3,656.5	1,916.7	65.6	34.4
1997	6,390.7	4,223.7	2,167.0	66.1	33.9
1998	7,306.7	4,858.6	2,448.1	66.5	33.5
1999	7,911.8	5,459.6	2,452.2	69.0	31.0
2000	7,234.8	5,122.6	2,112.3	70.8	29.2
2001	6,561.2	4,510.5	2,050.7	68.7	31.3
2002	5,741.8	3,848.3	1,893.5	67.0	33.0
2003	6,546.5	4,226.2	2,320.3	64.6	35.4
2004	7,223.6	4,732.1	2,491.5	65.5	34.5
2005	8,003.7	5,012.1	2,991.6	62.6	37.4
2006	7,691.5	5,223.8	2,467.7	67.9	32.1
2007	8,198.4	5,889.9	2,308.5	71.8	28.2
2008	8,696.8	6,586.4	2,110.4	75.7	24.3
2009	9,450.2	7,182.6	2,267.6	76.0	24.0
2010	10,215.6	7,690.5	2,525.1	75.3	24.7
2011	11,483.7	8,511.8	2,971.9	74.1	25.9
2012	12,205.4	9,025.4	3,180.0	73.9	26.1
2013	12,476.0	9,117.6	3,358.4	73.1	26.9

Figure 5. GDP (West Bank and Gaza Strip Shares (%))



Tab 4. Expenditure Share for West Bank and Gaza Strip (% of GDP)

Year	Final consumption	Gross Capital Formation	Exports	Goods	Services	Imports	Goods	Services
1994	119.81	35.38	13.37	12.46	0.91	68.57	60.57	8.00
1995	121.23	32.83	15.83	14.70	1.13	69.88	62.85	7.03
1996	121.31	31.38	15.02	13.85	1.17	67.71	60.14	7.57
1997	119.34	30.94	15.83	14.68	1.15	66.11	58.53	7.58
1998	115.34	31.49	16.22	14.64	1.58	63.05	55.43	7.62
1999	113.97	40.87	15.84	13.89	1.94	70.67	63.70	6.97
2000	118.00	31.56	20.28	15.91	4.37	69.84	60.93	8.92
2001	125.43	27.69	14.99	13.00	2.00	68.12	57.32	10.80
2002	128.36	25.33	13.98	12.15	1.82	67.66	56.33	11.34
2003	125.85	28.45	13.78	12.22	1.56	68.08	60.31	7.77
2004	131.02	27.66	13.79	12.13	1.65	72.47	65.84	6.63
2005	132.18	26.03	14.69	11.76	2.92	72.89	65.91	6.98
2006	133.41	24.89	14.83	12.79	2.03	73.13	57.79	15.34
2007	132.70	18.04	16.52	13.21	3.31	67.26	56.46	10.80
2008	126.68	22.15	18.25	14.45	3.80	67.08	58.04	9.05
2009	124.65	24.66	17.92	13.85	4.08	67.23	57.98	9.25
2010	119.57	21.64	16.85	14.10	2.75	58.06	49.85	8.21
2011	116.91	19.86	18.86	16.15	2.71	55.63	48.82	6.81
2012	120.61	21.57	17.64	14.84	2.80	59.81	52.85	6.96
2013	113.90	22.55	17.83	15.38	2.45	54.29	48.47	5.82

Tab 5. Expenditure Share for West Bank (% of GDP)

Year	Final consumption	Gross Capital Formation	Exports	Goods	Services	Imports	Goods	Services
1994	116.47	36.01	18.79	17.67	1.12	71.27	62.02	9.25
1995	120.35	32.20	22.17	20.71	1.46	74.72	67.51	7.21
1996	118.23	30.33	20.74	19.23	1.51	69.31	61.95	7.36
1997	117.14	30.30	21.49	20.02	1.47	68.93	61.36	7.56
1998	112.58	32.13	22.04	20.13	1.91	66.75	59.18	7.57
1999	109.98	44.06	20.48	18.03	2.44	74.52	67.98	6.54
2000	111.67	33.42	24.30	19.55	4.75	69.39	58.87	10.52
2001	125.72	29.30	18.82	16.71	2.11	73.83	60.98	12.85
2002	125.43	27.14	17.59	15.90	1.70	70.17	57.47	12.70
2003	124.53	29.50	17.60	16.07	1.53	71.63	63.05	8.58
2004	130.77	26.83	17.95	16.26	1.70	75.55	67.44	8.11
2005	139.36	24.76	19.39	16.25	3.14	83.50	74.65	8.85
2006	129.72	19.65	19.65	16.96	2.69	69.02	54.33	14.70
2007	130.38	21.29	20.66	17.19	3.47	72.33	61.23	11.11
2008	123.39	26.25	23.22	19.08	4.14	72.85	64.43	8.42
2009	121.55	31.36	22.75	18.21	4.54	75.66	67.73	7.94
2010	118.17	24.35	21.97	18.66	3.31	64.49	57.79	6.70
2011	112.52	23.67	23.54	20.51	3.03	59.73	52.79	6.94
2012	116.10	26.19	22.48	19.41	3.07	64.77	57.73	7.04
2013	113.08	28.02	22.62	20.03	2.59	63.72	57.22	6.50

Tab 6. Expenditure Shares in Gaza Strip (% of GDP)

Year	Final consumption	Gross Capital Formation	Exports	Goods	Services	Imports	Goods	Services
1994	125.8	34.3	3.6	3.1	0.5	63.7	58.0	5.7
1995	122.9	34.0	3.8	3.3	0.5	60.7	54.0	6.7
1996	127.2	33.4	4.1	3.6	0.5	64.7	56.7	8.0
1997	123.6	32.2	4.8	4.3	0.5	60.6	53.0	7.6
1998	120.8	30.2	4.7	3.8	0.9	55.7	48.0	7.7
1999	122.8	33.8	5.5	4.7	0.8	62.1	54.2	7.9
2000	133.4	27.0	10.5	7.1	3.4	70.9	65.9	5.0
2001	124.8	24.2	6.6	4.8	1.7	55.6	49.3	6.3
2002	134.3	21.7	6.6	4.5	2.1	62.6	54.0	8.6
2003	128.3	26.5	6.8	5.2	1.6	61.6	55.3	6.3
2004	131.5	29.2	5.9	4.3	1.6	66.6	62.8	3.8

2005	120.2	28.2	6.8	4.3	2.6	55.1	51.3	3.9
2006	141.2	36.0	4.6	4.0	0.6	81.8	65.1	16.7
2007	138.6	9.8	5.9	3.1	2.9	54.3	44.3	10.0
2008	137.0	9.4	2.8	0.0	2.7	49.1	38.1	11.0
2009	134.4	3.4	2.6	0.0	2.6	40.5	27.1	13.4
2010	123.8	13.4	1.2	0.2	1.1	38.5	25.7	12.8
2011	129.5	9.0	5.5	3.7	1.8	43.9	37.5	6.4
2012	133.4	8.4	3.9	1.9	2.0	45.7	39.0	6.7
2013	116.1	7.7	4.8	2.7	2.1	28.7	24.7	4.0

2.2.3 Macroeconomic Forecast Model

A macroeconomic forecast model is prepared with the purpose of estimating future development of West Bank and Gaza Strip, based on the following facts and assumptions:

- Time horizon is 2016-2045
- Analysis is elaborated at constant prices USD 2014
- Base political and security conditions are considered to be optimistic and positive hence considering the complete opening of the State of Palestine to the rest of the world, in terms of trade of goods/services and passenger flows, removal of any kind of barriers (internal, between Gaza Strip and West Bank, and at the boundaries), and achieving freed and unconstrained transport and mobility conditions.

In order to establish valid benchmarks of reference for forecasting a realistic economic growth pattern, reference to neighbouring countries is taken where it is assumed that the country's economy will gradually achieve the levels of proposed countries in two different years. The two countries used as benchmarks are Jordan and Lebanon, due to similarities in cultural, geographical, resource availability, etc. conditions. The GDP of the above referenced countries is shown below and is aimed to be achieved gradually within the 30-year plan where the Jordan GDP per capita will be reached in 2020 whereas Lebanon GDP per capita is reached in 2045.

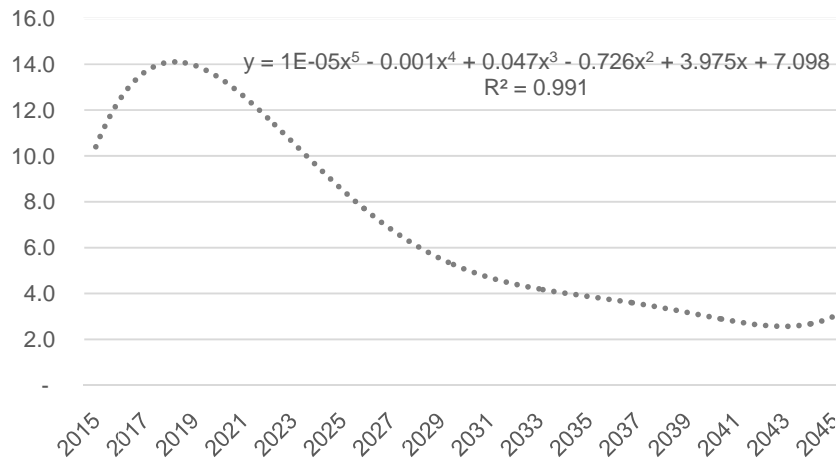
Tab 7. GDP Forecast² (Source: UN statistic database)

Country	GDP per capita (USD 2014)	Year in which the desired GDP per capita is reached
Jordan	4,618	2020
Lebanon	9,793	2045

The following chart shows the polynomial function (and its coefficients) used to estimate the growth rate trend (in % values) for the evaluation period. During the first 5 years, growth rate is assumed to be high with a gradual decrease in the following years prior to reaching standard growth values %.

Figure 6. GDP Growth Rate (%) estimation

²Source: UN Statistics Database



As a result of (1) the previously collected GDP data, (2) future trends assumptions and (3) the above reference to neighboring countries, GDP growth pattern is constructed.

Note: It is noteworthy that growth trends and patterns are constructed for the purposes of this study only, due to absence of other reliable forecasts, and shall not be utilized, cited, referenced and/or referred to whatsoever for the development of future economical studies.

Figure 7. Total GDP (constant 2013 prices): Observed and Estimated Values

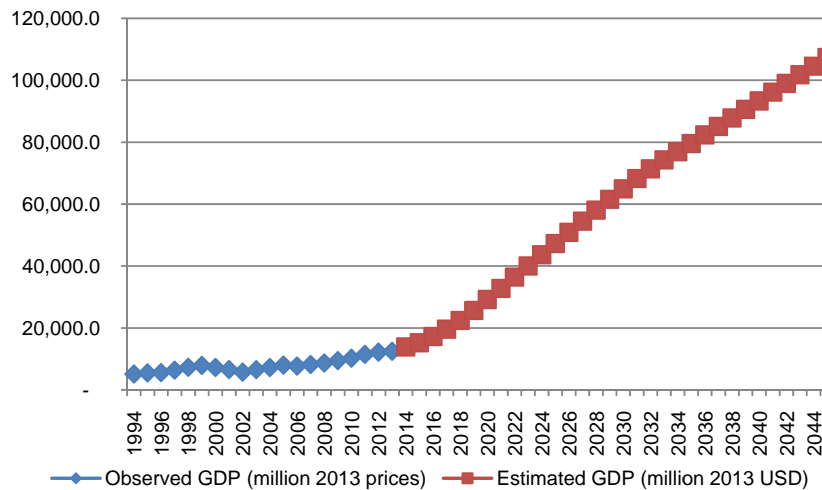
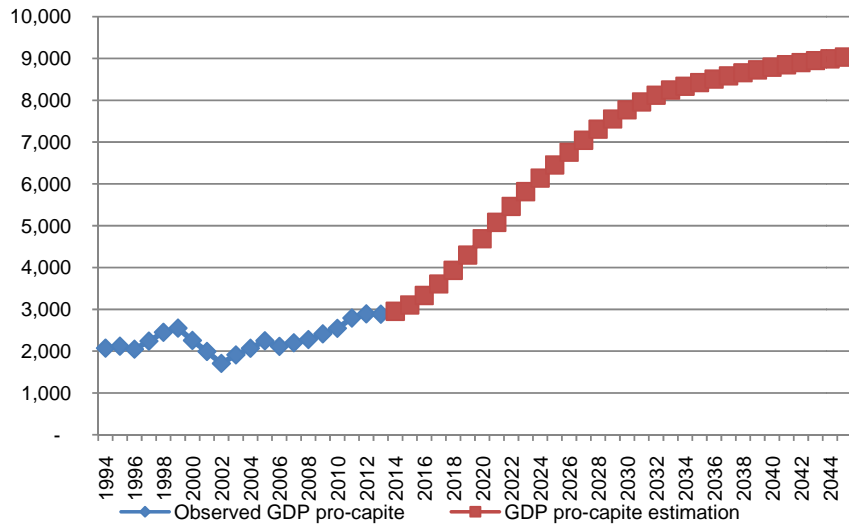


Figure 8. GDP per capita (constant 2014 prices): Observed and Estimated Values



Tab 8. Observed and Estimated Total and per capita GDP, and GDP Yearly Growth Rate – constant 2014 USD

year	Observed/estimated GDP (million 2014 prices)	Observed/estimated Growth rate (%)	Population (.000)	Population growth rate (%)	GDP per-capita estimation	
Observed	1994	5,140.4		2,481	-	-
	1995	5,506.3	7.12	2,598	-	-
	1996	5,573.2	1.22	2,722	-	-
	1997	6,390.7	14.67	2,852	-	-
	1998	7,306.7	14.33	2,981	-	-
	1999	7,911.8	8.28	3,100	-	-
	2000	7,234.8	- 8.56	3,205	-	-
	2001	6,561.2	- 9.31	3,292	-	-
	2002	5,741.8	- 12.49	3,364	-	-
	2003	6,546.5	14.02	3,427	-	-
	2004	7,223.6	10.34	3,490	-	-
	2005	8,003.7	10.80	3,560	-	-
	2006	7,691.5	- 3.90	3,639	-	-
	2007	8,198.4	6.59	3,725	-	-
	2008	8,696.8	6.08	3,818	-	-
	2009	9,450.2	8.66	3,914	-	-
	2010	10,215.6	8.10	4,013	-	-
	2011	11,483.7	12.41	4,114	-	-
	2012	12,205.4	6.28	4,219	-	-
2013	12,476.0	2.22	4,326	-	-	
Estimated	2014	13,911.7	11.5	4,711	8.90	2,953.1
	2015	15,261.7	9.7	4,916	4.63	3,104.3
	2016	17,258.8	13.1	5,181	5.82	3,331.3
	2017	19,642.7	13.8	5,445	5.67	3,607.2
	2018	22,452.7	14.3	5,710	5.53	3,932.2
	2019	25,682.9	14.4	5,975	5.40	4,298.7
	2020	29,247.1	13.9	6,239	5.27	4,687.7
	2021	32,814.2	12.2	6,457	4.24	5,081.7
	2022	36,449.5	11.1	6,675	4.15	5,460.2
	2023	40,090.9	10.0	6,894	4.05	5,815.7
	2024	43,662.7	8.9	7,112	3.96	6,139.5
	2025	47,303.9	8.3	7,330	3.87	6,453.5
	2026	50,919.6	7.6	7,536	3.58	6,756.5
	year	Observed/estimated GDP (million 2014 prices)	Observed/estimated Growth rate (%)	Population (.000)	Population growth rate (%)	GDP per-capita estimation
	2028	58,099.5	6.6	7,949	3.43	7,308.9



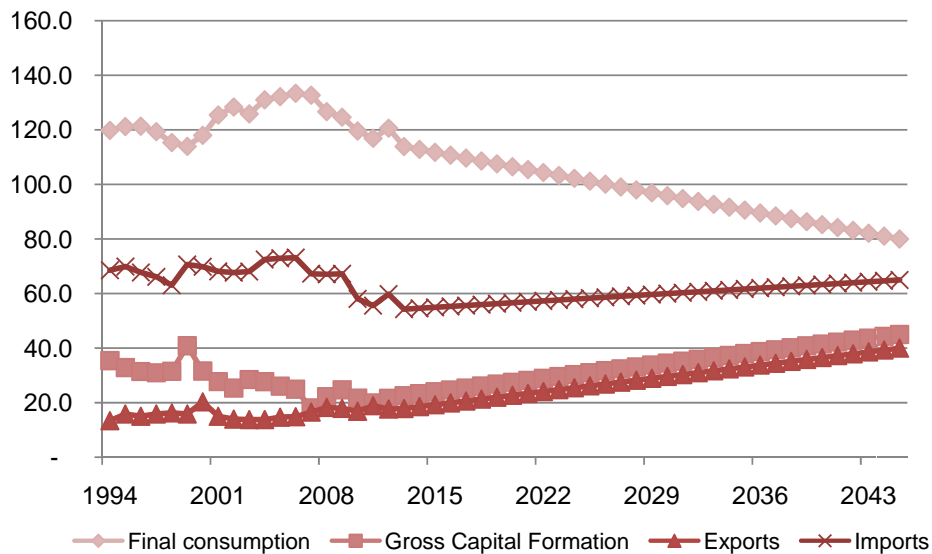
2029	61,595.2	6.0	8,156	3.35	7,552.5
2030	64,987.7	5.5	8,362	3.29	7,771.8
2031	68,305.6	5.1	8,580	3.40	7,961.3
2032	71,441.9	4.6	8,797	3.33	8,120.8
2033	74,333.9	4.0	9,015	3.27	8,245.5
2034	76,963.2	3.5	9,233	3.20	8,335.8
2035	79,602.5	3.4	9,451	3.14	8,423.1
2036	82,371.3	3.5	9,684	3.31	8,505.7
2037	85,130.5	3.3	9,918	3.26	8,583.5
2038	87,886.1	3.2	10,152	3.20	8,657.4
2039	90,632.5	3.1	10,385	3.14	8,727.0
2040	93,351.8	3.0	10,619	3.09	8,791.0
2041	96,212.0	3.1	10,872	3.30	8,849.2
2042	99,034.5	2.9	11,126	3.25	8,901.3
2043	101,825.1	2.8	11,379	3.20	8,948.3
2044	104,577.6	2.7	11,633	3.15	8,990.0
2045	107,377.7	2.7	11,886	3.10	9,034.0

The following average values of expenditure shares % are established based on benchmark referencing to neighboring countries, Lebanon and Jordan for 2014. The subsequent section illustrates the forecast of all the components of GDP expenditure. The analysis is carried out according to the following benchmarks for the last evaluation year 2045:

- Consumptions 80.0%
- Investments 45.0%
- Imports 65.0%
- Exports 40.0%

The following charts and tables show the main results concerning the shares of GDP expenditure:

Figure 9. GDP Expenditure Share (%): 2014-2045 Forecast Estimation





Tab 9. GDP expenditure share in %

Year	Final consumption	Gross Capital Formation	Exports (%)	Imports (%)
1994	119.8	35.4	13.4	68.6
1995	121.2	32.8	15.8	69.9
1996	121.3	31.4	15.0	67.7
1997	119.3	30.9	15.8	66.1
1998	115.3	31.5	16.2	63.1
1999	114.0	40.9	15.8	70.7
2000	118.0	31.6	20.3	69.8
2001	125.4	27.7	15.0	68.1
2002	128.4	25.3	14.0	67.7
2003	125.9	28.5	13.8	68.1
2004	131.0	27.7	13.8	72.5
2005	132.2	26.0	14.7	72.9
2006	133.4	24.9	14.8	73.1
2007	132.7	18.0	16.5	67.3
2008	126.7	22.1	18.3	67.1
2009	124.6	24.7	17.9	67.2
2010	119.6	21.6	16.8	58.1
2011	116.9	19.9	18.9	55.6
2012	120.6	21.6	17.6	59.8
2013	113.9	22.6	17.8	54.3
2014	112.8	23.3	18.5	54.6
2015	111.8	24.0	19.2	55.0
2016	110.7	24.7	19.9	55.3
2017	109.7	25.4	20.6	55.6
2018	108.6	26.1	21.3	56.0
2019	107.5	26.8	22.0	56.3
2020	106.5	27.5	22.7	56.6
2021	105.4	28.2	23.4	57.0
2022	104.4	28.9	24.1	57.3
2023	103.3	29.6	24.8	57.6
2024	102.2	30.3	25.5	58.0
2025	101.2	31.0	26.1	58.3
2026	100.1	31.7	26.8	58.6
2027	99.1	32.4	27.5	59.0
2028	98.0	33.1	28.2	59.3
2029	97.0	33.8	28.9	59.6
2030	95.9	34.5	29.6	60.0
2031	94.8	35.2	30.3	60.3
2032	93.8	35.9	31.0	60.6
2033	92.7	36.6	31.7	61.0
2034	91.7	37.3	32.4	61.3
2035	90.6	38.0	33.1	61.7
2036	89.5	38.7	33.8	62.0
2037	88.5	39.4	34.5	62.3
2038	87.4	40.1	35.2	62.7
2039	86.4	40.8	35.8	63.0
2040	85.3	41.5	36.5	63.3
2041	84.2	42.2	37.2	63.7
2042	83.2	42.9	37.9	64.0
2043	82.1	43.6	38.6	64.3
2044	81.1	44.3	39.3	64.7
2045	80.0	45.0	40.0	65.0



The following tables show the benchmark for year 2045 and import and export subdivided into goods and services both in share and values.

Tab 10. Shares (% of GDP in West Bank and Gaza Strip

West Bank

Year	Final Consumption	Gross Capital Formation	Exports	Goods	Services	Imports	Goods	Services
2015	111.0	29.1	23.7	19.7	4.0	63.8	56.5	7.3
2019	106.9	31.2	25.9	19.1	6.8	64.0	54.9	9.0
2025	100.7	34.4	29.1	18.1	11.0	64.2	52.6	11.6
2032	93.4	38.1	32.9	17.0	15.9	64.5	50.0	14.5
2038	87.2	41.3	36.2	16.1	20.1	64.7	47.7	17.0
2045	80.0	45.0	40.0	15.0	25.0	65.0	45.0	20.0

Gaza Strip

Year	Final Consumption	Gross Capital Formation	Exports	Goods	Services	Imports	Goods	Services
2015	113.9	10.1	7.0	3.4	3.6	31.0	25.6	5.3
2019	109.3	14.7	11.4	4.7	6.7	35.5	27.4	8.1
2025	102.6	21.7	18.0	6.7	11.3	42.3	30.1	12.2
2032	94.7	29.9	25.7	9.0	16.7	50.2	33.2	17.1
2038	87.9	36.8	32.3	11.0	21.3	57.1	35.9	21.2
2045	80.0	45.0	40.0	13.3	26.7	65.0	39.0	26.0

Tab 11. Import/Export Values of Goods only (m USD 2015)

Year	West Bank		Gaza Strip		Palestine	
	Import	Export	Import	Export	Import	Export
2015	6,226.4	2,174.8	1,083.9	144.3	7,310.3	2,319.1
2019	9,963.9	3,462.8	2,066.3	357.0	12,030.2	3,819.8
2025	16,975.6	5,852.1	4,526.9	1,011.2	21,502.5	6,863.3
2032	23,314.4	7,953.5	8,226.0	2,238.4	31,540.3	10,191.8
2038	26,337.8	8,895.3	11,709.3	3,596.1	38,047.2	12,491.4
2045	28,992.0	9,664.0	16,750.9	5,726.8	45,742.9	15,390.8



3 Sector Model

The Sector Model is aimed at establishing the criteria for forecasting GDP supply components (Value Added by economic sector) during the Master Plan time horizon. The model is implemented using Value Added by the agricultural, industrial and services sectors' shares over the total Value Added (GDP).

Base year % shares of GDP by economic sectors are presented in the table below:

Tab 12. Palestinian GDP by Economic Activity for Year 2013³

%	Agriculture	Mining and quarrying	Manufacturing & Construction	Utilities	Services	Total
West Bank	3.5	0.9	23.2	1.6	70.9	100.0
Gaza Strip	5.8	0.0	21.0	4.7	68.5	100.0
Palestine	4.1	0.6	22.6	2.4	70.2	100.0

Neighboring countries used as a benchmark reference are also used for establishing a similar trend per GDP shares per economic activity. GDP shares by economic activity of the two referenced countries are shown in the table below:

Tab 13. GDP Shares by Economic Activity of Selected Countries

%	Agriculture	Mining and quarrying	Manufacturing & Construction	Utilities	Services	Total
Lebanon	3.9	0.6	13.8	3.2	78.6	100.0
Jordan	2.8	2.5	21.6	2.4	70.7	100.0

Accordingly, the forecast of Palestinian shares is assumed through a 5 degree function, allowing for a more reasonable increase trend, compared to a logistic or a linear regression. The following charts show the functions utilized and coefficients of each variable. The R² parameters show the quality of the regression analysis (from 0 = no correlation to 1 = maximum correlation).

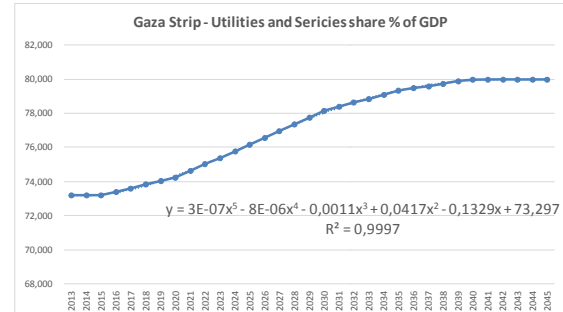
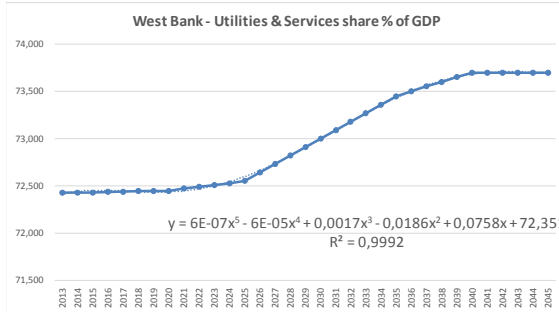
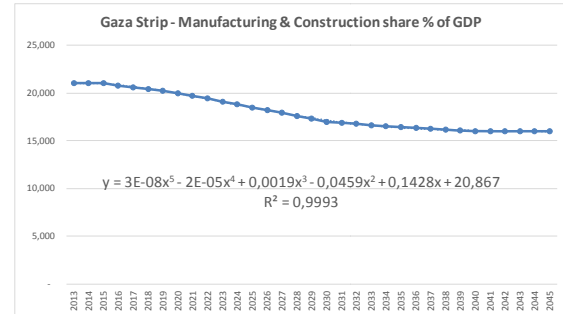
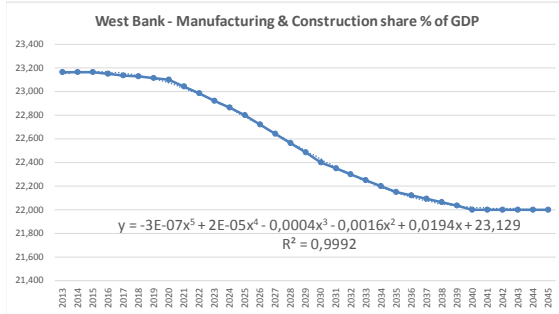
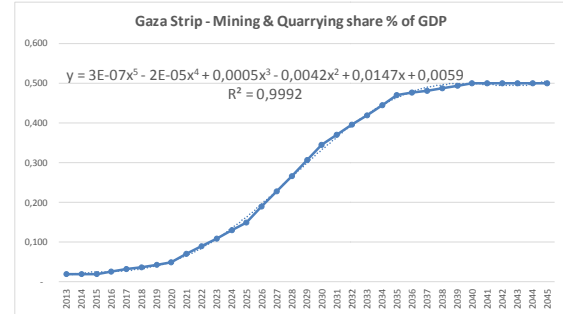
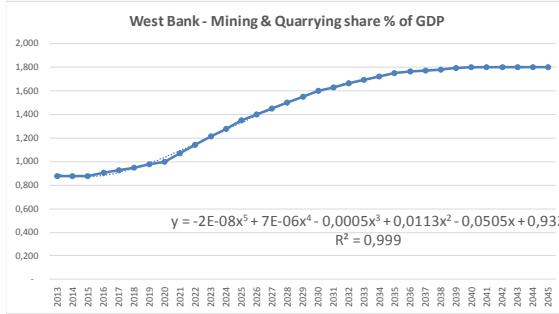
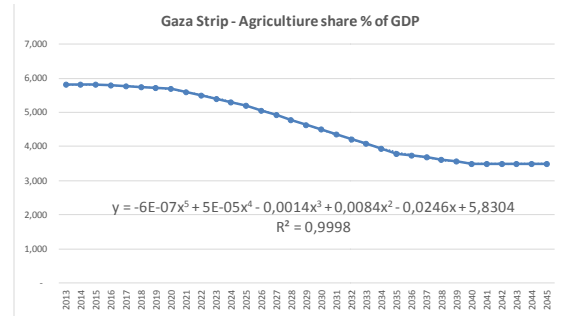
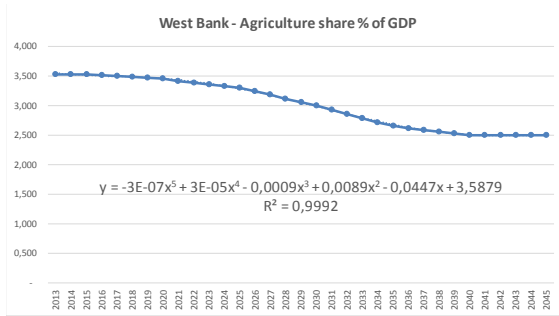
Tab 14. Benchmarks for Year 2045

%	Agriculture	Mining and quarrying	Manufacturing & Construction	Utilities	Services	Total
West Bank	2.50	1.80	22.00	3.00	70.70	100.00
Gaza Strip	3.50	0.50	16.00	3.00	77.00	100.00

³ PCBS



Figure 10. Sector Shares % of GDP by Region





A summary concerning the GDP values (thousands USD) by sector for years shown in following charts.

Figure 11. Palestine Values of GDP by Sector (USD)

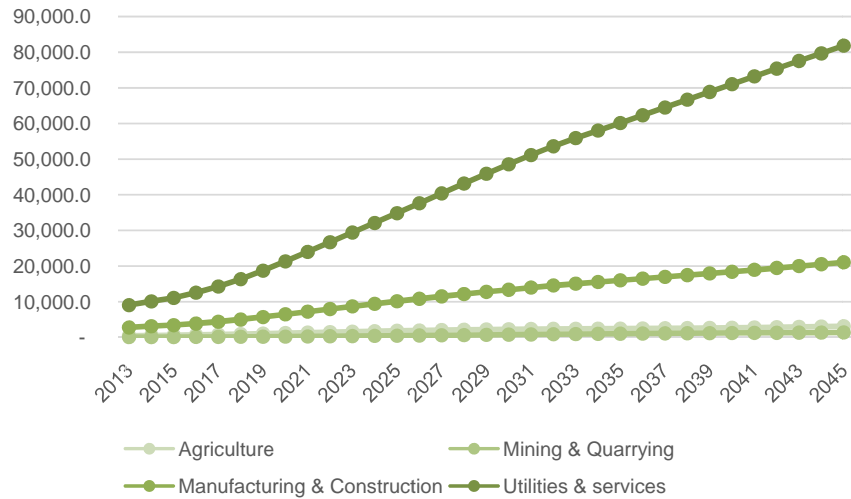


Figure 12. West Bank Values of GDP by Sector(USD)

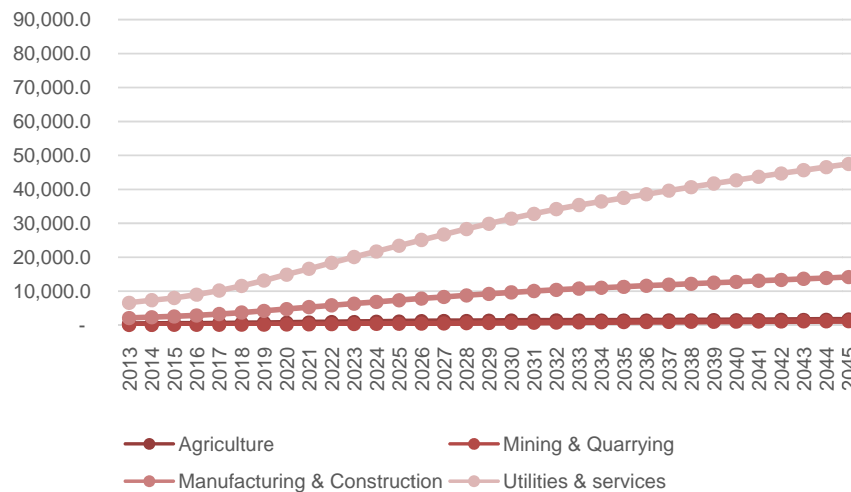
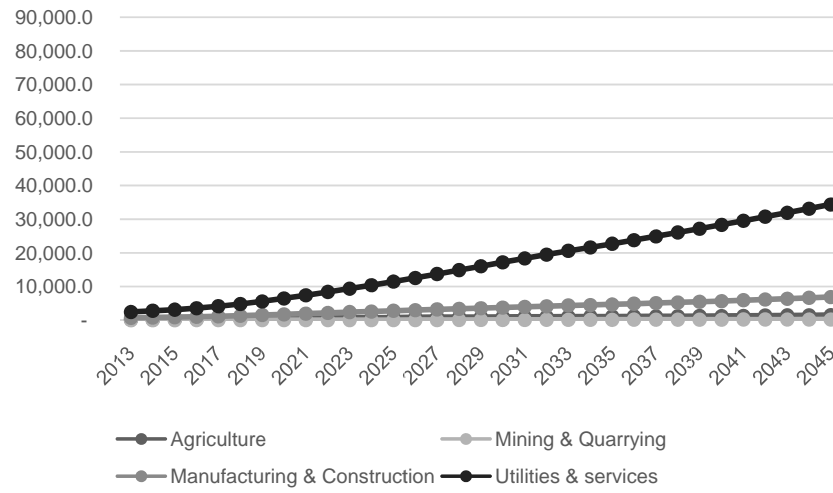


Figure 13. Gaza Strip Values of GDP by Sector





4 Internal Travel Demand Forecast

In order to evaluate internal forecast, passenger and freight traffic volumes are taken into account. The observed traffic flows registered during the extended traffic counts survey campaign and estimated economic growth results into reliable data for forecast of potential transport demand over NTMP time period.

4.1 Methodology

The objective is the assessment of the growth rates of passengers transported between each link of the multimodal transport network.

The analysis is carried out starting from the information concerning classified traffic counts for the year 2014 that shows the actual transport flows.

The base year data concerning internal passenger flows was the traffic survey performed in 2014. No changes are assumed for year 2015. The forecast for the next 30 years (2016-2045) are estimated according to the elasticity of transport related to GDP growth rate.

4.1.1 Passenger Movements

Annual Growth factors of internal passenger movements is based mainly on population growth. Unlike the estimation of freight traffic volumes and movements, increase in internal passenger movements is not based on GDP growth however on population increase as per the scenarios established by the PNA, through its Spatial Planning Department.

Tab 15. Population increase rates⁴

Year	Population	Growth Rate (Every 5 Years)
2015	4,916,267	-
2020	6,239,112	27%
2025	7,329,934	17%
2030	8,361,999	14%
2035	9,450,526	13%
2040	10,619,013	12%
2045	11,886,005	12%

Based on the following assumptions and input data growth factors are calculated:

- Daily trips per person globally range from 2.4-2.8 trips per day | 2.5 trips per day per person is used.
- Based on the weekly (7-day) traffic surveys it is determined that the 4-hour interval peak considered constitute 28% of the total number of movements per day
- Based on the weekly (7-day) traffic surveys it is determined that the examined day (Monday) constitutes 14.85% of the entire week.
- 52 weeks are considered to be the total number of weeks in a year
- Intercity vs. urban/rural movements is considered 9.22% during the base year which develops till reaching 12% in year 2045.

⁴ Source: National Spatial Planning (NSP)

Tab 16. Growth Factors Per Year (2015-2045)

Year	Population (Forecast from MoT)	Daily Trips	PM IN-IN Trips (intercity + intracity)	PM IN-IN Trips (intercity only)	% (PM intercity / PM total IN-IN trips)	% growth (5 years interval)	% growth (per year)	Growth Factor
2015	4,916,267	12,290,668	3,441,387	317,388	9.22%	/	/	/
2020	6,239,112	15,597,780	4,367,378	422,931	9.68%	33.3%	6.7%	1.33
2025	7,329,934	18,324,835	5,130,954	520,343	10.14%	23.0%	4.6%	1.64
2030	8,361,999	20,904,998	5,853,399	620,314	10.60%	19.2%	3.8%	1.95
2035	9,450,526	23,626,315	6,615,368	731,173	11.05%	17.9%	3.6%	2.30
2040	10,619,013	26,547,533	7,433,309	855,325	11.51%	17.0%	3.4%	2.69
2045	11,886,005	29,715,013	8,320,204	998,424	12.0%	16.7%	3.3%	3.15

4.1.2 Freight Movements

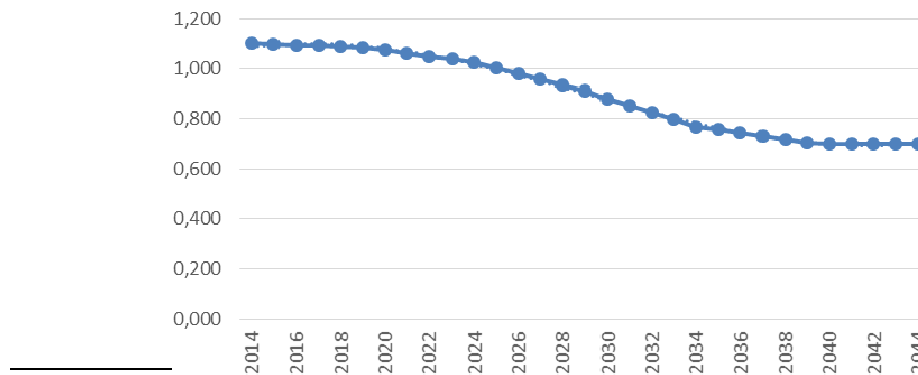
Freight movements are based on observed data and growth is attributed to increase in GDP per capita and GDP share variations for the different economic activities and sectors. Demand elasticity⁵ is based on the following formula:

$$\text{Elasticity} = (\% \text{ variation of passengers/freights}) / (\% \text{ variation of GDP})$$

It is assumed that, in 2045, elasticity for freight will reach values similar to those registered in developed countries, less than 70% of GDP variation. It is hence assumed that in year 2045 elasticity to GDP will be 70% for freight, whereas during the base year elasticity to GDP will be 110%, realistically reflecting the current economic conditions.

The following charts and tables illustrate the freight growth rate 2014 – 2045 for internal flows in West Bank and Gaza Strip.

Figure 14. Elasticity Freight Demand vs GDP



⁵ Demand Elasticity is a measure of a variable's sensitivity to a change in another variable. In economics, elasticity refers to the degree to which individuals (consumers/producers) change their demand/amount supplied in response to price or income changes. In the transport field, demand elasticity measures the transport demand of passengers and freight sensitivity to a change in GDP.



4.2 Internal Travel Demand Results

Based on the previously described methodology, the table below shows the real growth rate of domestic freight transport.

Tab 17. GDP Growth Rate, Elasticity Factors and Real Growth Rate Estimated for Both Passenger and Freight Flows

West Bank				Gaza Strip			
Year	GDP growth rate (%)	Elasticity (Freight/GDP)	Real growth rate % (Freight)	Year	GDP growth rate (%)	Elasticity (Freight/GDP)	Real growth rate % (Freight)
2014	4.4	-	-	2014	6.6	-	-
2015	7.2	1.100	7.913	2015	9.4	1.100	10.354
2016	9.4	1.097	10.287	2016	11.6	1.097	12.749
2017	10.4	1.094	11.343	2017	12.6	1.094	13.798
2018	11.1	1.091	12.067	2018	13.3	1.091	14.509
2019	11.4	1.088	12.355	2019	13.6	1.088	14.776
2020	11.1	1.085	11.993	2020	13.3	1.085	14.381
2021	10.4	1.073	11.110	2021	12.5	1.073	13.438
2022	9.4	1.061	9.927	2022	11.5	1.061	12.190
2023	8.4	1.049	8.768	2023	10.5	1.049	10.969
2024	7.4	1.037	7.632	2024	9.4	1.037	9.773
2025	6.9	1.025	7.031	2025	8.9	1.025	9.121
2026	6.4	1.002	6.371	2026	8.4	1.002	8.391
2027	5.9	0.979	5.735	2027	7.9	0.979	7.686
2028	5.4	0.956	5.121	2028	7.3	0.956	7.005
2029	4.9	0.933	4.530	2029	6.8	0.933	6.349
2030	4.4	0.910	3.963	2030	6.3	0.910	5.717
2031	3.9	0.882	3.399	2031	5.8	0.882	5.082
2032	3.4	0.854	2.864	2032	5.2	0.854	4.475
2033	2.9	0.826	2.356	2033	4.7	0.826	3.899
2034	2.4	0.798	1.876	2034	4.2	0.798	3.351
2035	2.2	0.770	1.731	2035	4.1	0.770	3.145
2036	2.1	0.757	1.623	2036	4.0	0.757	3.005
2037	2.0	0.744	1.518	2037	3.9	0.744	2.869
2038	1.9	0.731	1.416	2038	3.7	0.731	2.735
2039	1.8	0.718	1.316	2039	3.6	0.718	2.605
2040	1.7	0.705	1.219	2040	3.5	0.705	2.478
2041	1.6	0.700	1.138	2041	3.4	0.700	2.381
2042	1.5	0.700	1.066	2042	3.3	0.700	2.302
2043	1.4	0.700	0.993	2043	3.2	0.700	2.224
2044	1.3	0.700	0.920	2044	3.1	0.700	2.145
2045	1.3	0.700	0.917	2045	3.1	0.700	2.137



5 International Freight Flows Model

5.1 Introduction

This chapter is aimed to analyse future scenarios of inbound and outbound international passenger transport. Available data is collected from PCBS, summarized as follows:

- Main Indicators for Hotel Activities in West Bank by Region and Quarter, 2014;
- Percentage Distribution of Travelled Households on Outbound Trips by Purpose of Trip and Region, 2014;
- Number of Guests in Hotels by Nationality and Month, 2014;
- Percentage Distribution of Inbound Visitors by Country of Residence and the Site Visited, 2009.

5.2 Main Assumptions

Base year data are:

Tab 18. Distribution of Inbound Visitors by Visited Site (2009)

Area of destination	%
Jericho	25.5
East Jerusalem	33.5
Bethlem	28.3
Nablus	2.0
Other	10.7
Total	100.0

Tab 19. Number of Guests in Hotel in Palestine (2014)

Origin	N. of guests	%	Kind of flow
Palestine	54,437	8.9	Internal flows
Israel	67,646	11.1	Short distance
Arab Countries	6,338	1.0	Long distance
Asia	58,381	9.6	Long distance
U.S.A & Canada	59,568	9.8	Long distance
Other American Countries	14,375	2.4	Long distance
European Union	195,280	32.0	Long distance
Other European Countries	122,198	20.0	Long distance
Africa	26,900	4.4	Long distance
Australia & New Zealand	5,224	0.9	Long distance
Total	610,347	100.0	



Due to the lack of current air traffic data of passengers (locals and tourists) reaching West Bank and Gaza Strip, the traditional regression analysis type of time series is not used and an alternative methodology is devised.

The analysis is carried out according to the following steps:

- The same benchmark reference countries are used for estimating the average number of international passengers.

Tab 20. Number of Arrivals of Non-Resident Passengers (2010)

Country	Arrivals
Jordan	4,207
Lebanon	2,168
Average	3,188

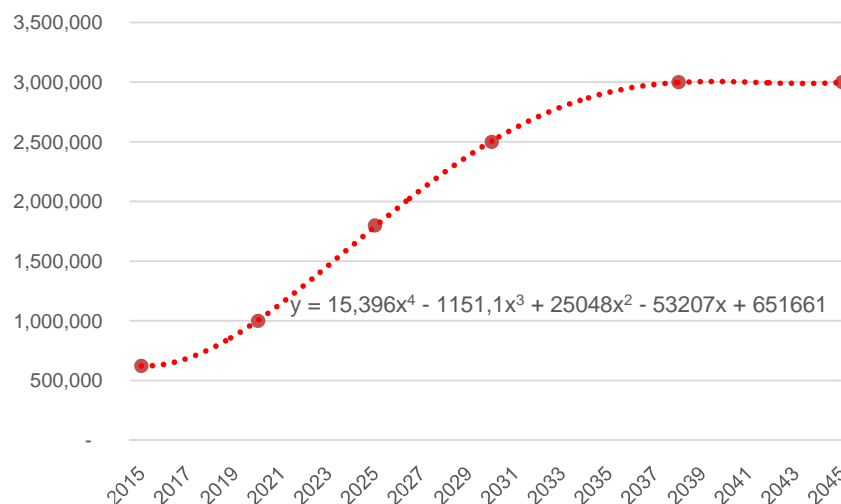
- Both outbound and inbound flows are analyzed and separated in Land and Air travel flows taking into consideration the distance of origin/destination.

Based on the above inbound flows are assumed to be:

- 3 million/year for total inbound passengers in 2037
- 1 million/year for total outbound passengers in 2037 (around 30% of total inbound passengers)

Growth rate trend is based on a polynomial function assuming a high increase in the first 10 years.

Figure 15. Growth Rate of Inbound Flows



Outbound flows are calculated based on a percentage of total inbound flows. It starts from a 43% for the base year (as observed from Palestinian Statistics) to a 33.7% in 2036 until the end of the evaluation period. Outbound flows by air are estimated to be 30% of total outbound flows.



The distribution of flows (inbound and outbound) between Gaza Strip and West Bank is estimated using the percentage contribution of total GDP of the two regions. Moreover, the total passenger flows, both inbound and outbound are divided according to Palestinian internal zoning:

- Inbound passengers**
 Flows by air: Based on the pattern observed in “Percentage distribution of visitors – 2009” from Palestinian CBS. All the available airports are considered to be potential origins.
 Flows by land: Destination weights are distributed according to population distribution in internal zones.
- Outbound passenger**
 Origins of both flows by air and by land are based on population distribution of internal zones. The destinations of outbound flows are based on the percentage distribution of export data.

5.3 Main results

Next tables and graphs show the inbound and outbound passenger flow projections with particular attention to the mode of transport: by *air* for long distance flows and by *land* (car, bus or rail) for short/medium distance.

Tab 21. Inbound and Outbound Passenger Flows (n.)

West Bank

Year	Inbound			Outbound		
	Land	Air	Total	Land	Air	Total
2015	67,646	488,264	555,910	-	-	-
2019	106,896	771,565	878,461	253,469	108,630	362,099
2025	218,406	1,576,441	1,794,847	484,331	207,570	691,901
2032	331,488	2,392,658	2,724,146	675,688	289,581	965,269
2038	365,055	2,634,945	3,000,000	700,000	300,000	1,000,000
2045	365,055	2,634,945	3,000,000	700,000	300,000	1,000,000

Gaza Strip

Year	Inbound			Outbound		
	Land	Air	Total	Land	Air	Total
2015	25,964	187,404	213,368	-	-	-
2019	44,453	320,860	365,313	18,323	132,257	150,581
2025	101,951	735,873	837,823	39,301	283,674	322,975
2032	176,039	1,270,639	1,446,678	62,377	450,236	512,613
2038	194,696	1,405,304	1,600,000	71,891	518,906	590,797
2045	194,696	1,405,304	1,600,000	81,123	585,543	666,667

West Bank + Gaza Strip



Year	Inbound			Outbound		
	Land	Air	Total	Land	Air	Total
2015	93,610	675,668	769,278	-	-	-
2019	151,349	1,092,425	1,243,774	271,793	240,887	512,680
2025	320,357	2,312,313	2,632,670	523,632	491,244	1,014,876
2032	507,527	3,663,297	4,170,824	738,066	739,817	1,477,883
2038	559,752	4,040,248	4,600,000	771,891	818,906	1,590,798
2045	559,752	4,040,248	4,600,000	781,124	885,543	1,666,667

The following figures show the inbound and outbound passengers flow. It is noteworthy that Outbound is outbound passengers presumably Palestinian and Inbound is incoming passengers presumably foreign nationals visiting Palestine.

Figure 16. Inbound Passenger Flows (n.)

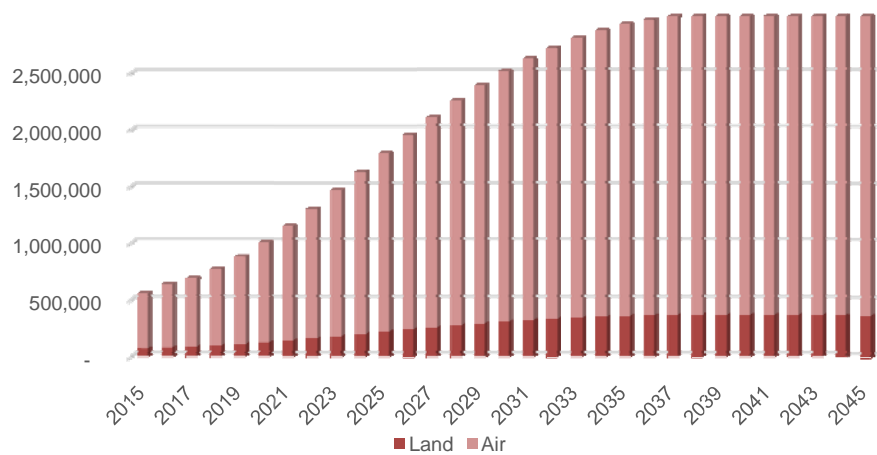
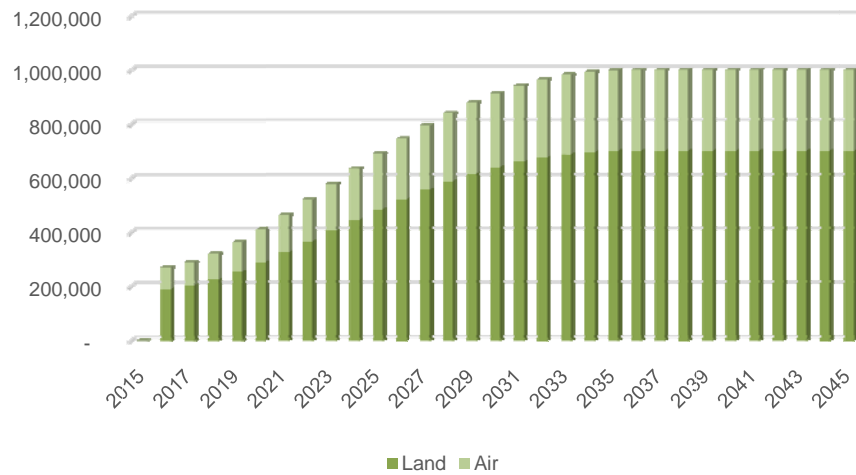


Figure 17. Outbound Passenger Flows (n.)



5.3.1 Passenger Movements on the Jordanian Border

No available and precise data is provided regarding the number of inbound and outbound passenger flows between West Bank and Gaza Strip. Nevertheless, different sources confirm that around 1million to 1.2million passengers transit through Jordan to travel.

5.3.2 Freight Movements

Forecast of international freight movements is developed as per the following steps and assumptions:

- Definition of Internal and External zoning;
- Definition of Generation and Attraction factors;
- Identification of Base year data;
- Estimation of Growth per Phase of Import and Export Volumes;
- Estimation of geographical patterns of import/export flows (2016-2045);
- Estimation of Import Shares Variations by sector (agriculture, mining and quarrying, manufacturing).

External zoning

In order to identify the main routes of international freight flows, countries are divided into 18 zones according to the main access points and direction to West Bank and Gaza Strip.

Tab 22. External Zones Definition

Code	Name
EZ001	Jordan
EZ002	Syria
EZ003	Lebanon
EZ004	Turkey



EZ005	Israel (North)
EZ006	Israel (Haifa port area)
EZ007	Israel (Tel Aviv)
EZ008	Israel (South)
EZ009	Egypt
EZ010	Cyprus
EZ011	Rest of Middle East
EZ012	Rest of Asia
EZ013	Rest of North Africa
EZ014	West Europe
EZ015	South Central Africa
EZ016	East Europe
EZ017	America
EZ018	Oceania

Internal zoning

The territory in West Bank and Gaza Strip is divided into 274 internal zones, 31 zones for Gaza Strip and 243 for West Bank aggregating the 556 administrative entities, as per the census block classification provided by the Palestinian Central Bureau of Statistics.

Figure 18. Internal Zones in West Bank

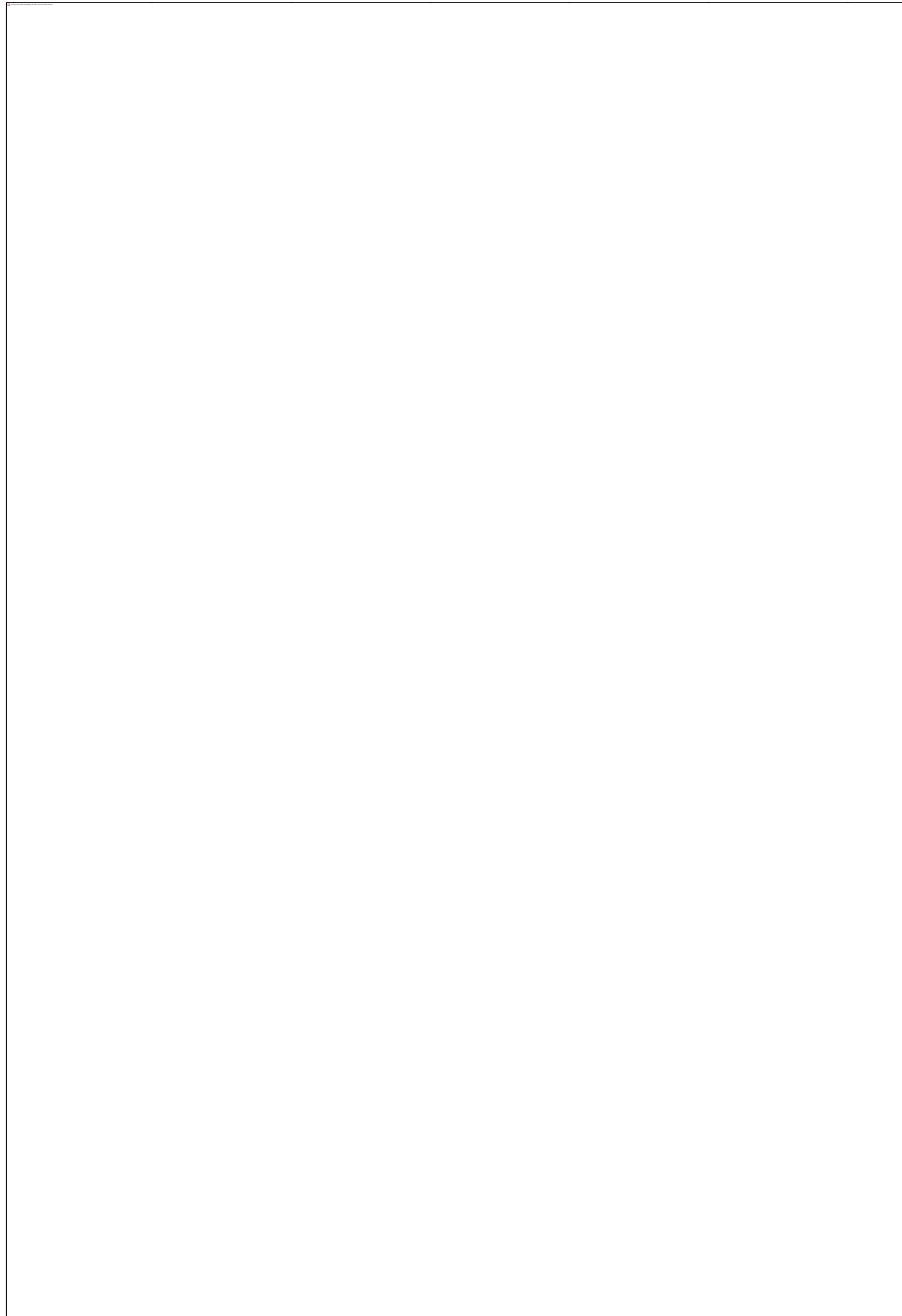
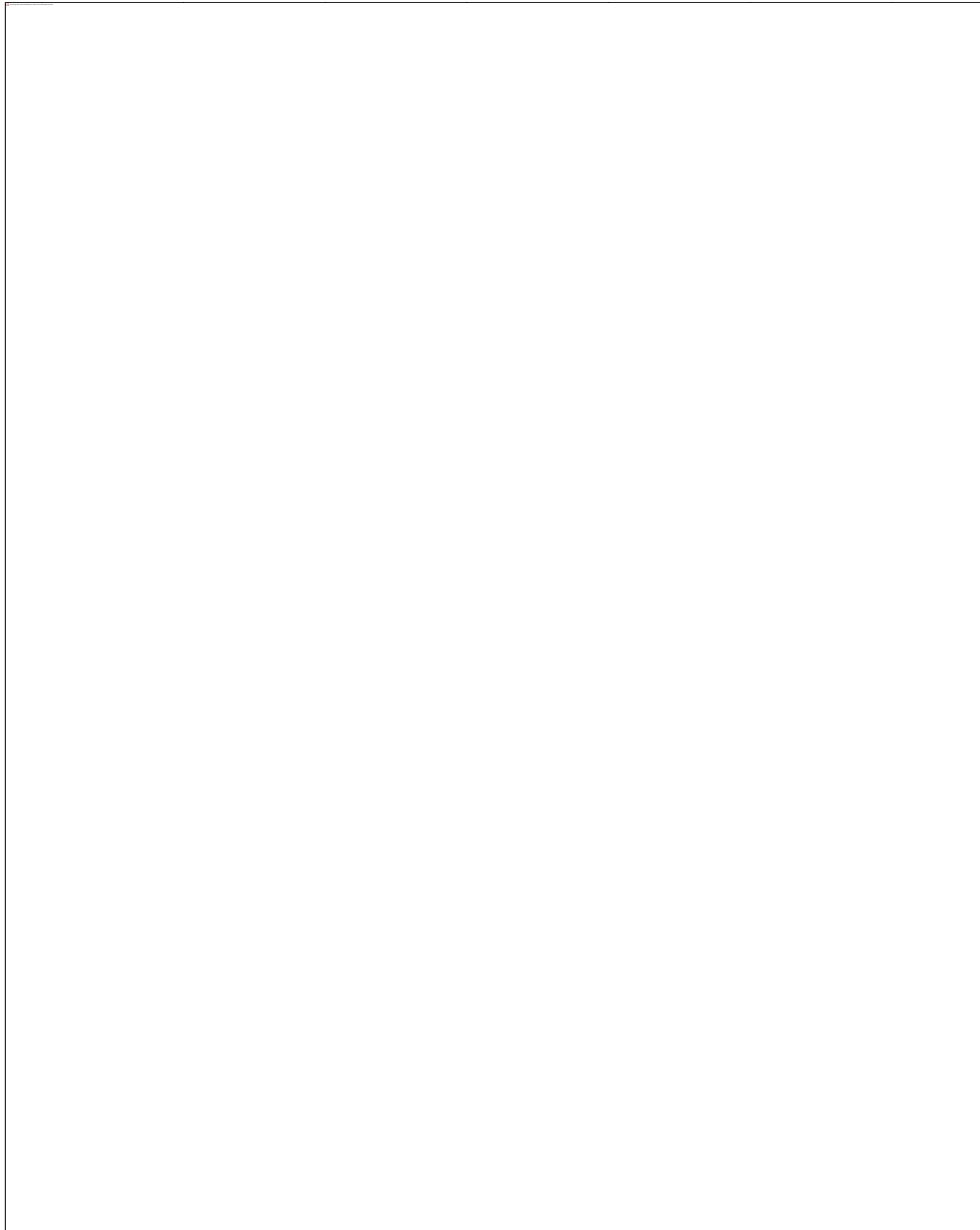


Figure 19. Internal Zones in Gaza Strip



Generation and attraction factors

Population data available at the local level is categorized into Urban, Rural and Camp categories. The following table shows the generation and attraction factors (values from 0 to 1), based on the distribution by place, according to the database of the Palestinian Central Bureau of Statistics for each internal zone and main sector (Agriculture, Mining and quarrying, Manufacturing).



Tab 23. Generation and Attraction Factors for each Internal Zone and Main Sector

West Bank

Import	Agriculture	Total population (urban, rural and camps)
	Mining and quarrying	Total population (urban, rural and camps)
	Manufacturing	Total population (urban, rural and camps)
Export	Agriculture	Rural population
	Mining and quarrying	Rural population
	Manufacturing	Urban population

Gaza Strip

Import	Agriculture	Total population (urban, rural and camps)
	Mining and quarrying	Total population (urban, rural and camps)
	Manufacturing	Total population (urban, rural and camps)
Export	Agriculture	Rural population
	Mining and quarrying	Rural population
	Manufacturing	Urban population

Estimation of the origin/destination of the international freight flows for the time horizon 2015-2045 is based on the above factors.

Base Year Data

Import and export data by sector and by country of origin or destination is considered to be 2014, based on:

- UN Comtrade Statistic Database
- Palestinian Central Bureau of Statistics for the year 2014

Growth per Phase of Import and Export Volumes

As previously presented, the following table shows the values (m USD) of import and export of West Bank and Gaza Strip.

Tab 24. Import/Export Values of Goods Only (m USD 2015)

Year	West Bank		Gaza Strip		Total	
	Import	Export	Import	Export	Import	Export
2015	6,226.4	2,174.8	1,083.9	144.3	7,310.3	2,319.1
2019	9,963.9	3,462.8	2,066.3	357.0	12,030.2	3,819.8
2025	16,975.6	5,852.1	4,526.9	1,011.2	21,502.5	6,863.3
2032	23,314.4	7,953.5	8,226.0	2,238.4	31,540.3	10,191.8
2038	26,337.8	8,895.3	11,709.3	3,596.1	38,047.2	12,491.4
2045	28,992.0	9,664.0	16,750.9	5,726.8	45,742.9	15,390.8



Base year data (concerning import and export shares by country of origin/destination and sector) are shown in the next tables. The 2015 pattern is assumed to be the same as 2014 extracted from PCBS.

Estimation of external zones pattern

Tab 25. Import Freight Flows by External Zones (shares %)

2015 PATTERN %						
External Zones (code)	External Zoning	Agriculture	Mining and quarrying	Manufacturing	Fuels and lubricants	Total
EZ001	Jordan	1.8	20.0	3.8	0.2	1.7
EZ002	Syria	-	15.0	-	-	-
EZ003	Lebanon	-	5.0	-	-	-
EZ004	Turkey	6.8	10.0	0.7	2.8	2.7
EZ005	Israel (North)	9.6	5.0	13.9	12.8	12.6
EZ006	Israel (Haifa port area)	28.8	-	41.6	38.5	37.9
EZ007	Israel (Tel Aviv)	22.4	-	32.3	30.0	29.5
EZ008	Israel (South)	3.2	10.0	4.6	4.3	4.2
EZ009	Egypt	1.7	10.0	1.2	1.4	1.4
EZ010	Cyprus	0.0	-	0.0	0.0	0.0
EZ011	Rest of Middle East	2.9	-	0.3	1.2	1.1
EZ012	Rest of Asia	4.7	-	0.3	1.8	1.8
EZ013	Rest of North Africa	0.1	-	0.0	0.0	0.0
EZ014	West & Med. Europe	7.5	15.0	0.6	2.9	2.9
EZ015	South Central Africa	1.2	-	0.1	0.5	0.5
EZ016	East Europe	4.3	10.0	0.3	1.6	1.6
EZ017	America	4.9	-	0.3	1.9	1.8
EZ018	Oceania	0.1	-	0.0	0.1	0.1

Tab 26. Export Freight Flows by External Zones (shares %)

External Zones (code)	External Zoning	Agriculture	Mining and quarrying	Manufacturing	Fuels and lubricants	Total
EZ001	Jordan	9.6	-	5.8	6.1	6.5
EZ002	Syria	-	-	-	-	-
EZ003	Lebanon	0.0	-	0.0	-	0.0
EZ004	Turkey	1.4	-	0.1	-	0.3
EZ005	Israel (Northern area)	9.4	-	12.1	12.8	11.6
EZ006	Israel (Haifa port area)	28.1	-	36.3	38.4	34.8
EZ007	Israel (Tel Aviv area)	21.9	-	28.2	29.9	27.1
EZ008	Israel (Southern area)	9.4	-	12.1	12.8	11.6
EZ009	Egypt	-	-	0.0	-	0.0



EZ010	Cyprus	-	-	0.0	-	0.0
EZ011	Rest of Middle East	8.6	-	3.5	-	4.4
EZ012	Rest of Asia	0.7	-	0.0	-	0.1
EZ013	Rest of North Africa	0.0	-	0.1	-	0.1
EZ014	West & Med. Europe	6.1	-	1.0	-	2.0
EZ015	South Central Africa	0.1	-	0.0	-	0.1
EZ016	East Europe	0.2	-	0.1	-	0.1
EZ017	America	4.4	-	0.6	-	1.3
EZ018	Oceania	0.2	-	0.0	-	0.0

Import Shares Variations by Economic Sector

Below is a summary of all assumptions taken for the estimation of future patterns for external origin/ destination for import shares variation by sector:

Import shares:

- Agricultural products: Currently most of agricultural import originates from Israel. In the new trade scenarios, this import share will decrease, allowing Palestine to increase import mostly from North Africa, neighboring Arab countries (North Africa 16%, Turkey 5% and Middle East countries 25%) and Far East (35%). Israeli imports will decrease by 10%.
- Mining and quarrying products: for 2013 and 2015 no import of mining and quarrying is observed. In the future a small amount of import volumes will arrive from neighboring countries.
- Manufacturing products: Currently 80% of imports originate from Israel. The new trade scenarios assume a strong increase of imports from the Rest of Asia (China, Korea etc.) for a share of nearly 60% and 15% for East Europe. USA will export to Palestine about 10% of total imports while Israel's share will decrease to 15%.

Export shares:

- Agricultural products: Current shares are confirmed also for the future. Israel will import a large share of agricultural products from West Bank and Gaza Strip. Agricultural exports will include also Europe and USA.
- Mining and quarrying products: In 2013 and 2015 no import of mining and quarrying was observed. In the future, a small amount of export to Israel and other neighboring countries is provisioned.
- Manufacturing products: Currently 88.8% of exports have Israel as a destination. Future provisions comprise of redistribution of export shares to other neighboring countries whereas the share of Israel will decrease to 65%.

Tab 27. Values of Import of Agricultural, Mining and Quarrying, and Manufacturing Goods (million USD)

Year	West Bank				Gaza Strip			
	Agriculture	Mining and quarrying	Manufacturing	Total West Bank export	Agriculture	Mining and quarrying	Manufacturing	Total Gaza Strip export
2013	866.80	-	1,781.4	2,648.20	137.89	-	283.39	421.28
2015	1,028.20	31.13	2,207.2	3,266.52	178.99	5.42	384.23	568.64
2019	1,625.27	149.46	3,791.8	5,566.53	337.04	30.99	938.52	1,306.56
2025	2,717.63	509.27	7,123.9	10,350.84	724.70	135.81	1,899.73	2,760.23
2032	3,650.06	1,107.43	10,847.6	15,605.13	1,287.85	390.73	3,215.41	4,893.99
2038	4,043.69	1,646.12	13,284.3	18,974.08	1,797.75	731.83	4,786.51	7,316.09
2045	4,348.80	2,319.36	15,945.6	22,613.75	2,512.64	1,340.07	6,740.74	10,593.46
Total	18,280.44	5,762.77	54,981.85	79,025.05	6,976.87	2,634.86	18,248.52	27,860.25

Tab 28. Values of Export of Agricultural, Mining and Quarrying, and Manufacturing Goods (million USD)

Year	West Bank				Gaza Strip			
	Agriculture	Mining and quarrying	Manufacturing	Total West Bank export	Agriculture	Mining and quarrying	Manufacturing	Total Gaza Strip export
2013	333.02	-	1,486.2	1,819.19	16.82	-	75.08	91.90
2015	398.90	6.80	1,760.8	2,166.49	26.47	0.45	116.84	143.76
2019	642.81	32.46	2,776.1	3,451.40	66.27	3.35	286.19	355.81
2025	1,105.74	109.73	4,621.8	5,837.25	191.07	18.96	798.62	1,008.65
2032	1,533.56	236.12	6,170.7	7,940.37	431.59	66.45	1,736.62	2,234.66
2038	1,744.66	347.47	6,795.3	8,887.43	705.32	140.47	2,747.15	3,592.93
2045	1,932.80	483.20	7,248.0	9,664.00	1,145.36	286.34	4,295.11	5,726.81
Total	7,691.50	1,215.78	30,858.85	39,766.12	2,582.90	516.02	10,055.61	13,154.53

Import and export unit values

In order to convert values in tons, an average unit value per ton is assumed according to observed international trade in the neighbouring countries (Source: OECD database).

Tab 29. Import and Export unit prices by Sector and Country of Origin and Destination

Agricultural products						Thousand US\$ per ton				
Year	Imports					Exports				
	Neighbouring countries / Middle East	Africa	West and East Europe and Israel	Rest of Asia	America and Oceania	Middle East	Africa	West and East Europe and Israel	Rest of Asia	America and Oceania
2015	0.306	0.306	0.267	0.567	0.085	1.46	1.026	1.026	2.043	1.310
2019	0.318	0.318	0.258	0.613	0.085	1.422	1.026	1.026	1.93	1.310

2025	0.329	0.329	0.250	0.652	0.085	1.39	1.026	1.026	1.833	1.310
2032	0.338	0.338	0.243	0.686	0.085	1.361	1.026	1.026	1.748	1.310
2038	0.346	0.346	0.237	0.716	0.085	1.336	1.026	1.026	1.672	1.310
2045	0.346	0.346	0.237	0.716	0.085	1.336	1.026	1.026	1.672	1.310

Thousand US\$ per

Mining and quarrying products

ton

Year	Imports					Exports				
	Neighbouring countries and rest of Middle East	Africa	West and East Europe and Israel	Rest of Asia	America and Oceania	Middle East	Africa	West and East Europe and Israel	Rest of Asia	America and Oceania
2015	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2019	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2025	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2032	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2038	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2045	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367

Manufacturing products

Thousand US\$ per ton

Year	Imports					Exports				
	Neighbouring countries and rest of Middle East	Africa	West and East Europe and Israel	Rest of Asia	America and Oceania	Middle East	Africa	West and East Europe and Israel	Rest of Asia	America and Oceania
2015	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2019	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2025	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2032	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2038	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367
2045	0.505	0.505	0.505	0.505	0.505	0.574	0.574	0.659	0.696	0.367

5.4 Freight transport Demand Main Results

Applying the above import/export unit rates, the quantities (expressed in tons) are estimated as shown in the following tables.

Tab 30. Import of Goods in West Bank(tons)

		2015	2019	2025	2032	2038	2045
EZ001	Jordan	228,080	453,024	934,659	1,415,675	1,687,492	2,034,981
EZ002	Syria	-	158,357	533,418	999,972	1,358,640	1,719,227
EZ003	Lebanon	-	143,559	482,995	890,325	1,195,658	1,489,587



EZ004	Turkey	259,345	416,944	748,238	1,140,569	1,416,639	1,719,227
EZ005	Israel (North)	974,891	1,456,588	2,058,367	2,154,399	2,156,903	2,175,399
EZ006	Israel (Haifa port)	2,924,672	3,781,410	4,342,592	3,683,579	3,131,113	2,496,240
EZ007	Israel (Tel Aviv)	2,274,745	3,025,929	3,321,612	2,781,591	1,639,878	682,742
EZ008	Israel (South)	324,964	435,644	596,765	650,922	665,483	728,888
EZ009	Egypt	110,370	262,157	688,205	1,147,148	1,438,173	1,802,272
EZ010	Cyprus	80	-	-	-	-	-
EZ011	Rest of Middle East	108,734	286,052	889,511	1,875,399	2,571,255	3,294,929
EZ012	Rest of Asia	99,764	1,538,396	5,224,713	10,055,918	13,386,557	17,023,674
EZ013	Rest of North Africa	2,493	168,721	523,703	934,500	1,195,658	1,489,587
EZ014	West & Mid. Europe	314,753	729,565	2,076,119	3,586,921	4,560,212	5,532,787
EZ015	South Central Africa	44,976	60,040	170,209	318,854	419,940	545,394
EZ016	East Europe	177,507	300,168	700,673	1,154,629	1,437,723	1,727,383
EZ017	America	604,357	709,395	1,275,894	2,094,197	2,662,704	3,157,544
EZ018	Oceania	18,089	11,296	6,406	-	-	-
		8,467,818	13,937,245	24,574,079	34,884,597	40,924,030	47,619,860

Tab 31. Import of Goods in Gaza Strip (tons)

		2015	2019	2025	2032	2038	2045
EZ001	Jordan	39,704	105,488	249,243	460,065	683,393	1,028,900
EZ002	Syria	-	33,968	142,245	335,013	563,926	895,420
EZ003	Lebanon	-	30,899	128,799	296,327	491,467	762,739
EZ004	Turkey	45,147	88,883	199,531	384,620	589,711	895,420
EZ005	Israel (North)	169,710	337,525	548,900	688,912	840,844	1,012,118
EZ006	Israel (Haifa port area)	509,129	871,222	1,158,029	1,172,491	1,213,808	1,197,493
EZ007	Israel (Tel Aviv)	395,990	701,657	885,767	892,398	662,225	345,517
EZ008	Israel (South)	56,570	100,014	159,138	211,858	271,356	372,179
EZ009	Egypt	19,213	58,234	183,522	390,757	615,994	992,357
EZ010	Cyprus	14	-	-	-	-	-
EZ011	Rest of meddle East	18,929	62,545	237,204	614,638	1,042,881	1,658,958



EZ012	Rest of Asia	17,367	370,610	1,393,262	3,077,445	5,015,722	7,632,890
EZ013	Rest of North Africa	434	36,117	139,655	310,641	491,467	762,739
EZ014	West & Med. Europe	54,792	160,967	553,634	1,135,844	1,771,185	2,609,252
EZ015	South Central Africa	7,829	13,257	45,389	101,309	165,533	266,161
EZ016	East Europe	30,901	64,988	186,847	374,319	574,578	851,176
EZ017	America	105,207	152,915	340,240	649,866	983,283	1,334,801
EZ018	Oceania	3,149	2,343	1,708	-	-	-
		1,474,085	3,191,631	6,553,113	11,096,503	15,977,373	22,618,117

Tab 32. Export of Goods in West Bank(tons)

		2015	2019	2025	2032	2038	2045
EZ001	Jordan	203,506	324,140	544,660	736,941	823,481	890,455
EZ002	Syria	-	103,887	295,970	510,885	637,660	760,252
EZ003	Lebanon	14	62,760	186,149	334,910	422,745	507,708
EZ004	Turkey	5,484	52,476	140,202	227,722	284,746	324,879
EZ005	Israel (North)	407,706	549,551	848,931	1,108,326	1,208,035	1,297,599
EZ006	Israel (Haifa port area)	1,223,118	1,661,773	2,506,047	3,249,095	3,569,325	3,808,616
EZ007	Israel (Tel Aviv)	951,314	1,321,287	2,045,563	2,661,813	2,898,849	3,052,455
EZ008	Israel (South)	407,706	542,307	833,934	1,084,690	1,175,138	1,255,508
EZ009	Egypt	1,205	97,142	274,698	453,031	557,748	631,359
EZ010	Cyprus	229	-	-	-	-	-
EZ011	Rest of meddle East	129,493	359,754	784,269	1,199,639	1,453,862	1,636,240
EZ012	Rest of Asia	1,916	1,171	1,211	1,144	732	-
EZ013	Rest of North Africa	3,513	106,856	282,777	453,031	545,881	631,359
EZ014	West & Med. Europe	51,173	66,081	98,301	127,049	140,240	149,691
EZ015	South Central Africa	1,610	440	433	300	170	-
EZ016	East Europe	3,613	9,253	18,306	27,844	32,981	37,676
EZ017	America	42,053	27,357	55,654	89,832	113,536	139,602
EZ018	Oceania	673	641	678	529	267	-
		3,434,324	5,286,876	8,917,780	12,266,783	13,865,395	15,123,398



Tab 33. Export of Goods in Gaza Strip (tons)

		2015	2019	2025	2032	2038	2045
EZ001	Jordan	13,504	33,416	94,115	207,398	332,910	527,677
EZ002	Syria	-	10,710	51,142	143,779	257,788	450,519
EZ003	Lebanon	1	6,470	32,166	94,254	170,904	300,864
EZ004	Turkey	364	5,410	24,226	64,088	115,115	192,521
EZ005	Israel (North)	27,054	56,654	146,692	311,917	488,374	768,948
EZ006	Israel (Haifa port area)	81,162	171,314	433,034	914,395	1,442,976	2,256,957
EZ007	Israel (Tel Aviv)	63,126	136,213	353,464	749,116	1,171,922	1,808,862
EZ008	Israel (South)	27,054	55,907	144,100	305,265	475,075	744,005
EZ009	Egypt	80	10,014	47,467	127,497	225,482	374,138
EZ010	Cyprus	15	-	-	-	-	-
EZ011	Rest of meddle East	8,593	37,087	135,518	337,615	587,755	969,624
EZ012	Rest of Asia	127	121	209	322	296	-
EZ013	Rest of North Africa	233	11,016	48,863	127,497	220,684	374,138
EZ014	West & Med. Europe	3,396	6,812	16,986	35,755	56,695	88,706
EZ015	South Central Africa	107	45	75	84	69	-
EZ016	East Europe	240	954	3,163	7,836	13,333	22,327
EZ017	America	2,791	2,820	9,617	25,281	45,899	82,727
EZ018	Oceania	45	66	117	149	108	-
		227,891	545,028	1,540,953	3,452,250	5,605,384	8,962,013

The tables below summarize the total tons of import and export for all products, while a the complete table of import/export by origin and destination zone is used as input data for the assignment model.

Tab 34. Total Import Flows (tons)

Year	Total Import (tons) by region		
	West Bank	Gaza Strip	Total
2015	8,467,818	1,474,085	9,941,903
2019	13,937,245	3,191,631	17,128,877
2025	24,574,079	6,553,113	31,127,192
2032	34,884,597	11,096,503	45,981,101
2038	40,924,030	15,977,373	56,901,403
2045	47,619,860	22,618,117	70,237,978

Tab 35. Total Export Flows (tons)

Year	Total export (tons) by region		
	West Bank	Gaza Strip	Total
2015	3,434,324	227,891	3,662,215



2019	5,286,876	545,028	5,831,905
2025	8,917,780	1,540,953	10,458,734
2032	12,266,783	3,452,250	15,719,032
2038	13,865,395	5,605,384	19,470,779
2045	15,123,398	8,962,013	24,085,411

6 Transit Flows

The analysis of freight routes of import and export, do not actually show potential transit flows in West Bank and Gaza Strip that can significantly affect the Palestinian transport network. The transit freight flow scenario could change only through a major improvement on the regional (Africa + Middle East) level.