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كلية الهندسة و تكنولوجيا المعلومات

Graduation Project Report I

Assessment of Pavement Conditions for Part of Nablus Network

By:

Mohammad Shakhsheer – Reg. No:11925525

Omar Qamhia – Reg. No:11924724

Omar Jaloud – Reg. No:11821712

Under supervision of: Dr. Amjad Issa

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DISCLAIMER

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LIST OF ABBREVIATIONS

CDV:	Corrective deduct value
TDV:	Total Deduct Value
DV:	Deduct Value
PCI:	Pavement Condition Index
q:	Number of deduct with value greater than or equal 5
AASHTO:	American Association of State Highway and Transportation Officials
ASTM:	American Standards of Testing Materials
PI:	Priority index for any section (out of 100).
W:	Priority factor weight of importance to priority ranking.
F:	Priority factor value, and
i:	Index for the selected priority factors

ABSTRACT

This research comprehensively investigates and assesses the pavement condition of three major roads in the western part of Nablus City: Tunis, Yafa, and Mohammad Ben Rashid Al-Maktoum. The primary objective is to calculate a priority index for each 100-meter section of these roads within the Nablus network. This index will guide road maintenance efforts by identifying sections requiring urgent attention.

To achieve this, the research team employed ASTM procedures to calculate the Pavement Condition Index (PCI) for each section, a crucial parameter in the priority index formula. Additionally, data was collected on Average Daily Traffic (ADT), road classification, perceived importance, and public complaints for each road.

Data collection involved site visits, field inspections, and interviews with pavement management experts. The density and severity of various pavement distresses, such as cracks, potholes, and deformations, were meticulously assessed and quantified.

The estimated total cost for rehabilitating these three roads is 181,600 NIS. The study findings will be presented to the Nablus Municipality to inform their maintenance prioritization, aid in developing road performance curves, and provide cost estimates for proposed repairs. This information will be instrumental in optimizing road maintenance budgets and extending the lifespan of the pavement infrastructure.

CHAPTER ONE: INTRODUCTION

1.1 DESCRIPTION OF THE PROJECT

Background:

This research presents a thorough investigation and assessment of the pavement condition for three main roads in Nablus City (Tunis, Yafa, and Mohammed Ben Rashid Al-Maktoum).

Nablus city is one of the most Palestinian commercial centers and it's located in the northern west bank. Nablus is the economic capital of Palestine. Several industries and intense commercial activities are located within Nablus including building stones industries, soap industries, etc. An-Najah University, the largest university in Palestine with more than 23,000 students, is located in Nablus. Figures 1.1-1.3 illustrate the location of the targeted streets in the study area.

This research project aims to address this critical need by developing a methodology for prioritizing road maintenance in Nablus. It focuses on three key aspects:

- Comprehensive Assessment: Conducting a thorough assessment of the pavement condition of selected roads in Nablus using established engineering principles and methodologies.
- Data Collection and Analysis: Gathering relevant data on traffic volume, road classification, and public feedback to inform the prioritization process.
- Development of a Prioritization Index: Creating a scientifically-based index to rank roads based on their maintenance needs, enabling efficient allocation of resources and targeted interventions.

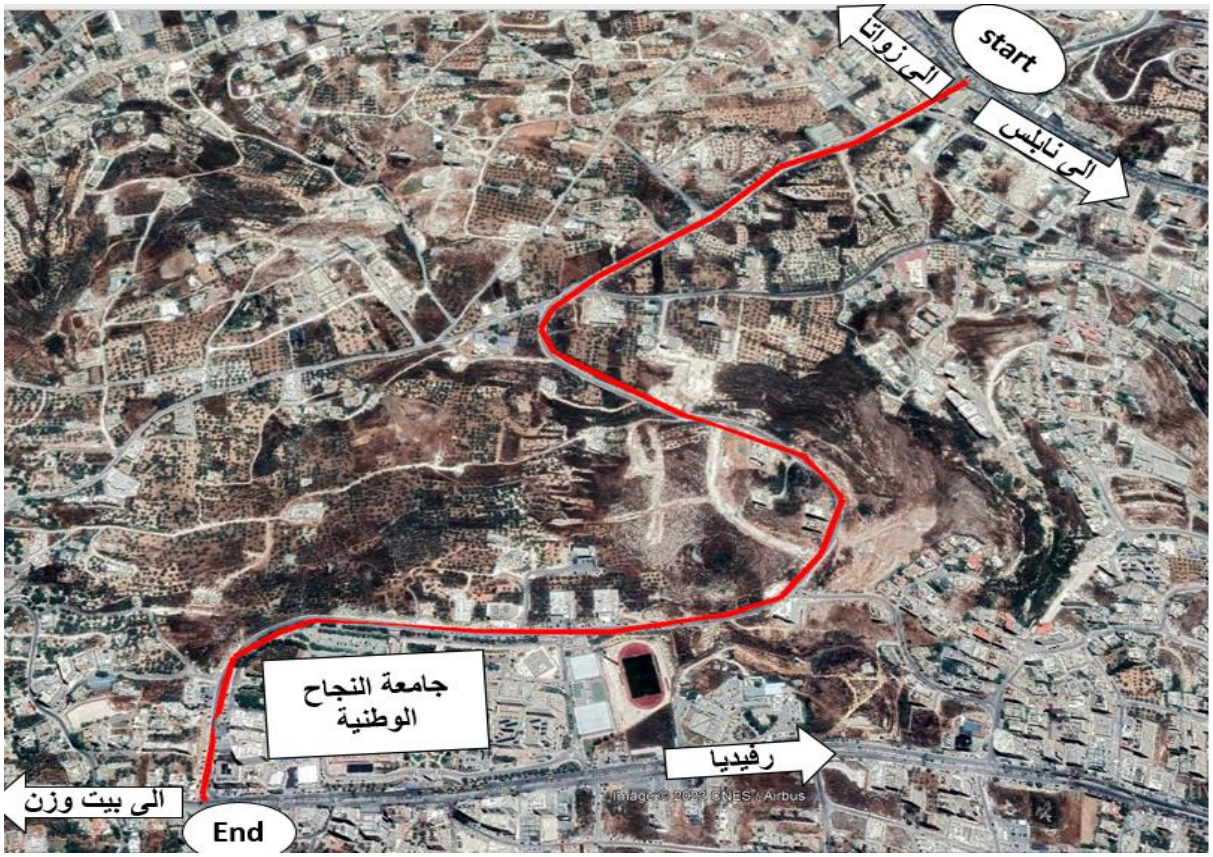


Figure 1.1: The location of Mohammed Ben Rashid Al-Maktoum Street.

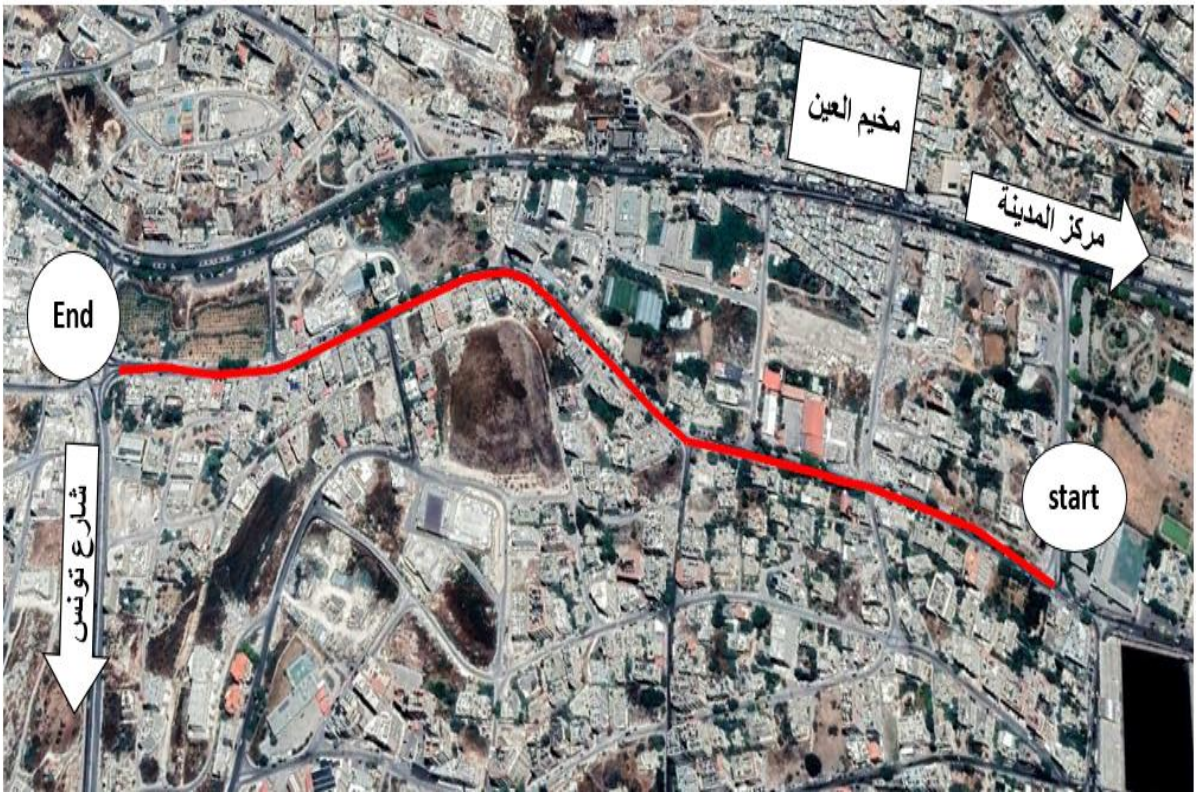


Figure 1.2: The Location of Yafa Street.

Figure 1.3: The location of Tunis Street

1.2 RESEARCH PROBLEM:

Nablus, like many cities, suffers from a gradual deterioration in the condition of the road network, which leads to a set of interconnected problems. Although there are previous studies on the condition of roads in Palestine, there is a noticeable lack of specialized studies that focus on the city of Nablus in particular, and conduct a comprehensive assessment of the condition of roads and determine maintenance priorities in a scientific and accurate manner.

The main problem is the lack of a comprehensive system for assessing the condition of roads and determining maintenance priorities in Nablus, which leads to:

- Increased maintenance costs: The absence of proper planning leads to costly emergency maintenance operations instead of regular periodic maintenance.

- Decreased level of traffic safety: The deterioration of road conditions leads to an increase in traffic accidents and endangers the lives of citizens.

- Negative impact on the economy: The condition of roads affects the movement of goods and services, which leads to increased transportation costs and delays in the delivery of goods.

Decreased quality of life: The condition of roads affects the comfort of citizens and leads to air and noise pollution.

1.3 AIMS AND OBJECTIVES:

The main goal in this project is evaluate, assess and rate the pavement sections in the proposed streets in terms of pavement distresses extent and severity. The final report will include recommendations for Nablus Municipality about the ranking and the priority of the maintenance for the studies sections.

These recommendations include a description and rating the existing distresses in the three streets in terms of severity and density as well as the appropriate treatments of these distresses. The minor objectives of the project are:

- To enhance the safety aspects and reduce number of accidents.
- To apply the required quality control and supervision from municipality during construction.
- To use the money specified for maintenance in cost-effective manner.

1.4 METHODOLOGY:

To achieve the aforementioned objectives of the project, the following steps will be applied:

- **Road inventory and inspection.**

Visiting the road and investigating the road conditions. The GP team will divide each street in each direction into equal sections of 100 m length.

- **Data collection.**

The data collection process is an important step in any comprehensive pavement management system. The collected data usually includes assessing several road conditions, such as: roughness (ride), surface distress (condition), surface skid characteristics, and structure (pavement strength and deflection).

- **Pavement condition rating.**

The Pavement Condition Index (PCI) is a numerical indicator that rates the surface condition of the pavement. The PCI provides a measure of the present condition of the pavement based on the distresses observed on the surface of the pavement, which also indicates the structural integrity and surface operational condition.

The condition of all segments in the road are evaluated using PCI. The value of PCI ranges from 0-100, where 100 means section is in excellent condition, and zero means very poor condition section.

- **Data results and analysis.**

After the completion of data collection process, it is necessary to calculate the rate of each section.

The value of PCI is calculated using the following equation:

PCI = 100 –CDV(Maximum)

Where: CDV (maximum), is the maximum corrective deductive values according to the existing pavement defects.

- **Selected the proper treatment.**

After the calculation of the PCI for each section, it is necessary to define the proper treatment for each section and the related cost.

- **Calculation of Priority Index (PI)**
  The PI for each section is calculated based on different parameters as agreed with Nablus Municipality. Next, all sections were arranged in descending order based on PI value. The section with high PI value will have the first priority and so on.
- **Recommendations.**

The GP team will propose recommendations for the sections that should to maintenance it firstly, and future improvements in the performance of pavement sections by minimizing the deterioration rate and proposing the proper maintenance strategies and actions for prolong pavement service life.

1.5 DESIGN CRITERIA:

The GP team will refer to AASHTO pavement management guide (second edition) in addition to the American Society for Testing and Materials (ASTM - D6433 11) during the pavement management process. When assessing pavement conditions for a specific location such as Nablus City or any other area, engineers and professionals typically follow a set of general principles and practices for pavement investigation and assessment.

It's essential to tailor the assessment approach and criteria based on the specific conditions, requirements, and objectives of the roads in Nablus City.

1.6 REPORT STRUCTURE:

This GP report is composed from four Chapters. The first Chapter is the Introduction. Methodology is illustrated in Chapter 2. Chapter three presents Results and Analysis. Finally, Chapter 4 depicts Conclusions and Recommendations.

1.7 PROJECT CONSTRAINTS:

- Time limitations: Project deadlines and limited time for data collection and analysis.
- Data availability and quality: Challenges in obtaining accurate and complete data.
- External factors: Weather conditions, security concerns, and cooperation from stakeholders.
- Ethical considerations: Ensuring data privacy and confidentiality.

CHAPTER TWO: METHODOLOGY

2.1 mythology for PCI calculation

Conducting a thorough investigation and assessment of the pavement condition for three main roads in Nablus City, namely Tunis, Yafa, and Mohammed ben Rashid Al-Maktoum, requires a systematic and well-structured research methodology. Here is our step-by-step methodology for our research. Moreover, Figure 2.1 illustrates the steps for calculating PCI.

1. Project Scope and Objectives:

The team will define the scope of the investigation, including the specific main roads in Nablus City that will be assessed. Establish clear objectives, such as assessing the current pavement condition, identifying distresses, evaluating structural integrity, and recommending maintenance or rehabilitation strategies.

2. Literature Review:

The GP students will conduct a thorough literature review to understand existing relevant local and regional studies, standards, and best practices related to pavement condition assessment and analysis. This helps in establishing a solid foundation for the investigation.

3. Data Collection:

The team will collect comprehensive data related to the pavement condition. This may include:

- Visual inspections of the pavement surface to identify distresses (cracks, potholes, rutting, etc.).
- Traffic data to understand the load and traffic patterns on the roads.
- Climate and environmental data that could impact the pavement condition, and.
- Historical maintenance records and rehabilitation activities on the selected roads.

4. Pavement Evaluation:

Employ appropriate evaluation techniques to assess the pavement condition. Common methods include:

- Visual Inspection: Conduct a systematic visual survey of the pavement surface to identify distress types, severity, and extent.
- Pavement Deflection Testing: Use non-destructive testing methods (e.g., Falling Weight Deflectometer) to evaluate pavement structural integrity.
- Core Sampling: Extract pavement cores to analyze layer thickness, composition, and quality.

5. Data Analysis:

Analyze the collected data to quantify the pavement condition using ASTM procedure. Use relevant software and tools to process the data and generate meaningful insights. This could involve: Microsoft Excel software for structural analysis. Applying statistical analysis to assess distress patterns and severity.

6. Performance Modeling (GPII):

Develop pavement performance models based on the collected data to predict future pavement conditions. Use modeling tools to simulate the impact of various maintenance and rehabilitation strategies.

7. Prioritization and Recommendations (GPII):

Based on the analysis and modeling, prioritize the identified distresses and recommend appropriate maintenance or rehabilitation strategies for each road. Consider factors like traffic volume, available budget, and the overall condition of the pavement.

8. Cost Estimation:

Estimate the costs associated with the recommended maintenance or rehabilitation strategies. This helps in budget planning and allocation.

9. Final Report:

Compile all the findings, analysis, recommendations, and cost estimates into a comprehensive report. Present the results in a clear and understandable format, including maps, graphs, and tables.

10. Stakeholder Engagement:

Engage with relevant stakeholders, such as local authorities and road management agencies, to discuss the findings, recommendations, and seek their input and approval for further action.

Implement the recommended maintenance or rehabilitation strategies and establish a monitoring program to track the effectiveness and performance of the interventions over time. Ensure that the investigation methodology adheres to local regulations, standards, and guidelines specific to Nablus City and its surrounding regions. Collaboration with local experts and authorities is crucial for successful execution and validation of the investigation.

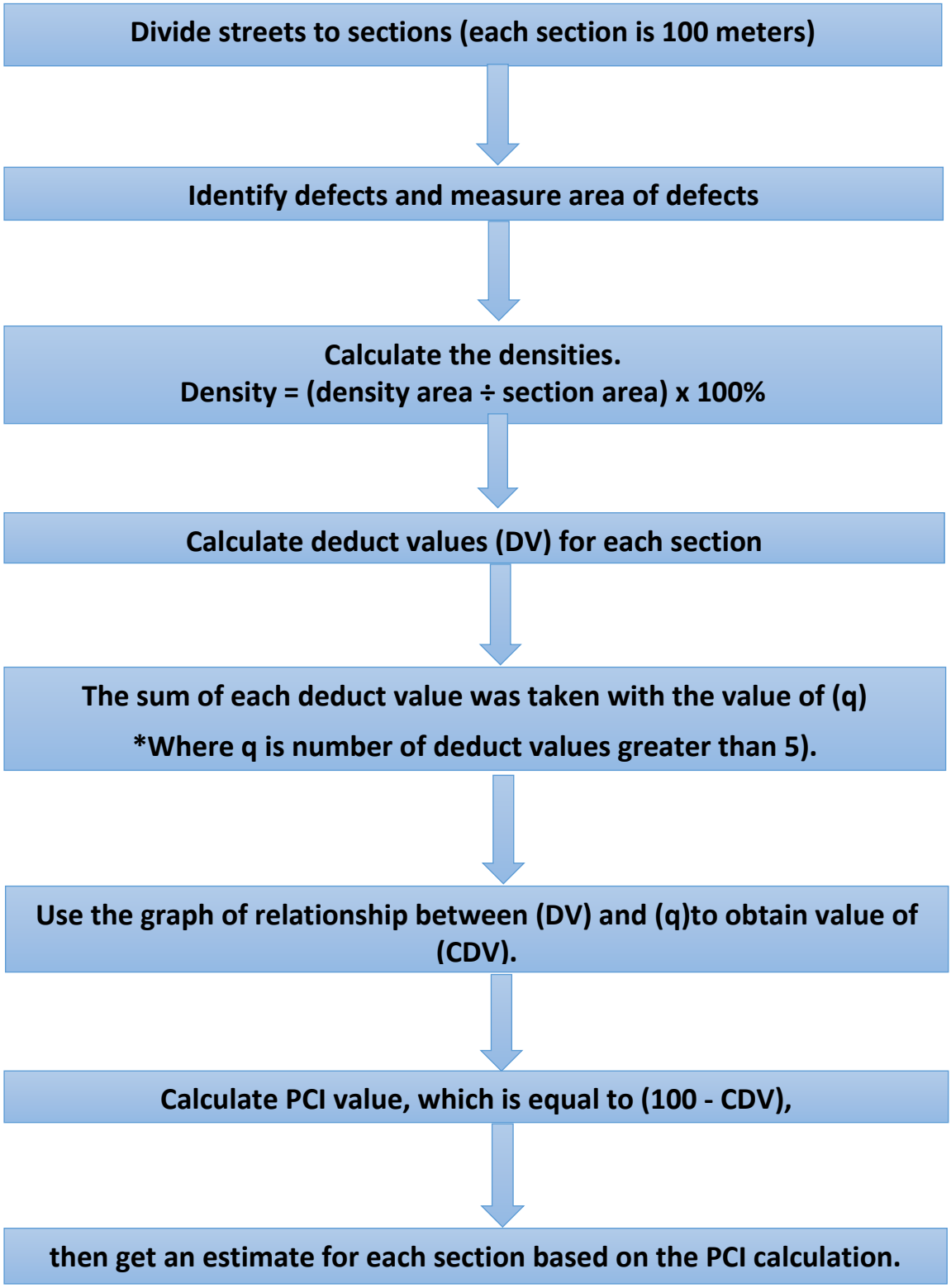


Figure 2.1: PCI calculation steps

Moreover, Figure 2.2 illustrates the 7-scale PCI rating.

Figure 2.2: 7-Scale PCI Rating [1]

2.2 mythology for PI calculations

In our project, we collected data on the six categories selected based on questionnaires distributed to 35 experts and institutions, including 27 individual experts and 8 institutions such as municipalities and contracting companies.

Experts were classified according to years of experience;
* 11 experts having less than 10 years of experience (representing 41% of the sample),
* 9 experts having 10 to 20 years of experience (representing 34%),
* 7 experts having more than 20 years of experience (representing 25%).

Experts were also classified according to their academic degrees;
* 11 experts having a bachelor's degree (41%),
* 12 experts having a master's degree (45%).
* 4 experts having a doctorate degree (15%).
* 2 experts with unspecified higher degrees.
* 1 institution without specifying an academic degree.

The weights of the six categories were collected based on the experts' responses, and the results were as follows:

1. **Pavement Condition**: This criterion was the most important to the experts, with weights ranging from 10% to 65%, with an average weight of approximately 30%. This indicates that the condition of the pavement is the most influential factor in maintenance decisions.

2. **Road Functional Classification:** Its weights ranged from 5% to 30%, with an average weight of approximately 15%. Despite its importance, it is considered less important than the condition of the pavement in determining maintenance priorities.

3. **Traffic Volume:** Its weights ranged from 0% to 40%, with an average weight of approximately 15%. Traffic volume is considered one of the factors influencing maintenance decisions.

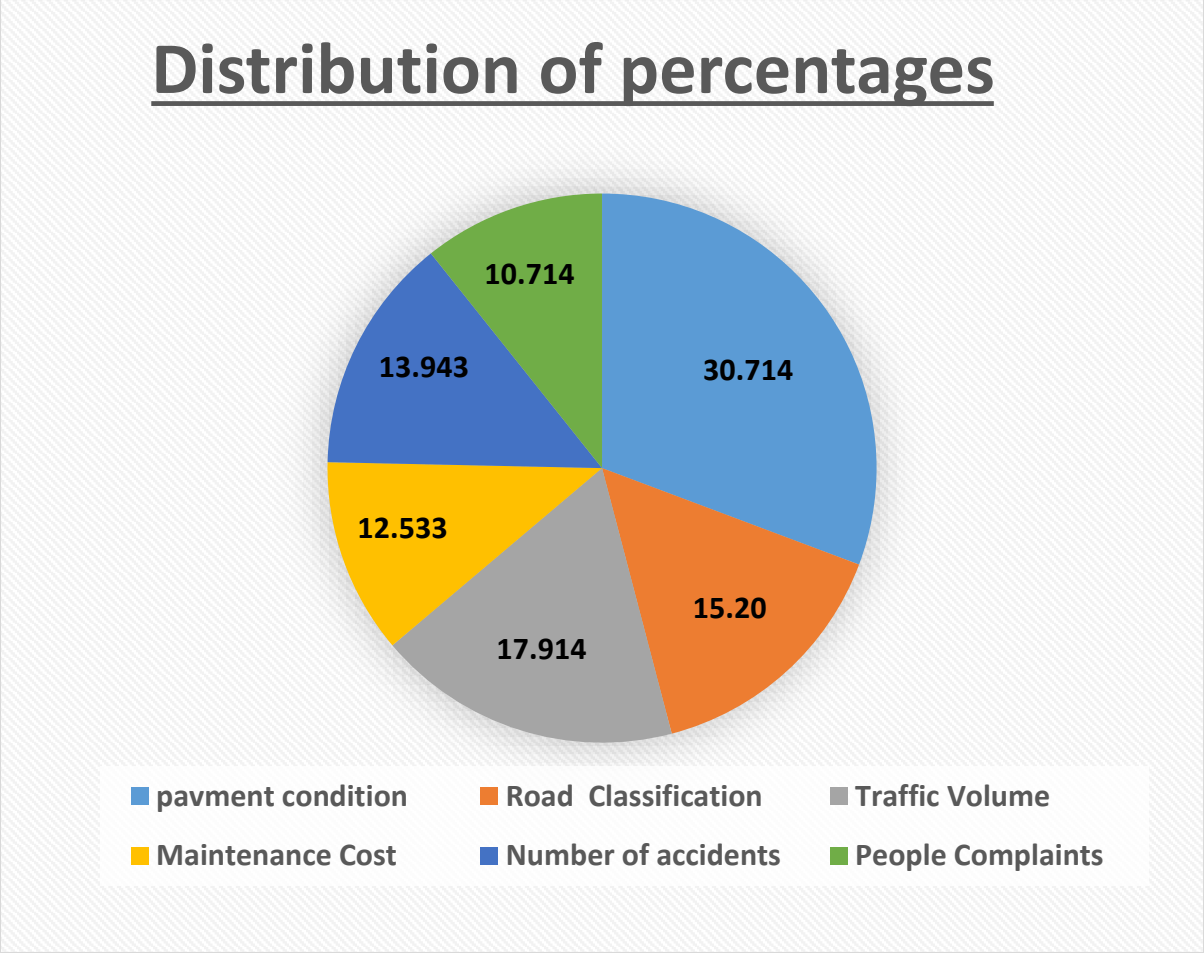
4**. Maintenance Cost:** Its weights ranged from 5% to 25%, with an average weight of approximately 10%. Although costs are important, they are not the most influential factor in determining priorities.

5. **No. of Accidents:** Its weights ranged between 5% and 30%, with an average weight of about 15%. The number of accidents is an important factor in evaluating maintenance priorities.

6**. People Complaints:** Its weights ranged between 5% and 20%, with an average weight of about 10%. Citizen complaints are a contributing factor in determining priorities.

Each one of this have a different value of (wi) and (fi).

After distributing the questionnaires to 35 different parties, whether individuals or institutions, the following values of **(wi)** were obtained:



And (Fi) values for each classification are Distributed as follows:

- **Pavement Condition**:

Fi = 100 – PCI value for each section.

- **Road Functional Classification:**

Type of Road	Factor (Fi)
Arterial	100
Collector	75
Local	50
Parking	25

- **Traffic volume**:

$$Fi = 100 * (\frac{ADT}{Max\ ADT})$$

Where:
ADT: Average daily traffic
Max ADT: Maximum daily traffic volume on the network to be maintained.

- **Maintenance cost:**

$$Fi = (\frac{Main\ cost\ for\ the\ section}{Max\ main\ cost}) * 100\%$$

- **Number of accidents:**

Accidents number	Fi
0 – 25	25
26 – 50	50
51 – 75	75
76 – 100	100

- **People complains:**

Complains number	Fi
0	0
1-2	35
3-5	65
>5	100

CHAPTER THREE: DATA ANALYSIS AND RESULTS

3.1 Introduction

The most important element of the transportation network is the road infrastructure, including the pavement structure. If the existing infrastructure is maintained frequently and properly, it can provide convenience to road users and reduce accident rates to some extent. As mentioned earlier, the right treatment at the right time on the right section of road will contribute to optimizing the funds allocated for maintenance purposes.

In the municipality of Nablus, or in developing countries such as Palestine in general, the lack of budgets and revenues for maintenance necessitates the implementation of pavement maintenance management systems. Preventive maintenance strategies are considered one of the most cost-effective strategies, since treatment and countermeasures are applied immediately after defects appear. In addition, clear criteria should be applied in selecting priority sections for maintenance. For example, maintenance of a road in a commercial area is quite different from that of a road in a residential area in terms of time, cost, damage rate, and weather conditions**[2]**

Road infrastructure needs to be properly maintained for a number of reasons**[2]**

1. Enhanced Convenience and Efficiency: Travel times are shortened, vehicle operating expenses are decreased, and traffic flow is generally improved on smooth roads. This benefits companies, drivers, and the economy as a whole by making things more convenient.
2. Enhanced Safety: Smooth surfaces, well-maintained roads with legible markings, and operational traffic signals all greatly increase the safety of driving. Timely repairs can save lives by averting accidents.
3. Cost-Effectiveness: Although maintenance may appear to be an expensive initial investment, there are substantial long-term savings. It is less expensive to make expensive repairs later if small problems are addressed before they become larger ones.

In general, putting road infrastructure maintenance first is a smart investment that benefits from convenience, safety, economy, and resource efficiency. Through the implementation of proactive strategies and strategic targeting, we can guarantee a resilient and dependable transportation network that benefits all.

The maintenance process depends on the aforementioned matters and can be of the following types [3]

1. Do Nothing: it involves leaving the street in its current condition without implementing repairs, upgrades, or changes. This approach may be chosen when a street's condition is deemed acceptable, or when there are budgetary constraints that prevent active maintenance or improvements

2. Preventative Maintenance: involves proactively addressing potential issues before they become major problems. It includes routine activities such as crack sealing, sealcoating, and minor repairs to preserve the road's integrity and prevent deterioration. The goal is to extend the lifespan of the street, minimize the need for costly repairs, and ensure safer and smoother transportation.

3. Routine maintenance: This means renewing the asphalt surface every specific period of time, and this period is usually annually.

4. Resurface: the process of repairing or renewing the surface of a road to improve its condition. This can include activities like repaving, filling cracks, and smoothing out the road to enhance safety and durability. Street resurfacing is a common maintenance practice in urban areas to ensure the quality and longevity of road infrastructure.

5. Rehabilitation: renews the durability and smoothness of the road almost every 15 years.

6. Reconstruction: Street reconstruction refers to a comprehensive process of rebuilding and redesigning a road or street. This typically involves significant changes to the underlying infrastructure, such as the roadway base, drainage systems, and sidewalks. Reconstruction may be undertaken to address issues like deterioration, accommodate increased traffic, improve safety, or upgrade outdated infrastructure..

3.2 Pavement Condition Data Collection

The existing pavement distresses for the targeted roads were inspected and investigated during the period from November 2023 to December 2023.

About **eleven** existing pavement distresses were collected based on **ASTM - 2007** The PCI was calculated for each section in both left and right directions. The following tables illustrate the data collected considering pavement conditions in terms of severity and density (extent). The rate and proper maintenance treatments were also identified. PCI rating is illustrated in Figure 3.1.

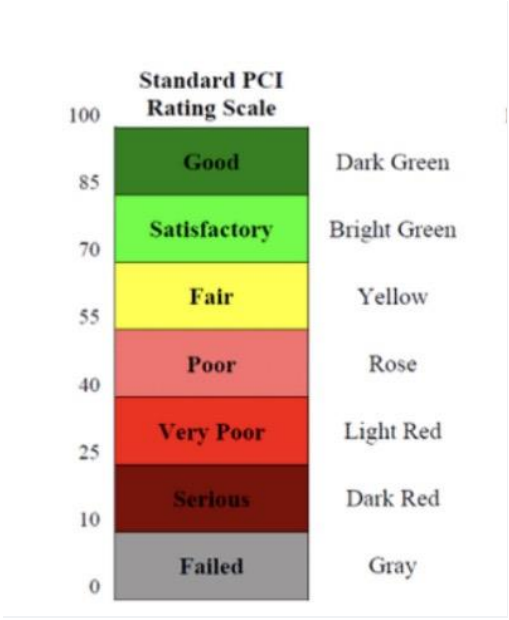


Figure 3.1: PCI rating

The general maintenance strategies corresponding to the PCI lower and upper limits are illustrated in Table 3.1.**[1]**

Table 3.1: General maintenance strategies according to PCI lower and upper limits.[1]

CONDITION CATEGORY	PAVEMENT CONDITION INDEX (PCI)		GENERAL TREATMENTS TRATEGY
	Upper Limit	Lower Limit	
Excellent	100	86	Do Nothing/Corrective Maintenance
Good	85	75	Preventative Maintenance
Fair	74	58	Resurface
Poor	57	40	Rehabilitation
Failed	39	0	Reconstruction

The general pavement distresses based on their ID in the **ASTM-2007** and the corresponding unit measurement are illustrated in Figure 3.2

ID	Distress type	Unit
1	Alligator cracking	m^2
2	Bleeding	m^2
3	Block cracking	m^2
4	Bumps and sags	m
5	Corrugation	m^2
6	Depression	m^2
7	Edge cracking	m
8	Reflection cracking	m
9	Lane/shoulder drop off	m
10	Long and trans cracking	m
11	Patching and utility cuts	m^2
12	Polished aggregate	m^2
13	Potholes	Count
14	Railroad crossing	m^2
15	Rutting	m^2
16	Shoving	m^2
17	Slippage cracking	m^2
18	Swell	m^2
19	Weathering and raveling	m^2

Figure 3.2: Types of pavement distresses and their unit of measurement[4]

The common pavement defects based on code number that were found and inspected in the three streets are illustrated in the following figures (3.3-3.13):

- Alligator cracking (1).

Figure 3.3: Alligator cracking

- Block cracking (3).

Figure 3.4: Block cracking

- Bumps and sags (4).

Figure 3.5: Bumps and sags

- Asphalt depression (6).

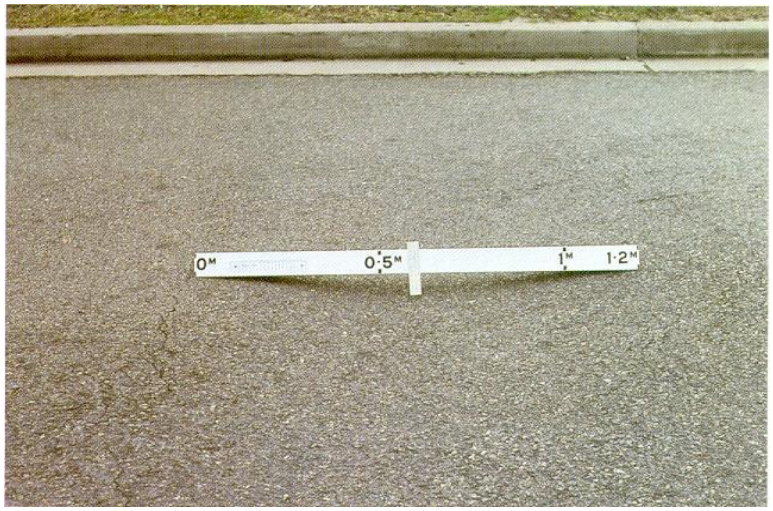


Figure 3.6: Asphalt depression

- Edge cracking (7).

Figure 3.7: Bumps and sags

- lane/shoulder drop off (9).

Figure 3.8: lane/shoulder drop off

- long and trans cracking (10).

Figure 3.9: long and trans cracking

- patching and utility cuts (11).

Figure 3.10: patching and utility cuts

- potholes (13).

Figure 3.11: potholes

- slippage cracking (17).

Figure 3.12: slippage cracking.

- weathering and raveling (19).

Figure 3.13: weathering and raveling

The PCI calculation based on distresses density and severity and the corresponding rating (7 scale) and proposed maintenance strategies in both directions are presented in the following tables.

Table 3.2 shows the results of Yafa Street in the right and left directions.

Table 3.2: Yafa Street (Right Direction)

Section	Distress Types	Length	Width	L/W	Degree Of Distress	PCI	Rate	Treatment
0 - 0+100						33	very poor	reconstruction
	13	3	1	length	high			
	6	2.5	1		meduim			
	10	4		length	meduim			
	3	5.5	1.5		meduim			
	10	4.5		length	meduim			
	1	4.5	1.8		meduim			
	10	2		width	low			
	1	10.5	6		meduim			
0+100 - 0+200						29	very poor	reconstruction
	3	10.5	4		low			
	10	17.5		length	meduim			
	1	21	1.5		high			
	19	12	6		high			
0+200 - 0+300						80	saticfactory	preventative maintenance
	10	2.1		width	low			
	10	0.9		width	low			
	10	3		width	low			
	1	19			low			
0+300 - 0+400						100	good	Do nothing
	10	5.5		width	low			
	10	3		width	low			
0+400 - 0+500						65	fair	resurface
	10	3.3		width	low			
	1	4.5	2.5		low			
	1	15	1		meduim			
	10	2		width	low			
	10	10		length	low			
0+500 - 0+600						100	good	Do nothing
	10	6.8		length	low			
0+600 - 0+700						87	good	Do nothing
	19	6	2.3		meduim			
	10	3		length	low			
	19	15	0.7		meduim			
0+700 - 0+800						100	good	Do nothing
	10	1		width	low			
	19	1.5	0.5		low			
0+800 - 0+900						95	good	Do nothing
	10	3		width	low			
	10	1.8		width	low			
	1	3	0.2		low			
	9	13			low			
0+900 - 1+000						85	satisfactory	preventative maintenance
	11	6	0.4		meduim			
	10	2		width	low			
	10	4.8	4.8		low			
	10	2		width	low			
	19	3	2		meduim			
	11	3.5	1.8		meduim			
1+000 - 1+100						91	good	Do nothing
	6	6	0.1		low			
	13	1.5	1		low			
1+100 - 1+200						58	fair	resurface
	10	5		width	low			
	10	2		length	low			
	10	14		length	meduim			
	10	5		length	low			
	10	5		width	meduim			
	11	11	3		high			

Table 3.2: Yafa Street (Left Direction)

Section	Distress Types	Length	Width	L/W	Degree Of Distress	PCI	Rate	Treatment
0 - 0+100						77	satisfactory	preventative maintenance
	10	8		length	low			
	10	4		width	meduim			
	10	4		width	medium			
	10	2		length	high			
	7	10			high			
	1	5	1		low			
	11	3.5	3		medium			
0+100 - 0+200						57	fair	rehabiritaion
	10	23		length	medium			
	13	1	0.8		high			
	10	2.2		width	medium			
	10	1.3		width	low			
	13	1.2	0.8		medium			
	1	13.8	1.5		low			
	19	6	2		medium			
	19	4	2		high			
0+200 - 0+300						98	good	Do nothing
	13	0.4	0.4		low			
0+300 - 0+400						98	good	Do nothing
	10	12		length	low			
	10	1		width	low			
	10	2		length	low			
	10	2.5		width	low			
0+400 - 0+500						84	satisfactory	preventative maintenance
	10	3.7		width	low			
	19	10	0.7		high			
	10	2.5		width	meduim			
0+500 - 0+600						83	satisfactory	preventative maintenance
	10	2		width	low			
	11	4.3	2.8		meduim			
	13	1	1		meduim			
0+600 - 0+700						86	good	Do nothing
	10	30		length	meduim			
	13	1.2	0.8		meduim			
	10	4		length	low			
0+700 - 0+800						100	good	Do nothing
	11	1.5	0.3		low			
	10	1		width	low			
	10	1		width	low			
0+800 - 0+900						94	good	Do nothing
	19	14	0.8		low			
	10	1		length	low			
	10	2		width	low			
	1	1.5	1		low			
0+900 - 1+000						91	good	Do nothing
	13	1	0.4		meduim			
	11	6	0.5		meduim			
	10	3		width	low			
1+000 - 1+100						92	good	Do nothing
	10	1		length	low			
	6	6	0.2		meduim			
1+100 - 1+200						38	very poor	reconstruction
	10	4		width	low			
	10	5		width	low			
	10	5		width	meduim			
	6	1	0.5		low			
	6	1.2	0.7		meduim			
	11	2	2		meduim			
	11	11	6		high			

Table 3.3 shows the results of Mohammad Ben Rashid Al-Maktoum Street.

Table 3.3: Mohammad Ben Rashid Al-Maktoum (Right Direction)

Section	Distress Types	Length	Width	L/W	Degree Of Distress	PCI	Rate	Treatment
0 - 0+100						62	fair	resurface
	1	18.9	2.1		high			
	1	65	2.35		high			
	1	9.3	2		meduim			
0+100 - 0+200						58	fair	resurface
	1	18	2.5		high			
	1	17	1		high			
	13	1	0.5		Low			
	11	2	0.5		Low			
	1	40	2		high			
	1	35	2		high			
0+200 - 0+300						63	fair	resurface
	1	80	2		high			
	3	20	1.5		meduim			
0+300 - 0+400						59	fair	resurface
	1	100	2.6		high			
0+400 - 0+500						59	fair	resurface
	1	100	2.6		high			
0+500 - 0+600						58	fair	resurface
	3	20	2.8		Low			
	1	80	2.8		high			
	13	1	0.3		Low			
0+600 - 0+700						74	satisfactory	resurface
	1	35	2.8		meduim			
	1	60	1.5		meduim			
0+700 - 0+800						81	satisfactory	preventative maintenance
	1	70	1		meduim			
	1	30	1.2		Low			
0+800 - 0+900						81	satisfactory	preventative maintenance
	1	80	3.5		Low			
	10	10		Length	meduim			
0+900 - 1+000						82	good	preventative maintenance
	11	5	7		Low			
	1	30	1		meduim			

Table 3.3: Mohammad Ben Rashid Al-Maktoum (Right Direction)

1+000 - 1+100						87	good	Do nothing
	11	2	7		meduim			
	1	20	1.5		meduim			
1+100 - 1+200						83	satisfactory	reventative maintenanc
	1	12	0.7		Low			
	1	7	3.5		high			
1+200 - 1+300						87	good	Do nothing
	1	4	3		high			
1+300 - 1+400						81	satisfactory	reventative maintenanc
	1	17	2		meduim			
	1	45	1.2		meduim			
1+400 - 1+500						59	fair	resurface
	1	100	2.5		high			
1+500 - 1+600						51	poor	rehabilitation
	1	100	4.5		high			
1+600 - 1+700						57	fair	rehabilitation
	1	100	3		high			
1+700 - 1+800						68	fair	resurface
	1	90	5		meduim			
1+800 - 1+900						57	fair	rehabilitation
	1	30	2		high			
	1	50	4		high			
1+900 - 2+000						51	poor	rehabilitation
	1	100	4		high			
2-000 - 2+100						65	fair	resurface
	1	17	0.5		meduim			
	1	50	2.5		high			
2+100 - 2+200						55	poor	rehabilitation
	1	20	4		meduim			
	1	70	3.5		high			
2+200 - 2+300						51	poor	rehabilitation
	1	100	4		high			
2+300 - 2+400						49	poor	rehabilitation
	1	100	4		high			
	13	0.4	0.4		Low			
2+400 - 2+500						62	fair	resurface
	1	25	4		high			
	13	0.5	0.5		meduim			
	1	3	0.7		high			
2+500 - 2+530						83	satisfactory	reventative maintenanc
	1	8	1		high			
	6	2	1		meduim			
	6	1	1		Low			
	1	2	1		high			

Table 3.3: Mohammad Ben Rashid Al-Maktoum (Left Direction)

Section	stress Typ	Length	Width	L/W	Degree Of Distress	PCI	Rate	Treatment
0 - 0+100						92	good	do nothing
	1	9.3	1.1		meduim			
	3	13.3	4.2		meduim			
0+100 - 0+200						50	poor	rehabilitation
	1	18	4		high			
	1	17	2.5		high			
	1	40	4		high			
	1	35	4		high			
0+200 - 0+300						49	poor	rehabilitation
	1	100	4		high			
	11	1	0.4		meduim			
0+300 - 0+400						49	poor	rehabilitation
	1	100	4.5		high			
	13	0.5	0.5		meduim			
0+400 - 0+500						91	good	do nothing
	3	100	4.5		meduim			
0+500 - 0+600						64	fair	reconstruction
	3	20	3.5		meduim			
	13	1	0.4		meduim			
	1	80	4.5		high			
0+600 - 0+700						51	poor	rehabilitation
	1	35	4.5		meduim			
	6	2	1		meduim			
	1	60	4		high			
0+700 - 0+800						54	poor	rehabilitation
	1	70	4.5		high			
	3	30	4.5		meduim			
0+800 - 0+900						91	good	do nothing
	3	100	4		meduim			
	10	8		Length	meduim			
0+900 - 1+000						84	satisfactory	ıreventative maintenance
	1	17	1.2		Low			
	1	10	2		high			
1+000 - 1+100						59	fair	resurface
	1	75	3		high			
1+100 - 1+200						82	satisfactory	ıreventative maintenance
	1	15	1		meduim			
	1	10	0.7		meduim			
	3	20	3		meduim			
	1	7	3.5		high			
1+200 - 1+300						60	fair	resurface
	1	40	4		high			
	1	20	3.5		high			

Table 3.3: Mohammad Ben Rashid Al-Maktoum (Left Direction)

1+300 - 1+400						71	satisfactory	resurface
	3	20	4.5		meduim			
	1	70	3		meduim			
1+400 - 1+500						56	fair	rehabilitation
	3	15	4.5		high			
	1	80	3.5		high			
1+500 - 1+600						54	poor	rehabilitation
	1	100	3.5		high			
1+600 - 1+700						74	satisfactory	resurface
	3	60	3.5		meduim			
	1	35	2		high			
1+700 - 1+800						65	fair	resurface
	1	100	5.5		meduim			
1+800 - 1+900						56	fair	rehabilitation
	1	30	4		high			
	1	50	3		high			
1+900 - 2+000						68	fair	resurface
	1	100	2.8		meduim			
2+000 - 2+100						61	fair	resurface
	1	45	1		high			
	1	50	3		high			
2+100 - 2+200						72	satisfactory	resurface
	1	20	4		meduim			
	1	50	2.5		meduim			
2+200 - 2+300						71	satisfactory	resurface
	1	60	3		meduim			
	6	1	0.5		meduim			
2+300 - 2+400						58	fair	resurface
	1	40	3		high			
	1	35	2.5		high			
	13	0.6	0.6		meduim			
2+400 - 2+500						73	satisfactory	resurface
	1	25	2.8		high			
	1	4	1.5		meduim			
	13	0.3	0.3		meduim			
2+500 - 2+530						82	satisfactory	reventative maintenance
	1	10	1		high			
	1	2	1		high			
	1	3	1.5		high			
	6	0.8	0.5		high			

Table 3.4 shows the results of Tunis Street.

Table 3.4: Tunis Street (Right Direction)

Section	Distress Types	Length	Width	Length/Width	Degree Of Distress	PCI	Rate	Treatment
0-0+100						97	good	Do nothing
	1	7.5	0.2		low			
	10	7		Width	low			
0+100-0+200						96	good	Do nothing
	6	2	0.5		low			
0+200-0+300						99	good	Do nothing
	17	0.5	0.1		low			
0+300-0+400						71	satisfactory	resurface
	10	4		Width	low			
	13	0.5	0.5		high			
	10	12		Length	low			
	4	8	3		low			
	1	3	0.4		high			
	13	1	0.8		meduim			
0+400-0+500						100	good	Do nothing
0+500-0+600						78	satisfactory	preventative maintenance
	13	0.4	0.3		low			
	11	3	4		meduim			
	17	1.5	1		high			
	13	2	0.5		meduim			
	6	0.4	0.4		meduim			
	17	2	1		high			
0+600-0+700						100	good	Do nothing
0+700-0+800						100	good	Do nothing
	10	8		Width	low			
0+800-0+900						100	good	Do nothing
0+900-1+00						100	good	Do nothing
1+00-1+100						79	saticfactory	preventative maintenance
	6	3	1		high			
	11	7	0.5		high			
1+100-1+150						100	good	Do nothing

Table 3.4: Tunis Street (Left Direction)

Section	Distress Types	Length	Width	Length/Width	Degree Of Distress	PCI	Rate	Treatment
0 - 0+100						100	good	Do nothing
	10	3		Length	low			
	10	7		Width	low			
0+100-0+200						100	good	Do nothing
	11	1	1		low			
0+200-0+300						100	good	Do nothing
0+300-0+400						100	good	Do nothing
0+400-0+500						100	good	Do nothing
0+500-0+600						100	good	Do nothing
0+600-0+700						100	good	Do nothing
0+700-0+800						100	good	Do nothing
	11	1.3	1		low			
0+800-0+900						94	good	Do nothing
	13	0.8	0.8		meduim			
0+900-1+00						100	good	Do nothing
1+00-1+100						100	good	Do nothing
1+100-1+150						100	good	Do nothing

The unit price per meter square for each maintenance strategy is presented in Table ****

Type of treatments	Maintenance cost per square meter (NIS)
Do nothing	0
Preventative maintenance	30
Resurface	35
Rehabilitation	45
Reconstruction	55

Table ** Cost of maintenance strategies per square meter**

3.4 PCI rating

The PCI rating based on Figure 3.1 for the three streets is illustrated in the following figures. Figures 3.18-3.23 show the seven-scale PCI rating and the number of sections in each category for each street. The ratings for both directions and the percentage of each are also presented in these figures.

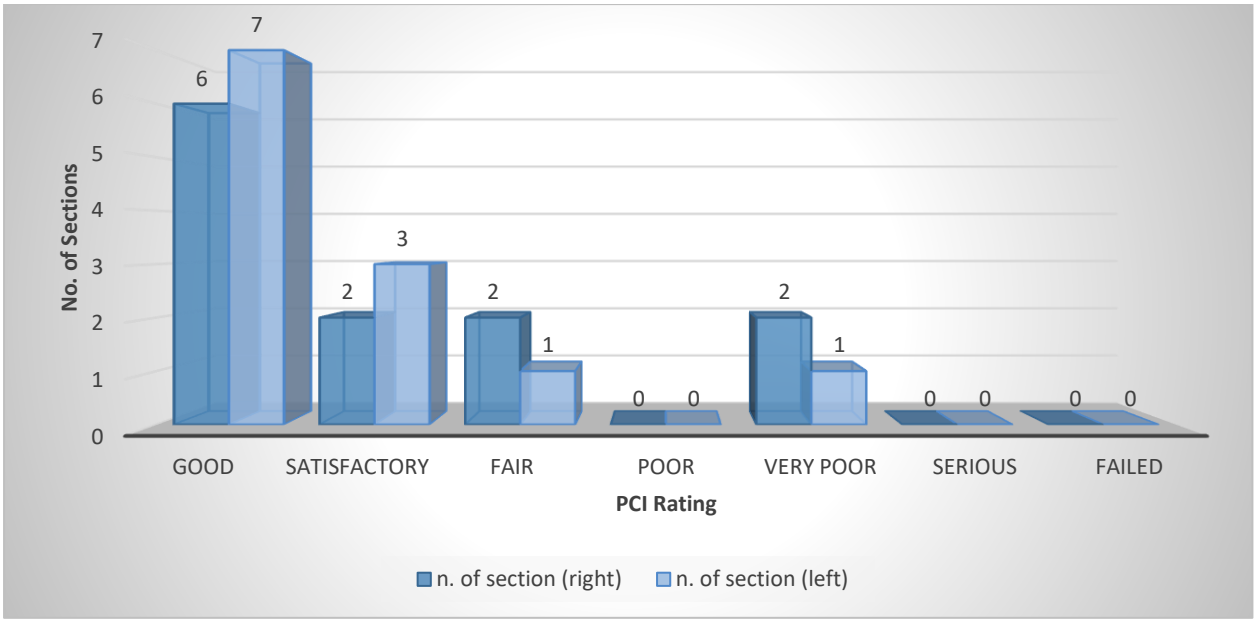


Figure 3.18: Number of sections based on PCI rating for Yafa Street

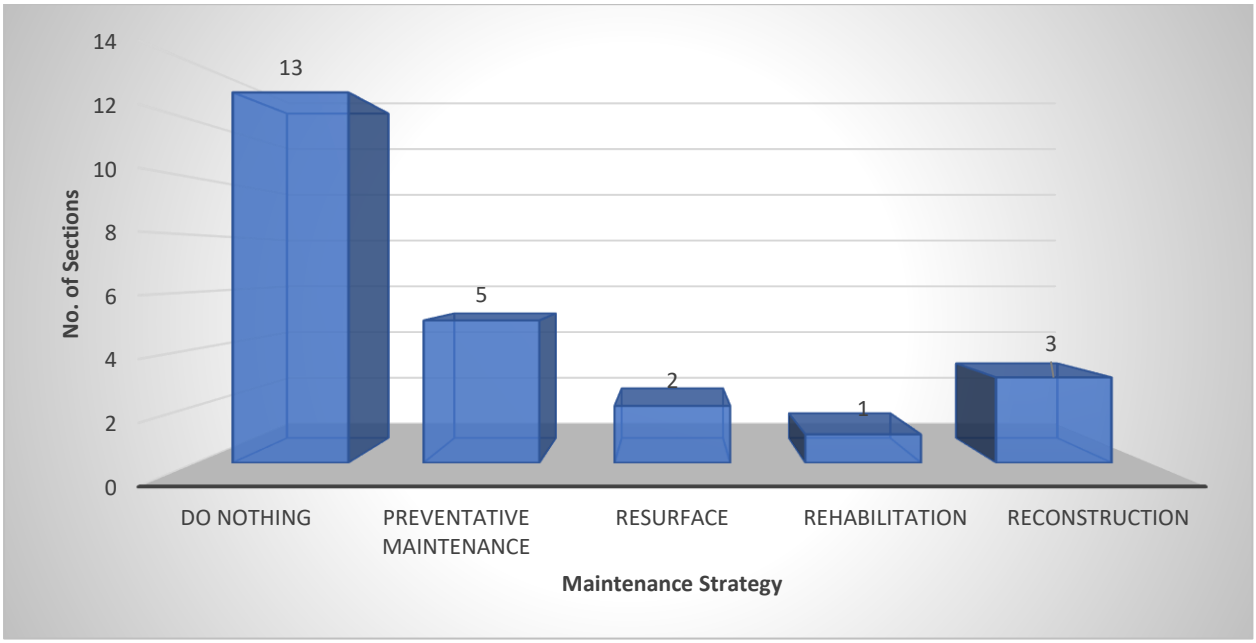


Figure 3.19: Number of sections based on maintenance strategies rating for Yafa Street

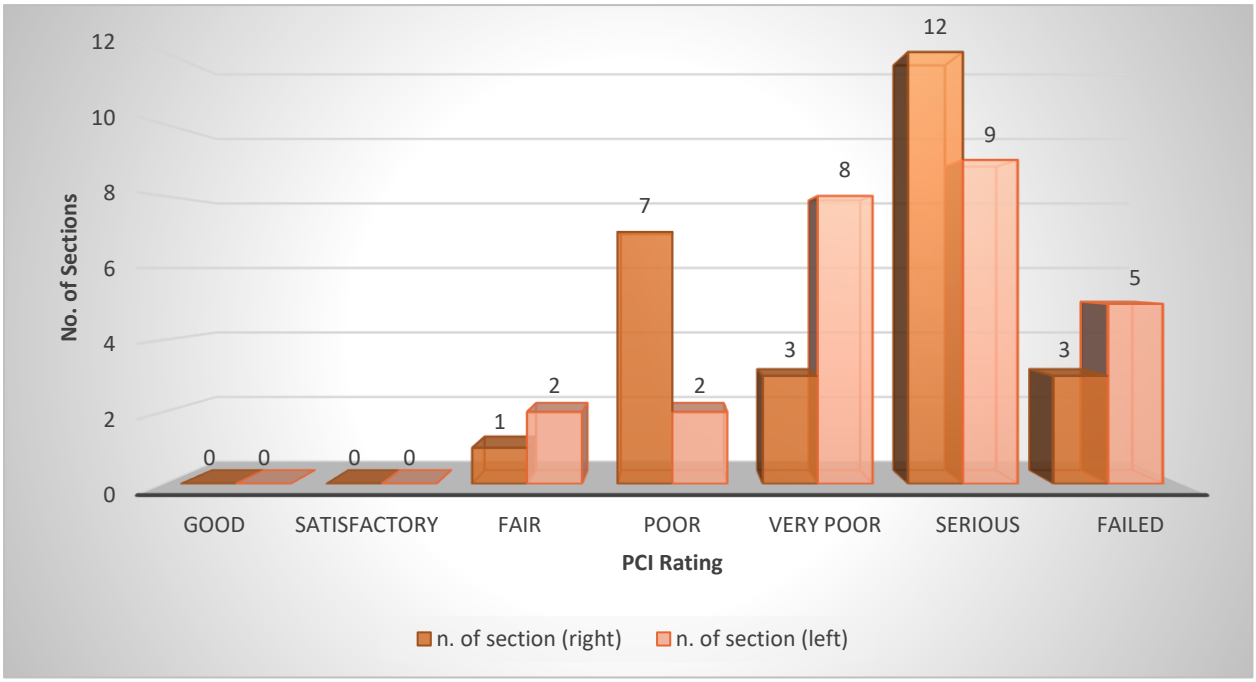


Figure 3.20: Number of sections based based on PCI rating for Mohammad Ben Rashid Al-Maktoum Street

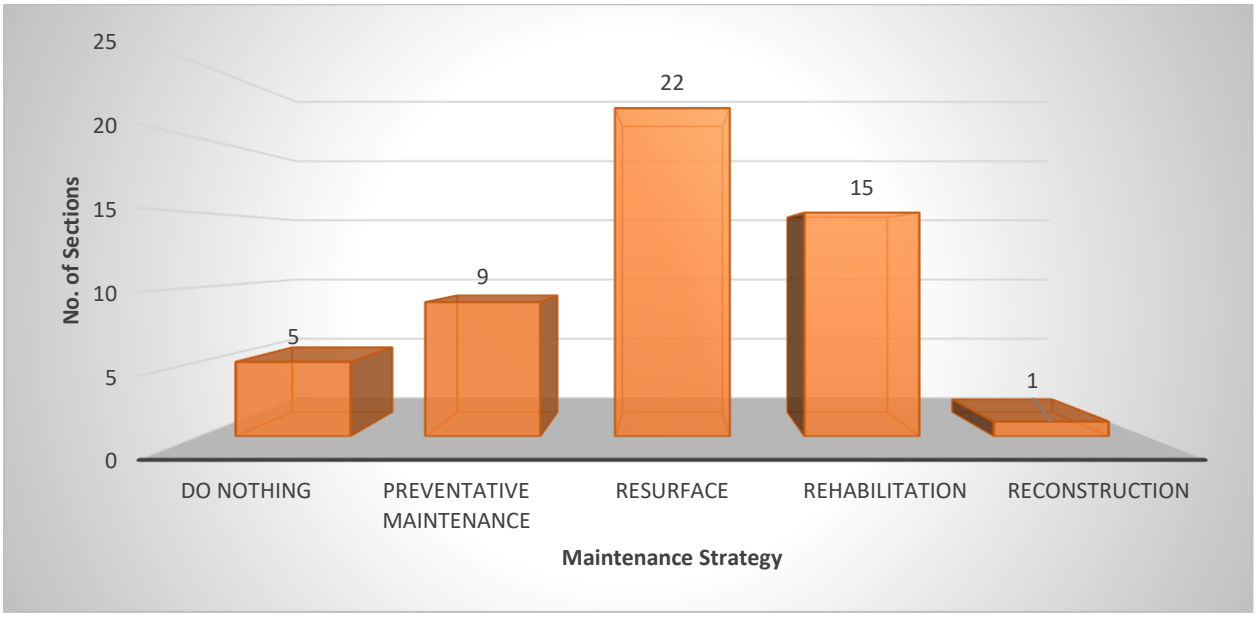


Figure 3.21: Number of sections based on maintenance strategies rating for Mohammad Ben Rashid Al-Maktoum Street

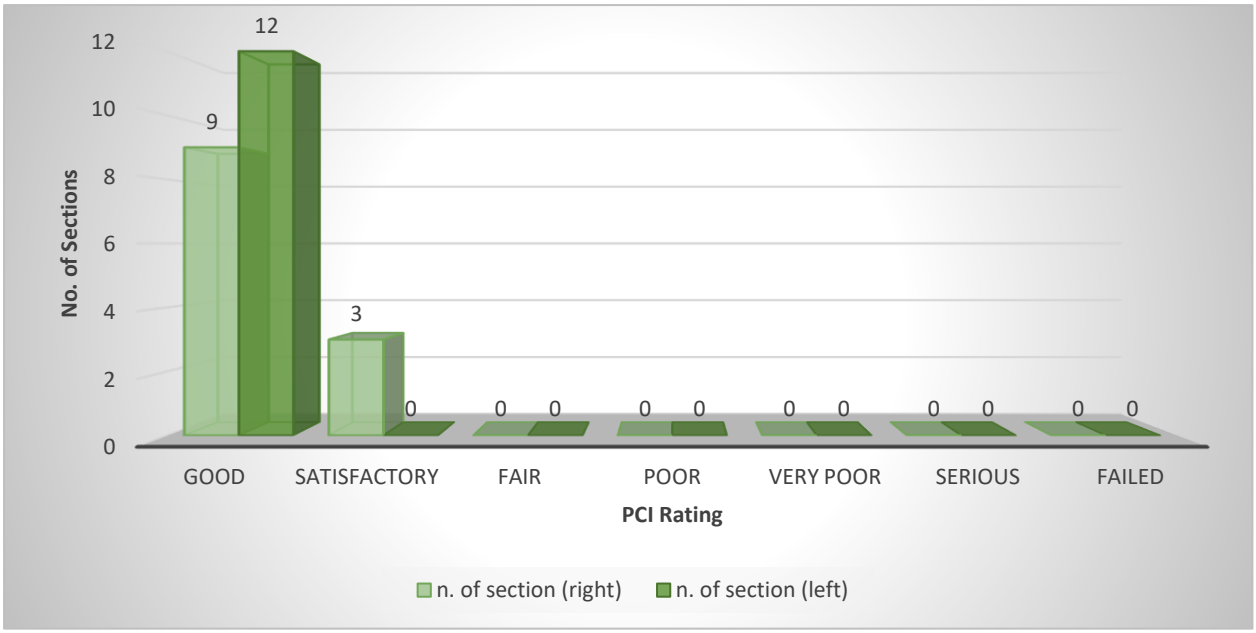


Figure 3.22: Number of sections based based on PCI rating for Tunis Street

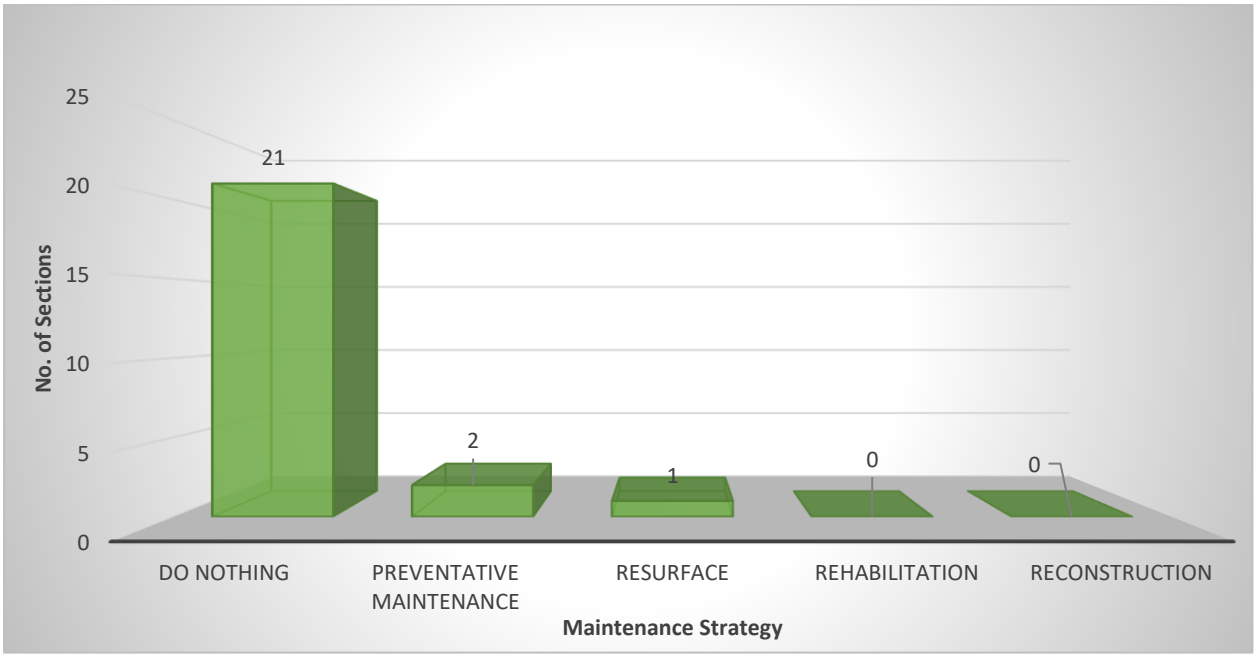


Figure 3.23: Number of sections based on maintenance strategies rating for Tunis Street

3.5 Survey results

# expert	pavment condition	Road Classification	Traffic Volume	Maintenance Cost	Number of accidents	People Complaints	total
1	25	15	15	10	30	5	100
2	25	15	20	10	10	20	100
3	20	10	25	20	15	10	100
4	40	15	15	10	10	10	100
5	40	5	5	20	15	15	100
6	20	15	20	10	20	15	100
7	30	20	20	10	15	5	100
8	20	20	20	10	15	15	100
9	25	15	10	20	15	15	100
10	25	10	15	15	20	15	100
11	30	5	20	20	15	10	100
12	40	10	30	5	10	5	100
13	35	20	25	10	5	5	100
14	30	15	20	10	5	20	100
15	20	10	35	10	5	20	100
16	10	20	40	10	5	15	100
17	20	15	20	15	10	20	100
18	20	20	20	25	5	10	100
19	20	20	20	10	15	15	100
20	20	25	20	10	15	10	100
21	55	12	9	4	10	10	100
22	50	20	15	5	5	5	100
23	15	20	20	10	30	5	100
24	30	15	25	10	15	5	100
25	20	25	10	10	25	10	100
26	30	15	25	10	15	5	100
27	20	30	15	5	25	5	100
28	30	15	15	10	20	10	100
29	40	12	13	12	13	10	100
30	45	12	13	10	15	5	100
31	50	15	10	10	10	5	100
32	20	15	15	10	20	20	100
33	65	7	0	10	10	8	100
34	40	13	12	15	10	10	100
35	50	6	15	12	10	7	100
avarage	30.714	15.20	17.914	11.514	13.943	10.714	100%

figure 3.24: the data we obtained from experts/institutions.

The table above represents the results of a questionnaire distributed to (35) experts in the fields of civil engineering and road and transportation engineering. The table shows the relative weights assigned by the experts to each of the criteria for evaluating the condition of the streets, which are: 1) pavement condition. 2) road classification. 3) traffic volume. 4) maintenance cost. 5) number of accidents. 6) citizen complaints.

The results indicate that the **pavement condition** criterion received the highest weight with an average of **30.714%**, reflecting its great importance in determining maintenance priorities. It is followed by the **traffic volume** criterion with an average of **17.914%**, which reflects the extent to which traffic density affects determining maintenance priorities. In contrast, the **maintenance cost** criteria **11.514%** and **citizen complaints 10.714%** received relatively lower weights, indicating that experts attach greater importance to technical and objective factors than to financial factors or citizen complaints.

The table also shows that the **total weights** for each expert are **100%**, reflecting a relatively balanced distribution among the criteria. These data reflect a general consensus among experts on the importance of each criterion, with some variations that may be due to each expert's experience or specialized perspective.

These results demonstrate a clear and precise methodology for setting priorities, which supports informed decision-making to improve the street infrastructure in Nablus.

In addition to the previous analysis, it can be noted that the relative weights reflect the experts' views on the factors that most influence the determination of maintenance needs. **The number of accidents** criterion, which received an average weight of **13.943%**, indicates the importance of traffic safety in the priority assessment. Although this criterion was not the highest weight, it reflects a pivotal role in improving road safety and reducing the risks associated with accidents.

On the other hand, the **road classification** criterion with an average weight of **15.20%** shows the importance of the street classification degree in the public transportation system, as these weights indicate that the streets with the highest classification need more attention due to their vital role in traffic and mobility.

The small differences between the weights indicate that there is relative agreement among the experts on the relative importance of the criteria, which enhances the reliability of the results. However, some variations in the weights can be observed among the experts, which may reflect differences in priorities depending on the expertise of each expert or the nature of the organization they represent.

Overall, these results provide a solid basis for developing a practical classification system that helps in making informed decisions regarding street maintenance. It also emphasizes the importance of combining technical and objective factors, such as pavement condition and traffic volume, with social factors such as citizen complaints, to ensure a balance between technical needs and local community satisfaction.

3.6 calculate PI for Yafa Street

section	pavment conditions		Road Classification		Traffic Volume		Maintenance Cost		No. of Accidents		People Complaints		∑wi*fi
	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	
yafa street (right)													
0 - 0+100	0.3071	45	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	55.6
0+100 - 0+200	0.3071	48	0.152	75	0.1791	83.333	0.1151	64.286	0.1394	75	0.1071	65	65.9
0+200 - 0+300	0.3071	20	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	49.9
0+300 - 0+400	0.3071	0	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	43.7
0+400 - 0+500	0.3071	35	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	59.4
0+500 - 0+600	0.3071	0	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	48.7
0+600 - 0+700	0.3071	13	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	47.7
0+700 - 0+800	0.3071	0	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	43.7
0+800 - 0+900	0.3071	5	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	45.3
0+900 - 1+000	0.3071	15	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	48.3
1+000 - 1+100	0.3071	9	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	46.5
1+100 - 1+200	0.3071	42	0.152	75	0.1791	83.333	0.1151	78.571	0.1394	75	0.1071	65	65.7
yafa street (left)													
0 - 0+100	0.3071	23	0.152	75	0.1791	83.333	0.1151	78.571	0.1394	75	0.1071	65	59.8
0+100 - 0+200	0.3071	43	0.152	75	0.1791	83.333	0.1151	78.571	0.1394	75	0.1071	65	66.0
0+200 - 0+300	0.3071	2	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	49.3
0+300 - 0+400	0.3071	2	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	44.4
0+400 - 0+500	0.3071	16	0.152	75	0.1791	83.333	0.1151	50.000	0.1394	75	0.1071	65	54.4
0+500 - 0+600	0.3071	17	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	49.0
0+600 - 0+700	0.3071	14	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	48.0
0+700 - 0+800	0.3071	0	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	43.7
0+800 - 0+900	0.3071	6	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	45.6
0+900 - 1+000	0.3071	9	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	51.4
1+000 - 1+100	0.3071	8	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	46.2
1+100 - 1+200	0.3071	62	0.152	75	0.1791	83.333	0.1151	50.000	0.1394	75	0.1071	65	68.5

table ( ) shows ∑**wi*fi** for Yafa Street

The results of the analysis of Yafa Street indicate that maintenance priorities differ between the different sections, as the street was divided into sections of 100 meters each. The final values of the priority factor **(PI = ∑wi*fi)** showed that the (1+100 - 1+200) section is the most in need of maintenance on both the right and left sides, as it obtained the highest values (65.7 for the right side and 68.5 for the left side). This is due to a clear deterioration in the condition of the pavement, an increase in the number of accidents, or a large number of citizen complaints. On the other hand, the lowest values of the priority factor were on the right side of the (0+800 - 0+900) section (43.7), and on the left side of the (0+700 - 0+800) section (44.7), indicating that these sections are in a relatively better condition and do not require urgent maintenance.

Based on these results, the competent authorities can determine priorities, where they should start with the sections with the highest priority factor values and allocate the necessary resources to address them. This analysis helps to improve the overall quality of the street and ensure its sustainability to meet the needs of users.

3.6 calculate PI for Tounes Street

section	pavment conditions		Road Classification		Traffic Volume		Maintenance Cost		No. of Accidents		People Complaints		∑wi*fi
	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	
Tounes (right)													
0 - 0+100	0.3071	3	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	42.8
0+100 - 0+200	0.3071	4	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	43.1
0+200 - 0+300	0.3071	1	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	42.1
0+300 - 0+400	0.3071	29	0.152	100	0.1791	88.889	0.1151	50.000	0.1394	50	0.1071	35	56.5
0+400 - 0+500	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+500 - 0+600	0.3071	22	0.152	100	0.1791	88.889	0.1151	42.857	0.1394	50	0.1071	35	53.5
0+600 - 0+700	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+700 - 0+800	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+800 - 0+900	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+900 - 1+000	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
1+000 - 1+100	0.3071	21	0.152	100	0.1791	88.889	0.1151	42.857	0.1394	50	0.1071	35	53.2
1+100 - 1+200	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
Tounes (left)													
0 - 0+100	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+100 - 0+200	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+200 - 0+300	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+300 - 0+400	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+400 - 0+500	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+500 - 0+600	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+600 - 0+700	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+700 - 0+800	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+800 - 0+900	0.3071	6	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	43.7
0+900 - 1+000	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
1+000 - 1+100	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
1+100 - 1+200	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8

table ( ) shows ∑**wi*fi** for Yafa Street

Right side: A significant increase in the Priority Index (PI) is observed for the section between km 0+300 and 0+400, indicating an urgent need for maintenance in this particular section. This increase may be due to a clear deterioration in the condition of the pavement, an increase in the number of accidents, or citizen complaints.
Left side: In general, the sections on the left side show low PI values, indicating a relatively good condition of the road. However, there is a slight increase in the PI for the section between km 0+900 and 1+000, which requires further follow-up.

Maintenance priorities Based on these results, the focus should be on maintaining the section between km 0+300 and 0+400 on the right side of the street.
Continuous monitoring All sections of the street should be monitored periodically to detect any deterioration in condition.

3.7 calculate PI for Mohammad Ben Rashid Al-Maktoum Street

section	pavment conditions		Road Classification		Traffic Volume		Maintenance Cost		No. of Accidents		People Complaints		∑wi*fi
	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	
25th street (right)													
0 - 0+100	0.3071	38	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.7
0+100 - 0+200	0.3071	42	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	66.0
0+200 - 0+300	0.3071	37	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.4
0+300 - 0+400	0.3071	41	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.7
0+400 - 0+500	0.3071	41	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.7
0+500 - 0+600	0.3071	42	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	66.0
0+600 - 0+700	0.3071	26	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	61.0
0+700 - 0+800	0.3071	19	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	58.1
0+800 - 0+900	0.3071	19	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	58.1
0+900 - 1+000	0.3071	18	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.8
1+000 - 1+100	0.3071	13	0.152	100	0.1791	100.000	0.1151	35.714	0.1394	25	0.1071	100	55.4
1+100 - 1+200	0.3071	17	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.5
1+200 - 1+300	0.3071	13	0.152	100	0.1791	100.000	0.1151	35.714	0.1394	25	0.1071	100	55.4
1+300 - 1+400	0.3071	19	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	58.1
1+400 - 1+500	0.3071	41	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.7
1+500 - 1+600	0.3071	49	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	69.8
1+600 - 1+700	0.3071	43	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	67.9
1+700 - 1+800	0.3071	32	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	62.9
1+800 - 1+900	0.3071	43	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	67.9
1+900 - 2+000	0.3071	49	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	69.8
2-000 - 2+100	0.3071	35	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	63.8
2+100 - 2+200	0.3071	45	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.5
2+200 - 2+300	0.3071	49	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	69.8
2+300 - 2+400	0.3071	51	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	70.4
2+400 - 2+500	0.3071	38	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.7
2+500 - 2+530	0.3071	17	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.5
25th street (left)													
0 - 0+100	0.3071	8	0.152	100	0.1791	100.000	0.1151	0.000	0.1394	25	0.1071	100	49.8
0+100 - 0+200	0.3071	50	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	70.1
0+200 - 0+300	0.3071	51	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	70.4
0+300 - 0+400	0.3071	51	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	70.4
0+400 - 0+500	0.3071	9	0.152	100	0.1791	100.000	0.1151	0.000	0.1394	25	0.1071	100	50.1
0+500 - 0+600	0.3071	36	0.152	100	0.1791	100.000	0.1151	78.571	0.1394	25	0.1071	100	67.4
0+600 - 0+700	0.3071	49	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	69.8
0+700 - 0+800	0.3071	46	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.8
0+800 - 0+900	0.3071	9	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	55.0
0+900 - 1+000	0.3071	16	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.2
1+000 - 1+100	0.3071	41	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.7
1+100 - 1+200	0.3071	18	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.8
1+200 - 1+300	0.3071	40	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.3
1+300 - 1+400	0.3071	29	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	62.0
1+400 - 1+500	0.3071	44	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.2
1+500 - 1+600	0.3071	46	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.8
1+600 - 1+700	0.3071	26	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	61.0
1+700 - 1+800	0.3071	35	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	63.8
1+800 - 1+900	0.3071	44	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.2
1+900 - 2+000	0.3071	32	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	62.9
2-000 - 2+100	0.3071	39	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.0
2+100 - 2+200	0.3071	28	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	61.7
2+200 - 2+300	0.3071	29	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	62.0
2+300 - 2+400	0.3071	42	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	66.0
2+400 - 2+500	0.3071	27	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	61.4
2+500 - 2+530	0.3071	18	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.8

table ( ) shows ∑**wi*fi** for Yafa Street

The results indicate that both sides need immediate maintenance and effective treatment

The analysis of 25th Street data shows a slight variation in the condition of the pavement between the right and left sides. In general, the left side of the street shows a better condition compared to the right side, with most sections of the left side recording lower Priority Index values. However, there are some sections on the left side, such as the section between km 0+900 and 1+000, that achieved relatively higher Priority Index values compared to the rest of the sections on the same side. As for the right side, it showed a greater variation in Priority Index values between the different sections, with one section achieving the highest Priority Index value across the entire street. In general, the results indicate that both sides need regular maintenance, with a greater focus on the sections that recorded the highest Priority Index values.

3.8 Sort sections in descending order

section	pavment conditions		Road Classification		Traffic Volume		Maintenance Cost		No. of Accidents		People Complaints		∑wi*fi
	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	Wi	Fi	∑wi*fi
2+300 - 2+400	0.3071	51	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	70.4
0+200 - 0+300	0.3071	51	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	70.4
0+300 - 0+400	0.3071	51	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	70.4
0+100 - 0+200	0.3071	50	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	70.1
1+500 - 1+600	0.3071	49	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	69.8
1+900 - 2+000	0.3071	49	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	69.8
2+200 - 2+300	0.3071	49	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	69.8
0+600 - 0+700	0.3071	49	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	69.8
0+700 - 0+800	0.3071	46	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.8
1+500 - 1+600	0.3071	46	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.8
1+100 - 1+200	0.3071	62	0.152	75	0.1791	83.333	0.1151	50.000	0.1394	75	0.1071	65	68.5
2+100 - 2+200	0.3071	45	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.5
1+400 - 1+500	0.3071	44	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.2
1+800 - 1+900	0.3071	44	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	68.2
1+600 - 1+700	0.3071	43	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	67.9
1+800 - 1+900	0.3071	43	0.152	100	0.1791	100.000	0.1151	64.286	0.1394	25	0.1071	100	67.9
0+500 - 0+600	0.3071	36	0.152	100	0.1791	100.000	0.1151	78.571	0.1394	25	0.1071	100	67.4
0+100 - 0+200	0.3071	43	0.152	75	0.1791	83.333	0.1151	78.571	0.1394	75	0.1071	65	66.0
0+100 - 0+200	0.3071	42	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	66.0
0+500 - 0+600	0.3071	42	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	66.0
2+300 - 2+400	0.3071	42	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	66.0
0+100 - 0+200	0.3071	48	0.152	75	0.1791	83.333	0.1151	64.286	0.1394	75	0.1071	65	65.9
1+100 - 1+200	0.3071	42	0.152	75	0.1791	83.333	0.1151	78.571	0.1394	75	0.1071	65	65.7
0+300 - 0+400	0.3071	41	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.7
0+400 - 0+500	0.3071	41	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.7
1+400 - 1+500	0.3071	41	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.7
1+000 - 1+100	0.3071	41	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.7
1+200 - 1+300	0.3071	40	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.3
2-000 - 2+100	0.3071	39	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	65.0
0 - 0+100	0.3071	38	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.7
2+400 - 2+500	0.3071	38	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.7
0+200 - 0+300	0.3071	37	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.4
2-000 - 2+100	0.3071	35	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	63.8
0 - 0+100	0.3071	38	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.7
2+400 - 2+500	0.3071	38	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.7
0+200 - 0+300	0.3071	37	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	64.4
2-000 - 2+100	0.3071	35	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	63.8
1+700 - 1+800	0.3071	35	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	63.8
1+700 - 1+800	0.3071	32	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	62.9
1+900 - 2+000	0.3071	32	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	62.9
1+300 - 1+400	0.3071	29	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	62.0
2+200 - 2+300	0.3071	29	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	62.0
2+100 - 2+200	0.3071	28	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	61.7
2+400 - 2+500	0.3071	27	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	61.4
0+600 - 0+700	0.3071	26	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	61.0
1+600 - 1+700	0.3071	26	0.152	100	0.1791	100.000	0.1151	50.000	0.1394	25	0.1071	100	61.0
0 - 0+100	0.3071	23	0.152	75	0.1791	83.333	0.1151	78.571	0.1394	75	0.1071	65	59.8
0+400 - 0+500	0.3071	35	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	59.4
0+700 - 0+800	0.3071	19	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	58.1
0+800 - 0+900	0.3071	19	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	58.1
1+300 - 1+400	0.3071	19	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	58.1
0+900 - 1+000	0.3071	18	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.8
1+100 - 1+200	0.3071	18	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.8
2+500 - 2+530	0.3071	18	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.8
1+100 - 1+200	0.3071	17	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.5
2+500 - 2+530	0.3071	17	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.5
0+900 - 1+000	0.3071	16	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	57.2
0+300 - 0+400	0.3071	29	0.152	100	0.1791	88.889	0.1151	50.000	0.1394	50	0.1071	35	56.5
0 - 0+100	0.3071	45	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	55.6
1+000 - 1+100	0.3071	13	0.152	100	0.1791	100.000	0.1151	35.714	0.1394	25	0.1071	100	55.4
1+200 - 1+300	0.3071	13	0.152	100	0.1791	100.000	0.1151	35.714	0.1394	25	0.1071	100	55.4
0+800 - 0+900	0.3071	9	0.152	100	0.1791	100.000	0.1151	42.857	0.1394	25	0.1071	100	55.0
0+400 - 0+500	0.3071	16	0.152	75	0.1791	83.333	0.1151	50.000	0.1394	75	0.1071	65	54.4
0+500 - 0+600	0.3071	22	0.152	100	0.1791	88.889	0.1151	42.857	0.1394	50	0.1071	35	53.5
1+000 - 1+100	0.3071	21	0.152	100	0.1791	88.889	0.1151	42.857	0.1394	50	0.1071	35	53.2
0+900 - 1+000	0.3071	9	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	51.4
0+400 - 0+500	0.3071	9	0.152	100	0.1791	100.000	0.1151	0.000	0.1394	25	0.1071	100	50.1
0+200 - 0+300	0.3071	20	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	49.9
0+200 - 0+300	0.3071	2	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	49.3
0+500 - 0+600	0.3071	17	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	49.0
0+500 - 0+600	0.3071	0	0.152	75	0.1791	83.333	0.1151	42.857	0.1394	75	0.1071	65	48.7
0+900 - 1+000	0.3071	15	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	48.3
0+600 - 0+700	0.3071	14	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	48.0
0+600 - 0+700	0.3071	13	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	47.7
1+000 - 1+100	0.3071	9	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	46.5
1+000 - 1+100	0.3071	8	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	46.2
0+800 - 0+900	0.3071	6	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	45.6
0+800 - 0+900	0.3071	5	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	45.3
0+300 - 0+400	0.3071	2	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	44.4
0+300 - 0+400	0.3071	0	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	43.7
0+700 - 0+800	0.3071	0	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	43.7
0+700 - 0+800	0.3071	0	0.152	75	0.1791	83.333	0.1151	0.000	0.1394	75	0.1071	65	43.7
0+800 - 0+900	0.3071	6	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	43.7
0+100 - 0+200	0.3071	4	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	43.1
0 - 0+100	0.3071	3	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	42.8
0+200 - 0+300	0.3071	1	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	42.1
0+400 - 0+500	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+600 - 0+700	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+700 - 0+800	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+800 - 0+900	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+900 - 1+000	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
1+100 - 1+200	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0 - 0+100	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+100 - 0+200	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+200 - 0+300	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+300 - 0+400	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+400 - 0+500	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+500 - 0+600	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+600 - 0+700	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+700 - 0+800	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
0+900 - 1+000	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
1+000 - 1+100	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8
1+100 - 1+200	0.3071	0	0.152	100	0.1791	88.889	0.1151	0.000	0.1394	50	0.1071	35	41.8

3.9 PI and maintenance cost for the (3) selected Street

Yafa:

section	∑wi*fi	cost (nis)
	Right	
0 - 0+100	55.6	315
0+100 - 0+200	65.9	1471
0+200 - 0+300	49.9	0
0+300 - 0+400	43.7	0
0+400 - 0+500	59.4	210
0+500 - 0+600	48.7	360
0+600 - 0+700	47.7	0
0+700 - 0+800	43.7	0
0+800 - 0+900	45.3	0
0+900 - 1+000	48.3	0
1+000 - 1+100	46.5	0
1+100 - 1+200	65.7	3630
	Left	
0 - 0+100	59.8	3465
0+100 - 0+200	66.0	3960
0+200 - 0+300	49.3	0
0+300 - 0+400	44.4	0
0+400 - 0+500	54.4	525
0+500 - 0+600	49.0	0
0+600 - 0+700	48.0	0
0+700 - 0+800	43.7	0
0+800 - 0+900	45.6	0
0+900 - 1+000	51.4	691
1+000 - 1+100	46.2	0
1+100 - 1+200	68.5	1155

TOUNES:

	Right	
0 - 0+100	42.8	0
0+100 - 0+200	43.1	0
0+200 - 0+300	42.1	0
0+300 - 0+400	56.5	840
0+400 - 0+500	41.8	0
0+500 - 0+600	53.5	360
0+600 - 0+700	41.8	0
0+700 - 0+800	41.8	0
0+800 - 0+900	41.8	0
0+900 - 1+000	41.8	0
1+000 - 1+100	53.2	105
	Left	
1+100 - 1+200	41.8	0
0 - 0+100	41.8	0
0+100 - 0+200	41.8	0
0+200 - 0+300	41.8	0
0+300 - 0+400	41.8	0
0+400 - 0+500	41.8	0
0+500 - 0+600	41.8	0
0+600 - 0+700	41.8	0
0+700 - 0+800	41.8	0
0+800 - 0+900	43.7	0
0+900 - 1+000	41.8	0
1+000 - 1+100	41.8	0
1+100 - 1+200	41.8	0

Mohammad Ben Rashid Al-Maktoum:

section	∑wi*fi	cost (nis)
	Right	
0 - 0+100	64.7	0
0+100 - 0+200	66.0	5997
0+200 - 0+300	64.4	1575
0+300 - 0+400	65.7	0
0+400 - 0+500	65.7	2800
0+500 - 0+600	66.0	0
0+600 - 0+700	61.0	1050
0+700 - 0+800	58.1	7800
0+800 - 0+900	58.1	7800
0+900 - 1+000	57.8	1680
1+000 - 1+100	55.4	0
1+100 - 1+200	57.5	2940
1+200 - 1+300	55.4	0
1+300 - 1+400	58.1	1080
1+400 - 1+500	65.7	9800
1+500 - 1+600	69.8	0
1+600 - 1+700	67.9	1350
1+700 - 1+800	62.9	490
1+800 - 1+900	67.9	1200
1+900 - 2+000	69.8	1105
2-000 - 2+100	63.8	420
2+100 - 2+200	68.5	0
2+200 - 2+300	69.8	2430
2+300 - 2+400	70.4	11250
2+400 - 2+500	64.7	15750
2+500 - 2+530	57.5	9000
	Left	
0 - 0+100	49.8	0
0+100 - 0+200	70.1	7300
0+200 - 0+300	70.4	3240
0+300 - 0+400	70.4	7200
0+400 - 0+500	50.1	0
0+500 - 0+600	67.4	3050
0+600 - 0+700	69.8	20250
0+700 - 0+800	68.8	5200
0+800 - 0+900	55.0	0
0+900 - 1+000	57.2	650
1+000 - 1+100	65.7	0
1+100 - 1+200	57.8	60
1+200 - 1+300	65.3	3500
1+300 - 1+400	62.0	4725
1+400 - 1+500	68.2	18000
1+500 - 1+600	68.8	6500
1+600 - 1+700	61.0	700
1+700 - 1+800	63.8	7875
1+800 - 1+900	68.2	675
1+900 - 2+000	62.9	2100
2-000 - 2+100	65.0	1050
2+100 - 2+200	61.7	2450
2+200 - 2+300	62.0	3150
2+300 - 2+400	66.0	2000
2+400 - 2+500	61.4	9800
2+500 - 2+530	57.8	10500

4.1 CONCLUSIONS

Overall, these results provide a solid basis for developing a practical classification system that helps in making informed decisions regarding street maintenance. It also emphasizes the importance of combining technical and objective factors, such as pavement condition and traffic volume, with social factors such as citizen complaints, to ensure a balance between technical needs and local community satisfaction.

From these data, it was determined that **pavement condition** is the most important factor in maintenance decisions, followed by **road classification** and **traffic volume**.

It was also suggested that maintenance costs should be weighted more heavily in some evaluations due to limited economic conditions. Based on these results, we recommended that pavement condition be the primary factor in determining maintenance priorities, with road classification and traffic volume being taken into account, and that the number of accidents and maintenance costs be used as supporting factors.

and the most critical sections of the road was found in Mohmmed Ben Rashid al-Maktoum

After calculated the value of PI for the three targeted roads by dividing each road into equal 100m length sections in both directions. Moreover, the corresponding rating and maintenance treatments were identified. The main results for each road were:

- The overall assessment of a significant portion of Yafa Street was fair to good conditions (87.5% of the sections). However, there are three sections within the street which has the rate of very poor 12.5%).
- The overall assessment of Tunis Street is fair to good for all sections. This means that currently no need for major maintenance activities.
- The overall assessment of Mohammad Ben Rashid Al-Maktoum street is poor to fair which presents about 94% of the total sections. The remaining 3 sections are rated from fair to good with about 6% of the total sections.
- The total expected costs for the three street are: 5200 (NIS), 1400 (NIS), and 175000 (NIS) for Yafa, Tunis, and Mohammad Ben Rashid Al-Maktoum, respectively.
- The total expected cost for the three streets is currently equal to 181600 (NIS).

4.2 Recommendations

The GP students recommend the following:

- Determine maintenance priorities and give priority to pavement conditions first.
- consider the results of this study in the future maintenance plans in Nablus.
- To apply detailed visual pavement inspection to the remaining roads based on their importance.
- To adopt the preventive maintenance strategy wherever possible.

4.3 REFERENCES:

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