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Faculty of Graduate Studies

Transportation Strategic Planning Under Uncertainty:

The Palestinian Case

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This Thesis is Submitted in Partial Fulfillment of the Requirements for the Degree of Master in Engineering Management, Faculty of Graduate Studies, An-Najah National University, Nablus, Palestine

2011

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DEDICATION

Thanks to all those who supported me to achieve my work successfully.

I dedicate this humble work in particular to:

*The soul of father, the martyr, whom I miss and feel his delight on my achievement.

*My beloved mother whose prayers and blessing spurred me to accomplish my work successfully.

*My brothers and sisters, may Allah bless them all.

*My dear husband (Mohammad Nassar) whose help, support, encouragement and constant assistance accompanied me all through my way to bring this work to light.

* My dear children: Hamza (May he get well soon), Mujahed and Shahd who had to endure my absence and being busy doing the study.

*My friends and fellow sisters.

*Everyone who helped and supported me.

* To you all I dedicate my love and gratitude and the outcome of my work.

ACKNOWLEDGEMENT

First of all, Praise and thanks to Allah who granted me the power to finish this work, and for all the great blessings and virtues that he bestowed on me and helped me to complete this work and continues to bestow on me.

I am deeply indebted to many people who have made the success of my research possible.

I'd like to extend my thanks and appreciation to my instructors in An-Najah National University, Faculty of Engineering, especially my Supervisor Prof. Sameer Abu-Eisheh whose support and encouragement was a great factor for my success. Allah bless him.

I'd to thank also Dr. Ali Shaat and Dr. Khaled Al- Sahili, and who honored me in their valuable discussion from which I benefited much.

I am grateful to my sister Samar who did her best to help me.

Finally, thanks to all official organizations which provided me with valuable information and figures. I mention, in particular, Ministry of Transport, the Ministry of Planning and Administrative Development and Palestinian Central Bureau of Statistics.

إقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

Transportation Strategic Planning Under Uncertainty:

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أقر بأن ما اشتملت عليه هذه الرسالة إنما هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وإن هذه الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل درجة أو لقب علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification

Student's name: **اسم الطالب:**

Signature: **التوقيع :**

Date: **التاريخ :**

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ABBREVIATIONS

AMA	Agreement on Movement and Access
CAA	Civil Aviation Authority
CPA	Crossing Point Authority
GDP	Gross domestic Product
GIA	Gaza International Airport
GOI	Government of Israel
GPS	Global Positioning System
ICAO	International Civil Aviation Organization
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOLG	Ministry of Local Government
MOP	Ministry of Planning
MOT	Ministry of Transport
MPWH	Ministry of Public Works and Housing
NSU	Palestinian Negotiations Support Unit
OCHA	Office of the Coordination of the Humanitarian Affaires
PAL	Palestinian Airlines
PCBS	Palestinian Central Bureau of Statistics
PECDAR	Palestinian Economic Council for Development and Reconstruction

PLC	Palestinian Legislative Council
PNA	Palestinian National Authority
PNDP	Palestinian National Development Plan
TMP	Transportation Master Plan
TSP	Transportation Strategic Plan
TSRSN	Transport Sector Review and Strategy Note
UNRWA	United Nations Relief and Works Agency
VAT	Value Added Tax

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ABSTRACT

The current transport system, in the Palestinian territories which is an important component of the economy affecting the development and the welfare of populations was severely affected by the Israeli occupation measures. Strategic planning is a key tool to prepare for the establishment of the Palestinian state and to achieve the anticipated development. However, due to the high uncertainty in the Palestinian case, the process of the strategic planning in the various disciplines, in general, and in the transport sector at specific, is not an easy and direct exercise.

The aim of this study, which is conducted on the transportation sector in Palestine is to explore prospective planning methods capable of dealing uncertainty while preparing an overall framework for transport strategic planning. This study derives its significance from the importance of the transport sector and the concept of strategic planning. It concentrates in particular on developing a potential framework for strategic planning in the transport sector under the conditions of high uncertainty.

A SWOT analysis (Strength9+s, Weaknesses, Opportunities, and Threats) is conducted to form the basis for defining the strategic goals, objectives and strategies. In order to identify the proper outline strategies, four scenarios are developed taking into account the potential and expected future political and socio-economic conditions. Four different aspects of uncertainties were analyzed through each scenario, including the political, economic, demographic and institutional aspects. These four uncertainties for each scenario vary in level from low to medium to high level. A set of robust strategies that can respond to each scenario are then developed in order to succeed in the current uncertain environment. The strategies are based on possible changes in the four different aspects (uncertainties) in each scenario. It is noticed that there are some strategies that are common between the four different scenarios, while there are special strategies that apply for some scenarios only.

However, Developing the outline strategies for each of the four planned scenarios don't mean that we are accepting all these scenarios, since the Palestinians preferred option is the second (optimistic) scenario. Developing these scenarios and these strategies was made to know how to deal with uncertainty related to these scenarios, and in order to maintain and restore the transport sector under these scenarios.

The output of this study would be of great importance to the related official institutions in order to adopt and to build on. Basically this study will provide a new approach to the planning and development of the transport sector in Palestine. It can be the basis for the required development in the transport sector, and also it could be a strong foundation for developing a Master Transportation Plan that will guide potential development of the transportation sector in Palestine, capacity building, programming, funding, legal, managerial and technical mechanisms needed to support the institutional structure within the sector.

Chapter One

Introduction

Transportation helps in shaping an area's economic, health and quality of life. Not only does the transportation system provide for the mobility of people and goods, it also influences the patterns of growth and economic activity. The performance of the transportation system affects public policy concerns like air quality, environmental resource consumption, social equity, land use, urban growth, economic development, safety, and security. Thus this sector is a vital one for the development of any country.

The Strategic Transportation Plan (STP) is a multimodal transportation plan initiated to understand and address the current and future transportation needs. The STP also serves as a unique and innovative approach to identifying future system needs and community values, and provides a method to incorporate them into future transportation decisions and solutions. The STP outlines the strategies and actions required to achieve the transportation goals in the plan.

Transportation planning historically has followed the rational planning model of defining goals and objectives, identifying problems, generating and evaluating alternatives, and developing the plan. It recognizes the critical links between transportation and other societal

goals. While the transportation planning and policymaking process is characterized by many uncertainties, uncertainty arises in the performance of the transportation system every single day. So it is vital for the planners to adopt strategic policies which hedge against uncertainty, and respond to events as they unfold in time.

The current transport sector in the West Bank and Gaza Strip is in urgent need for rehabilitation and improvement. It is primarily a single mode system depending on road transportation for the movement of people and goods within the area and to the outside world. Rail, air, and sea transportation was discontinued during various conflicts of occupations.

Maintenance and efficiency are fundamental to the current transportation system, along with improvements and planning for future transportation. So it is needed to define future transportation options, maintain existing infrastructure, and maximize efficiency and safety.

1.1 The Problem of the Study

The World Bank Transport Sector Study for the West Bank and Gaza Strip issued on January 24, 2000, stated that;

> ***"Transport development is probably the most difficult issue confronting the future development of the Palestinian economy. With its two parts, the West Bank and Gaza, separated by Israeli territory, with Palestinian "self-rule areas" not contiguous in the West Bank with limited control***

> ***over transport infrastructure connecting its various part, and with an economy heavily dependent for trade and development on Israel and neighboring countries, transport development is of central concern to the Palestinian Authority."***

Many other documents which are published in this field, have identified this problem in particular, such as the World Bank Transport Strategy Note 2004, World Bank Transport Sector Review 2007, PDP 2000, and the series of the PNA Development Plans. These studies have identified the most relevant issues in the transport sector, and confirmed that the transport development is of central concern to the Palestine National Authority (PNA). To achieve such development, the sector needs the preparation of a strategic plan and the identification of a master plan. However, it could be said that there is no comprehensive or sectoral strategic planning in general in Palestine, and so for the transport sector, and because of the high uncertainty in the Palestinian case, the process of the strategic planning in the various disciplines in general, and in the transportation sector at specific is not an easy and direct exercise.

1.2 Significance of the Study

This study derives its importance from the importance of the transport sector and the subject of study "strategic planning". The concept of strategic planning is of the most important management concepts that are well received and widespread in the recent years. This proposal looks in particular to study the strategic planning in the transportation

sector under the conditions of the high uncertainty. Such study will add something new to the planning and development of the transportation sector. Moreover, there is a specific significance of this research for the Palestinian territory that it can be a basis for the strategic planning in the transportation sector while dealing with the uncertainty, which will contribute to development of the Palestinian economy.

1.3 Objectives of the Study

The aim of this study, which will be conducted on the transportation sector in Palestine, is to know how to deal with uncertainty while preparing transportation strategic planning. This will be through:

- Analyzing the current situation of this sector
- Exploring and analyzing the reality of the strategic planning in the sector
- Forecasting the future situation and needs under the conditions of uncertainty
- Developing a framework for the strategic plan that is integrated with the needs of the future development patterns, and the high uncertainty in Palestine.

1.4 Methodology

This study which is a descriptive one will rely mainly on the following methodology:

- Desk research / Internet research, which is mainly designed to review existing literature and publications on the concept of strategic planning under uncertainty, and to review all transport sector studies and reports recently completed.
- A series of unstructured interviews with the decision makers personnel in the relevant PNA agencies, including the Ministry of Transport (MOT), the Ministry of Planning (MOP) and other agencies directly concerned with transport and the private sector in order to:
    - Collect the physical information about the infrastructure of the transport sector.
    - Collect and analyze the historical and current data on traffic demand and growth.
    - Assess the adequacy of infrastructure and recommendations for changes.
    - Examine all modes of transport on the national level including roads, rail, sea ports, and airports.
    - Examine all aspects of economic, social and political activities of the country that have a bearing on the supply of transport services.
- Conduct a strategic analysis for the transportation system based on the collected data.
- Identify how to deal with uncertainty elements in the strategic plan.

- Develop and formulate a strategic plan framework for the transport sector in Palestine considering uncertainty.

1.5 Study Output

This study is conducted on the Palestinian transport sector in order to analyze it and develop a framework for the strategic plan under the conditions of high uncertainty. The output of this study can be summarized in the following;

- A strategic analysis of the current situation of the transportation sector.
- A framework of a Strategic Transportation Plan that is integrated with the needs of the future development patterns, and the high uncertainty in Palestine. This framework can be the basis for the required development in this sector, and a basis for a Master Transportation Plan that will help in guiding the development of the transportation sector in Palestine, building the capacity, and setting the programming, financial, legal, managerial and technical mechanisms needed to develop this sector.

Chapter Two

Definitions And Concepts

2.1 The Concept of Strategic Planning

2.1.1 Strategy

The very term strategy is derived from the Greek word strategos, meaning a military leader, commanding both sea and land operations. Strategy is the science and art of planning for battle, as opposed to tactics, which involve methods of conducting a battle. The father of modern strategic study, Carl von Clausewitz, defined military strategy as “the employment of battles to gain the end of war” (Clausewitz, Howard, and Paret, 1976).

Some definitions of strategy as offered by various writers are briefly reviewed below.

- The determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources for carrying out these goals (Chandler, 1966).
- The pattern of decisions in a company that determines and reveals its objectives, purposes or goals, produces the principal policies and plans for achieving those goals, and defines the range of businesses

the company is to pursue, the kind of economic and human organization it is or intends to be, and the nature of the economic and non-economic contribution it intends to make to its shareholders, employees, customers, and communities (Andrews, 1987).

- Porter defined competitive strategy as "a broad formula for how a business is going to compete, what its goals should be, and what policies will be needed to carry out those goals" (Porter, 1988).
- Bryson defines strategy as "a pattern of purposes, policies, programs, actions, decisions, or resource allocations that define what an organization is, what it does, and why it does it" (Bryson, 1988).
- Mintzberg said that strategy is "a plan, a pattern, a position, a perspective and, in a footnote, he indicated that it can also be a ploy, a maneuver intended to outwit a competitor" (Mintzberg, 1994).

2.1.2 Strategic

Strategic means "of or having to do with strategy." Because strategies can and do exist at various levels of the organization, it is entirely conceivable and appropriate for all organizations and sectors to have a strategic plan.

Strategic also means “of great significance or important” and so strategic plans, at all levels, are intended to address matters of great importance. For those concerned with the enterprise, strategic issues, initiatives, and plans are those that affect the entire enterprise in important ways. Chief among these are the direction and destination of the entity. Not all strategic issues are long-term, although many are. A short-term crisis can be of strategic significance and should be dealt with accordingly. These considerations hold true at all levels of the organization.

2.1.3 Planning

Planning is the organizational process of creating and maintaining a plan. It involves the process of thinking about the activities required to create a desired future on some scale.

Planning has been defined in various ways, ranging from thinking about the future to specifying in advance who is to do, what and when. It can be defined as “the activity of preparing a plan” and the plan is a set of intended outcomes (ends) coupled with the actions by which those outcomes are to be achieved (means). Planning can be formal or informal and involve lots of documentation or very little. The information base can be large and captured in a wide range of reports,

studies, databases, and analyses, or it can rest entirely on the personal knowledge of a few people, or even just one (Alvord, 2008).

Plans, and thus the planning activities that produce them, frequently will address timeframes, either generally, or in the form of milestones and perhaps detailed schedules. Resources, too, might be addressed, whether in terms of money, space, equipment, or people. There are no predetermined, mandatory guidelines to follow; it is a matter of doing what is appropriate for the task at hand (Nickols, 2008).

2.1.4 Transportation Planning

Transportation is the connecting thread for people, business, and communities. Transportation is as critical to the mobility and economic and employment health of a nation, state, region, or community as the circulatory system is to the mobility and health of the human body.

Maximizing the benefits of the transportation system requires robust and active planning to assure effective flows within and between our major urban, suburban, and rural areas. However, transportation planning has lost its purpose since planning is simply done because it is required to obtain funding and not because it is useful or needed. Planning is a process from which to make transportation mobility and access decisions properly carried out. The planning process provides a context for understanding the relationship of mobility to economic

development and land use. In the real world, however, the transportation planning process operates within the framework of a public financing and business model wedded to modal funding sources and modal politics and projects. As a result, planning reality is far different than planning theory and its intentions (Ankner, 2005).

However, planners are increasingly expected to adopt a multi-disciplinary approach, especially due to the rising importance of environmentalism. For example, the use of behavioral psychology to persuade drivers to abandon their automobiles and use public transport instead. The role of the transport planner is shifting from technical analysis to promoting sustainability through integrated transport policies (Southern, 2006).

2.1.5 Strategic planning

The concern in the strategic planning has increased as a means for countries, regions and sectors to organize the future in a time the variables and the internal and external effects has increased. So it is necessary to have a strategic plan for every sector, the plan must be simple, written, clear, based on the real current situation, and have enough time allowed giving it a time to settle as it should not be rushed.

Simply put, strategic planning determines where an organization is going over the next year or more, how it's going to get there and how it

will know if it got there or not. Strategic planning isn't only for use by military and large for-profit corporate entities. Civilian government agencies at the national and local levels and nonprofit organizations of various sorts have successfully used strategic planning techniques to define their long-term direction, adjust their programs to a changing environment.

Strategic planning is a tool for organizing the present on the basis of the projections of the desired future. That is, a strategic plan is a road map to lead an organization or a sector from where it is now to where it would like to be in five or ten years.

Strategic planning is a management tool for organizing the present on the basis of the projections of the desired future. It is the process done by the guiding members of the organization to envision its future, and develop the necessary procedures and operations to achieve that future" (Goodstein, Nolan, and Pfeiffer, 1992). It is an iterative process, with no clear beginning or ending point.

Strategic planning is based on analysis. In other words, it is about breaking down a goal into steps, determining how the steps could be implemented, and identifying the possible consequences of each step. It is a disciplined effort to produce fundementa1 decisions and actions

shaping the nature and direction of an organization's (or other entity's) activities within legal bounds.

Kerzner (2004) said that the formulation process is performed at the top levels of the organization. Here, top management values provide the ultimate decision template for directing the course of the firm. Formulation process will:

- Scans the external environment and industry environment for changing conditions.
- Interprets the changing environment in terms of opportunities or threats.
- Analyzes the firm's resource base for asset strengths and weaknesses.
- Defines the mission of the business by matching environmental opportunities and threats with resource strengths and weaknesses.
- Sets goals for pursuing the mission based on top management values and sense of responsibility.

2.2 Evolution of Strategic Planning

The concept of developing a strategy to guide actions was first outlined by Greek philosophers. Then during the Roman era and middle Ages, the concept of strategy came to be the domain of military and national

statecraft. The Prussian military theorist, von Clausewitz is credited with establishing the fundamental definition of tactics and strategies: `tactics constitute the theory of the use of armed forces in battle, strategy forms the theory of using battle for the purposes of war' (Paret, Craig, and Gilbert, 1986).

Modern business strategic approaches based on quantitative methods emerged from the development of operations research and linear programming during World War II. In the decades following the war, strategy emerged as a key business concept as the commercial world moved from a relatively stable environment with predictable change to a rapidly changing, uncertain, unstable and competitive environment (Ircha,2001).

In later years, strategic planning theory took two divergent paths that recently have begun to converge. Initially, strategic planning focused on quantifying measurable and mathematical modeling (the decision process school). An alternative, though complementary approach, was created by the supporters of the environmental context approach (the change process school).

2.3 The Importance of Strategic Planning

Strategic planning is the cornerstone of every entity or sector. An important concept of strategic planning is an understanding that in

order for the sector to develop, everyone needs to work to ensure that the goals are met, so strategic planning is of great importance for the different institutions and organizations in order to achieve sustainability and success. This importance can be summarized as follows:

- Rationalize the decision-making in the management process in institutions, management and control of resources available, and control the process of allocation the resources.
- Effectively influence the surrounding environment and maximize the role of leadership or management to deal with aspects of technical, rather than the decisions to be random and just a reaction to the ongoing events.
- Achieve coordination between the various aspects of activity and commitment to the objectives set by management.
- Reduce the negative effects of the surrounding circumstances that increase efficiency and effectiveness.

It is important, of course, for planners to be very careful about how they engage in strategic planning, since every situation is at least somewhat different and since planning can be effective only if it is tailored to the specific situation in which it is used (Bryson, 1988).

Government and non-profit organizations are finding that strategic planning can help them to think strategically, clarify future direction, make today's decisions in light of their future consequences, develop a

coherent and defensible basis for decision making, exercise maximum discretion in the areas under organizational control, solve major organizational problems, improve performance, deal effectively with rapidly changing circumstances and build teamwork and expertise (Bryson, 1988).

2.4 The Concept of Uncertainty

2.4.1 Definitions of Uncertainty

There are many definitions of uncertainty, the term is used in various ways among the general public, many specialists in decision theory, statistics and other quantitative fields have defined uncertainty and risk more specifically. Such definitions illustrate similarities in relation to the perceived influence of lack of information, knowledge, and consequently, understanding.

Hubbard (2007) defines uncertainty as "the lack of certainty, a state of having limited knowledge where it is impossible to exactly describe existing state or future outcome, more than one possible outcome".

Lindley (2006) explained uncertainty as "There are some things that you know to be true and others that you know to be false; yet, despite this extensive knowledge that you have, there remain many things whose truth or falsity is not known to you. We say that you are

uncertain about them. You are uncertain, to varying degrees, about everything in the future; much of the past is hidden from you; and there is a lot of the present about which you do not have full information. Uncertainty is everywhere and you cannot escape from it" (Carson, Gilmore and Johnston, 2008).

So the common themes running through each of these typologies of uncertainty is lack of information and knowledge; lack of understanding; and an inability to predict changes in the external environment.

2.4.2 Uncertainty in Strategic Planning

Projections and assumptions are always needed and they are always subject to error; this is a characteristic of planning. People plan in part because they cannot see the future with certainty, but to plan they must reduce the complexity of the world for which they plan.

Planning is the process of finding sets of actions which can be executed to achieve some desired result. One of the central assumptions of classical planning is that the state resulting after performing an action can be predicted completely and with certainty, these traditional approaches to planning require precise predictions. This assumption has allowed the development of provably correct planning algorithms, but it has also hindered the use of planning in many real-world applications

because of the inherent uncertainty in the domains. This uncertainty tax managerial skills as well as the sector's ability to respond to contingencies. The traditional approaches lead decision-makers and planners to underestimate uncertainty. The planners should define the perceived uncertainty and make it explicit in order to improve their capability to deal with a changing environment (Blythe, 1998).

Morrison and Mecca (1989) explained that this uncertainty is derived from two sources:

- The first is the nature of the environment in which we live, this nature is multivariate, complex, and interrelated.
- The second is the probabilistic quality of our environment in which an event can occur tomorrow, next week, or next year and could affect the interrelationships of variables, trends, and issues.

The question of uncertainty is concerned with three questions: (a) how do decision makers conceptualize uncertainty? (b) How do decision makers cope with uncertainty? and, (c) What are the relationships between different concepts of uncertainty and different methods of coping? (Lipshitz, Strauss, 1997).

In essence, the more turbulent and complex the system's environment appears, the less able a planner is to anticipate the probability of success in implementing a particular strategy. Although too much

uncertainty is undesirable, manageable uncertainty provides the freedom to make creative decisions.

Time and uncertainty are two important factors in determining strategic planning decisions. This has led to more recent investigations of strategic planning models, which enable the decision maker to adopt strategic policies which hedge against uncertainty, and respond to events as they unfold in time. The following explain some of these policies used to cope with uncertainty:

- Environmental analysis is a tool used to identify the possible uncertainty. Morrison and Mecca (1989) assumed that environmental analysis and forecasting are based upon a number of assumptions, among them are the following:

    - The future cannot be predicted, but it can be forecasted probabilistically explicit account of uncertainty.
    - Forecasts are virtually certain to be useless or misleading if they do not sweep widely across possible future developments in such areas as technology, economics, demography, values and lifestyles, , laws and regulations, political factors and institutional changes.

- Alternative futures including the "most likely" future are defined primarily by human judgment, creativity, and imagination.
- The aim of defining alternative futures is to try to determine how to create a better future than the one that would materialize if we merely kept doing essentially what is presently being done.

- Contingency plans can be made ahead of time even if not every situation can be predicted and planned for. To make contingency plans a planning system must be able to prioritize the different possible situations that might occur when a candidate plan is executed, and produce a plan that covers the most important ones while leaving others to be completed as more information is available during execution. One way to approach this problem is to assign probabilities to the various sources of uncertainty in the planning domain and use them to derive probabilities for each of the different possible outcomes when the plan is executed (Blythe, 1998).

- Scenario planning is another approach to deal with uncertainty in planning, scenarios are commonly employed techniques for dealing with complexity and uncertainty in forecasting. Ideally, one generates relevant information using credible research

methods and objectively analyzes it with alternative scenarios of the future. Scenarios are descriptions of visions of the future, envisions of possible thinkable futures. They are used to test ideas and extrapolate them into the future. They reflect assumptions, as well as personal and group beliefs about the future (Mintzberg, 1994).

In Palestine, Sha'ath (2003) addressed the conditions of high uncertainty that make the planning process a difficult and unrealistic one. Most of the constraints in relation to physical planning can be traced back to the occupation of Palestinian land by Israel since 1948 and Israel's subsequent land-grab in 1967. In particular, these constrains can be:

- Unstable and uncertain political situation,
- Lack of sovereignty over resources and limited availability and accessibility to natural resources, including, land, water, etc,
- Impediments created by the spread of numerous Israeli colonies and related by-pass roads,
- Deteriorated physical environment purposely neglected by Israel through its years of occupation, and lack of historic and current information on specific conditions of the infrastructures including transportation infrastructure,

- The anticipated, but at the same time, uncertain increase in population in regard to returnees,
- The dynamic of demographic structure of the Palestinian population where the young generation increasingly constitutes the majority of the people, as well as the dynamics related to the population shifts,
- High rates of unemployment coupled with limited job opportunities, and
- Lack of unified planning laws and regulations.

2.4.3 Uncertainty in Transportation Planning

Solving purely technical problems is comparatively simple, as compared to tackling those problems encountered in transportation planning which are associated with social, economic, and environmental, and ethical concerns, all embedded in uncertainty. In addition, such planning problems are basically unbounded, poorly structured and thus frank defy analysis. The technical problem of transportation planning could be closely linked to a land-use problem, with social, economic, environmental, ethical, and political implications. Naturally, there is no clear-cut boundary, and the problem thought to be originally faced with has now transformed into a cluster of problems, often called a “problematique”, because it has properties that none of its parts have (Ackoff, 1999 and Banathy, 1996).

Transportation planning clearly falls in the category of designing complex systems because it has the following unique characteristics: it consists of a large number of elements, it consists of many interactions between elements; the attributes of the elements are not predetermined, the interactions between elements are loosely organized, non-linear, and probabilistic (rather than deterministic) in their behavior, the individual sub-systems are embedded in the larger system and evolve over time which are purposeful and generate their own goals, and so the system is subject to behavioral influences and open to the environment (Khisty, 2000).

Uncertainty in transportation systems has recently received attention. Many studies have highlighted uncertainty that is presented in all aspects of transportation and land use planning. Sources of uncertainty range from technological advances to changing economic conditions to enacted policy to errors in data and model structure. While much research has been devoted to analyzing the variation in model outputs due to uncertainty, little has been done to quantitatively answer the more important question of how decision making will change based on recognition of this uncertainty (Duthie, Voruganti, Kockelman and Waller, 2010).

In such a dynamic and uncertain environment, a difficult but important question in network planning is how best to cope with uncertainty. The

transportation planning and policymaking process is characterized by many uncertainties. The demand for transportation services is determined by key inputs to policy making processes such as population growth, the distribution of population and economic activities in space, the growth or decline in economic activity, the introduction of new technologies, and so forth. When planning for a transportation system and its operations over many years into the future, it is certain that planners cannot anticipate with precision all the changes that will occur.

Mahmassani (2000) categorized uncertainties affecting the evaluation of alternative transportation options into classes. The most difficult to represent, is uncertainty arising from major political upheavals or unexpected technological breakthroughs. Another one arises from political, economic, or social events and variables relatively independent of the transportation system being evaluated, but affecting the environment in which it operates.

Most transportation forecasts rely upon exogenous forecasts of population, employment and housing. These descriptors of the future communities are themselves subject to uncertainty, but transportation planners tend to start their planning exercises on the basis of the “best available” forecasts of these quantities rather than by incorporating the notion that they are uncertain. The paradigm by which the current

system plans to accommodate future needs is almost defiant in the extent to which it ignores uncertainty. Despite this, uncertainty arises in the performance of the transportation system every single day (Pradhan and Kockelman, 2002).

Chapter Three

Related Studies

The related studies will be divided into two sections; the first will be about the strategic plans of transport sector in some countries, the second will be about uncertainty in transportation strategic planning.

3.1 Relevant International Transport Sector Strategic Planning:

- **Scotland's National Transport Strategy**

Scotland's National Transport Strategy (NTS) was published in December 2006. The NTS was the product of consensus achieved through wide consultation with key stakeholders (business, transport and wider interests, general public). In this study the national strategy was developed according to these steps:

- **First, Analyzing The Current Situation Of The Transport Sector**

The transport sector (i.e., logistics, haulage, rail, air, bus and ferry services) contributes directly to the Scottish economy and, like any other sector, changes in employment and output will have impacts on the rest of the economy, both directly and indirectly. However, the growing economy and changing society have led to changes in the journeys made and the way in

which it is made, also an increased reliance on cars, which is mirrored by a reduction in other forms of transport such as walking and cycling, is noticed. More travels are made by plane; one of the most significant changes in transport in recent years has been a dramatic growth in air travel.

- **Second, Identifying The Key Challenges Which Are To Be:**
    - Providing an efficient, integrated and reliable transport network that successfully promotes economic growth, protection of the environment, health and social inclusion.
    - Reducing journey times, tackle congestion, provide attractive alternatives to the private car and improve connections and accessibility.
    - Reducing the impact of transport on the environment.
    - Providing a public transport system which is attractive, efficient and affordable with proper integration and through ticketing.

- **Third, Developing The Vision Which Is**:

"an accessible Scotland with safe, integrated and reliable transport that supports economic growth, provides opportunities for all and is easy to use; a transport system that meets everyone's needs, respects our environment and contributes to health; services recognized internationally for quality, technology and innovation, and for effective and well-maintained networks; a culture where fewer short

journeys are made by car, where we favor public transport, walking and cycling because they are safe and sustainable, where transport providers and planners respond to the changing needs of businesses, communities and users, and where one ticket will get you anywhere".

- **Fourth, Establishing The High Level Objectives:**

  - Promote economic growth by building, enhancing managing and maintaining transport services, infrastructure and networks to maximize their efficiency,
  - Promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network,
  - Protect the environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimize emissions and consumption of resources and energy,
  - Improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians, drivers, passengers and staff, and
  - Improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

- **Fifth, Setting The Strategic Outcomes**

The Scottish Executive's National Transport Strategy (NTS) addresses these challenges through three strategic outcomes:

  - **Journey times and connections**, to tackle congestion and the lack of integration and connections in transport which impact on the high level objectives for economic growth, social inclusion, integration and safety.
  - **Reduce emissions**, to tackle the issues of climate change, air quality and health improvement which impact on the high level objective for protecting the environment and improving health.
  - **Improve quality, accessibility and affordability**, to give people a choice of public transport, where availability means better quality transport services, value for money and a realistic alternative to the car.

- **Sixth, Monitoring and Reviewing the National Transport Strategy**

Reviews of the strategy included open and accountable monitoring of progress against the strategic outcomes. This was informed by the use of indicators, grouped around the outcomes. A small number of performance

indicators were set out in this strategy for each strategic outcome to monitor the progress.

- **Transport Sector Master Plan for East Timor (May 2002)**

This plan was organized into three sections: Part A covering general and cross-modal issues, Part B dealing with physical development of the road network and the roads administration, and Part C with the land transport, maritime, and aviation sectors. The starting point for planning was to set out the national goals and objectives toward which the transport system can contribute, and to help identify where deficiencies and constraints in the transport system could act as a barrier. Then the goals and objectives for the transport sector that support the national goals were developed to be:

- An Efficient Transport System,
- A Sustainable Transport System,
- Efficient Transport Sector Agencies,
- An Appropriate Legal Framework,
- Transport Network Supportive of Economic and Social Development, and
- Minimum Adverse Impacts on People and the Environment.

The Transport Sector was divided to Road Transport, Ports and Shipping, Airports and Aviation, and Institutional Structure.

Each division was discussed by analyzing the current situation for each division, the demand on each one and the critical issues related to each one. Then a vision for each division was developed, the general goals were established, the guiding principles for each division were created, key performance indicators for each one were proposed for monitoring the performance of the transport sector, and finally the strategies and actions for the Transport Sector were developed.

- **Transport Sector Plan of Jamaica (2009-2030)**

This Sector Plan for Transport was one of the strategic priority areas of the Vision 2030 Jamaica - National Development Plan. It was one of thirty-one sector plans that formed the foundation for Vision 2030 Jamaica – a 21-year plan based on a fundamental vision to make 'Jamaica the place of choice to raise families, live, work and do business,' and on guiding principles which put the Jamaican people at the centre of the nation's transformation.

The preparation of the plan was supported by a quantitative system dynamics computer model – Threshold 21 (T21) – which supports comprehensive, integrated planning that enables the consideration of a broad range of interconnected economic, social and environmental factors. The T21 model was used to project future consequences of different strategies across a wide range of indicators, and enabled planners to trace

causes of changes in any variable or indicator back to the relevant assumptions and policy choices.

This sector plan was developed using the following processes:

- Participation of Task Force Members through Task Force Meetings that were used to solicit ideas and views on transport issues and challenges facing Jamaica as well as identifying a vision for transport in Jamaica, and determining key goals, objectives and strategies for the sector,
- Sub-committees on land, air and maritime transport involving sector stakeholders,
- Research on international best practices in transport that could be adopted in the Jamaican context,
- Working group meetings between task force members and the Planning Institute Of Jamaica (PIO), and
- Development of a detailed Action Plan with responsible agencies and time-frames for implementation

This Sector Plan for Transport was structured in the following main chapters as follows:

- Situational Analysis
- SWOT Analysis
- Strategic Vision and Planning Framework

- Implementation, Monitoring And Evaluation Framework Action Plan.

The transport sector was divided into; land transport (road and railway transport), air transport and maritime transport. Then a situational analysis for each sub-sector was made to identify the challenges in each one.

The SWOT analysis was done along with the situational analysis to form the basis for identifying goals, objectives and strategies that may be employed to apply the strengths and address the weaknesses of the sector, and capitalize on the opportunities and mitigate the threats to the long-term development of the sector.

The SWOT analysis was categorized according to the following dimensions:

- Overall Transport Sector
- Land Transport
- Air Transport
- Maritime Transport

Then the vision for each sub-sector was created and so the goals and outcomes for each one were established. Finally, the Action Plan represented the main framework for the implementation of the Transport Sector Plan for Vision 2030 Jamaica. The tracking of implementation of

the Transport Sector Plan will take place through the Action Plan as well as the framework of sector indicators and targets.

The Action Plan contained the following elements: sector goals, sector outcomes, sector strategies, sector actions, responsible agencies, and time-frame**.**

- **Regional Transportation Strategy (RTS) for Northern Ireland (2002-2012).**

The Regional Transportation Strategy (RTS) for Northern Ireland 2002-2012 identified strategic transportation investment priorities and considers potential funding sources and affordability of planned initiatives over the following 10 years.

Purpose of the Regional Transportation Strategy

The purpose of the RTS to support the Regional Development Strategy and to move significantly, over a 10-year period, towards achievement of the longer-term transportation vision.

Transportation Vision is "To have a modern, sustainable, safe transportation system which benefits society, the economy and the environment and which actively contribute to social inclusion and everyone's quality of life."

In preparing the RTS, the Department had focused on the **major objectives** of the RDS relating to transportation, which are:

- Developing a Regional Strategic Transport Network, based on Key Transport Corridors, to enhance accessibility to regional facilities and services,
- Extending travel choice for all sections of the community by enhancing public transport (which includes taxis and community transport as well as conventional bus and rail services),
- Integrating land use and transportation planning,
- Changing travel culture and contributing to healthier lifestyles, and
- Developing a modern, integrated transport system for the Belfast Metropolitan Area.

- **National Transport Strategy for Mongolia**

A transport strategy for Mongolia was prepared in 1999 by the World Bank. There had been several developments since 1999, which established the need for formulation of a new National Transport Strategy which was based on the objectives of the Government's 2004-2008 Action Plan.

Challenges for the Transportation Sector

The following challenges for the transportation sector had been identified and reflected in the formulation of the transportation strategy:

- Mongolia's landlocked location
- Isolated regions within the country
- Transport and poverty reduction
- Integration of various transport modes
- Need for appropriate transport policies and regulations
- Transport financing
- Traffic safety
- Private sector involvement
- Human resource development
- Government response to challenges

Vision for the Transport Sector

To provide safe, dependable, effective, efficient and fully integrated transport operations and infrastructure in order to best meet the needs of freight and passenger customer.

Transport Sector Objectives

The objectives were categorized as the following:

Operational and management:

- To meet the needs of transport users at a minimum cost via an improved integration of transport system and services.
- To provide accessible, safe and affordable transport services, especially for the poor.
- To reduce traffic accidents and adverse environment impacts.
- To create an enabling environment in which the transport industry can operate efficiently with appropriate levels of government regulations.

Infrastructure development objectives:

- To establish a competitive and efficient national primary and secondary transport network with links to rural and international gateway.
- To establish an efficient tertiary and rural transport network that provides access to the main transport network.

Institutional development objectives:

- To establish a regulatory framework to encourage competition with adequate safety and environmental safeguards.
- To strengthen the sector administrative capacity at the national and levels
- To promote private sector capacity and participation.

Then the plan reviewed available existing forecasts for future vehicle numbers and expected demands for transport services by mode and where

appropriate, additional estimates have been developed. The envisaged effects of the forecasts had also been reviewed; with respect to the requirements of the transport strategy to accommodate and/or manage the future traffic demand. The future demand for transport were classified according to the transport modes which were roads, road transport services, urban transport, rail traffic, air traffic, and inland waterways.

After that the Transport Strategies were developed by:

1) Setting the guiding principles,
2) Developing the overall transport sector strategies based on the principles, and
3) Categorizing the strategies according to the sub-sectors (transport modes, i.e., strategies for roads, urban, rail, civil aviation, waterways and sea transport).

Finally, the plan had identified the role of the private sector in the transport strategy, and identified the sector priorities and strategic action plans.

3.2 Uncertainty in Transportation Strategic Plan

Many recent studies discussed uncertainty in the transportation strategic plan, but from different perspectives. In this section some of the researches and studies that have dealt with uncertainty in transportation planning are discussed.

- **Possibilities of Steering the Transportation Planning Process In The Face of Bounded Rationality and Unbounded Uncertainty (Khisty, 2005)**

The author identified the bounded rationality and unbounded uncertainty, and the difference between them in the planning perspective. Confirming that in the world of planning problems connected with transportation, a distinction can be made between problems that can be well defined and those that are ill-defined. Most planning problems are really "wicked" and can be characterized as follows: (1) there is no definite formulation of a wicked problem, (2) wicked problems have no stopping rule, and one usually ends by saying, "that's good enough", (3) solutions to wicked problems are neither true or false, but just good or bad; for instance there is no such thing as a true or false plan, but just a good or bad plan, (4) the solution to a wicked problem has no immediate and no ultimate test, (5) every wicked problem is a one-shot operation, (6) wicked problems do not have an exhaustive set of potential solutions, (7) every wicked problem is essentially unique, and (8) every wicked problem can be considered as a symptom of another problem.

The paper discussed that the transportation planning clearly falls in the category of designing complex systems. Transportation systems are planned and managed by several actors, and these actors form a pluralistic system of their own, where issues of concern are discussed. Naturally,

conflicts are ubiquitous, because the multidimensional and dynamic nature of planning is complex, subtle, and poorly understood.

This paper proposed to critically examine the relationships among some issues (complexity, conflict, coercion and wicked problems), to the basic problem of bounded rationality and unbounded uncertainty.

The research concluded that some of these alternative paradigms should be examined: (1) sub optimizing by seeking alternative solutions through trade-offs, (2) reducing the dependence on data demands using hard and soft data, (3) resorting to greater simplicity and transparency to reduce conflicts, (4) depending on citizen inputs and participation, using the 'bottom-up' rather than the 'top-down' approach and (5) making use of deductive and inductive inferencing in forecasting variables.

So, the potential for improving the transportation process is an opportunity to take up the challenge of examining and exploiting a variety of newer methodologies that can help decision-makers to complement the often opaque and inflexible mathematical models of analysis being currently used.

- **Simulation of Production and Transportation Planning With Uncertainty and Risk (Chen and Che, 2008)**

In this research, a mathematic model of supply chain with risk and uncertain demand were established and solved. The inherent complexity of such an integer programming model leads to the solving difficulty in speedily finding exact and integer optimal solutions. Therefore, a quick and decent answer becomes essential to pace up with the competitive business world; even it is usually only an approximate estimate. Four types of model were discussed in this study, including certain demand without risk, certain demand with risk, uncertain demand without risk, and uncertain demand with risk. After model verification and validation, computer simulations were performed with three selecting policies, namely “low cost first”, “random”, and “minimum cost path”. The results were analyzed and compared, in which the “minimum cost path” wasthe better policy for node selection according to simulation runs. A general linear programming solver called LINDO was used to find the optimal solutions but took days as the problem size increases, while simulation model obtains an acceptable solution in minutes.

So, three policies for node selecting were tested and the “lower cost for whole path first” policy out-performed “random” and “lower cost first”. It was also found that the priorities of node selections and routing choices were usually close in great portion of the network but slightly different

from the relaxed linear programming solutions. However, simulation can find the exact optimal solutions for the deterministic models if supplied with enough iteration.

For supply chain problems, a very important task was to obtain an acceptable solution in a short time while the costs and risks vary all the time. Upon built, a simulation model could provide sensitivity analysis and quick solutions and answers to what-if questions. The results from simulations are usually straight-forward and easy to understand.

- **Transportation Planning, Climate Change, and Decision Making Under Uncertainty (Dewar and Wachs, 2008)**

This research had discussed many points; one of these was that the urban transportation planning and policymaking process is characterized by many uncertainties such as the variability of travel on that network, and consequently the variability and uncertainty of the network's performance under different circumstances. The demand for transportation services was determined by key inputs to policy making processes such as population growth, the distribution of population and economic activities in space, the growth or decline in economic activity, the introduction of new technologies, and so forth.

Another point was that when planning for a transportation system and its operations over thirty or more years into the future, it is certain that

planners cannot anticipate with precision all the changes that will occur, so the related uncertainties are of necessity incompletely addressed in the formal long-range planning and modeling process. Transportation planning is done on the basis of point estimates (forecasts) of the future. They are likely to be wrong in their particulars, but perhaps close enough to right to be useful. Furthermore, the inadequacies of the system that flow from these flaws is to some extent offset by the adaptive behavior of millions of individual decision makers who use the system. Even current uncertainties could unmask those flaws by way of breakdowns to which those independent decision makers are unable to adapt. Climate change is a new and different challenge to the transportation network that adds to the likelihood that flaws in that network will be unmasked.

The other point is that planners practically assume away much of that uncertainty in the planning of the physical networks. Yet, to some extent planners manage to create systems that operate under a wide variety of unanticipated conditions because the individual travel decisions that people make respond to uncertainties far more effectively than do the systems themselves.

Finally, the research briefly summarized a variety of methods that had been used to address some or all of the uncertainties that climate change poses for the transportation system. These methods could, however, assist transportation planners in thinking about the very real possibility that

climate change could seriously affect the adequacy and survivability of the nation's transportation sector. In addition, each of the methods could be used to explore other uncertainties in transportation planning. These methods are: Decision tree, Influence diagram, real options, adaptive management, assumption-based planning (ABP), The robust decision making (RDM), and scenarios which when specifically used in connection with planning under uncertainty. Planners are confronted with several scenarios (usually 3-5) and asked to prepare for each.

The research concluded that it is important for the transportation planning to address uncertainties more appropriately than it now does. This will require a rethinking and reworking of the entire transportation planning system. Methods that would be useful for addressing the challenges of climate change should be integrated into a revised planning system that handles current uncertainties plus those posed climate change.

- **A Bayesian Approach to Modeling Uncertainty in Transport Infrastructure Project Forecasts. (Cheung and Polak, 2009)**

This research discussed that the traffic forecasts produced by transport models are subject to a number of sources of uncertainty including errors in the measurement of input data, errors in the estimated value of model parameters and errors in the specification of the underlying models themselves. Ideally, analysts would wish to understand the separate and

collective impact of these errors on the uncertainty of model forecasts, so as to be able to attach credible confidence intervals to model forecasts and optimize the allocation of study resources. However, in large model systems, the interaction between each of these sources of error can be very complex, making the analysis of propagation of uncertainty through the modeling process extremely challenging.

The classical approaches to addressing these issues in the transport literature include scenario analysis, sensitivity testing and statistical risk analysis using Monte-Carlo methods. However, all these approaches have significant limitations. This paper proposed a new approach which is based on Bayesian statistical principles which can offer superior insight into the structure of the underlying problem. The approach in this study involves expressing the transport demand model as a Bayesian belief network (BBN). BBNs are powerful tools for Bayesian statistical inference, which enable the representation of causal dependencies between sets of random variables and the computation of the joint posterior distribution of these random variables, conditional on prior distributions of each variable and data.

The paper was divided into a number of sections. Following the introduction, the second section provides a brief overview of the existing literature on the modeling of uncertainty in transport modeling, highlighting the strengths and weaknesses of the different approaches. The

third section briefly introduces the BBN methodology and discusses some of the specific issues associated with its application to typical transport modeling contexts. The fourth section presents an application of the BBN approach to a toll road case study in São Paulo, Brazil. The fifth section summarizes a number of test results from the model including a comparison between the BBN and a more conventional sensitivity analysis and discusses the relative merits of each approach. The paper concluded with a summary of the main findings and directions for future research.

There are a number of general approaches to assess the degree of forecasting risk in any type of project or investment analysis. These include scenario testing, sensitivity testing and risk analysis.

The most basic form of analysis used to assess uncertainty in traffic forecasts is scenario testing. This is where a number of alternative scenarios are developed, based on the simple variation of key model assumptions around a “central case” (or “base case”) forecast. Sensitivity analysis is a variation on scenario testing which is a series of model runs for a range of input parameters and used to pinpoint the variables where forecasting risk is most severe. There are shortcomings to the scenario, sensitivity and conventional risk analysis approaches. No developed methodology or model incorporates these uncertainties through the traffic model system. Instead, conventional risk analysis relies upon obtaining a relationship between model inputs and outputs based on sensitivity testing

and combining these relationships. Other techniques are available that may offer superior insight into the structure of the underlying problem.

- **Forecasting Automobile Demand for Economies in Transition: A Dynamic Simultaneous-Equation System Approach. (Abu-Eisheh, and Mannering, 2002)**

The dynamic characteristics of automobile demand are critical for national economic and revenue predictions. Automobile demand and ownership level forecasts are also the basis for travel demand models, land-use-transport interaction models, and transport policies and regulations. In this article, a dynamic automobile demand simulation model was developed utilizing a simultaneous-equation system. The system considers the interaction between supply and demand and the resulting equilibrium. Although forecasting automobile demand had been previously investigated, it had not been within such a dynamic simulation framework. The modeling approach was based on the joint modeling quantity and price variables of automobiles, uses a differenced and lagged form of a simultaneous-equation modeling system. The model includes the current and lagged automobile quantity and price variables; economic, financial and operating cost variables; and income and government policy variables.

The capabilities of the model were then demonstrated through performing a number of simulation experiments considering various growth-development scenarios, changes in operating costs, government policies towards automobile imports, and demographic/employment shifts in the Palestinian Territories. Relevant tests were applied to examine the econometric specifications and to evaluate the simulation model performance.

The article began by first presenting previous research efforts. This was followed by a description of the methodological approach. An overview of the data collection effort and the variables that form the basis of subsequent model estimation was then provided. The estimation results were presented along with a discussion of the resulting model structure and relevant econometric issues and this was followed by a discussion of forecasting results.

The model estimation results underscore the importance of the simultaneous estimation of automobile ownership and price. The estimations show that much if the growth of automobile ownership is driven by economic growth.

Chapter Four

Current Situation of Transport Sector in Palestine

4.1 Introduction

The transport sector is a vital sector for the development of the Palestinian economy; it plays a leading role in boosting the economy by securing the movement of goods and passengers at the local and international levels, providing services to other sectors, providing opportunities for investment and creating employment opportunities.

The current transport sector in the West Bank and Gaza Strip is primarily a single mode system, depending on road transportation for the movement of people and goods within the area and to the outside world. Rail, air, and sea transportation was discontinued since the beginning of the Israeli occupation in 5 June 1967. The West Bank has one airport (Qalandia Airport) currently under Israeli military control and Gaza Strip has one, but Israel closed the airspace of this airport in 2000 and destroyed the runway in 2002. The construction of an international seaport in Gaza Strip has been put on hold as a result of Israeli assault on the seaport site. and the roads and border crossings connecting the West Bank to Jordan and Gaza Strip to Egypt are under full military control of Israel.

Existing Palestinian transportation infrastructure has been deliberately damaged by Israeli military operations during the Second Intifada late 2000 and depreciated as a consequence of the economic situation and mobility restrictions. So the Palestinian physical infrastructure needs considerable improvement.

But even before the Second Intifada, Palestinian infrastructure was in poor conditions because of the Israeli occupation, despite significant donor assistance. The hilly topography of the West Bank and Gaza Strip and the construction of Israeli settlements and bypass roads have inhibited the development of an adequate Palestinian road network. The transport sector, like other economic and service sectors, has suffered of a sharp deterioration and heavy losses (directly and indirectly), as a result of Israeli practices on the Palestinian people including the closure, siege and disrupting the movement of persons and goods, and also the destruction of installations and facilities of the road network, the seaport and airport.

A remarkable growth in the Palestinian transport sector was noticed since the establishment of the Palestinian National Authority after it suffered from neglecting because of the occupation for long years. Many programs and projects were implemented to upgrade this sector to cope with its role in the economy and development, through the

rehabilitation and development of transportation and development of the existing networks.

4.2 Palestine at a Glance

Geography:

The location of Palestine is at the eastern coast of the Mediterranean Sea. Palestine is located to the south of Lebanon and to the west of Jordan. Palestine geography consists of four regions in the country. The four regions of Palestine geography are Jordan valley (Ghawr), Coastal and Inner Plains, Mountain and Hills, and Southern Desert. The West Bank is bounded by the Jordan River and the Dead Sea from the east and from Israel the other three directions, and has an area of 5860 km^2. Distances are small less than 60 km at the widest point east to west and about 130 km where the distance north to south is the longest. Topographically the West Bank is defined as a mountainous area with a maximum elevation not exceeding 1022 above mean sea level. It also includes the lowest point in the World, the Dead Sea, at 408 m below sea level. The Gaza Strip borders Egypt on the southwest and Israel on the south, east and north. It is about 40 km long, and between 6 and 12 km wide, with a total area of 360 km^2. The West Bank and the Gaza Strip are separated by about 40km measured from the northern part of the Gaza Strip to the southern part of the West Bank.

Population: By the end of 2010, about 4.1 million Palestinians were in the Palestinian Territory, of which 2.5 million were in the West Bank and 1.6 million in Gaza Strip. The population is relatively young as nearly 48% are under the age of 15 years and only 7% are 55 years or older. The life expectancy is 72.5 years. In the Palestinian Territory, two thirds of Palestinians live in the West Bank while one third in Gaza Strip. Of every 100 person in the Palestinian Territory, about 44 are refugees, of whom 18 live in the West Bank and 26 in the Gaza Strip.

The total fertility rate had declined in 2007 to 4.6 birth compared with 6 births in 1997. The rate in Gaza Strip in 2007 reached 5.3 births compared to 4.1 in the West Bank. These rates have been stable for the past few years with a simple trend to decline. On the other hand, there has been a decline in the detailed fertility rate particularly in the early reproductive years (15-24 years) (PCBS, 2010).

Rule: Administratively, the West Bank and Gaza are divided into 11 and 5 governorates, respectively (see Figure 4.1). After 1967, the West Bank and Gaza came under the Civil Administration of the Israeli military. However, this situation changed as a result of the peace process that started in 1990 between the Palestinians and the Israelis and the Oslo Interim Agreement that was signed in 1993.

The Oslo Agreement divided the West Bank and the Gaza Strip into three areas: A, B and C. Area A corresponds to all major population centers, where the PNA has full responsibility for both civilian and security matters, including land administration and planning. Area B encompasses most rural centers, in which the PNA is responsible for civilian affairs, again including land administration and planning, with security under joint PNA and Israeli military responsibility, although in reality today security is for the most part controlled exclusively by the Israeli military. The territorial space of Areas A and B is not contiguous, and consists of some 227 separate geographical areas under partial or full Palestinian control.

Area C, which covers the entire remaining area, is the only contiguous area of the West Bank, and includes most of the West Bank's key infrastructure, including the main road network. Area C is under full control of the Israeli military for both security and civilian affairs related to territory, which includes land administration and planning. It is sparsely populated and underutilized (except by Israeli settlements and reserves), and holds the majority of the land (World Bank, 2008 A).

4.3 Historical Background Of The Transport Sector

Based on the Strategy of Transport Sector prepared by MOT and MOP (MOT, 2010 A), the historical background of the transport sector can be summarized hereafter:

The transport networks developed through history from narrow, primitive roads into well-built ones in the 19th century during the Ottomn period. The first road was Jafa-Jerusalem which was built in 1867, Nablus-Ramallah-Jerusalem road was constructed at the beginning of the 20th century. Later, other roads were built to connect Palestinian cities and other large rural areas.

Figure 4.1: Governorates that make up the Palestinian Territories (West Bank and Gaza Strip)
Source: Wikipedia

In the period of 1948-1967, the establishment of the state of Israel over parts of Palestinian lands was a turning point in the modern history of Palestine. The disconnection of links between the West Bank which became under the Jordanian rule, and the Gaza Strip, which became under the Egyptian rule, and with the rest of Palestine, resulted in considerable change in the transportation system.

After the Israeli occupation of the West Bank and the Gaza Strip in 1967, the Israeli authorities prepared a National Highway Master Plan, which considered the linkage of the new occupied territories with Israel and thus began to plan and construct new roads, motivated by their claimed security and settlement needs.

After 1977, the Israeli strategy was modified to allow for the full integration of the West Bank network with the Israeli transportation system. In 1978, the West Bank was separated from Gaza Strip and of the area occupied in the 1948. Additionally, Israel started to build new roads that serve the Israeli settlement in the Palestinian territories, these roads didn't consider the shortest distances between areas, causing an increase in the time and cost of the traveling.

During this period a dual road network exists in the West Bank and the Gaza Strip, with one advanced system serving Israeli security and settlement policies, and another less developed system for Palestinian

use, which revived only minor improvements during the period of occupation. Thus, the road networks in the Palestinian territories became weak and inefficient.

The Palestinian transport system witnessed development since the coming of the Palestinian National Authority through rebuilding the networks of the already existing roads besides, constructing Gaza International Airport and Gaza Seaport. However, the Israeli actions during the Second Intifada prevented the development of that section as it was intended. That resulted in great damage to the Palestinian economy.

Recently, many projects of developing and rehabilitating the road network in West Bank have been applied by the Ministry of Transport (MOT) and the Ministry of Public Works and Housing (MPWH).

4.4 Divisions of the Palestinian Transport Sector

According to the information collected from MOT, MOPH, MOP, and the Ministry of Local Government (MOLG), the transport sector is divided into the following sub-sectors to facilitate further analysis of the sector; land transport (road network and internal transport), international transport, rail transport, air transport and maritime transport.

All the data and numbers in the following sub-section are based on the Strategy of Transport Sector prepared by MOT and MOP (MOT, 2010 A).

4.4.1 Land Transportation

This includes two sections; the road networks and internal transport (public and private spheres), each of the two sections are presented below.

4.4.1.1 Roads Network

Roads in the Palestinian territories on the national level are divided into main, regional, local and bypass roads (see Figure 4.2).

The **main roads** which are linking major cities are usually of two lanes (but in few cases of four lanes), two-way traffic and relatively high speeds, but with lower speed in the populated areas. They connect the main built up areas, including the Jenin - Nablus - Ramallah - Jerusalem - Hebron.

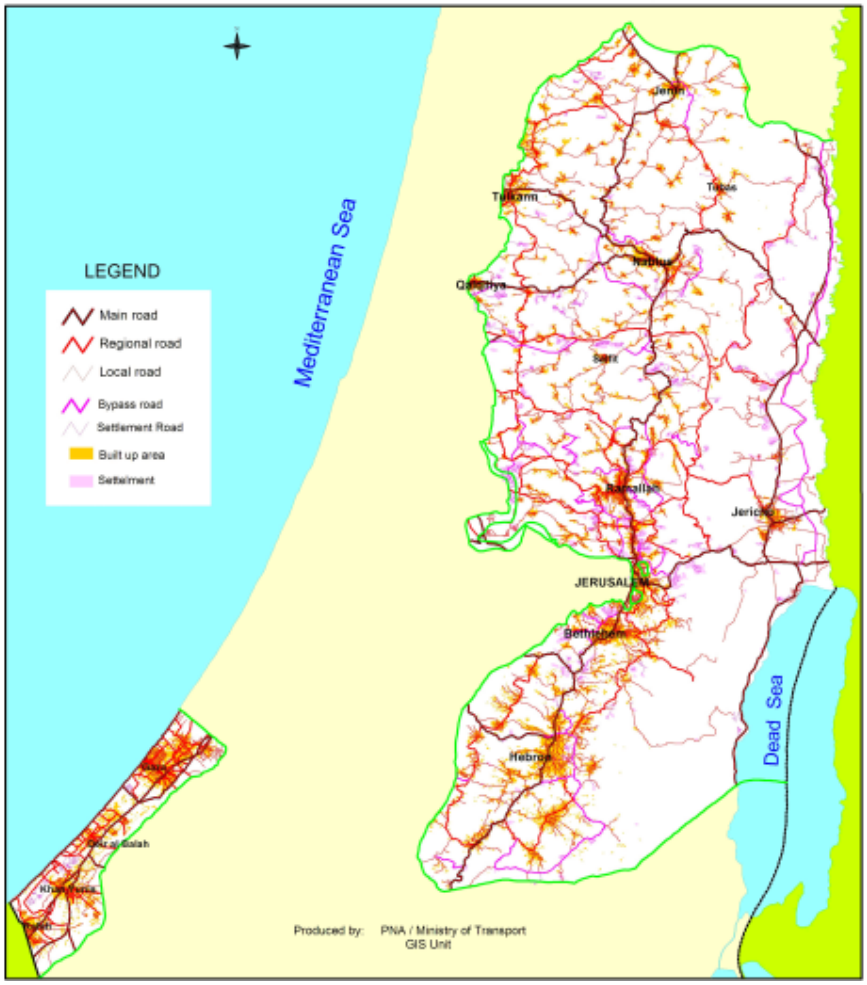

Figure 4.2: Roads in West Bank and Gaza Strip.
Source: MOT

Regional roads are the roads linking the governorates of the West Bank and the other Palestinian areas; they were built during the Israeli occupation and are used to serve the settlements. Regional roads are two lane roads, and the traffic volume is usually moderate with moderate densities and speeds.

The **local roads** are used to provide access to the villages on the national level, with lower traffic volumes and lower speed. They are usually two-lane with no restrictions to stop vehicles. They include agricultural roads which are used to serve the agricultural areas and private equity, and usually are unpaved roads.

Finally, the **bypass roads** which penetrate the West Bank and Gaza Strip from the Green Line to reach the Israeli settlements. These roads are designed to link the settlements and provide a passage to the settlers and the Israeli army inside the West Bank and Gaza Strip to Israel and vice versa. Before the Oslo Accords, Palestinians lived under Israeli authority and could travel freely on the road. After the Palestinian Authority assumed control over various cities, Israel established checkpoints on areas of such routes which entered the Palestinian jurisdiction. New bypass highways were paved so that Israeli traffic could bypass the Palestinian towns in order to reduce friction.

The available data of the Palestinian road network varies according to its source. The PCBS (2006) reported that the length of paved roads in the West Bank and Gaza Strip is 5,147 km of roads. However, MOT reported different values. Therefore, the lengths of roads in the West Bank and Gaza Strip vary according to the source of the data, but the records of the MOT are more reasonable. The total length of the road network in West Bank and Gaza Strip according to MOT is 6874 km

and the paved part of them is 5000 km. Table 4.1 shows the length of the different roads classification.

Table 4.1:The total length of the road network in West Bank and Gaza Strip.

Roads classification	Total Length (km)	Length of Paved roads (km)
Main	936	936
Regional	782	782
Local	4150	2308
Bypass	974	974
Total	6874	5000

Source (MOT, 2010 A)

4.4.1.2 The Internal Transportation

It is divided into two sections; public and private transport. The MOT organizes the internal transport through the development of issuing licenses for vehicles, machines, garages, workshops, car shows, check centers, bus companies, driving teaching schools, etc. It also issues regulations that control the traffic and it promotes the level of safety on roads. It should be known that MOT had prepared the Traffic Law No (5) for the year of 2000. It also formed the Higher Council of Traffic.

There are three **public transportation** modes in Palestinian Territories. These are buses, share-taxis, and taxis. The fleet is owned and operated

by the private sector; individuals or firms. In addition, there is a limited illegal operation of private vehicles as shared-taxis or taxis.

The statistics of MOT (2010 A) indicate that there are 9139 public cars, 909 public buses, 128 companies for renting cars, 459 taxi offices, and 97 public transport companies. The statistics also indicate that the number of vehicles in both the West Bank and Gaza Strip in 2009 is 229,886 cars, 175,265 in the West Bank and 54,621 are in Gaza Strip. Private cars have a rate of 67.0% then the commercial ones which comprise 17.8%, then public cars (shared-taxis or taxis) which have a rate of 7.4%.

This sector faces a lot of problems. For example, the buses are outdated as one third of them will be out of services in 2013 (more than 30 years in service). This is in addition to the inefficient companies, the Israeli obstacles on roads, and the effect of the closure regime imposed on West Bank and Gaza Strip.

No major developments in public transportation have been observed during the past few years. There were no funds assigned by PNA for the development of the public transport facilities, as public transport is owned and operated by the private sector. The following reasons clarify the decision of PNA to defer the development of public transport (Abu-Eisheh, Al-Sahili, and Kobari, 2004):

- Public transportation agencies are privately owned
- PNA focused on physical infrastructure rather than on operation projects and programs
- Most intercity roads and the roads connecting the villages are still not controlled by the PNA
- Some of public transportation development projects need public awareness

MOT is responsible for the regulation of public transport services. This implies, for example, that every bus and shared-taxi is required to have a permit, which specifies the route on which it must operate. The maximum number of shared-taxis to operate on a line is also regulated by the MOT. The determination of the tariff and the fares is another responsibility of the MOT. In addition, the MOT only has the right to give a certain bus company the right to operate on a certain line, which is called exclusive rights.

The **private transportation** which is combined of personal cars, commercial cars and tractors. Here the Directorates of MOT supervise the licensing and the registration of these cars. The statistics of MOT (2010 A) indicate that 68% of these vehicles are between 20-30 years old and 21% are 10 or less years old. This indicates the high cost of the maintenance of these old cars and so the cars cause a lot of pollution.

4.4.2 The International Transportation

The international transportation is related to the transportation of people and goods from and to the Palestinian territories which links the West Bank and Gaza Strip to the rest of the world, and forms the bases for developing economic activities and the achievement of the economic integration.

All international transportation is through land border crossings controlled by Israel. There are three border crossings with Jordan. King Abdullah Bridge Crossing is an important element in the Amman-Jericho- Jerusalem connection, but it has not been used since the occupation of West Bank by the Israelis and it is in need for rehabilitation and permit to using it. Another crossing is the Prince Mohammed/Damiah Bridge Crossing, which had been used for freight but not any more since 2003, and the third is the King Hussein/Allenby Bridge which is currently used for the movement of people and goods between Jordan and the West Bank.

For transport between the West Bank and Israel there are number of crossings such as Al-Jalameh near Jenin in the north, Al-Taibeh/Ephraim near Tulkarm in the west; and Tarquima near Hebron in the South, which have been placed on the "Green Line"/1967

borders. On the other hand, Betunia crossing near Ramallah does not sit on the 1967 borders. Figure 4.3 shows these crossings.

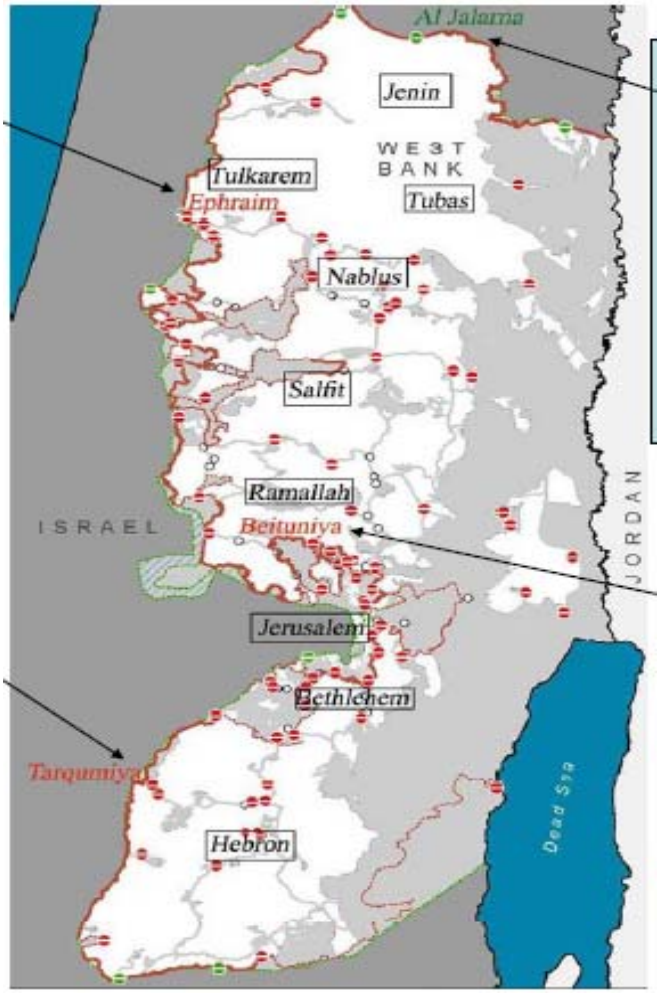

Figure 4.3: Border crossings between West Bank and Israel
Source: PALTRADE, (2010)

For East Jerusalem there are four checkpoints, through which Palestinians with permits may enter East Jerusalem, they are Ras Abu Sbeitan, Qalandia, Shu'fat and Gilo. These checkpoints continue to have limited capacity resulting in long delays and uncertainty for

Palestinians entering Jerusalem for work, medical care, education and worship.

There are six border crossings on the Gaza strip borderlines (see Figure 4.4), these crossings are utilized for the crossing in and out of imported commodities and exported goods. Four of the terminals are controlled by the Israeli government, while Rafah terminal is controlled by the Palestinian Authority, Egyptian and under the European supervision. The newly considered Karm Abu Salem (Kerim Shalom) crossing is a temporary trade terminal classified in the Agreement on Movement and Access (AMA) (See Annex. B), the terminal is ought to be utilized for the crossing in of imports coming from Egypt.

These border crossings are:

1) Al-Montar/Karni terminal which is considered the major commercial terminal of Gaza Strip, where it connects the Gaza Strip with the West Bank, Israel and the rest of the world, the terminal is located at the east of Gaza City and deemed the lifeline for the inhabitants of the Gaza Strip, but is marred by inefficiency and insecurity.
2) Sufa terminal which is located in the south of the Gaza Strip (east of Rafah City) used for the imports of construction

materials only and in case of the closure of AlMontar/ Karni terminal, Sufa is used for the imports of some goods.

Figure 4.4: border crossings between Gaza Strip and Israel

Source: PALTRADE, 2008

3) Karem Abu Salem/Kerem Shalom crossing which is located in the south east of Gaza strip, it is 3.6 Km away from Rafah

Terminal. Karem Abu Salem/Kerem Shalom is a temporary trade terminal "as classified in the AMA", the terminal is ought to be utilized for the crossing of imports coming from or through Egypt.

4) Nahal Oz Entry Point which is located east of Gaza Strip and is considered a transit terminal restricted for the imports of Liquid Fuels and Gas, only from Israel. The point consists of storage petrol tanks and Gas tanks linked directly with pipelines, with the Israeli side.
5) Beit Hanoun/ Erez terminal which is located in the north of Gaza Strip; it is the border crossing between Gaza Strip and Israel/West Bank. It primarily serves civilians, (diplomats, businessmen, international organizations staff, laborers, medical cases) with permits in and out of Gaza Strip. The terminal is also used for the imports of cars.
6) Rafah Border terminal which is located in the south of Gaza Strip (south of Rafah City); it is the border crossing between Gaza Strip and Egypt. It serves travelers in and out of Gaza Strip, and was also used as a cargo crossing point for imports from Egypt (until 2005), mainly aggregates and food items.

Transport to and from the West Bank and Gaza Strip is affected by a number of regulations which make imports and exports costly. For

example, at all the border crossings, all goods and containers have to be scanned and inspected, procedures which result in delays and increased damage of goods (much of West Bank and Gaza Strip exports are made up of vegetables). The worst performer is Al-Montar/Karni, which is the lifeline of Gaza. The GOI refers to security concerns, but independent observers have criticized the Israeli authorities for poor management and also that operations are hampered by corruption.

Mindful of the delays previously experienced at the Karni Crossing for Gaza, the GOI has stated that it will not allow the crossings to become a bottleneck to trade. To this end, the GOI has established a civilian Crossing Point Authority (CPA) and has committed to expanding the facilities as necessary to ensure that there are no queues at the terminals and that all vehicles will move through the crossing points in 30 to 60 minutes (world bank, 2008 B). However, since the Israeli unilateral withdrawal from Gaza Strip in 2005, sever delays and long closures have been observed at all these crossings.

4.4.3 The Rail Transportation

There is no rail transport currently in West Bank and Gaza Strip, but there was the Palestinian Hijaz railway which is considered as an Islamic endowment. It was connecting Damascus and Madeena Monawarah in Saudi Arabia in addition to some sub rails in Bilad

Alsham. It was 1400 kilometers long. The work for the construction of this railway started in 1900 and finished in 1908. It worked till 1916 when the Arab revolt took place and as a result, it was damaged. However, it was constructed during the reign of Sultan Abdulhamid to serve pilgrims and to connect the Empire parts as well. It passes through Syria, Palestine, Jordan and Saudi Arabia.

The line route of Hijaz railway is from the city of Damascus through Horan plain then passes Al-Mazirib and a number of areas south of Syria and up to the city of Daraa and then to Jordan. There was a line branching from Marj Bin Amer, and reaches the major Palestinian cities of Nablus, Tulkarem, Qalqilya and Jenin to Haifa, and there is another branch of the coastline which extends from Jaffa to Gaza , and reaching Jerusalem as well. It complements passing Jordan south to enter the territory of Hijaz where the ends of the city of Madeena Monawarah (see Figure 4.5).

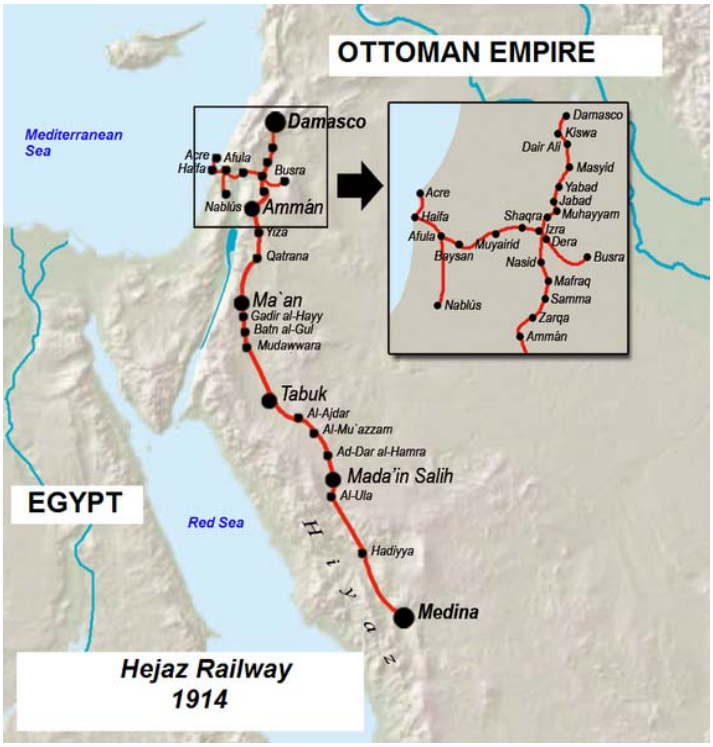

Figure 4.5: Hijaz Railway
Source: Wikipedia

Recently, through the attempts to rehabilitate the parts of the railway in the Palestinian Authority Territories, studies were made to link Gaza Strip with the neighboring countries as well as to construct a rail to connect Gaza governorates and the West Bank and to construct a line within the West Bank governorates and the Jordan Valley reaching Jordan and Saudi Arabia. However, the Israeli occupation is the main hinder for the implementation of these projects.

4.4.4 The Air Transportation

There are two airports in Palestine, one is **Qalandia Airport** and the other is **Yasir Arafat International Airport** in Rafah. Until 1930, the

only airport in Palestine was Qalandia Airport which is located in Qalandia in East Jerusalem. It was built during the period of Jordanian rule in 1952. It was renamed Atarot Airport by Israel after occupation, but in 2001, the Israel Defense Forces closed the airport to civilian air traffic and took it over for military use - not by the Israeli Air Force but also as a base for ground troops. Today it is forbidden for the Palestinians to reach and use it. It is used for domestic Israeli services and general aviation.

Yasir Arafat International Airport was constructed by the PNA. It was built in Gaza, adjacent to the border with Egypt in 1996 in accordance with ICAO recommended standards. It was operated in accordance with an agreement with Egypt to allow for use of Egyptian airspace for landing and take-off operations.

The Palestinian Civil Aviation Authority (CAA) was created to administer and operate the airport. The CAA is part of the Ministry of Transport. It has eight departments, including engineering and maintenance, air transport, and air safety. Utilization of the airport during 1999 was much below its capacity due to Israeli restrictions and the limited market in Gaza. It was used by the Palestinian Airlines as well as airlines from Jordan, Egypt, Morocco and Romania.

Following the outbreak of the Second Intifada, the airport was closed, and during 2001 and later in 2004 and 2005 it sustained severe damages by Israeli army. They continued their aggression and demolition of parts of the airport over the years especially during 2008-2009 war. The airport therefore requires extensive rehabilitation before operations can be resumed. In the summer of 2003 MOT cited the figure of $35 million as the estimated outlay to repair and reopen the airport. The Gaza airport was never equipped to handle substantial commercial traffic, this would require additional investment.

It has to be indicated that a third new airport, **Palestine International Airport**, to the east of the city of Jerusalem is planned. The establishment of this airport was approved on 2009 by the Council of Ministers. It will be implemented on an area of 4 square kilometers and at a distance 10 km south east of the city of Jerusalem, and 10 kilometers north of Jericho. The total estimated cost for the establishment of the airport is approximately 500 million dollars.

The obstacles to the establishment of the airport are: the lack Israeli approval to set up the airport to date and not finding the necessary funding to proceed in spite of addressing the donors more than once. MOT has completed all the plans to implement one of the largest projects in the West Bank, which represents an important stage of the establishment of a Palestinian state, the airport is designed to

accommodate large numbers of arrivals and departures to the Palestinian State to be established.

The construction of the airport in Palestine is considered one of the most strategic projects considering politics, economics and security aspects. This project involves developing an airport facility in the West Bank to ensure proper access to the rest of the world and provides a more convenient and less costly alternative to Palestinians living in the West Bank. It may be financially and economically viable as an international gateway for goods and passengers to and from the West Bank, and enhance tourism in the region.

The PNA established the Palestinian Airlines as an international carrier. On the 10th of January 1997, Palestinian Airlines flight number (PF 141) took off on that day as the first trip carrying Palestinian pilgrims from Port Saed Airport in Egypt to Jeddah in Saudi Arabia. Two Fokker 50 aircraft had airlifted 325 pilgrims through seven return flights.

Up until it stopped operations due to the Israeli closure of Rafah in 2001, the airline had therefore scheduled international services from El Arish, Egypt to Amman, Jordan and pilgrim charter services to Jeddah. Its main base is El Arish International Airport.

4.4.5. The Maritime Transportation

Since 1967, the West Bank and Gaza Strip have relied on Israeli ports (Ashdod and Haifa) for imports and exports of goods by maritime transport. The use of the existing fishing port in Gaza for commercial traffic was then prohibited by the Israelis. Since reliance on Israeli ports is costly and time-consuming on account of a number of restrictions imposed on the Palestinian trade, the PNA decided to build a new seaport in Gaza. The port was considered to be an integral part of the peace process, as it is an essential element required for the economic vitality of the Palestinian economy and hence, for the sustainability of peace in the region. The port is also critical for integrating the Palestinian economy in the region and allowing it to take advantage of all possible free trade agreements.

The initial construction of Gaza Seaport began in November 1999, and in April 2000 the Gaza Seaport Authority signed a contract with the European Gaza Development Group to implement the project. Finance required for Phase1 was estimated to be around $70 million, with funding from the Dutch and French governments, a loan from the European Investment Bank in addition to a contribution from the PNA. The deep-water seaport is planned to be built on a site some 5 kilometers south of Gaza city, and to service not only Palestinian traders but also other Arab countries in the east, providing them with an

alternative transit corridor to Europe and North America. Following the outbreak of the Second Intifada in September 2000, construction stopped. Since very limited constructions works had been completed, the damage made has only involved the installations made as part of the preparation for the construction works.

MOT has prepared future plans include expanding the port's capacity to handle large vessels, and linking its facilities to the neighboring ports of Port Said in Egypt, Ashdod, Beirut and Cyprus. A three phased plan was prepared. In addition to the seaport, the project design also included other infrastructure and facilities, such as an electrical substation, communication system, water supply system, surface water drainage system, waste disposal facility, storage facilities, transportation plan and access roads. An industrial zone, including cement and other heavy industries was also contemplated.

The Palestinian Seaports Authority, within the MOT, was set up in 1999 to oversee construction and later to operate the port. To commence construction, an agreement was reached with the GOI covering operations and security referred to as the joint Sea Port Protocol. It also provides for the legal framework to be developed to provide a basis for the management and regulation of the seaport.

Chapter Five

Strategic Analysis of the Palestinian Transport Sector

This chapter is on performing the strategic analysis for the transport sector. This involves the strategic analysis, and the identification of the vision, mission and goals for this sector, taking into account the documents available at the MOT, interviews with transportation experts, and the analysis of historical data and other information.

The strategic analysis will lead to identifying a strategic framework intended to provide the PNA with strategies to address the most important issues and to revive the transport sector in order to facilitate its contribution to the socio-economic growth in West Bank and Gaza Strip. This strategic framework will take uncertainty into consideration, through utilization of the approach of scenario planning which is based on the strategic framework to deal with uncertainty.

Strategic analysis is an objective analysis and understanding of the environment. From such analysis and by applying creativity within the strategic planning approach, then a number of options can be used to develop the framework for a solid strategic plan for the future taking into consideration expected uncertainties. It is a disciplined effort to

produce fundamental decisions and actions shaping the nature and direction of sector activities.

5.1 The Proposed Methodology for the Transport Sector Strategy

The proposed methodology for the Transport Sector Strategy includes main steps connected with each other in a sequential way with feedback. The feed back can be similar to the standard process, but with adding uncertainty as needed. These steps are:

1- Specifying the critical issues and problems which the transport sector suffers from

It is necessary to understand the current situation of the transport sector and to identify the problems which the sector suffers from in its various elements in order to specify the strategies that should be used with such problems. This step includes the attempt to predict the nature of the problems which is expected to change in the future because of the expected change in the related conditions and the effects. The ability to determine the size of the problems that may arise in the future partially depends on the ability to determine the size and nature of future demand for transport services, which is expected to continue to increase due to the continued increase in the number of the population

(Mosaind, 1998), but could be affected negatively with specific uncertainties under specific scenarios.

2- Applying SWOT analysis to the transport sector

The SWOT strategic analysis seeks to identify the main strengths, weaknesses, opportunities and threats for the transport sector in the Palestinian territories. The identification of strengths and weaknesses represents the internal assessment of the sector while the consideration of opportunities and threats represents the analysis of the external environment for the sector.

3- Developing vision and mission for the sector

Based on the previous steps, the vision and the mission of this sector can be developed. The vision articulates the sector's "end state" towards which collective efforts should lead, based on which priorities, programs and resource allocations should be derived. A long term vision needs, as far as possible, to have the commitment of all stakeholders (Mosaind, 1998). On the other hand, the mission statement answers the question, "Why do we exist?". So it is a brief description of the sector's fundamental purpose.

4- Specifying the strategic goals to develop the transport sector strategy

After specifying the problems which the transport sector suffers, classifying them, applying SWOT analysis, and developing vision and mission, it is necessary to identify future goals and objectives to develop this sector. These goals or objectives ensure the direct dealing with problems and lead the process of the development of the various elements of the transport sector. These goals usually consider future development concerns dealing with current problems and future opportunities and taking advantage of current and projected elements of the sector in the promotion of transport sector services.

5- Identifying the expected uncertainties affecting the transport sector

For a country in a state of transition like Palestine suffering from occupation and conflicts and looking for freedom and independence, there is high uncertainty and risk in forecasting and planning. Therefore, it is important to identify the related uncertainties to the transport sector and the effect of these uncertainties on the sector.

6- Generate expected scenarios for the sector in the future

Because of the high uncertainty and risk in forecasting and planning, it is inappropriate to use the traditional techniques of planning. Scenario planning is a commonly employed technique for dealing with complexity and uncertainty in planning. Ideally, one generates relevant

information using credible research methods and objectively analyzes it with alternative scenarios of the future. The scenarios reflect believable, but often quite contrary, descriptions of the prospective development pathways.

7- Formulating the key strategies of the sector under different scenarios

That is to agree upon key strategies to reach the goals and address key issues and problems identified through the strategic analysis. These strategies should be related to specific goals or address several goals under different scenarios. This process requires looking at where the sector is now and where its vision and goals indicate what it wants to be, and identifying strategies to get there. Formulating new strategies or reviewing existing strategies (if available), requires agreement on a development vision, setting clear priorities and identifying means for achieving and reviewing them.

Although all the strategic development steps for the transport sector has a serial nature, as every step depends on what has previously achieved in the previous steps, it has also a dynamic nature so it is necessary to reevaluate the results of a step after finishing the step that follows and so on until the end of the steps. This may necessarily lead to the reevaluation of many of the solutions and suggestions in order to keep

up with the conditions that may arise during the process of studying and development or during the stages of executing the strategy.

The first step of the previous methodology has been done in chapter four on current situation. The next step is presented through this chapter. Then the other following steps will be presented in chapter six and seven, as shown in Figure 5.1.

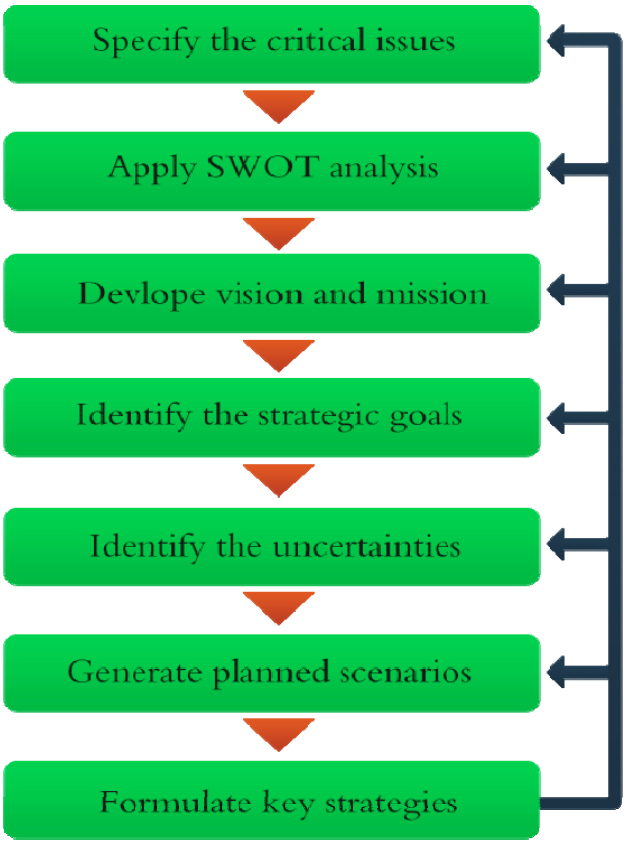

Figure 5.1: The Proposed Methodology for the Transport Sector Strategy

5.2 SWOT Analysis of the Palestinian Transport Sector

SWOT analysis is a standard tool of strategic analysis. It seeks to identify the main strengths, weaknesses, opportunities and threats for a given entity or sector. For the transport sector in Palestine, the identification of strengths and weaknesses represents the internal assessment of the sector, while the consideration of opportunities and threats represents the analysis of the external environment for the sector.

SWOT analysis forms the basis for identifying goals, objectives and strategies that may be employed to apply the strengths, address the weaknesses of the sector, capitalize on the opportunities, and mitigate the threats all within the long-term development framework of the sector.

This SWOT analysis is done based on the documents available in the MOT, and on any historical data and other relevant information, as well as on interviews with transportation experts. SWOT analysis is categorized according to the following dimensions:

- **S**trengths: characteristics of the sector that give it an advantage over other sectors.
- **W**eaknesses: are characteristics that place the sector at a disadvantage relative to others.

- **O**pportunities: external chances to make greater benefits in the environment.
- **T**hreats: external elements in the environment that could cause troubles or disadvantages for the sector

For the Palestinian transport sector, the external environment has more impacts than the internal one, because Palestine is in a state of transition looking for freedom and independence, and due to the extraordinary political conditions prevailing in Palestine resulting in high uncertainties and risks in various related aspects.

5.2.1. The Strengths

The transport sector owns some strength that can be deployed to achieve the strategic goals. These are the most important ones:

- The availability of a record of work (experience and data) to develop the transport sector in the relevant ministries (MOT, MOLG, MPWH, and PECDAR).
- The partial availability of qualified staff in the relevant ministries which has relatively good experience in management and financing work.
- Lasting relationship between the MOT and the private sector which the ministry can develop it to a real partnership for the benefit of the transport sector.

- The relative availability of a database and statistics needed to facilitate the process of planning for the sector.
- Stock of available transport sector infrastructure; physical assets, roads, airports, and seaport.
- Stock of available public transportation sub-sector; taxis shared taxis, buses, informal taxis, and the bases regulations which is to be developed.
- The preparation of some studies and general plans to promote public, freight, air, rail, roads, and maritime transportation.
- The contribution of the transport sector in the gross domestic product (GDP); the Ministry of Transport is distinctive in supplying the Palestinian authority with funds. As mentioned by Sha'ath, the revenues of MOT are amounted to be about 130 million NIS in the Northern governorates between the periods of May 2009 and May 2010, in term of permits and licenses fees, excluding fuel and vehicles import customs and VAT. These revenues can be used for the development of vital projects.

5.2.2. The Weaknesses

Some of the weaknesses of the Palestinian transport sector are identified in the quarter publication of The World Bank Group, West Bank and Gaza Updates, July 2009. They are listed as follows:

- Underdeveloped infrastructure for economic growth. Physical Factors which are primarily related to two reasons; one of them is the already limited existing road network under PNA control, the other is the damaged road network and infrastructure. Recent estimates by the Ministry of Public Works and Housing (MPWH) indicate that almost 50 percent of the road network, under the PNA's control, is in poor, very poor or failed condition, and hence beyond economic repair. This has been caused by an under-funding of regular maintenance over many years as well as damage caused by the Israeli military incursions since the Second Intifada (PRDP, 2008).
- There is a lack of completely clear responsibilities and roles within the sector stakeholders. This greatly weakens policymaking, planning, management and development in the sector.
- The PNA's weak capacity for sector management. Considerable progress had been made in building capacity - including capacity in key sector agencies- up until 2000. Even then, policymaking and program management capacity remained relatively weak by modern standards. This modest capacity has been severely eroded by the breakdown of governmental institutions under the pressure of financial and higher-level political disarray.
- Limited accessibility and connectivity within West Bank and Gaza Strip and with the outside world is related to the limited control and

access to most of the road network used within the West Bank, and to the inadequate road facilities, which restrict accessibility of a considerable portion of the population and limited accessibility to reliable public transportation services for considerable portions of population centers. Moreover, the existing Israeli internal and external closure regime together with the "Separation Wall" severely constrains economic and social development in the West Bank. Also the current practically complete closure on Gaza, through the limited control on the Gaza – Egypt border and no control on that with Israel, the 1.5 million Palestinians in Gaza are effectively cut-off from the outside world, the markets and employment opportunities in Israel, the West Bank or regional and international markets.

- Public transport management and regulation are in disarray. Public transport in the West Bank and Gaza Strip is performing largely by privately owned buses, shared taxis and taxis. The supply has been regulated by a traditional system with roots many years back in history.
- Road traffic safety record is poor and the rule of law is not respected; the fatality rate in the West Bank and Gaza Strip is about 10 times that in Western Europe (World Bank, 2007). This is partly a consequence of the relatively poor condition of the road network, and the relatively lack of traffic regulations.

- Coordination between the components of the transportation sector and inter-modal transportation is lagging. Furthermore, no proper road infrastructure is present within Gaza Strip that connects the road network with the airport, the seaport, border crossings, and the planned free trade zones.
- Development activities in the transportation system have not been following a national transportation master plan. The inexistence of such plan has led to projects, which, in a number of cases, are not coordinated, or not in harmony with the prioritized national needs within the transportation sector.
- The insufficient well-trained human resources in the aspects of planning and policy making, and the limited capacity of the contractors, consultants, as well as the public sector, could restrict their capacity to deal with the transport sector development.
- The limited allocation of funds which affect both the development of the transportation sector and the maintenance of the road network. Most funds came from international donors and were spent to finance rehabilitation and upgrading of roads, and very little was devoted for road development and construction of new roads. The allocated funds by the PNA for the transportation sector and for roads are very limited and are mostly directed towards maintenance of roads through the Ministry of Public Works and Housing.

5.2.3. The Opportunities

On the Political Level

- Geographic location of Palestine as a link between the eastern and western Arab States and between Asia and Africa. This location is asset for land, marine and air transport sub-sectors.
- The possibility of establishing a Palestinian state based on the 1967 borders.
- The international desire to establish a Palestinian State.
- A real and sincere direction towards change and development from the leadership of the Ministry of Transportation (MOT).
- The Attempts of the national dialogue to end the state of division, which will help to stabilize the political situation and promote the Palestinian formal institutions.
- The geopolitical location of Palestine; Palestine as a link between East and West.

On the Economic Level

- The availability of the Palestinian Reform and Development Plan (PRDP) for 2011-2013. This is a national plan which sets out the PNA's medium term agenda for Palestinian reform and development. It provides a coherent basis for the allocation of all government resources and reflects the commitment of the PNA to adopt an integrated policymaking, planning and budgeting process.

The PRDP sets out a comprehensive framework of goals, objectives, performance targets and the allocation of resources to achieve them.

- The donors funding to the Palestinian Authority and the partial efficient utilization of this fund in the development of the transport sector.
- The trend towards more private investment in the Palestinian economy, which was clear in the investment conference held lately in Bethlehem in 2009, and enhances the chances of the successful of implementing some vital projects in the sphere of transport.
- Growing interest and trend from local authorities and relevant ministries to develop the infrastructure of the transport sector.
- International trend to support the economic development and revival of Gaza Strip from which the transport sector will benefit from.

On The Technological Level

- The rapid development in the sphere of the communication means and technology.
- Increased awareness and attention to the technological developments and changes in the various aspects of transportation.
- This technological development may lead to the using the natural gas instead of oil, the development in the aspect of alternative fuels such as bio-fuels and bio-diesel, this is in addition to evolution in

the automotive industry and the entry of modern transportation means to the sector. This will have a significant impact on the transport sector and in reducing costs of transportation, because of the availability of the natural gas near Gaza Strip.

On The Legal Level

- New regulations and legislations are being prepared and are about to be adopted.
- Preparing and ratifying a new law for traffic that will comprise a base for the stage of safe and efficient transport sector.
- There is a trend at the MOT to develop the legal department to develop laws, regulations and policies.

On The Environmental Level

- The requirements to prepare the Environmental Impact Assessment studies for developmental projects, set by Palestinian Environment Quality Authority.
- The increase of awareness by people and NGOs to limit the pollution and to protect the environment from pollution.
- There are many official institutions and NGOs which are concerned to protect the Palestinian environment.

5.2.4. The Threats

There are many threats and obstacles coming from the external environment which could affect negatively the growth and development of transport sector. They are the following:

On the Political Level

- The practices of the occupation towards the Palestinians. There are many means of restrictions on movement in the West Bank and Gaza Strip due to the closure regime that has been imposed externally and internally. The external closure which is intended to impose restrictions on movement between the West Bank and Gaza Strip into Israel, and between West Bank and Gaza Strip and neighboring countries such as Jordan and Egypt. The internal closure which is intended to restrict movement within the West Bank, between the cities, and between cities and neighboring villages.
- Israel ignorance of the international agreements with the Palestinian Authority especially what concerns transport sector, such as AMA.
- The continuity of the political division of West Bank and Gaza Strip and its effects on all aspects and sectors, resulting in a state of chaos due to lack of security control.
- Slow progress in the reform process due to the instable Palestinian situation.

- No controls over Palestinian resources, since most of the natural resources (land, water, and energy) are under Israeli control.
- The inability of the Palestinians living in the West Bank to utilize the existing airport at Qalandia north of Jerusalem, which is currently controlled and operated by the Israeli authorities.

On the Economic level

- High dependence on the Israel economy. For example, the dependence on the Israeli ports increases the Israeli dominance on our economy.
- The restrictions imposed by the economic agreements between the Palestinians and the Israelis are for the benefits of the Israelis.
- High cost of transition in the Palestinian territories which posed great challenge to investment in this sector. This requires economic studies to determine the factors that raise the cost, and the search to find alternative solutions to reduce cost, and make it more attractive to the investor. It is also necessary to develop a diverse system of incentives to encourage investment in this sector.
- The dependence on the irregular donors funding for economic growth which hinders the proper planning.
- The relative deterioration of the economy, the increase of the unemployment and poverty among people and the impact of these on financial resources of the Palestinian authority as a whole.

On the Demographic Level

- High population growth rate despite the reduction of the average natural population growth in the West Bank and Gaza Strip from 3% in 2007 to 2.9% in 2009, and in the total fertility rate from 6 births per woman in 1997 to 4.6 births in 2007. Despite all mentioned, these numbers are still considered high if compared with other countries.
- Immigration of qualified individuals to other countries, such as the engineers and those who works in transportation and planning.
- The internal immigration which leads to the concentration of population in some cities, and will eventually lead to a similar increase in the means of transport, causing the congestion in a number of urban areas and on specific roads.
- The high opportunity for the diasporic Palestinian to return to Palestine after the establishment of the Palestinian state.

On the Legal Level

- The need for the approval of the Council of Ministers for the implementation of the Strategic Plan of the sector, which will need time and coordination between relevant ministries.
- The adoption of some laws and regulations without referring to the MOT and other institutions related to the transport sector, such as: financial leasing law and the law of local authorities. This may result in conflicts when applying these regulations.

On the Environmental Level

The deterioration in the Palestinian environment that is a result of the Israeli practices in the construction of new roads, or as a result of the behavior of some Palestinians.

Table 5.1 summarized the previous SWOT analysis.

Table 5.1: The SWOT Matrix

Strengths – S	Weaknesses – W
• The availability of a good record of work(experience and data) to develop the transport sector in the relevant ministries (MOT, MOLG, MPWH, and PECDAR). • The relative availability of qualified staff and good management in the relevant ministries which has relatively good experience in management and financing work. • A mutual respect relation between the MOT and the private sector. • The relative availability of a database and statistics needed to facilitate the process of planning for the sector. • Stock of available transport sector infrastructure; physical assets, roads, airports, and seaport. • Stock of available public transportation sub-sector; taxis shared taxis, buses, informal taxis, and the bases regulations which is to be developed. • The preparation of many studies and general plans to promote public, freight, air, rail, roads, and maritime transportation. • The contribution of the transport sector in the gross domestic product (GDP).	• Underdeveloped infrastructure for economic growth. • The unclear responsibilities and roles within the sector stakeholders • The PNA's weak capacity for sector management. • Limited accessibility and connectivity within West Bank and Gaza Strip and with the outside world. • Public transport management and regulation are in disarray. • Road traffic safety record is poor and the rule of law is not respected. • Coordination between the components of the transportation sector and inter-modal transportation is lagging. • Development activities in the transportation system have not been following a national transportation master plan. • The insufficient well-trained human resources in the aspects of planning and policy making. • The limited allocation of funds which affect both the development of the

	transportation sector and the maintenance of the road network.
Opportunities –O	**Threats – T**
On the Political Level • Geographic location of Palestine as a link between the eastern and western Arab States and between Asia and Africa. • The possibility of establishing a Palestinian state based on the 1967 borders. • The international sincere desire to establish a Palestinian State. • A real and sincere direction towards change and development from the leadership of the Ministry of Transportation (MOT). • The Attempts of the national dialogue to end the state of division, which will help to stabilize the political situation and promote the Palestinian formal institutions. • The geopolitical location of Palestine; Palestine as a link between East and West. **On the Economic Level** • The availability of a reform and development plan 2011-2013 • Efficient Utilization of Donor Support • The trend towards the investment in the Palestinian economy • Growing attention to develop the infrastructure • International Willingness to Support the Development of Gaza **On The Technological Level** • The rapid development in the sphere of the communication means and technology. • Increased awareness and attention to the technological developments and changes in the various aspects of transportation. • This will lead to the using the natural	**On the Political Level** • The practices of the occupation towards the Palestinians. • Israel ignorance of the international agreements with PA especially what concerns transport sector such as AMA. • The continuity of the political division on the Palestinian arena and its effects on all aspects • No control over resources • Continuing the policy siege and the partitioning of the areas by the Israelis • Slow progress in the reform process. • The inability of the Palestinians living in the West Bank to utilize the existing airport at Qalandia north of Jerusalem. **On the Economic level** • High Dependence on Israel economy. • The restrictions imposed by the economic agreements for the benefits of the Israelis. • High cost of traveling in the Palestinian territories • Irregular Donor Funding for Economic Growth. • The deterioration of the economy, increase of unemployment and poverty among people **On the Demographic Level** • Increased Population Growth Rate • Migration of qualified individuals to other countries • The internal emigration which

gas instead of oil, the development in the aspect of alternative fuels such as bio-fuels and bio-diesel, this is in addition to evolution in the automotive industry and the entry of modern transportation means to the sector. **On The Legal Level** • New legislations are to be adopted. • Preparing and ratifying a new traffic law • serious intention to develop the legal department to develop policies, and laws. **On The Environmental Level** • The increase of awareness by people and NGOs to limit the pollution and to protect the environment from pollution. • There are many institutions which are developed to protect our environment from the bad behavior by irresponsible people from both the Palestinians and the Israelis.	leads to the concentration of population in some cities, and will eventually lead to a similar increase in the means of transport, causing the congestion in a number of urban areas and on specific roads. • The high opportunity for the diasporic Palestinian to return to Palestine after the establishment of the Palestinian state. **On the Legal Level** • The need for the approval of the Council of Ministers for the implementation of the Strategic Plan of the sector, which will need time and coordination between relevant ministries. • The adoption of some laws and regulations without referring to the MOT, such as: financial leasing law and the laws of local authorities which would disrupt the work of the MOT. **On the Environmental Level** • The deterioration in the Palestinian environment as a result of the Israeli practices.

Chapter Six

Strategic Formulation and Scenario Development

After performing the SWOT analysis (analysis of the internal environment, identifying the major strengths and weaknesses, and analyzing the external environment, including major opportunities and threats, the second phase in the strategic planning process is the formulation of the vision, mission and strategic goals.

6.1 The Vision of the Transport Sector

The vision articulates the sector's "end state" towards which collective efforts should lead, based on which priorities, programs and resource allocations should be derived. A long term vision needs, as far as possible, to have the commitment of all stakeholders.

MOT has prepared a draft outline towards the preparation of the General Roads and Transportation Master Plan in 2010 (MOT, 2010 B). In this plan the vision of the transport sector is developed to be: "Effective and comprehensive, integrated and sophisticated, safe and friendly environment roads and transportation networks, that verify local levels of connectivity between all communities and governorates within the Palestinian State, promote regional and international cooperation, meet the needs of the citizens, facilitate the movement of

people and goods, encourage investment, and contribute to economic development."

This vision addresses the following set of issues:

- ✓ Affordable transport, where it is illustrated that an efficient, effective, comprehensive, integrated and sophisticated transport will lead to an affordable transport system. Affordability concerns not only the rural and urban areas but also the whole transport sector and all the transport sector sub-components, aiming at encouraging investment to foster stronger economic growth.
- ✓ Safe transport. The vision stresses the need to address safety in all transport modes, especially road transport.
- ✓ Clean transport. The vision reflects the contribution of transport to the wider environmental aims of the Millennium Development Goals.

6.2 The Mission of the Transport Sector

The mission statement answers the question, "Why do we exist?". So it is a brief description of the sector's fundamental purpose. The mission of the transport sector is formulated based on the previous SWOT analysis and on the vision of the transport sector. This mission is "Palestine as part of the Arab and the regional network covered with a

safe and developed transport network connecting all the governorates of Palestine which helps and facilitates people's life".

This mission also addresses the same issues the vision addresses safe, clean and affordable transport.

6.3 Strategic Goals of the Transport Sector

After applying the SWOT analysis, specifying the critical issues and problems, which the transport sector suffers from, and formulating the vision and mission, the next step will be establishing the goals and objectives of the transport sector.

The defined goals and objectives are based on previous strategic analysis and the formulation of the vision and mission, on the Sectoral Strategy of Transport (2011-2013) prepared by MOT, learning from the experiences of similar sectoral strategic plan for transport sector in other countries, the goals for the infrastructure sector specified in the PNDP (2011-2013).

These strategic goals will be:

- **Achieving an Efficient Transport System (Affordable transport)**

Affordable transport can be achieved by establishing or improving local, main and regional roads and railways to connect all areas, including remote and marginalized areas, to enhance the connection between all governorates which assures the geographic integration and unity of the country.

- **Ensuring that Palestine is Part of a Regional and International Network**

Because of the geopolitical location of Palestine, it is simple to ensure it as part of the regional and international network, by developing plans and standards to improve local, main and interconnecting roads and railways and developing the regional connection with the neighboring countries, improving the connection among the residential areas, industrial zones, the seaport and the border crossings.

- **Achieving a Safe Transport System**

Road traffic safety record is poor, so it is an important goal to achieve safety in the transport sector, by promoting a safe transport system, and developing traffic safety standards, including standards associated with the design of roads, management of traffic and certification of vehicles.

- **Upgrading an Appropriate Institutional Framework**

It is imperative to develop laws and regulations governing the transportation sector to improve the institutional capacity, and to build the capacity of the related ministries by developing an efficient organization structures with clear functions and responsibilities, and well-trained, appropriately paid staff suited to their positions.

- **Satisfying the Need for a Supportive Role of the Transport sector for the Economic and Social Development**

It is important to enhance the contribution of transport sector in the economy and in the Palestinian Authority revenues, by developing mechanisms to involve the private sector in the development and management of the transport sector infrastructure, and promoting national, regional and sub-regional integration and development by restoring, expanding, and improving roads and highways, civil aviation, maritime, rail and transport services.

- **Achieving A Clean Transport Sector**

Ensuring to have a clean transport sector that is friendly to the environment, by working to restrain transport energy consumption, and studying the transport-energy-environment nexus, from energy

consumption to the emissions and climate change impact perspectives.

6.4 Scenario development

To generate future scenarios, analysis of current and expected trends, and professional judgments, along with interviews with transportation experts are made. In scenario developing, several scenarios are constructed to represent the expected range in likely future conditions. The main purpose is thus to identify the key measures that need to be taken into consideration in the future transport sector in order to contribute to each scenario, and to formulate strategies for the sector according to each scenario.

Scenarios have been prepared based on previous studies and papers developing similar scenarios for different purposes. One of them is The World Bank's Country Economic Memorandum; Growth in West Bank and Gaza: Opportunities and Constraints, which identifies three scenarios of economic development in the WBG. Another is Palestinian Central Bureau of Statistics (PCBS, 2010), which developed Economic Forecasts based on the three scenarios. Each scenario has been built considering the internal political situation, the siege imposed on the Gaza Strip, results of the last Israeli aggression on the Strip, foreign aid, Israeli actions in the Palestinian Territory and the number of

Palestinian workers inside Israel. MOP (1998) in it's Regional Plan for the West Bank Governorates, has studied three different scenarios for the projected population in the future.

Therefore, in each of the previous studies, three scenarios have been developed. The difference between these three scenarios is based only on changes in external factors. Government policies are assumed to remain the same, and so the policy variables that relate to these are held constant throughout.

In this research, four scenarios are developed as will be illustrated later in this chapter, taking into consideration the previous studies and the data collected and analyzed. Each scenario will have its impact on the transport sector. However, before developing these scenarios, the aspects related to such scenarios are illustrated first.

6.5 The Current Situation of the Considered Aspects of Uncertainties

6.5.1The Political Aspect

The political situation has the greatest effect on the transport sector; any change in the political situation will have an effect on the sector. Palestinian politics is a special case because of the Israeli occupation, the future political situation can range from independence and

establishing the Palestinian State or the establishing an expanded entity inside the separation wall to deterioration in the overall situation back to the previous years. So it must be taken in to consideration while developing future scenarios.

Recently, Israeli security concerns led severe restrictions on movement within the territories and to border closures. Israel retained full control over all borders: Israel effectively controlled the movement of goods and labor among the West Bank, Gaza, and Israel. Continued allocation of land for Israeli settlements and the construction of bypass roads for exclusive use by Israelis further divided the domestic landscape, increasing transportation delays and transaction costs.

The other political challenge facing Palestinian transport sector is the closure regime imposed on the West Bank and Gaza Strip by the GOI for security reasons. The system of closures affects Palestinian businesses by significantly increasing costs, making the transport of goods increasingly expensive. So any change in the political situation in each scenario will have a remarkable effect.

The Oslo Agreement divided the West Bank and the Gaza Strip into three areas: A, B and C. The territorial space of Areas A and B is not contiguous, and consists of some 227 separate geographical areas under partial or full Palestinian control. Area C, which covers the entire

remaining area, is the only contiguous area of the West Bank, and includes most of the West Bank's key infrastructure, including the main road network. Area C is under full control of the Israeli military for both security and civilian affairs related to territory, which includes land administration and planning. It is sparsely populated and underutilized (except by Israeli settlements and reserves), and holds the majority of the land (approximately 59%).

6.5.2 The Economic Aspect

The transport sector is in itself a major component of the economy. The transport sector moves goods and people, employs workers, generates revenue, and consumes materials and services produced by other sectors of the economy. Like many economic activities that are intensive in infrastructures, the transport sector is an important component of the economy impacting on development and the welfare of populations. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment and additional investments. When transport systems are deficient in terms of capacity or reliability, they can have an economic cost such as reduced or missed opportunities.

The Palestinian economy in the West Bank and Gaza Strip still suffers from the cruel policies and practices of the Israeli occupation. This has been attained through the policy of closure, which broadly consists of comprehensive restrictions on the movement of people and goods within the West Bank, highly constricted movement of goods across the border with Israel, almost total isolation of the Palestinian economy from the outside world, both at the Arab and international levels, except, however, for some extremely limited transactions. Hence, the one and only one option left for the Palestinian economy was to be directly dependent on the Israeli economy. Moreover, the Palestinian economy continues to suffer from the closure of the crossings, the siege imposed on Gaza Strip for more than four years, and from the socio-political and economic separation of the Gaza Strip from the West Bank on one hand, and Gaza Strip from the outside world on the other hand.

This has resulted in a highly fragmented Palestinian economy, and led to deterioration of living standards, inflation, poverty and rise in the unemployment rate. Unemployment in the West Bank, despite recent improvements, remains high. Furthermore, labor force participation rates are quite low.

Preliminary figures released by the PCBS for 2010 indicate the following:

- The GDP recorded an increase by about 9% during the three quarters of 2010 compared with the same period of 2009. The growth was concentrated in economic activities with largest share to the GDP mainly Agriculture and Fishing, Construction, Wholesale and retail trade, Transport, Storage and Communications, Services, and Public Administration. The construction activity recorded the highest growth rate during that period by about 36%
- The Gross Domestic Product per capita for the Palestinian Territory increased by 5% during the third quarter of 2010 compared with the same quarter of 2009.
- An Increase in the number of workers during the first three quarters of 2010 compared with same period of 2009 due to increase in the number of workers in the construction, industry and services sectors in the Palestinian Territory.
- The unemployment rate during the first three quarters of 2010 reached about 24% compared with 25% during the same period in 2009. The unemployment rate declined in the West Bank from 17.7% to 17.3% and in the Gaza Strip from 38.4% to 37.9%.
- Regarding trade movement in Palestine (the total exports and imports), there was an increase during 2010 in revenues of the Value Added Tax related to trade exchange with Israel. In 2010,

exports increased by 8% compared with 2009, while imports increased by 6% compared with 2009.

The poor economic performance is reflected in the growing unemployment. The unemployment rate during the 2000s has increased to about 25%. Simultaneously the poverty rate has increased to more than 45% in 2005. Since the outbreak of the Second Intifada, Israel has significantly tightened its policy of issuing work permits to Palestinians, contributing to unemployment. Furthermore, external closures, including the separation wall have reduced the number of days worked in Israel.

Any change in the overall situation especially the political one, will affect the economic situation whether improvement or deterioration, and thus certainly will affect the transport sector. The priority given to the transport sector projects or development will depend on the economic situation, so the changes of the economics must be taken into consideration while developing the future scenarios.

6.5.3 The Demographic and Social Aspect

The demographic aspects have an important effect on the transport sector; the demographic indicators that are considered the essential elements of change and population growth for any country or region are the fertility, death, and immigration rates. Although immigration

doesn't affect the estimates seriously, and the size of this phenomenon hasn't yet constituted a serious threat to the Palestinian internal demographics, emigration from the West Bank and Gaza Strip should not be overlooked; awareness should be raised about its risks to limit its future negative impact on the region.

Therefore, the factors affecting the population growth trends are actually the fertility, death rates and, in the Palestinian case, the returnees.

At the end of 2010, the Palestinian Central Bureau of Statistics (PCBS) issued a Press Release on the Palestinians in the World, the release contained the following:

- 11.0 million Palestinians in the World by the end of 2010, more than half of them live in Diaspora, 4.1 million in the Palestinian Territory, 1.4 in Israel, 5 in Arab countries and about 600 thousand in other countries.
- By the end of 2010, about 4.1 million Palestinians were in the Palestinian Territory, of which 2.5 million were in the West Bank and 1.6 million in Gaza Strip.
- In the Palestinian Territory, two thirds of Palestinians live in the West Bank while one third in Gaza Strip. Of every 100 person in

the Palestinian Territory about 44 are refugees, of whom 18 live in the West Bank and 26 in Gaza Strip.

- The total fertility rate had declined in 2007 to 4.6 birth compared with 6 births in 1997. The rate in Gaza Strip in 2007 reached 5.3 births compared to 4.1 in the West Bank. These rates have been stable for the past few years with no significant changes. On the other hand, there has been a decline in the detailed fertility rate particularly in the early reproductive years (15-24 years).

The issue of the Palestinian refugees still represents one of the most tragic catastrophes of refuge in modern history. In addition to about 5.63 million Palestinians living in the diaspora, about 1.78 million Palestinians of the 1948 occupied lands live in the West Bank and Gaza Strip, and approximately 140 thousand additional Palestinian refugees living inside Israel, who all in all represents 70% of the Palestinian people. The number of the Palestinian refugees registered with the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) was estimated to be 4.74 million Palestinian refugees by 30/9/2009. However, many others did not register with this agency, either because they do not need its services, or because they are not residing in places where it operates.

The average natural population growth in the West Bank and Gaza Strip has decreased from 3% in 2007 to 2.9% in 2009. Similarly, there

is a decrease in the total fertility rate from 6 births per woman in 1997 to 4.6 births in 2007. This is noticed as a drop in the fertility rate of the Palestinian woman and an increase in the percentage of population aged between 15-65, as well as a decrease in the percentage of population aged less than 14 years.

Transport also carries an important social and environmental load, which cannot be neglected. Transport systems are closely related to social and socio-economic changes. The mobility of people and freight and levels of territorial accessibility are at the core of this relationship. Access to social services and to employment sources has been reduced substantially due to road blocks and checkpoints with resultant increases in travel cost, unemployment, and poverty (World Bank, 2007). However, even if transportation has positive impacts on socio-economic systems, there are also negative consequences such as congestion, accidents and mobility gaps. The limitation imposed on accessing major roads has impacted the travel cost and time. Both travel cost and time have increased substantially in a period of increased unemployment and drop in income.

So the social life and the socio-economics has its impact on the transport sector, the resultant increases in unemployment and poverty, the decreased income level has affected the movement of people within the territory and to the neighboring countries, and the cars ownership

will also be affected by any change in the social life, thus the travel demand will change.

These demographic realities greatly affect the likely economic and social development of the Palestinian state and therefore affecting the transport sector. Immigration from the West Bank and Gaza Strip, migration of professionals, and the internal migration within West Bank and Gaza Strip, can happen as a result of the changes of the overall situation. These changes effect can be represented in an increase or decrease in the travel demand, automobile ownership, and movement of people and goods, and other related dimensions.

Finally, the demographic and social aspect must be taken into consideration in developing the future scenarios and in the strategic planning under uncertainty.

6.5.4 The Institutional Aspect

The PNA's capacity for management of the transport sector is weak. The overall political circumstances have prevented the PNA to attend to the proper development of its own organization and capability to plan, manage and deliver. This manifests itself in several ways, such as a complete lack of formulated policies for the transport sector, inadequately developed strategies for how to develop the transport sector and poorly developed plans for what to do specifically in order to

achieve certain results. The PNA is relatively well equipped when it comes to trained staff with good competency, but it lacks the basic instruments required to effectively utilize this resource and to manage the development of the sector.

Also the responsibilities for the transport sector in PNA are confused and unclear. During the years 1996-2000, the PNA established several institutions related to road transport. MOT leads these institutions with a mandate to develop policies and regulation to govern the sector; MOPH is responsible for development and maintenance of regional and access roads under PNA's jurisdiction; MOP is responsible for national and regional physical planning; MOLG identifies local needs and directs donors' assistance; PECDAR was a vehicle to implement donor-financed rehabilitation and reconstruction projects, but still plays a role in the developing sector; Ministry of Agriculture (MOA) is responsible for agricultural roads which are used to serve the agricultural areas and private equity; Ministry of Finance (MOF) provides the financial support for such activities; and the local authorities—in particular, the larger municipalities—are responsible for planning, developing and maintaining internal roads. In addition, the CAA within MOT was created to administer and operate the airport, and recent studies have been encouraging the establishment of a Central Roads Authority (CRA) to deal with this confused situation.

Improving this weak institutional situation and the confused roles of the related ministries will impact the transport sector. So this dimension must be taken into consideration.

6.6 The Planning Scenarios

In order to deal with uncertainty linked to the Palestinian transport sector while developing the strategic framework for the sector, four future scenarios will be developed to anticipate the projected future for Palestine during the following 5-10 years. These scenarios are explained hereafter.

6.6.1 First scenario (status quo):

This scenario is based on the premise of the continuation of the political, economic, demographic and institutional situation in the West Bank and Gaza Strip as it was during the year 2010. The status quo scenario's results are sensitive to the extent of expected relaxation of Israeli restrictions.

Political Aspect: This scenario is characterized by no Palestinian state, the continuation of the political embargo imposed on the Gaza Strip is assumed, no change in movement and access restrictions, full control over all borders, the continued existence of the obstacles placed by Israel on the movement of persons and goods within the Palestinian

Territory or the Palestinian Territory and neighboring countries as it is. Continued allocation of land for Israeli settlements and the construction of bypass roads for exclusive use by Israelis is expected under this scenario, thus this will further divide the domestic landscape, increasing transportation delays and transaction costs, the existence of the closure regime imposed on the West Bank and Gaza Strip by the (GOI) for security reasons, the division of the West Bank and the Gaza Strip into three areas: A, B and C, as shown in Figures 6.1 and 6.2.

Economic Aspect: The constancy of the recent economic situations with some development is assumed to continue, and so donor countries provision of financial support for financing the budget of the PNA, and the flow of funds for custom revenues through Israel at the same level. Moreover, the complex, costly, and unreliable trade logistics at the borders, and the existence of the obstacles placed by Israel on the movement of persons and goods within the Palestinian Territory or the Palestinian Territory and neighboring countries would continue to be as it is now. Finally high levels of unemployment and the poverty are expected to prevail

Demographic and Social Aspect: In this scenario the demographic changes will not be of great impact, since the net growth rate will be the same. There will be no external immigration and no returnee.

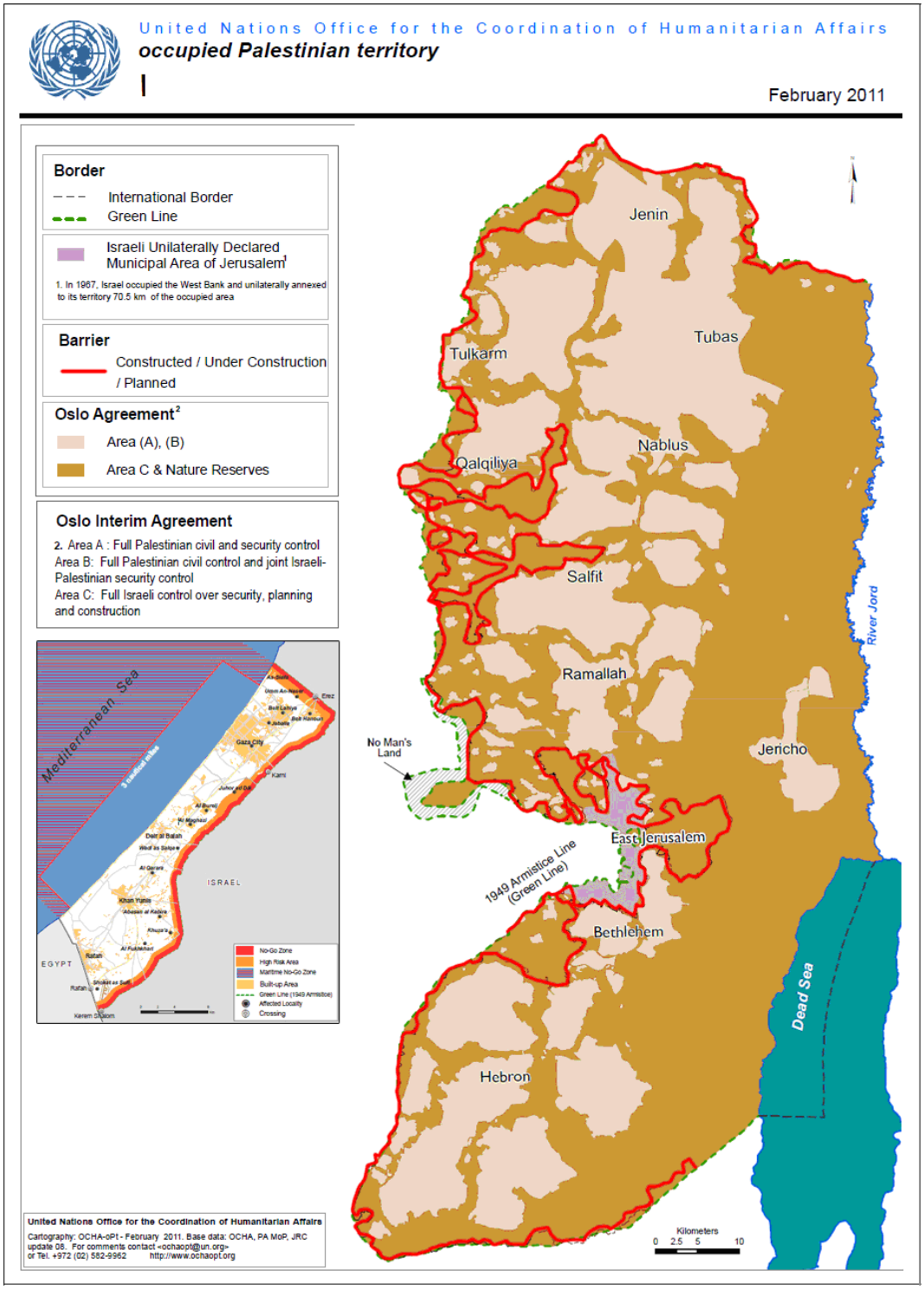

Figure 6.1: First scenario (status quo)
source: OCHA (2011)

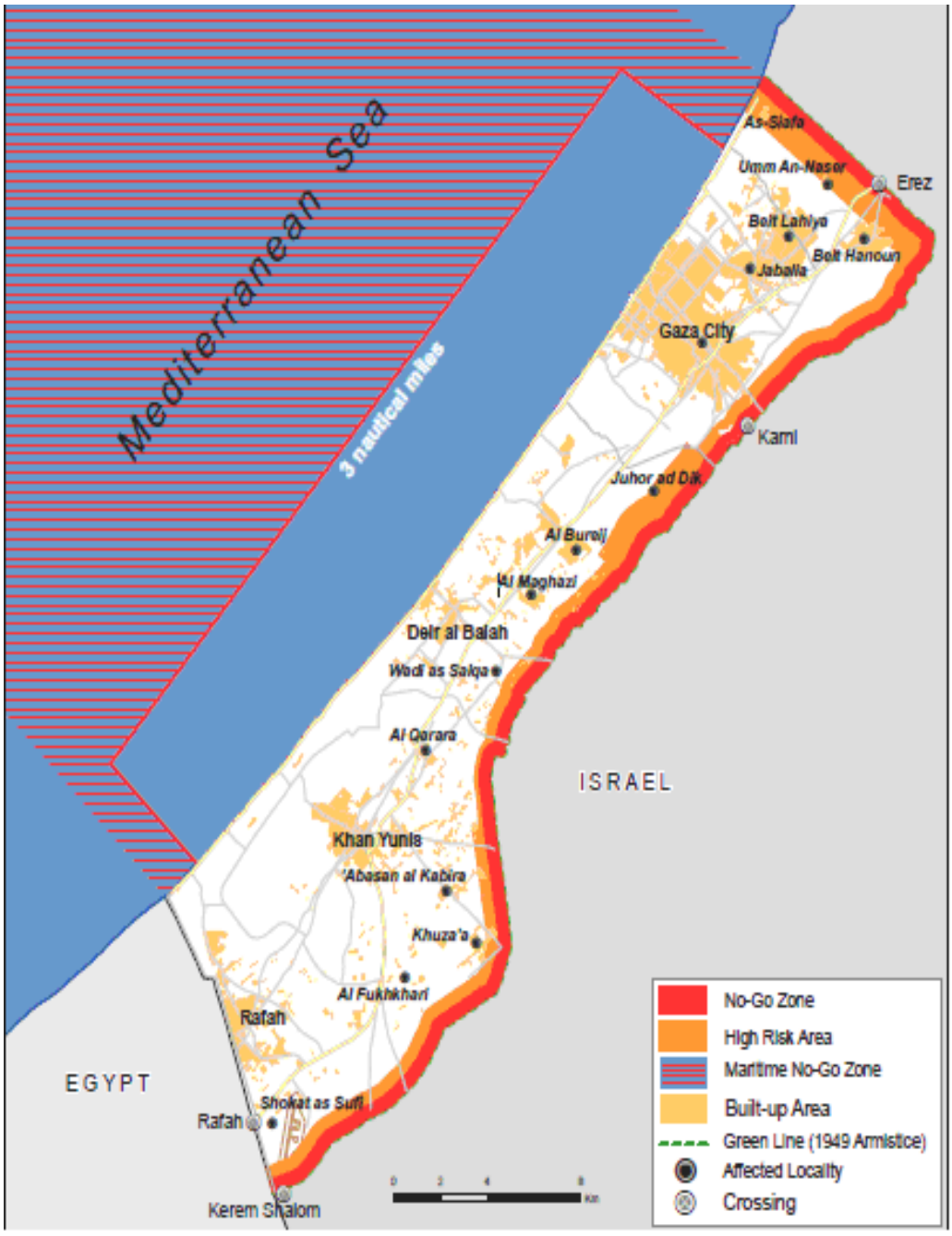

Figure 6.2: First scenario (status quo), Gaza Strip
Source: (OCHA, 2010)

Institutional Aspect: The institutional situation according to this scenario can be described as; lack of optimization of resources, duplication, conflict and the absence of some of the mandates, especially in the traffic safety. Despite this situation there are attempts to promote and develop many aspects in the formal institutions related to transport sector, such as establishing the Higher Council of Traffic which will lead to some development in the sector, and the attempts to establish a Central Roads Authority (CRA) to deal with this confused situation.

6.6.2 Second Scenario (The Optimistic Scenario)

This scenario considers the political progress case, assuming the establishment of the Palestinian State. This will imply as well the construction of the corridor between the West Bank and Gaza, no restrictions on the movement of goods and people and marginally greater access to Israeli labor markets resulting in greater remittances with accelerating growth in the GDP.

This scenario assumes a combination of political progress and an improved security environment which will accelerate the lifting of movement and access restrictions. The level of foreign financed public investment and private sector activity would increase substantially. The

return of private sector confidence would boost private investment, employment, economic growth and social development.

Political Aspect: This scenario considers the political progress case, assuming the establishment of the Palestinian State on the 1967 borders, the return of the refugees, the establishment of the state institutions, and the construction of the corridor between the West Bank and Gaza, lower or no restrictions on the movement of goods and people on the borders, no curfews and restrictions on movement by Israel, the full control or slightly less management of the borders between Israel and PNA.

Economic Aspect: This scenario assumes the relaxation of security measures to levels assuring normal economic activity together with other measures improving public finance management, investment climate and guaranteeing necessary investment in infrastructure, which also means that full relationship between the international/donor community and the PNA will be restored. It assumes an increase in the level of donor assistance; the flow of financial assistance for the reconstruction of the Gaza Strip, the custom revenues, the number of Palestinian workers in Israel, and the implementation of investment and development projects in the Palestinian territories.

In this optimistic scenario, progress in the peace process and improvement in the security situation would enable a substantial easing of Israeli restrictions, and marginally greater access to Israeli labor markets resulting in greater remittances with accelerating growth in the GDP.

Demographic and Social Aspect: In this scenario there will be a change in the demographic situation since there will be a high opportunity for the diasporic Palestinian to return to Palestine, in addition to the normal increase in the population. Once a state is founded, however, many Palestinians in the diaspora would likely return almost immediately. Estimates of Palestinians returnees from abroad according to MOP (2011), reach 700,000, rapidly making conditions more cramped. These estimates assumed that the average population growth rate will be 2% and that the population of West Bank and Gaza Strip will be 11 million on the year 2050.

Institutional Aspect: The establishment of the Palestinian state will require a great improvement in the institutions in order to be able to meet the needs of the state. The PNA will be committed the proper development of its own organization and capability to manage, plan and deliver both hardware and software required for the proper functioning of the transport sector. There will be a clarification of roles and responsibilities between various public institutions in the transport

sector, including MOT, MPWH, MOLG and PECDAR, A development and implementation of the necessary laws and regulatory frameworks are necessary to provide the right legal environment for advancing an effective and efficient market economy, as well as building capacity in policy formulation and planning.

A vision of the roads and railways master plan which will be developed after the establishment of the Palestinian state, was prepared by MOT, as shown in Figure 6.3.

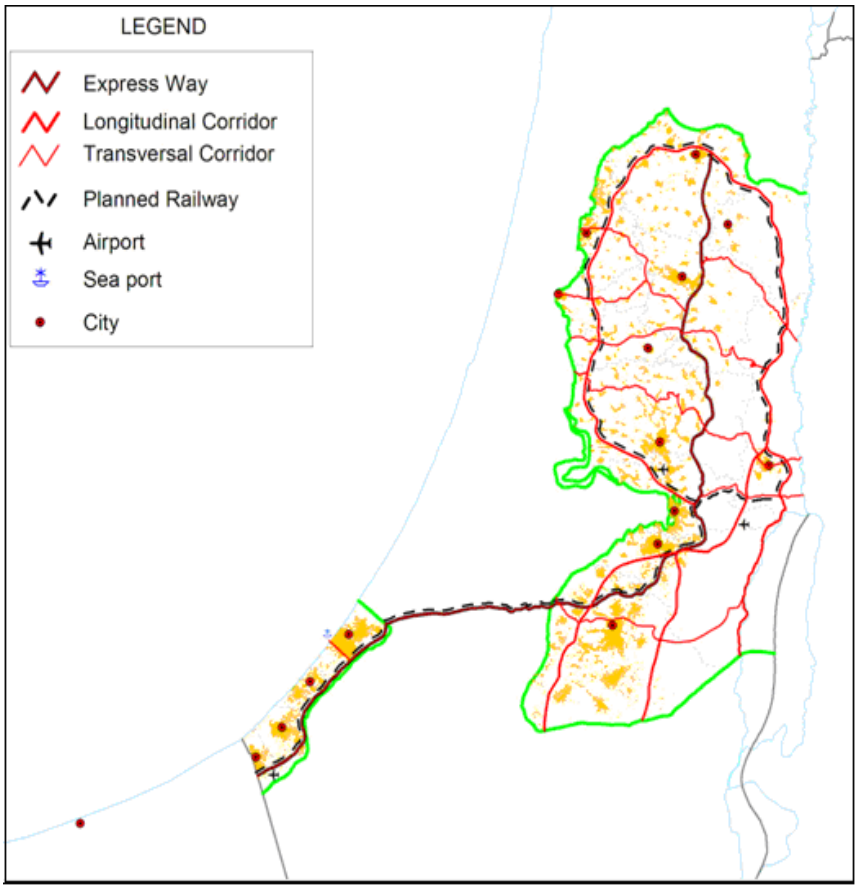

Figure 6.3: The Transport Sector In The Second Scenario
Source: MOT, 2010

6.6.3 Third Scenario (The Expanded Autonomous Scenario)

The third scenario assumes that there is an Israeli withdrawal from West Bank with keeping their control over borders, establishing the expanded autonomous area inside the Separation Wall. This scenario assumes that the current conditions in Gaza Strip to prevail. As shown in Figure 6.4.

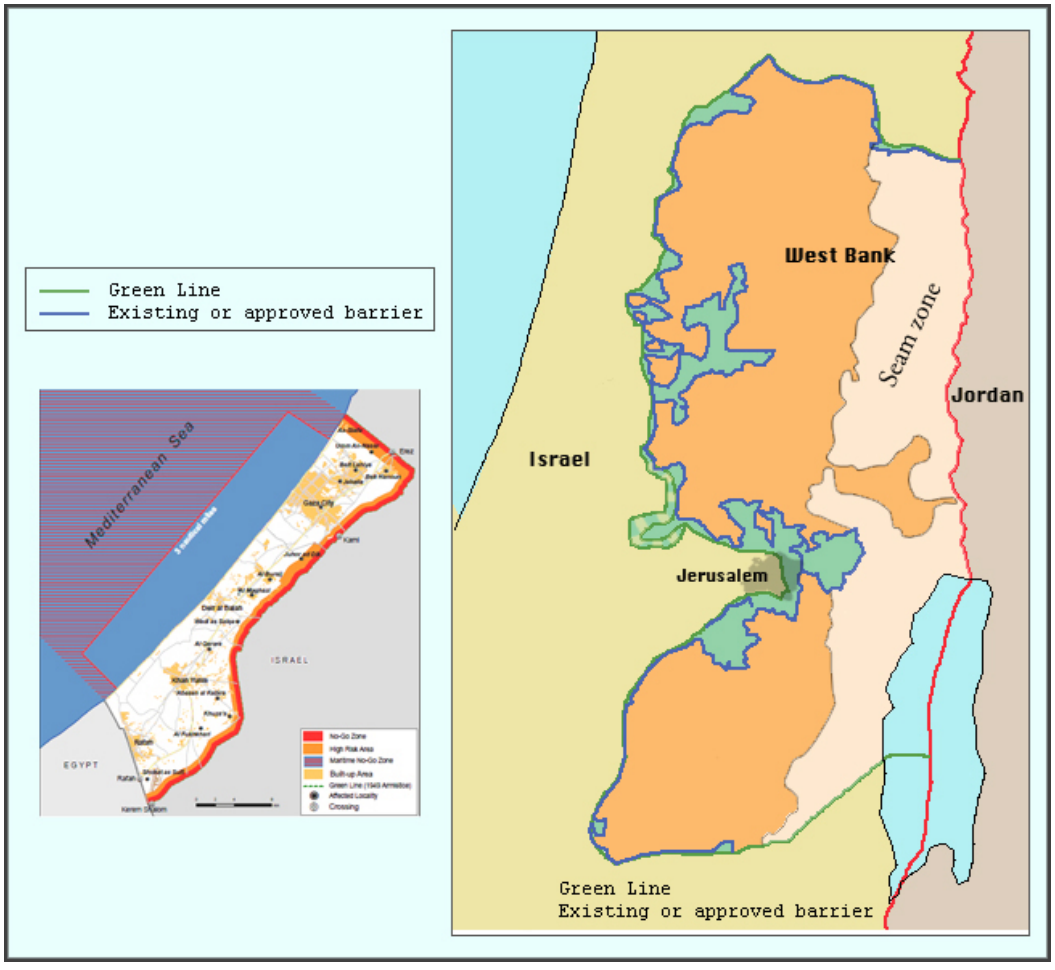

Figure 6.4:Third Scenario (The Expanded Autonomous Scenario)

If the establishment of the separation wall is complete, the road network in the West Bank will be strongly affected, Abu-Eisheh (2004) analyzed the road network and the lengths of roads that will fall outside the Separation Wall and that will be cut using the GIS. The results of the analysis were that a distance of 1300 km of paved roads will be outside the Separation Wall, including the separated area in the east, which forms 46% of the total length of roads in the network. The separation wall after completion will make the remainder of the Palestinian areas inside the Wall as non-contiguous cantons, in many cases, which is equivalent to 54% of the area of the West Bank, which constitutes only 12% of the total area of historical Palestine.

The results of the analysis showed that the main roads on the national level will be the most affected, where 54% of them will be falling outside the Wall. However, the effect also would apply to the regional roads and local evenly.

The restrictions imposed by the Israeli occupation authorities, through the arrangements for the movement of people from the affected areas through the Separation Wall, will lead to separate a proportion of about 17.6% of the total population of the West Bank the Palestinians within the seam zone which is a term used to refer to a land area in the West Bank located east of the Green Line and west of Israel's separation

Wall, and a proportion of about 27.1% will be separated from their fields and farms outside the wall. (see annex A)

The internal conditions in this scenario can be distinguished through these points;

- How to deal with the settlements? If the settlement will not be dismantled, there will still be checkpoints, bypass roads, the occupation of Palestinian lands, and separation of some Palestinian areas which are near the settlements.
- Is there a linkage between West Bank and Gaza Strip?
- What will be the situation of Jerusalem, Bethlehem, Qalqilia and Salfeet governorates, as shown in Figure 6.5 and 6.6, which are the most affected by the closure regime? The closure regime has penetrated deeply through these governorates to include some Israeli settlements, this has made some towns and villages separated from the other cities and towns.

Political Aspect: This scenario assumes modest improvements in the political and security environment, envisages continuation of the closure regime; which should allow for lifting of restrictions and increased stability in West Bank and Gaza Strip will result in a gradual increase in trade and private sector confidence. Israel may retain full

control over all borders, and so effectively control the movement of goods and labor between the Bank and Gaza Strip and Israel.

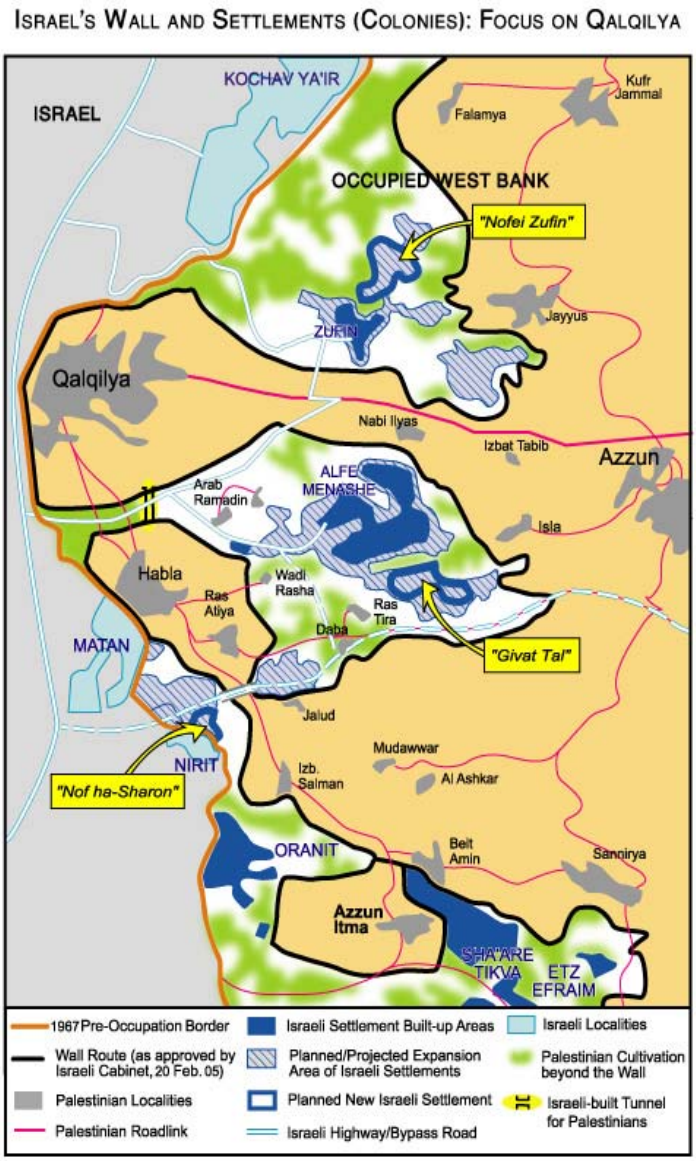

Figure 6.5 : Israeli Wall And Settlements (Focus On Qalqilia)
Source: The PLO Negotiations Affairs Department (NAD), 2005

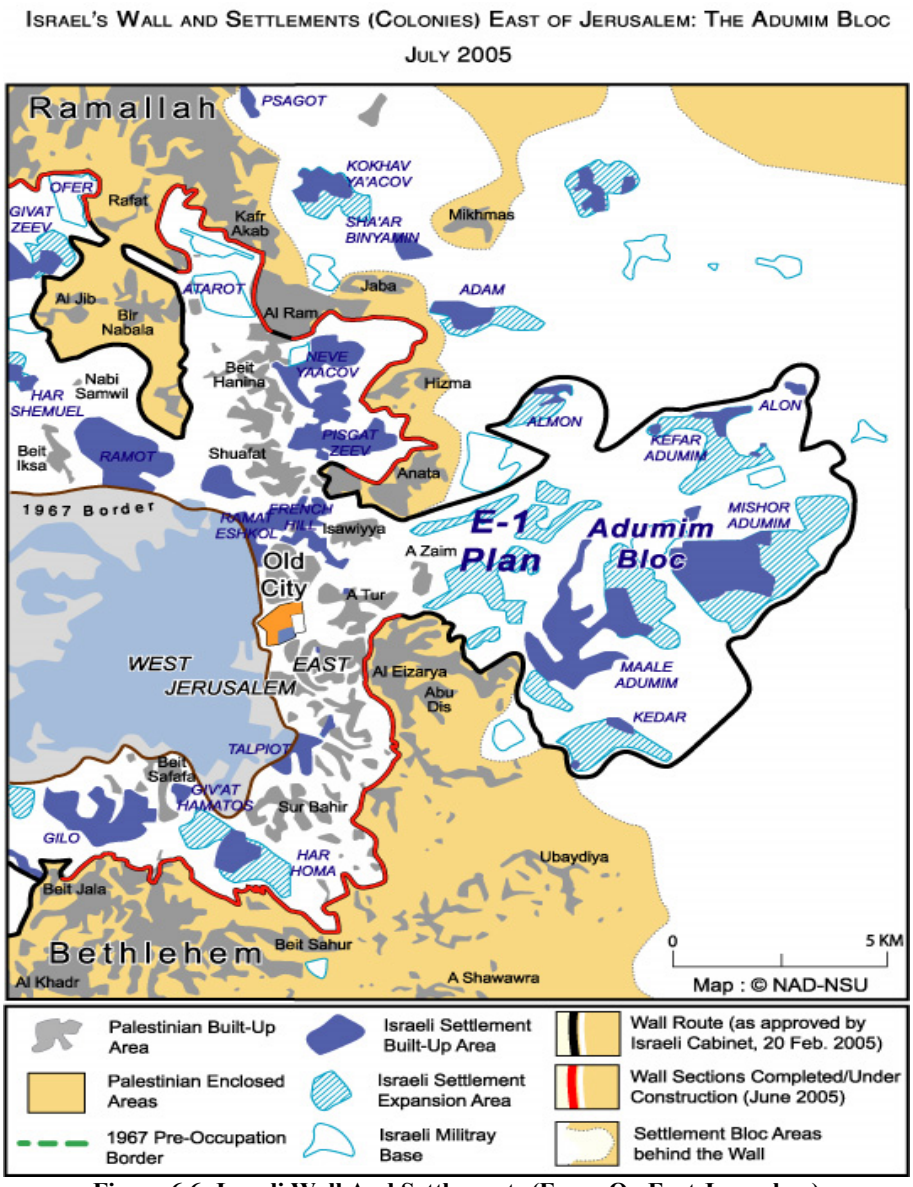

Figure 6.6: Israeli Wall And Settlements (Focus On East Jerusalem)
Source: The PLO Negotiations Affairs Department (NAD), 2005

Economic Aspect: The West Bank and Gaza Strip economy will slightly recover but the projected recovery is subject to downside risk, and would not be sufficient to significantly raise living standards and lower unemployment, it would nevertheless remain stagnant and reliant on foreign aid to finance current consumption. This would make any

related reluctance on the donor side to finance the budget lead to further accumulation of arrears.

Demographic and Social Aspect: In this scenario a slight change in the demographic situation will occur, as a result of the normal increase in the population and because the limited number of the refugee returning to West Bank and Gaza Strip since the improvements in the political and security environment will be modest.

Institutional Aspect: The current situation of the Palestinian institutions is expected to be developed after the establishment of the Expanded Autonomous Entity inside the Separation Wall will also require a great improvement in the institutions in order to be able to meet the needs of the entity (as explained in the optimistic scenario).

6.6.4 The Fourth Scenario (Pessimistic Scenario)

This scenario considers the political deterioration case, assuming that the PNA might cease to govern, the feasibility of a third Intifada, more frequent closures (see figure 6.7) and more limited access to Israeli labor market with decreasing growth of the GDP.

Political Aspect: From the Political perspective; Israeli restrictions would remain at the same level as in 2007, or the PNA might cease to govern, or there will be a feasibility of a third Intifada, more frequent

closures, and more limited access to Israeli labor market. This includes the tightening of the political and economic embargo imposed on the Gaza Strip, the inability to rebuild the Gaza Strip, deterioration of the political and economic conditions in the city of Jerusalem, including the imposition of restrictions and closures.

Economic Aspect: This scenario would limit trade and private investment, and impede the public investment program. Lower growth and rising unemployment would exert further pressures for higher social and emergency spending. Under this scenario, real GDP per capita would decline and unemployment would rise, a decrease of transfers from donor countries, a decrease the numbers of Palestinian workers inside Israel through existence of the obstacles placed by Israel on the movement of persons and goods within West Bank. In addition, there is no Palestinian employees from the Gaza Strip into Israel.

Demographic and Social Aspect: Demographic change will occur in this scenario because a decrease in the population may occur as a result of the general deterioration. Many people (especially the young and professionals) are expected to immigrate in order to work and live in better conditions. According to a survey conducted by Bir-Zeit University, 32 percent of all Palestinians and 44 percent of Palestinian youth would immigrate if they could.

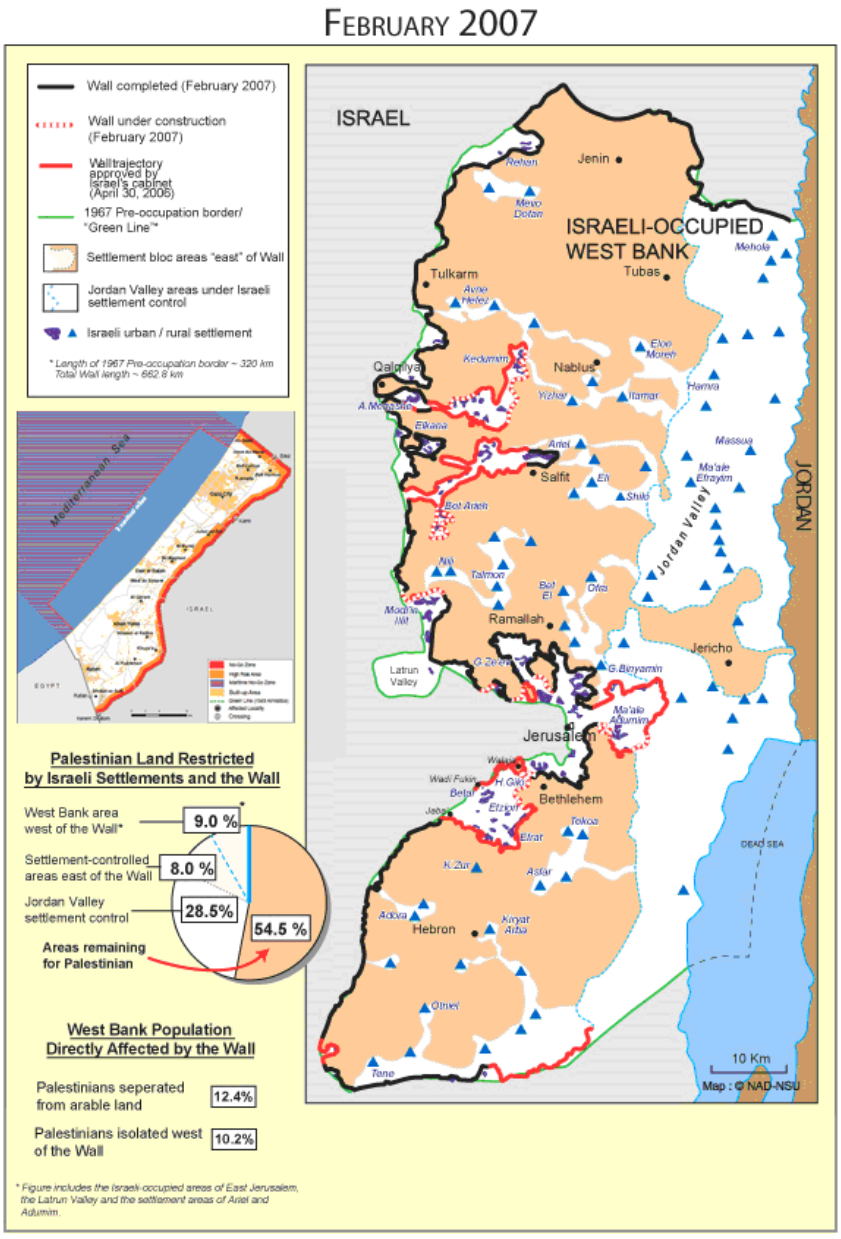

Figure 6.7: The Fourth Scenario (Pessimistic Scenario)
Source: The PLO Negotiations Affairs Department (NAD),2007

Institutional Aspect: This scenario will make it difficult for the PNA to improve and develop the formal institutions because of the general deterioration. The overall political circumstances will prevent the PNA

to be fully capable to the proper development of its own organization and capability to plan, manage and deliver. Very limited budget will be available for the development and this will be reflected on the transport sector negatively.

6.7 Uncertainties Across the Expected Scenarios

Due to the extraordinary political conditions prevailing in Palestine for more than six decades, the Palestinian experience of development planning and strategy formulation differs from that of neighboring Arab countries. The characteristics of the Palestinian experience can be attributed to chronic instability and the existence of a dual reality, since the Palestinian case is distinguished by incorporating, at the same time, the goals of national liberation and the establishment of a national state.

The Palestinian experience in formulating and developing strategies and policies has been influenced by a set of unique interlinked aspects. the uncertainties related to the political, economic, demographic, and institutional aspects in each scenario will be discussed in the following:

6.7.1 Uncertainties across the First Scenario (Status Quo)

Low Political Uncertainty; since there is no evidence of changes in the political situation, so it is assumed to remain the same. This implies that there will be no change in movement and access restrictions, no

control over borders and border crossings, thus assuming the continued existence of the obstacles placed by Israel on the movement of persons and goods within West Bank and Gaza Strip or between the West Bank and Gaza Strip and the neighboring countries, and with no Palestinian operating seaport or airport.

Low Economic Uncertainty; because of the constancy of the recent economic situations with some development which is assumed to be, since the political breakthrough is farfetched, and the Israeli practices that shrink the Palestinian economic performance are expected to continue, it is unlikely that there will be a tangible economic growth, or even a meaningful reform of the Palestinian economy. This gloomy picture is particularly due to the continuation of the imposed restrictions on the free movement of commodities and individuals in all the Palestinian territories, and the ongoing brutal economic embargo on Gaza Strip. Thus, at best, the Palestinian economy is likely to remain static without any core change.

Low Demographic Uncertainty; since the change in the population will be mainly related to the normal growth rate, there will be some but limited migration abroad and there is no evidence about the return of the Palestinian refugees. Therefore there is low uncertainty related to the demographic aspect.

Low Institutional Uncertainty; since there is some obvious attempts to promote and develop many aspects in the formal institutions related to transport sector, such as establishing the Higher Council of Traffic, and defining the roles and responsibilities of each ministry or agency related to the transport sector. Therefore, there will be limited uncertainty related to the institutional aspect.

6.7.2 Uncertainties in the Second Scenario

High Political Uncertainty. This Optimistic scenario considers the political progress case, assuming the establishment of the Palestinian state within the 1967 borders, establishing the corridor between the West Bank and Gaza, no restrictions on the movement of goods and people on the borders, and of course no curfews and restrictions on movement by Israel. This progress will affect all the sectors, and it will be of great significance to develop and improve the transport sector and its components.

However, this Palestinian State could not be empowered, and could have only limited authority, especially as related to the connectivity with the rest of the world. Due to the complex relationship between political uncertainty and the economic and demographic uncertainty, this high uncertainty in the political aspect will greatly impact the other aspects.

This scenario will make the PNA responsible of the planning, development and maintenance of the transport sector which will be consisted of the land transportation (the road networks and internal transport (public and private spheres)), the air, maritime, rail transport and border crossings.

High Economic Uncertainty. This optimistic scenario assumes a combination of political progress and an improved security environment, resulting in freedom of internal movement and access, and greater access to Israeli labor markets which will result in accelerating growth in the GDP and decreasing in the unemployment rate.

Also by having control over borders, the barriers on exports to Israel will be removed and PNA will have direct outlet to external markets, the seaport and airport. The flow of funds for custom revenues through Israel would increase the level of foreign financed public investment, and private sector activity would increase substantially. The return of private sector confidence would boost private investment, employment, economic growth and social development.

These radical changes in the Palestinian economy might not be fully or even partially satisfied. This will result in high economic uncertainty. Moreover, because of the complex relationship between the various

aspects of uncertainty, the impact of the economic changes on other aspects will be difficult to predict.

High Demographic Uncertainty. This scenario will have the normal growth rate and a high opportunity for the diasporic Palestinian to return to Palestine. The high increase in the population because of the expected number of returnees, in addition to the normal growth in population. Due to the expected numbers of returnees, which could rang from tens of thousands to probably one million, and the lack of knowledge to where these will be settled will contribute to the expected high uncertainty.

This requires an improvement, and development of the sector to meet the needs of the growing population, the existing transport network will not be able to meet these needs.

High Institutional Uncertainty. This scenario which is about the establishment of the Palestinian state will require a great improvement in the institutions in order to be able to meet the needs of the state. The PNA will have to attend to the proper development of its own organization and capability to manage, plan and deliver both hardware and software required for the proper functioning of the transport sector, and define the roles and responsibilities of each ministry or agency related to the transport sector.

6.7.3 Uncertainties in the Third Scenario

Medium Political Uncertainty. This scenario which assumes continuation of the closure regime, establishing the autonomous area or entity inside the Separation Wall, the Israeli full control over all borders, lifting of restrictions and increased stability inside the Separation Wall, the uncertainty will be medium since the change will be inside the Separation Wall and Israeli will have the full control over all borders.

This scenario will make the PNA responsible of some of the components of the transport sector which will be the land transportation (the road networks and internal transport (public and private spheres)), while the components that will connect Palestine with the outside world (the air, maritime, rail transport and the border crossings), will be under the expected Israeli control with limited Palestinian coordination.

Medium Demographic Uncertainty. This scenario assumes that the change in the demographic situation will be a result of the normal growth rate in the population and the limited number of the refugee returning to West Bank and Gaza Strip since the improvements in the political and security environment will be modest.

Medium Economic Uncertainty. This scenario assumes that the West Bank and Gaza Strip economy will slightly recover simply by relaxing

the restrictions on internal movement. An increase in growth is expected to in the short run, just because the existing resources are better utilized. People are expected to be able to make better use of labor and capital to produce more output without necessarily actually reducing unemployment.

However, the projected recovery is subject to downside risks, and would not be sufficient to significantly raise living standards and lower unemployment. It would nevertheless remain stagnant and reliant on foreign aid. This is because of not having the control over borders and resources.

Medium Institutional Uncertainty; In this scenario the establishment of the expanded autonomous area inside the Separation Wall will require improvement in the institutions in order to be able to meet the needs of the expanded autonomous area. The PNA will have to attend to the proper development of its organization and [capability to manage, plan and deliver both hardware and software required for the proper functioning of the transport sector. The situation of the institutions in this scenario will be relatively similar to the current situation with some developments to meet the needs of the transport sector under this scenario, so medium institutional uncertainty will be related to this scenario.

6.7.4 Uncertainties in the Fourth Scenario

Low to Medium Political Uncertainty. This scenario assumes that the Israeli restrictions will remain at the same level as in 2007, more frequent closures, and more limited access to Israeli labor market. This includes the tightening of the political and economic embargo imposed on the Gaza Strip, the inability to rebuild the Gaza Strip, deterioration of the political, and consequently, the economic conditions in the city of Jerusalem, including the imposition of restrictions and closures. Since the PNA has been through this situation previously the uncertainty will be ranging from low -if the Israeli restrictions remain at the same level as in the first quarter of 2008- to medium if the PNA ceases to govern.

Low Economic Uncertainty. This scenario assumes that the real GDP per capita would decline, unemployment would rise, and the transfers from donor countries would decrease. This economic deterioration will lead to deterioration in different aspects of the transport sector, and there will be a minimum budget for improvements and developments.

Low Demographic Uncertainty. This scenario assumes that a limited increase in the population may occur as a result of the general deterioration, since many people (especially the youth) would migrate in order to work and live in better conditions, no or limited returnees

are expected, and the growth rate will remain the normal rate. Such related conditions will cause a limited effect on the prevailing travel demand and the number of vehicles ownership. There will be a need for minor development of the transport sector components because of the conditions of deterioration.

Low Institutional Uncertainty: In this pessimistic scenario, the overall political circumstances will prevent the PNA to carry out the institutional development; limited budget will be available for that, so there will be a low uncertainty.

6.8 Concluding Remarks on Uncertainties

The considered aspects of uncertainties across each scenario have been analyzed. In this study the levels of uncertainty across the different scenarios are categorized from low to medium to high as illustrated in Table 6.1

Table 6.1: Ranges of Uncertainties Related to the Four Scenarios

Uncertainties / Scenarios	Political	Economic	Demographic	Institutional
First Scenario	Low	Low	Low	Low
Second Scenario	High	High	High	High
Third Scenario	Medium	Medium	Medium	Medium
Fourth Scenario	Low To Medium	Low	Low	Low

Chapter Seven

Strategies

In the previous chapters the expected scenarios that could impact the strategic planning of the transport sector in Palestine were developed and the uncertainties in the considerable aspects; political, economic, demographic and institutional were identified. However, and in order to promote sustainable development of this sector, a well-defined set of priorities would be needed to ensure the best economic allocations and the optimal use of donors' assistance and sustainability of the processes. National revenues would need to be reviewed to identify resources that could be committed primarily to finance recurrent costs, including institutional building, routine maintenance, and development projects that aim at promoting economic growth.

To succeed in today's uncertain environment, we need a set of robust strategies that can respond to any scenario that unfolds. In this chapter, strategies related to each scenario will be developed are outlined to promote sustainable development of the Palestinian transport sector.

7.1 First Scenario (Status Quo) Strategies

In this scenario, the strategies that will be developed to improve the transport sector will consist of strategies related to the sub-sectors of the transport sector on the internal level. These strategies will include:

- Develop and rehabilitate the road network, this will include:

- Rehabilitating and maintaining the road network by restoring the damaged road and traffic systems, as considerable portions of the road network and traffic systems were physically damaged due of the Israeli actions during the past years.
- Launching a road maintenance and rehabilitation program, by identifying specific projects and their priority. A simplified approach for prioritizing is expected to be used involving measures of traffic demand, a measure of the severity of the deterioration of the road and a measure of its urgency.
- Preparing the technical specifications for the Palestinian roads in partnership with the related ministries.
- Reconstructing and rehabilitating roads and bridges that have been destroyed and suffered the highest degree of destruction throughout the Gaza Strip as a result of the massive destruction caused by the Israeli bombardment during the 2009 Israeli war.

- Prepare a comprehensive transport national plan that links spatial planning to development planning, and developing a road master plan to guide development on national and regional levels.
- Strengthen the 'Road Safety' program which will include:

    - Strengthening planning, regulatory and enforcement capacity.
    - Developing traffic safety standards, including standards associated with the design of roads, management of traffic and certification of vehicles.
    - Rehabilitating and upgrading public transport to ensure safety on roads.
    - Developing road safety awareness programs by organizing conferences, seminars and training programs aiming at promoting road safety.
    - Developing and implementing a safety program on the national level, accompanied with strengthening traffic police and enforcement measures.
    - Developing and producing educational materials and media programs and campaigns on road safety and environment protection.
    - Disseminating the Palestinian Traffic Law and clarifying its provisions.

- Develop the Public Transport through:

    - Establishing development strategies and policies to enhance public transportation through changes in the composition and structure of the passenger transportation industry, operating practices, and legislation in order to arrive at efficient, reliable, and affordable public transportation system.
    - Initiating detailed studies by the MOT and municipalities on coverage, routes, and the traffic carried in order to arrive at public transport plans and services.
    - Providing the financial and technical support to the operators of public transportation as this is one of the priority areas in the sub-sector, in order to maintain the existence, improve, and expand the provided services. Furthermore, technical support is needed to help the public transportation operators perform up to standards.

- Develop the Freight Transport through:

    - Regulating the freight services and promoting private, registered companies engagement.

- Encouraging the formation of new registered specialized freight companies.
- Studying the potential for constructing freight land border crossings and links between the seaport and airport to major commercial centers in the West Bank and Gaza Strip.

- Encourage the private sector participation and investment in the activities of the transportation sector.

    - Encourage the private sector to establish, operate and manage the central passenger terminals.
    - Encourage private sector investment in the transport sub-sectors.
    - Facilitate the institutional procedures for the private sector to invest in the sector.

- Improve the institutional situation, this will include:

    - Clarifying mandates roles and responsibilities among the various stakeholders and develops the official (ministerial and municipal) cadre to take on the challenges in this sector.
    - Strengthening the PNA's capacity in physical, strategic, maintenance planning, procurement and

contract management, and project supervision at national and local levels.

- Assisting the Palestinian institutions, including MOT to develop plans and strategies to identify the Palestinian priorities and developing plans based on theses priorities.
- Formulating the construction and maintenance guidelines and road norms and standards to ensure safety and to deal with environmental issues.

- The construction of the International Airport in the West Bank. Despite the fact that this construction needs the Israeli approval, this is considered one of the most strategic projects on the aspects of the politics, economics and security. The project would involve developing an airport facility in the West Bank to ensure proper access to the rest of the world and provide a more convenient and less costly alternative to Palestinians living in the West Bank. It may be financially and economically viable as an international gateway for goods and passengers to and from the West Bank, and enhance tourism in the region.
- Developing and implementing traffic management plans for urban areas. The internal roadway networks and facilities within the various large urban communities and the smallest towns, as

many parts of internal networks in the Palestinian territories which experience high traffic congestion and limited capacities need to be developed and well managed.

7.2 Second Scenario(The Optimistic Scenario) Strategies

Under this scenario, the basic assumption is that Palestinians will establish their own independent state. This scenario includes dismantling Israeli settlements, removing checkpoints, and increasing the contiguous nature of Palestinian lands. This would reduce travel and transaction costs, thereby spurring economic activity. Strategies that will be developed to improve the transport sector will be related to the transport subsector on the internal level and the international level. Strategies will include:

- Develop the Transportation Master Plan (TMP). This national transport master plan will provide direction for the systematic approach in the implementation of transport infrastructure on the road network and also in the development of an adequate, modern and innovative public transport system, to accommodate the future needs and the future transport demand in Palestine. It is to prepare a physical development plan as the framework by which our future multi-modal transportation systems planning, implementation, maintenance, operations, investments, and

monitoring decisions are to be made. It provides the policy basis for how transportation funding is spent, and what projects or programs the PNA focuses on to provide transportation services for its citizens.

- Develop the West Bank to Gaza Corridor:

The chances of success of a Palestinian state will increase with a high level of territorial contiguity of Palestinian lands. One idea is to build a safe passage that would connect numerous towns and cities in the West Bank with Gaza.

Palestinians first identified the need for a connection between West Bank and Gaza strip by a corridor as illustrated by Abu-Eisheh, S., et al, (1989). The notion of safe passage is first mentioned in the Gaza-Jericho Agreement article on security arrangements.

There are several options for how to improve connectivity between the West Bank and Gaza. One suggested alternative is the building of a secure elevated highway that would connect the two areas. In 1999 then Israeli Prime Minister Ehud Barak proposed the building of a highway that would connect the two areas, and that would consist of four lanes, a railway line, a water pipe and a communication cable. Another option, a subterranean highway,

might present fewer security risks to the Israeli's, but the cost of construction would likely be prohibitive.

The Rand Corporation recognizes that economic development and sustainability requires the creation of rapid North-South transportation links within the West Bank, and between the West Bank and the Gaza Strip. The project would consist of the construction of a railroad and toll road along the ridgeline. This, the corporation posits, would encourage further development along the ridge line of lines for electricity, natural gas, communications, and water.

In a shorter perspective, two options can be considered, (i) scheduled convoys for vehicles, including buses and trucks, as was implemented during 1996 – 1998 and (ii) utilizing GPS to monitor bus and truck convoys between the two territories.

In the long-term, a fixed link would provide a solution. A link could be in a number of forms including a road only, rail only, and road and rail.

- Develop and rehabilitate the road network, this will include:

    - Repairing the damage and alleviate the impacts caused to the transport sector by Israeli military incursions

and movement restriction measures, including those related to the construction of the separation wall.

- Launching a road maintenance and rehabilitation program, by identifying specific projects and their priority. A simplified approach for prioritizing is expected to be used involving measures of traffic demand, a measure of the severity of the destruction of the road and a measure of its urgency.
- Linking the governorates, cities and communities in the Palestinian state and to enhance communication and geographical correlation between them, and upgrading the major links connecting the urban centers and connecting the Palestinian territories with the outside world.
- Establishing an integrated network of roads and railways, and modern transportation, with high specifications, to contribute to the economy and encourage and facilitate internal and external tourism, including the construction and development of new road and transportation facilities.
- Enhancing accessibility to several rural village communities, which are served by inadequate roads through rehabilitating such roads or constructing new

ones. This will alleviate deficiencies related to poor accessibility between adjacent rural communities and with the agricultural fields.

- Expanding and upgrading the internal roadway networks and facilities within the various urban and rural communities, as many parts of internal networks in the Palestinian territories experience high traffic congestion and limited capacities. Traffic management plans as well as long term transport plans are highly needed for most major urban areas.

➢ Develop the Public Transport through:

- Establishing development strategies and policies to enhance public transportation through changes in the composition and structure of the passenger transportation industry, operating practices, and legislation in order to arrive at efficient, reliable, and affordable public transportation system.
- Initiating detailed studies by the MOT and municipalities on coverage, routes, and the traffic carried in order to arrive at public transport plans and services.

- Providing the financial and technical support to the operators of public transportation as this is one of the priority areas in the sub-sector, in order to maintain the existence, improve, and expand the provided services. Furthermore, technical support is needed to help the public transportation operators perform up to standards.
- Encouraging the use of the natural gas discovered in front of Gaza Strip as a alternative fuel in the public transportation.
- Controlling the public transport stations and establishing appropriate public transport terminals in the urban areas.

➢ Develop the Freight Transport through:

- Regulating the freight services and promote private, registered companies engagement.
- Studying the potential for constructing freight land border crossings and links between the seaport and airport to major commercial centers in the West Bank and Gaza Strip.
- Encouraging and facilitating inter-modal freight transportation which integrates land, air, and sea

transportation systems. Inter-modal plans to coordinate among these systems and their connection with potential free trade zones are to be developed. This will also facilitate freight transit to and from neighboring countries.

- Strengthen The ‘Road Safety’ program which will include :

  - Establishing an effective regulatory framework and regime; formulation of construction and maintenance guidelines, road norms, and standards to ensure safety; studies related to the roads classification will be essential to help in the delineation of assets, responsibilities, and shares of revenues
  - Strengthen Road Traffic law enforcement and enforcement of the road transport regulatory system; the explanation of the current poor performance of road traffic and transport is in that current laws and regulations are not being enforced, and that stepped up enforcement will likely improve performance quickly.

- Encourage the private sector participation and investment in the activities of the transportation sector.

- Encourage the private sector to establish, operate and manage the central passenger terminals.
- Encourage private sector investment in the transport sub-sectors.
- Facilitate the institutional procedures for the private sector to invest in the sector

➢ Building adequate transportation infrastructure for the new cities and suburbs to accommodate the demographic change (urban expansion).

In the scenario of the establishment of the Palestinian State, there will be a significant increase in the population as a result of natural growth and the expected return of refugees. Also, since Gaza is one of the most densely populated places with squalid conditions in the globe, one of the challenges for Palestinian leaders is how to reduce the population pressure on Gaza and encourage development in the less-crowded West Bank.

The regional plan for West Bank Governorates 1998, prepared by the Ministry of Planning and International Corporation (MOPIC), has developed four alternative models in order to reach the most suitable pattern of geographical distribution of the population that can be considered in the future development and expansion of urban

areas. These models have been rated based on the previous aspects and the fourth model was the model which can result the best in all indicators. This model shows that the concentration of population in the future can be on the length of the string Highland Home and the rest of the population has received the current natural growth.

This strategy will be applied by:

- Building new cities and suburbs based on studies that take into account several aspects, such as land use, consumption of transport and communications, accessibility to the vital centers, water availability and distribution, etc…
- Developing a network of road and public transport to connect these areas with the surrounding areas and provide access to vital areas.

- Rehabilitate and Improve Border Crossings with Jordan and Egypt, through:

    - Complementing the service provided by the three border crossings in West Bank. The improvement should include bridge construction, terminal improvement and construction of a customs clearance area at this crossing. The Prince Mohammed/Damiah Bridge Crossing, which was used for freight then

closed later by the Israeli Authority, can be reorganized to accommodate passengers, as was the case years ago.

- upgrading three border crossings for the Gaza Strip, which are Rafah Border, Al-Montar/Karni crossing and Beit Hanoun crossing (the Erez crossing). Beit Hanoun crossing is relatively the only operating crossing for people between Israel and the Gaza Strip but it is under complete Israeli control.
- Reopening the border crossing at Rafah which has limited capacity, and can handle only part of the total demand for travel through the border crossing. The Rafah trade corridor provides a viable alternative trade route for Gaza; it can also provide an essential additional route with potentially high returns for the Palestinian private sector. This crossing should be opened not only for passengers, but for the movement of goods so that Palestinian producers have the option of accessing Egypt's port at the entrance to the Suez Canal and Cairo International Airport. Initial analysis suggests that this route provides competitive trade logistics in terms of performance and at a cost equivalent to Israel's ports and airports. Even more

importantly, it offers Palestinians direct access to Europe and the Gulf, which are potentially the most lucrative markets for Palestinian exports. Opening Rafah is complementary to and not a substitutive for ongoing efforts to improve the border crossings with Israel at Al-Montar-Karni.

- Develop the air transportation services in the West Bank, through:

  - Constructing the new Palestinian International Airport in the West Bank. This project would involve developing an airport facility in the West Bank to ensure proper access to the rest of the world and provide a more convenient and less costly alternative to Palestinians living in the West Bank. It may be financially and economically viable as an international gateway for goods and passengers to and from the West Bank. An airport in the West Bank would also enhance tourism in the region.
  - Rehabilitating the damaged parts of the Gaza airport especially the runway system, the traffic control system, and the other various parts of the infrastructure. In addition. It is needed to repair and upgrade the operational systems, including the

operations and control equipment, navigational equipment and radar system, and the metrological station.

- Developing arrangements that ensure the Palestinian could control, expand, and operate Qalandia Airport as a local and regional airport.
- Performing the necessary training for the airport staff, especially the technical staff, as they have not been practicing their work for years, nor they are aware of the recent developments in the modern navigational and control equipment.

- Develop the maritime transportation services in Gaza Strip through:

  - Constructing a Seaport in Gaza: Improving access by sea for WBG is viewed as vital as a strategy to have access to international markets.
  - Repairing and upgrading the structures of the fishery port, and transferring the responsibility of its control to the Seaport Authority.
  - Initiating a capacity building program to train the Seaport Authority personnel in relevant areas, such as port planning and management, sea transportation

operations, environmental pollution, and quality control.

- The re-establishment of the railway system linking West Bank and Gaza Strip with the neighboring countries:

  The Palestinian National Authority has prepared feasibility studies and infrastructure for the implementation of the project for linking the Gaza Strip with West Bank and with the neighboring countries. This will be through:

  - The establishment of a railway system linking the governorates of Gaza and the West Bank.
  - Constructing a rail line within the West Bank governorates and the Jordan Valley reaching Jordan and Saudi Arabia.

- Applying the Convention of Multimodal Transport:

  The Palestinian Authority Cabinet on 2010, approved the Convention on Multimodal Transport between the Arab states, which aims to promote trade exchange through multiple means of transport, which will contribute to the establishment of close cooperation among Arab States in the Economic and Financial Affairs. Thus it is vital to conduct a study to apply the system of the Multimodal Transport.

- Improve the institutional situation, this will include:

- Developing the proper legislations and implement the identified institutional reform steps needed in order to well define the mandate, responsibilities, and functions of each of the key stakeholders in the transportation sector.
- Strengthening the PNA's capacity in physical, strategic, maintenance planning, procurement and contract management, and project supervision at national and local levels, especially for the large scale transportation projects expected under this scenario.
- Assisting the Palestinian institutions, including the Ministry of Transport to develop plans and strategies to define and develop the Palestinian priorities.
- The preparation of the transportation sector development plan. The plan aims at identifying the needed transportation activities and projects in the coming years, and presenting the program to the international community to respond to the sectoral needs.

7.3 Third Scenario Strategies

The third scenario assumes that there is an Israeli withdrawal from West Bank with keeping their control over borders, establishing the expanded autonomous area or entity inside the Separation Wall.

This separation wall is about to be completed and the PNA has been dealing with the restrictions on access resulted from this wall to certain key roads throughout the West Bank by gradually funneled Palestinian traffic into a secondary road network. During the last five years new roads have been paved and poor quality ones upgraded in the process of developing this secondary network. These roads have created or reinforced alternative routes that "compensate" for the loss of, or reduced access to, main routes that were totally or partially blocked.

This strategy can be subjected to criticism because it can be seen as recognition of the Israeli practices as a reality. But this strategy does not mean that the PNA accepted this situation. For this situation the strategies of alternative roads will be developed on the basis of alleviating the suffering of the Palestinian people affected by the closure regime, not on the basis of the recognition of the Israeli policies and practices. When it is pointed out that many of the alternative roads could facilitate settlement expansion, apartheid-style segregation and annexation by taking Palestinians off the main grid--

thus working against a Palestinian state--Shtayyeh said to The Nation (2010), "We don't look at it this way. The Israelis are stopping people from using these roads, and our job is to find ways for people to survive. This doesn't mean these roads are permanent structures."

The strategies developed in this scenario are the same as the strategies of the second scenario that are related to the sub-sectors on the internal level. The strategies for developing the crossing borders, the maritime, rail and air transportation, can be considered on a limited scale, because Israel may retain full control over all borders, and so effectively control the movement of people and goods among the West Bank and Gaza Strip and Israel and with the neighboring countries.

The strategies developed here must help to alleviate the suffering of these most affected areas, this can be through:

- Securing unrestricted access for these areas to essential services.
- Provide these areas with means of public transportation to facilitate their movement.
- Provide a governmental aid and support to these separated areas.

Other strategies on the internal level will be the same strategies in the second (optimistic) scenario (where applicable). These strategies which has been explained previously include:

- Developing and rehabilitate the road network
- The construction of the International Airport in the West Bank
- Developing the Freight Transport.
- Developing the Public Transport.
- Strengthening The 'Road Safety' program.
- Encouraging the private sector participation and investment in the activities of the transportation sector.
- Repairing and upgrading the structures of the fishery port, and transferring the responsibility of its control to the Seaport Authority.
- Rehabilitate and Improve Border Crossings with Jordan and Egypt (as in the previous scenario), assuming that the PNA could have shared control over these border crossings. Otherwise, the role of PNA will be only logistic.
- If there is a linkage, the construction of the corridor will be a vital strategy, or reconstruct the rail to connect Gaza governorates and the West Bank.
- Improving the institutional situation

7.4 Fourth Scenario (Pessimistic) Strategies

This scenario considers the political deterioration case, assuming that the PNA might cease to govern, the feasibility of a third Intifada, more frequent closures and more limited access to Israeli labor market with decreasing growth of the GDP. In this scenario the strategies will affected by the medium uncertainty, so the strategies will be developed on the bases of keeping the status levels as it is by doing no major improvements, but only rehabilitation, and by developing some strategies that will help to alleviate the suffering of people through this scenario. These strategies can be identified to concentrate on the following:

- Launching a road maintenance and rehabilitation program, to maintain the current conditions of the roads network will suffer of a sharp deterioration and heavy losses (directly and indirectly), as a result of Israeli practices on the Palestinian people including the closure, siege and disrupting the movement of persons and goods, and to prevent further deterioration and the eventual loss of the existing facilities.
- Developing and implementing traffic management plans for urban areas, the internal roadway networks and facilities within the various large urban and the smaller towns communities, as many parts of internal networks in the

Palestinian territories which experience high traffic congestion and limited capacities need to be developed and managed.

- Restructuring the institutions, decreasing the number of employees while building the employees capacities. This is in the case that PNA does not have to resolve, the conditions of the Palestinian institutions will be bad and poor.
- Clarifying mandates roles and responsibilities among the various stakeholders and developing the official (ministerial and municipal) cadre to take on the challenges in this sector.
- Reviewing and allocating the national revenues and donors funding. It will be needed to identify resources that could be committed primarily to finance recurrent costs, including institutional capacity building, routine maintenance, and development projects that aim at promoting economic growth.
- Providing a public transport system for all segments of society helping people to travel and reach the vital centers as public transport is the only mode of transport for a majority of the Palestinian population.

7.5 Concluding Remarks on Strategies

Strategies for each scenario have been formulated to accommodate with the uncertainties related to each scenario. Table 7.1 illustrate these different strategies that have been formulated.

Table 7.1: Strategies For The Four Scenarios

Scenarios	Strategies
First Scenario (Status Quo)	➢ Develop and rehabilitate the road network ➢ Prepare a comprehensive transport national plan that links spatial planning to development planning, and developing a road master plan to guide development on national and regional levels. ➢ Strengthen The 'Road Safety' program ➢ Develop the Public Transport ➢ Develop the Freight Transport ➢ Encourage the private sector participation and investment in the activities of the transportation sector. ➢ Improve the institutional situation. ➢ The construction of the International Airport in the West Bank. ➢ Developing and implementing Traffic management plans for urban areas, the internal roadway networks and facilities within the various urban and rural communities.
Second Scenario (Optimistic)	➢ Develop the Transportation Master Plan (TMP). ➢ Develop the West Bank to Gaza Corridor ➢ Develop and rehabilitate the road network ➢ Prepare a comprehensive transport national plan that links spatial planning to development planning, and developing a road master plan to guide development on national and regional levels. ➢ Develop the Public Transport. ➢ Develop the Freight Transport. ➢ Strengthen The 'Road Safety' program. ➢ Encourage the private sector participation and

	investment in the activities of the transportation sector. ➢ Building new cities and suburbs to accommodate the demographic change (urban expansion). ➢ Rehabilitate and Improve Border Crossings with Jordan and Egypt ➢ Develop the air transportation services in the West Bank. ➢ Rehabilitating and improve the damaged parts of the Gaza airport ➢ Develop the maritime transportation services in Gaza Strip through ➢ The re-establishment of the railway system linking West Bank and Gaza Strip with the neighboring countries: ➢ Applying the Convention of Multimodal Transport: ➢ Improve the institutional situation, this will include: ➢ The preparation of the transportation sector development plan.
Third Scenario	➢ Developing and rehabilitating the road network ➢ Improving the institutional situation ➢ Strengthening The 'Road Safety' program ➢ The construction of the International Airport in the West Bank ➢ Developing the Freight Transport ➢ Developing the Public Transport ➢ Encouraging the private sector participation and investment in the activities of the transportation sector. ➢ Constructing the International Airport in the West Bank. ➢ Repairing and upgrading the structures of the fishery port, and transferring the responsibility of its control to the Seaport Authority ➢ Rehabilitate and Improve Border Crossings with Jordan and Egypt (as in the previous scenario), assuming that the PNA will have control over these border crossings. Otherwise, the role of PNA will be only logistic. ➢ Rehabilitating the damaged parts of the Gaza airport ➢ the construction of the corridor, or reconstruct the rail to connect Gaza governorates and the

	West Bank. ➢ Securing unrestricted access for these areas to essential services ➢ Providing these areas with means of public transportation to facilitate their movement. ➢ Providing a governmental aid and support to these separated areas. ➢ Establishing alternative roads will be developed on the basis of alleviating the suffering of the Palestinian people affected by the closure regime
Fourth Scenario (Pessimistic)	➢ Launching a road maintenance and rehabilitation program. ➢ Developing and implementing Traffic management plans for urban areas. ➢ Restructuring the institutions, decreasing the number of employees while building the employees capacities. ➢ Clarifying mandates roles and responsibilities among the various stakeholders and developing the official (ministerial and municipal) cadre to take on the challenges in this sector. ➢ Reviewing and allocating the national revenues and donors funding. ➢ Providing a public transport system for all segments of society helping people to travel and reach the vital centers as public transport is the only mode of transport for a majority of the Palestinian population.

Chapter Eight
Conclusions And Recommendations

8.1 Summary

- The transport sector is a vital sector for the development of the Palestinian economy; it is an important sector in facilitating socio-economic development and to provide welfare to the population.
- The current transport system in the Palestinian territories was severely affected by the Israeli Occupation Authority imposed measures during the years of occupation. That is there are many means of restrictions on movement imposed in the West Bank and Gaza Strip due to the external closure which is meant to impose restrictions on movement between the West Bank and Gaza Strip and Israel, and between West Bank and Gaza Strip and neighboring countries such as Jordan and Egypt, and to the internal closures which are meant to restrict movement within the West Bank and between cities and villages.
- The current transport sector in the West Bank and Gaza Strip is primarily a single mode system, depending on road transportation for the movement of people and goods within the area and to the outside world. Rail, air, and sea

transportation was discontinued during various conflicts caused by Israeli occupation.

- Several Palestinian ministries and institutions play a role in a way or another in the transport sector. According to these related ministries; Ministry of Transport (MOT) and the Ministry of Public Works and Housing (MPWH), the transport sector is divided into sections to facilitate analysis and understanding of it; the land transport (road network and internal transport), rail transport, air transport, maritime transport and international transport.
- Because of the changes in the various aspects which lead to considerable uncertainty in Palestine, PNA's development plans on the national level were always made as a short term plan. But in the cases of high uncertainty, scenario planning is the most appropriate approach in performing the strategic planning . SWOT analysis for the transport sector is made. Then the vision, mission, and strategic goals are formulated as general. Next, the expected scenarios are developed taking into consideration the related uncertainties. Finally the strategies for each scenarios are developed.

8.2 Conclusions

- A SWOT analysis is made in order to form the basis for formulating the vision, mission, and goals, and developing the

strategies. This SWOT analysis is based on the documents provided by MOT, interviews with transportation experts, and available data.

- A framework of the strategic plan of Transport Sector comes in accordance with the MOT's vision which is "Effective and comprehensive, integrated and sophisticated, safe and friendly environment roads and transportation networks, that verify local levels of connectivity between all communities and governorates within the Palestinian state, promote regional and international cooperation, meets the needs of the citizens, facilitate the movement of people and goods, encourage investment, and contributes to economic development".
- A mission for the transport sector was developed. This mission states that "Palestine as part of the Arab and the regional network covered with a safe and developed transport network connecting all the governorates of Palestine which help and facilitate people's life".
- The Strategic goals that were developed are:
    - Achieving an efficient transport system (affordable transport).
    - Ensuring that Palestine is part of a regional and international network.
    - Achieving a safe transport system.

- Upgrading an appropriate institutional framework
- Satisfying the need for a supportive role of the transport sector for the economic and social development.
- Achieving a clean transport sector.

- Four scenarios are identified taking into account the previous studies and the data collected and analyzed; each scenario will have its impact on the transport sector. These scenarios are:

    - **First Scenario (Status Quo):** This scenario is based on the premise of the continuation of the political and economic situation in the West Bank as it was during the year 2010.
    - **Second (Optimistic) Scenario:** This scenario considers the political progress case, assuming the establishment of the Palestinian State and the construction of the corridor between the West Bank and Gaza, no restrictions on the movement of goods and people and marginally greater access to Israeli labor markets resulting in greater remittances with accelerating growth in GDP.
    - **Third Scenario:** The third scenario assumes that there is an Israeli withdrawal from the West Bank with keeping their control over borders, establishing

the expanded autonomous area inside the Separation Wall, while the situation in Gaza Strip continues as it is.

- **Fourth (Pessimistic) Scenario:** This scenario considers the political deterioration case, assuming that the PNA might cease to govern, the feasibility of a third Intifada, more frequent closures and more limited access to Israeli labor market with decreasing growth of the GDP.

- Four different aspects of uncertainties were analyzed through each scenario. These aspects include the political, economic, demographic and institutional uncertainties. These four uncertainties for each scenario vary from low to medium to high level.
- A set of robust strategies that can respond to each scenario that unfolds are developed in order to succeed in the current uncertain environment. The strategies are based on the changes in the four different aspects (uncertainties) for each scenario. But there are main and essential strategies that are to be developed in almost every scenario nearly; these are:

  - Develop and rehabilitate the road network.
  - Develop the Public Transport.

- Develop the Freight Transport.
- Strengthen The 'Road Safety' program.
- Improve the institutional situation.
- Encourage the private sector participation and investment in the activities of the transportation sector.

- In this study the second scenario (establishing the Palestinian State) is the base scenario and the more expected one. Developing strategies for the four planned scenarios don't mean that all these scenarios are accepted (especially the third one). Developing these scenarios and these strategies was made to know how to deal with uncertainty related to these scenarios, and in order to maintain and restore the transport sector under these scenarios.

8.3 Recommendations

It is difficult to sequence recommendations in this highly uncertain environment because they are all interdependent and success ultimately hinges upon political situations. For example, without independence, forming a sovereign state, and the full control of border by Palestinian, there will be little need for developing strategies on the international level, such as the border crossings management.

Some recommendations will take years to implement, while others such as drafting a law or developing a master plan can be done relatively in a shorter period. However, for all of the recommendations, actions can

and should be followed immediately. These recommendations are presented as follows:

8.3.1 General Recommendations

The following recommendations are essential ones and are recommended to be taken into consideration in the strategic planning for the Palestinian transport sector, which are common for the four developed scenarios:

- Since transportation reflects sovereignty, it is recommended to exert all governmental and public pressure to establish the Palestinian State, end the Israeli occupation, and restore to the Palestinians their right to freedom including the freedom of access and movement, as well as their control over the West Bank space which will improve all the Palestinian lives and conditions, and affect the transport sector significantly.
- Take governmental and public pressure to lift the siege on Gaza and to end the division between the West Bank and Gaza. This will be reflected appreciably as easing transportation between West Bank and Gaza Strip.
- Conduct sectoral strategy for the different sub-sectors, and to pay more attention to the different expected future scenarios and their impacts on the transport sector.
- The uncertainty is to be considered in a more detailed way while developing the Transport Master Plan and the strategic plan of

the Palestinian transport sector due to the extraordinary political conditions prevailing in Palestine, and related economic and demographic consequences.

- Utilize the framework for the strategic plan of the transport sector to develop and adopt a full-scale TSP. This national strategic master transport plan will provide direction for the systematic approach in the implementation of transport infrastructure on the road network and also in the development of an adequate, modern and innovative public transport system, to accommodate the future needs and the future transport demand in Palestine.
- Make further studies on the uncertainty related to the four aspects (political, economical, institutional, and demographical), by examining every aspect in a quantitative manner and developing a model to deal with uncertainty in the strategic planning.
- Concentrate on the developed strategies which are common between all the planned scenarios. However, it is recommended also to prepare for the other scenarios (especially the second scenario), and conduct studies related to the strategies developed for the sector and the sub-sectors (rail, airports, maritime, etc).
- Pay more attention for the dynamics feedback while utilizing the framework and developing TSP. That is because of the high

uncertainties and the changes in the various aspects will need continuous improvement and development.

- Achieve financial sustainability and, in the sectors where it is possible, achieving self-sustainable transport infrastructure, by directing the transportation related taxes and fees towards a local transport fund to finance transportation projects.
- Document the consequences of the Israeli measures on all Palestinian sectors, on the official level, and efforts must be intensified to identify the devastating impact of the Israeli actions on the lives of Palestinian citizens into the world, so an action plan based on appropriate information and scientific methods can be prepared to gain worldwide support.
- Organize a donor conference for the transport sector. This should, of course, be done when the political situation will allow. The PNA should take the initiative and should start by calling for a donor conference on transport, at which the PNA strategy document for transport will be presented and considered.
- Establish an institutional strengthening, restructuring, and a capacity development Action Plan. The capacity of the PNA in transport is weak. Support for capacity development in road management was provided from PNA to the related ministries but on a limited scale. So it is needed to provide training and

capacity building for institutions and staff working in the transport sector.

- It is imperative that the Palestinian Cabinet and the Legislative Council delineate clearly the roles and responsibilities of each Palestinian ministries and institutions that are related to the transport sector. It is also necessary that an inter-ministerial committee is activated to coordinate among various ministries and agencies involved in the transport sector.

8.3.2 Recommendations for Some Sub-Sectors

- Achieve regional coordination with neighboring countries, which requires a connection with neighboring countries. This can be achieved by developing and rehabilitating the regional roads.
- Work on the "Road Master Plan", that is a national plan of roads from which current roads and routes can be assessed, a vision for the future of the proposed methods in terms of location, classification and engineering appropriate technical specifications can be developed, a road improvement program can be prepared, and the roles and responsibilities of agencies related to the road sector can be clearly defined in order to eliminate existing overlaps and confusion.
- Establish a unified road authority. The worldwide experience of road sector management suggests that all major dimensions of road management, including planning, programming,

procurement and supervision should be under the control of one and only one management structure. The reason is that road management is a continuous operation for which accountability is diluted if preparation is done by one organization and implementation by another. It is vital for the PNA is to establish the Central Road Authority which was addressed in a World Bank study, this authority will be responsible of the road sector.

- Develop the "Road Maintenance Management" through which road maintenance mechanisms can be identified, and the foundation upon which priorities are determined can be established, so that priority is given to the most important roads with bad situation and high need in order to allocate the appropriate budget for the maintenance and rehabilitation of these roads.
- Arrange and prepare the studies for the rehabilitation reconstruction of the two airports (Yasser Arafat and Qalandia airport)
- Arrange and prepare the studies for the rehabilitation and reconstruction of Gaza seaport.
- Pay more attention to the public and freight transportation with adequate strategies to regulate and develop these sub-sectors.
- Encourage the private sector participation and investment in the activities of the transportation sector.

- Construct the Palestine International Airport, in the east of the city of Jerusalem. This is considered one of the most strategic projects on the aspects of the politics, economics and security.

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Ministry of Transport

- **Dr Ali Shaat**

Deputy Minister of the Ministry Of Transport. Interviewed on 24/5/2010

- **Ziad Badda**

General Manager, Palestinian Airlines, Interviewed on 24/5/2010

- **Abdullah Abdul Razak**,

General Director of the Roads and Transport Planning, Interviewed on 24/5/2010

Ministry of Planning and Administrative Development

- **Taghreed Hithnawi**

General Directorate of the Infrastructure Planning, Interviewed on 8/6/2010

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Director of housing department. Interviewed on 8/6/2010

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ANNEX

Annex A. The Separation Barrier and the "seam zone"

- In 2002, GOI took the decision to construct the Separation Barrier for security purposes with a route which significantly departs from the 1967 Armistice Line (the Green Line) and cuts into the territory of the West Bank. With the construction of the barrier wall, GOI has declared the land in between the route of the barrier itself and the Green Line – now referred to by GOI as the "seam zone" – a "closed area" for an indefinite period of time pursuant to occupation military orders. This "seam zone" accounts for roughly 8.5% of the territory of the West Bank. In addition, another 3.4% of Palestinian land to the east of the barrier is completely or partially surrounded by the Separation Barrier, creating a number of small Palestinian enclaves where special permits are now required even by those who live within. Finally, military orders created a "buffer zone" of 150-200 meters adjacent to the wall on the east side where Palestinian construction is not allowed.
- Roughly 50,000 Palestinians in 38 villages and towns will find themselves living in "the seam zone" once the construction of the barrier is completed. Another estimated 61,000 Palestinians who are residents of East Jerusalem will be separated by the barrier from family and community networks, employment opportunities and municipal services. Furthermore, approximately half a million

Palestinians live within 1 km of the barrier on its eastern side, and many of these people have been negatively affected by a structure that cuts through properties, economic networks, service access routes and neighborhoods.

- Palestinians who now find themselves residents of the "seam zone" are required to apply for a "permanent resident ID" from the Civil Administration in order to seek permission to remain in their homes and have access to their property. To obtain an ID, they must prove "permanent residence" by providing relevant documentation although there is no definition of "permanent" contained in the order, nor is there a definitive list of documentation necessary to establish proof of residency. In addition, IDs need to be renewed on a periodic basis, thus endangering the test of residence of those who spend time outside of the "seam zone" for educational, professional or family purposes. Palestinians not residing in the "seam zone", but who own land or businesses there or who work in the area are also required to obtain permits, primarily based on proof of land ownership. Obtaining such permits is complicated by the difficulties inherent in proving ownership and even more difficult for those who work in the "seam zone" or who are family members of land-owners. For Palestinians, entering or residing in the "seam zone" without a permit can result in a five-year prison sentence or heavy fine. "Seam Zone" restrictions apply only to Palestinians;

Israeli citizens, residents and settlers are exempted from the regulations prohibiting access and construction.

- Even if a person holds the appropriate permit, the Separation Barrier acts as a very significant physical hindrance to movement. This is because passage is only available through gates which are operated by the IDF, often on a temporary or ad hoc basis. GOI has created four types of gates: (i) "seasonal" agricultural gates which are only open during certain times of the year with the goal of facilitating harvesting; (ii) agricultural gates that are supposed to open periodically during the day; (iii) gates that provide access to other parts of the West Bank and (iv) gates that provide entry into East Jerusalem, the "seam zone" or Israel depending on its location.50 Because the gates are spaced sporadically within the wall, residents may have to travel considerable distances, sometimes over dirt roads, to reach them. Moreover, there are no service standards for gate operations and there appears to be little attention to fixed operating hours (see paragraph 26). The IDF can close gates for security or other unspecified reasons. Gates are routinely closed, for example, on public holidays in Israel. As permits are usually valid only at certain gates, the *ad hoc* nature of the opening and closing hours of the gates can be particularly difficult as alternative passages do not exist. In general, gates are not open at night which causes complications for the normal

conduct of life and business and can be life threatening in cases of medical emergency.

- The route of the Separation Barrier can be directly linked to Israeli settlements in the West Bank, as the route has been influenced by perceived needs to protect settlers and to provide space for future expansion of settlements. The Israeli Office of State Attorney has stated that part of the route of the Barrier was planned with the aim of providing protection to Israeli settlers, and admitted that in some cases expansion of settlements was taken into account in planning the route of sections of the Barrier. Including East Jerusalem settlements, the route of the barrier puts some 87% of the settler population into the "seam zone" according to estimates of the Palestinian Negotiations Support Unit (NSU) based on the 2005 census. In a precedent-setting case, the Israeli Supreme Court ruled that the Separation Barrier could be built inside the West Bank and that protection of Israeli settlers and settlements were legitimate security interests of GOI and could be factored into decisions about the barrier's route. The Israeli Supreme Court did, however, also state that security requirements would need to be balanced against hardship caused to Palestinians residents of the West Bank in determining the route. An advisory opinion issued by the International Court of Justice in The Hague, on the other hand, stated that construction of the Separation Barrier within the West

Bank violated international law, and that settlements themselves were also illegal under international law. Despite this, in January 2007 GOI announced plans to shift the planned route of the Separation Barrier another five kilometers into the West Bank in order to include two settlements near Modiin. In addition, a new settler-only road will be constructed to connect the settlements.

- In November 2006, OCHA conducted a study of the effects on Palestinian residents of the completed portions of the Separation Barrier in the northern West Bank. The data demonstrates the negative economic impacts from the barrier itself as well as the haphazard operation of the barrier gates:
  - ✓ Roughly 60% of families owning land in the "seam zone" area of the northern West Bank no longer could access it because they were not provided permits by the GOI.
  - ✓ More than 50% of the communities surveyed no longer had direct, regular access to their land.
  - ✓ 22% of land became accessible only by foot, thus no vehicles could be used to transport produce grown there.
  - ✓ Only 26 of 61 gates located in the Barrier were open year-round and only 64% of the gates operated in accordance with officially-stated opening times.
  - ✓ Traditional travel routes were severed in 90% of communities.

- ✓ Damage or refusal of entry of agricultural produce was experienced by 24% of respondents.

- These findings are reinforced by another recent study funded by the New Israel Fund and the British Embassy in Tel Aviv and conducted by the Israeli organization, Bimkom, which found that the current route of the Separation Barrier, “almost totally ignores the daily needs of the Palestinian population” and is “focused almost exclusively on the desire to maintain the fabric of life of Israeli settlers”. It also states the Separation Barrier is cutting employment for Palestinians, isolating farmers from markets, causing "particularly serious damage" to residents' health-care needs and undermining social and family life, and that “there has been no meaningful change in the system of considerations guiding the planners.”

Annex B. Agreement on Movement and Access

To promote peaceful economic development and improve the humanitarian situation on the ground, the following agreement has been reached. It represents the commitments of the (GOI) and the Palestinian National Authority (PNA). Its implementation and further elaboration will be assisted by the Quartet Special Envoy for Disengagement and

his staff and/or the United States Security Coordinator (USSC) and his staff.

1. Rafah

The parties have agreed to the attached statement of principles. Rafah will be opened as soon as it is ready to operate at an international standard in accordance with the specifications of this agreement and as soon as the 3rd party is on site, with a target date of November 25.

2. Crossing Points

The parties have agreed that:

The passages will operate continuously. On an urgent basis, Israel will permit the export of all agricultural products from Gaza during this 2005 harvest season.

The new and additional scanner will be installed and fully operational by December 31.

At that time, the number of export trucks per day to be processed through Karni will reach 150 and 400 by end-2006. A common management system will be adopted by both parties.

In addition to the number of trucks above, Israel will permit export of agricultural produce from Gaza and will facilitate its speedy exit and

onward movement so that quality and freshness can be maintained. Israel will ensure the continued opportunity to export.

To enhance operation, the parties agree that:

- ✓ When a new generation of x-ray equipment able to scan trailers as well as containers becomes available it will be used. Once it arrives in the country, testing will also be carried out with the assistance of the Quartet Special Envoy.
- ✓ The USSC will ensure continuing consultation, with unresolved implementation issues to be discussed as needed with the parties.
- ✓ The PA will ensure that the passages will be protected on the Palestinian side of the border and will train and upgrade the management of all crossings to ensure efficiency and effectiveness. The PA will establish, without delay, a unified system of border management.
- ✓ The management system that has been developed for Karni should, with suitable local variations, be adapted to the passages at Erez and Kerem Shalom. Israel also undertakes to put in place similar arrangements as appropriate that will make West Bank passages fully operational as soon as possible. A bilateral committee, with participation as needed of the Quartet Special Envoy and/or the USSC, will develop operational procedures for those passages.

جامعة النجاح الوطنية
كلية الدراسات العليا

التخطيط الاستراتيجي لقطاع المواصلات في فلسطين في ظل ظروف عدم اليقين

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قدمت هذه الأطروحة استكمالاً لمتطلبات درجة الماجستير في الإدارة الهندسية بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين

2011

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الملخص

إن نظام المواصلات الحالي في فلسطين والذي يعتبر أحد الدعائم الرئيسية للنمو والتطور الاقتصادي, قد تأثر بشدة بإجراءات الاحتلال الإسرائيلي. وعليه فإن التخطيط الاستراتيجي ضروري لتحقيق التطور المطلوب. ولكن بسبب حالة عدم اليقين في الحالة الفلسطينية، فان عملية التخطيط الاستراتيجي في الأنظمة المختلفة بشكل عام وفي قطاع المواصلات بشكل خاص, هي ليست بالعملية السهلة.

هدفت هذه الدراسة التي اختصت بقطاع المواصلات في فلسطين لمعرفة كيفية التعامل مع ظروف عدم اليقين أثناء عملية التخطيط الاستراتيجي لقطاع المواصلات. وتنبثق أهمية هذه الدراسة من أهمية قطاع المواصلات ومفهوم التخطيط الاستراتيجي حيث أنها تبحث على وجه الخصوص في تطوير إطار معتمد للتخطيط الاستراتيجي في قطاع المواصلات تحت ظروف عالية من عدم اليقين.

في هذه الدراسة تم عمل تحليل مواطن القوة والضعف والفرص والتحديات (SWOT) لتشكيل أساس لتحديد الأهداف والاستراتيجيات. واستنادا لهذا التحليل تم تطوير الرسالة والرؤية والأهداف الإستراتيجية ومن ثم تم تطوير أربع سيناريوهات لتحديد الخطوط

العريضة للاستراتيجيات المناسبة, مع الأخذ بعين الاعتبار الظروف السياسية والاجتماعية والاقتصادية المتوقعة. ثم تم تحليل المظاهر الأربعة المختلفة لحالات عدم اليقين وهي السياسية، الاقتصادية، السكانية والمؤسساتية المرتبطة بهذه السيناريوهات والتي تتباين في المستوى، بين منخفض و متوسط و مرتفع. إضافة إلى ذلك، تم تطوير مجموعة من استراتيجيات يمكنها التعامل مع كل سيناريو. تعتمد هذه الاستراتيجيات على التغييرات في المظاهر الأربعة المختلفة لحالات عدم اليقين في كل سيناريو. وقد لوحظ أن هناك استراتيجيات مشتركة بين جميع السيناريوهات مع وجود خصوصية لكل سيناريو.

إن تطوير استراتيجيات لكل من السيناريوهات الأربعة المطورة لا يعني القبول والتسليم بها إذ أن الخيار المفضل فلسطينيا هو السيناريو الثاني (المتفائل) وهو سيناريو إقامة الدولة الفلسطينية المستقلة. ولكن تطوير هذه السيناريوهات وما تم التوصل إليه من استراتيجيات مختلفة جاء من باب التخطيط والتحضير لأي سيناريو متوقع, حتى ولو كان غير مفضل, وعمل ما يلزمه من دراسات ولمعرفة كيفية التعامل مع ظروف عدم اليقين المرتبطة بهذه السيناريوهات,من أجل الحفاظ على أن يقوم قطاع المواصلات بدوره على أفضل وجه في ظل هذه السيناريوهات.

إن نتاج (توصيات) الدراسة لا تعتبر ذات أهمية ما لم يتم تبنيها وإتباعها من قبل الهيئات الرسمية ذات العلاقة, حيث أن دراسة كهذه من شأنها أن تضيف شيئاً جديدا إلى تخطيط وتطوير قطاع المواصلات. ومن الممكن أن تكون أساسا لتطوير قطاع المواصلات، بالإضافة إلى أنها يمكن إن تكون أساسا لخطة المواصلات الرئيسية التي سوف تساعد في توجيه تنمية وتطوير قطاع المواصلات في فلسطين وبناء القدرات ووضع الآليات القانونية والإدارية والتقنية اللازمة لدعم البناء المؤسسي داخل القطاع.