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Peshawar Mor to New Islamabad Airport Metro Bus Project

by

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A project submitted in partial fulfillment for the
degree of Master of Science

in the

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First of all, I thank ALLAH Almighty who is the most merciful and beneficent. ALLAH created us and showed us a correct pathway. ALLAH always secretes sins and protects us from social troubles. I also dedicate my study to my grandfather and grandmother (late), my dearly loved parents.



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Abstract

The report is about a study of Project Management Plan (PMP) of Peshawar Mor to New Islamabad Airport Metro Bus Project executed by National Logistics Cell (NLC). For this purpose, actual data of Metro Bus Project was analyzed by using knowledge of PMP. The information is collected through Project Documents, Interviews of Project Managers in Metro Bus Project, Interviews of Project Managers in NLC and Organizational Process Asset. After the analysis, we evaluated the existing Metro Bus Project against the PMP template. In which we try to evaluate that whether the existing Metro Bus Project plan is based on the guidelines of project management plan template or not. To evaluate Metro Bus Project plan in the light of PMP template we try to establish a proper Change Control Flow Chart. Risk Register also established on the basis of information given in their Metro Bus Project plan.

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Abbreviations

NLC	National Logistics Cell
NIIA	New Islamabad International Airport
M1	Motorway 1
M2	Motorway 2
NUST	National University of Sciences and Technology
KM	Kilo Meter
NESPAK	National Engineering Services Pakistan Private Limited
NHA	National Highway Authority
PERT	Program Evaluation Review Technique
CPM	Critical Path Method
PEA	Pakistan Environmental Agency
GM	General Manager
RACI	Responsible Accountable Counseled Informed
PMO	Project Management Office
VPO	Vendor Performance Office
QC	Quality Control
ASST	Assistant
RFP	Request For Proposal
SPI	Schedule Performance Index
CPI	Consumer Price Index
BAC	Budget At Completion
WBS	Work Breakdown Structure
SRS	Software Requirement Specification
BRT	Bus Rapid Transit

EVM	Earned Value Management
RBS	Risk Breakdown Structure
CCB	Change Control Board
DPD	Deputy Project Director
PM	Project Manager
FWO	Frontier Work Organization

Chapter 1

Introduction

National Logistics Cell is a Pakistani logistics company run by Pakistan Army, NLC acted as the single point of disasters management and logistics. Also, NLC is a national managerial department of Government of Pakistan and a municipal-preserved planned organization for state of Pakistan. The function of NLC is to offer state reserve level management facilities to the government: NLC provides the crucial government authority for disaster management. It is the industry of containerization freight system founded Aug 16, 1978, 41 years ago and a military logistics strategic organization. The founder of NLC is Pakistan Armed Forces as well as headquarters based in Rawalpindi Pakistan. Area served worldwide is one of the most energetic public sectors that lead different operations for example transport as well as construction. NLC has a story of offering landmark advanced, and customize results and definitely NLC is designed to discourse or fulfill the business needs with honesty. The miscellaneous besides big level reaching facilities and work presented by NLC includes construction of mega structure projects in a given time, and also deliver the cargo with safely to destinations.

The new Islamabad bus rapid transit service project, this project will look at how the construction of metro bus project influence people of Islamabad who use that path every day. They will travel from Peshawar Mor and then travel G10 bus station, G11 bus station, G13 bus station, and GT road to New Islamabad International Airport. Along the route the project will look at constructing 9 bus stations that will help get more of the population to use the public transportation

system. The stations are Police line bus station, G13 bus station, M1 M2 Junction bus station, Bandana Kalan bus station, Airport station, Nust bus station. The total length of the new Metro Bus project will approximately cover 25.6 kilometers in distance and the overall project was estimated cost Rs16.46 billion to build.

Some of the other beneficial outcomes of project will open up a new corridor for development along the transportation route. It is hoped that the new route will stimulate business development along the corridor. Additionally, the population at large will receive a reliable and safe public transportation system hopefully reducing travel times.

1.1 Description of Project

Metro Bus Service Peshawar Mor to New Islamabad International Airport salient features package wise. Project was initiated by Govt of Pakistan and they are also the end client, unfortunately it is subsidized. Current project duration and estimated start and end date of Project is 6 months and it was initiated in May 2017, the project completion date is around November 2017.

There are four packages in Peshawar Mor to NIIA Metro Bus Project. Detail of these packages are following:

Package 01: This package includes 08 km bus track and 05 bus stations. Also includes 01 bridge, 08 culverts and 06 underpasses. The total cost of this package is 6.5 Billions. Starting date of this package is May, 2017 and the completion date are Nov, 2017. Client, consultant and contractor of this package is NHA, NESPAK and NLC respectively. Current status of this package is 60% work is done.

Package 02: This package includes 3.8 km bus track and 02 bus stations. Also includes 01 bridge, 01 culvert and 01 underpass. The total cost of this package is 5.5 Billions. Starting date of this package is May, 2017 and the completion date are Nov, 2017. Client, consultant and contractor of this package is NHA, NESPAK and MATRACON respectively. Current status of this package is 35% work is done.

Package 03: This package includes 8.3 km bus track and 03 bus stations in future. Also includes 04 bridges, 11 culverts and 04 underpasses. The total cost of this package is 3.84 Billions. Starting date of this package is June, 2017 and the completion date are Dec, 2017. Client, consultant and contractor of this package is NHA, NESPAK and FWO respectively. Current status of this package is 35% work is done.

Package 04: This package includes 5.5 km bus track and 02 bus stations in future. Also includes 02 bridges, 07 culverts and 03 underpasses. The total cost of this package is 3.781Billions. Starting date of this package is June, 2016 and the completion date are Nov, 2017. Client, consultant and contractor of this package is NHA, NESPAK and NLC respectively. Current status of this package is 80% work is done.

1.2 Project Purpose or Justification

The fundamental reason for this project is to give safe journey to the travelers of the Rawalpindi and Islamabad and individuals with only 20 rupees can travel from Peshawar mor to NIIA. The primary intention is to give safe and well-being making cross to the general population of Islamabad and Rawalpindi so a real issue around crowding of traffic within both cities. Metro bus project is the planned framework for upgrading current existing structure. This will give the general population to have a protected trip from Rawalpindi to Islamabad. The outcomes of this project will give a great deal of advantage to the general population of both twin cities as they can travel securely and achieve their goal in a matter of moments. They dispose of the additional charges from the cab drivers and anybody from the Rawalpindi to Islamabad they can go with in brief time with less cost another fundamental reason for existing is that streets accident gets lessen in light of the fact that a different street track is distributed for that as street accident get decline.

1.3 Objective

1. The traffic congestion will be reduced.
2. This bus service is economical for type of citizens like poor and rich and there is equality because this bus service is publicly reachable.
3. Through this bus service people can move easily.
4. Passengers who will travel through metro bus will be secure and they will be checked by the scanner on every bus station.
5. Traffic accidents ratio will be decreased because of metro bus service.
6. As well as accident ratio will be decreased so death ratio will also be highly decreased.
7. Separate seats will be available for ladies and disabled.
8. There will be female staff available who will guide ladies.
9. There are separate road tracks for metro bus so there will be no blockage of traffic.
10. University students and airport employees will be also entertaining from metro bus service.
11. This service will be proved as a beneficiary for the todays, era.
12. The distance will become shorter and time will be saved.

1.3.1 Primary Business Objective

- The primary business objectives include providing the efficient travelling vehicle to the people travel safely.
- Second business objective is to reduce traffic so that people travel safely with no extra time.

- It would be beneficial for all people along with a alit category and average.
- As traffic get reduce the number of accidents will also get reduce which result in less death rates.
- New jobs get introduce for the people of Rawalpindi and Islamabad.

1.3.2 Project Objective Deliverable

- The Pubic transport will be available to all the general public regardless of social economic status.
- It will provide a much more efficient system of getting from one sector to another between the two cities.
- Passengers who will travel through metro bus will be security proof and they will be checked by the scanner on every bus station.
- As the percentage of road traffic incident will be reduced therefor its hoped that the percentage of fatalities will also be reduced.
- Seating will be reserved for women.
- Employment will be provided for women so that they can provide assistance to single female travelers.
- The metro bus will not contribute to road congestion.
- Individual groups such as university student and airport employees will find the service to their advantage.
- It will congest Fateh Jung with Rawalpindi and Islamabad.

1.3.3 Benefits

The main objective of this project is to provide bus service to give simple and safe journey to the overall population of Rawalpindi and Islamabad individuals

can easily move from any territory inside Rawalpindi and Islamabad with in time. Bus transport station are presented in principle areas in Rawalpindi. It will be good to all kind of individuals like business class individuals and needy individuals will go on same transport with no difference of position. It will offer comfortable journey to traveler to move starting with one area then onto the next part between the two cities. It is envisaged that the number of accidents will be reduced because of metro transport. There will be special seating for female passengers on the new service, as well as the new bus service will provide women so as to treat the women traveler.

1.4 Success Criteria of Project

The project success criteria follows:

- It gets completed on time, budget and within its scope.
- It gets operational and people get benefit from it.
- It operates according to its plan.
- Road safety get improves.
- Death rate get decrease and many more.

1.5 High Level Requirements

The one track will be reserved for metro bus and no other traffic can move from that track. There would be no road blockage on metro bus track, passengers have to purchase one token of 20 rupees and it will cover a distance of 26.5 km. There will be no difference between alit class and other because every passenger will be treated equally in this system. This system will be fully computerized tickets are issue through computerized system. The passenger will reach save and sound from one sector to another in safe and economical way, there will be a scanner on every Metro Bus Station.

Chapter 2

Change Management

Change Management is a way to achieve goal and get fruitful outcomes by project team or project leader by making actions and set of activities in order (Avila, Galind, & Mendez, 2012). Some important things that may be affecting by change management are project scope project scope will be change by make any kind of changing in project, project cost that may be change in case of any change request.

2.1 Project Change Control Narrative

Project team as change request is received so may have to make changes in project team to achieve goal. Roles of the team members by using project change management process, various roles will be assigned to individuals of the project team. Project structure by changing the scope of the project the structure gets changed as there are techniques that can develop project organization, finally support adjustments the section of one of four of the organization mentioned above in order to meet customer change request. Any change to processes, project scope, project cost, roles of the project team and the structure of organization and employees at their side have to technical side along with the job roles. Expected tools oversee and admit changes developed by change management and project management on the specific and personal side. In new Islamabad metro project few changes were made at H11 sector police line station there was no metro bus station. Green belt

land was given over to used for the new project on the Kashmir highway. The location of the green belt land was between Peshawar morr to Islamabad chowk. Initially the Pakistan Environment Agency denied for construction on the green belt land, but a new report was commissioned and then on the Kashmir highway from Peshawar morr to G12 sector was granted permission to constructed. The area from G12 sector to Islamabad chowk was given permission to build on green belt land because the ground was not suitable to lay a new track.

2.2 Flow Chart

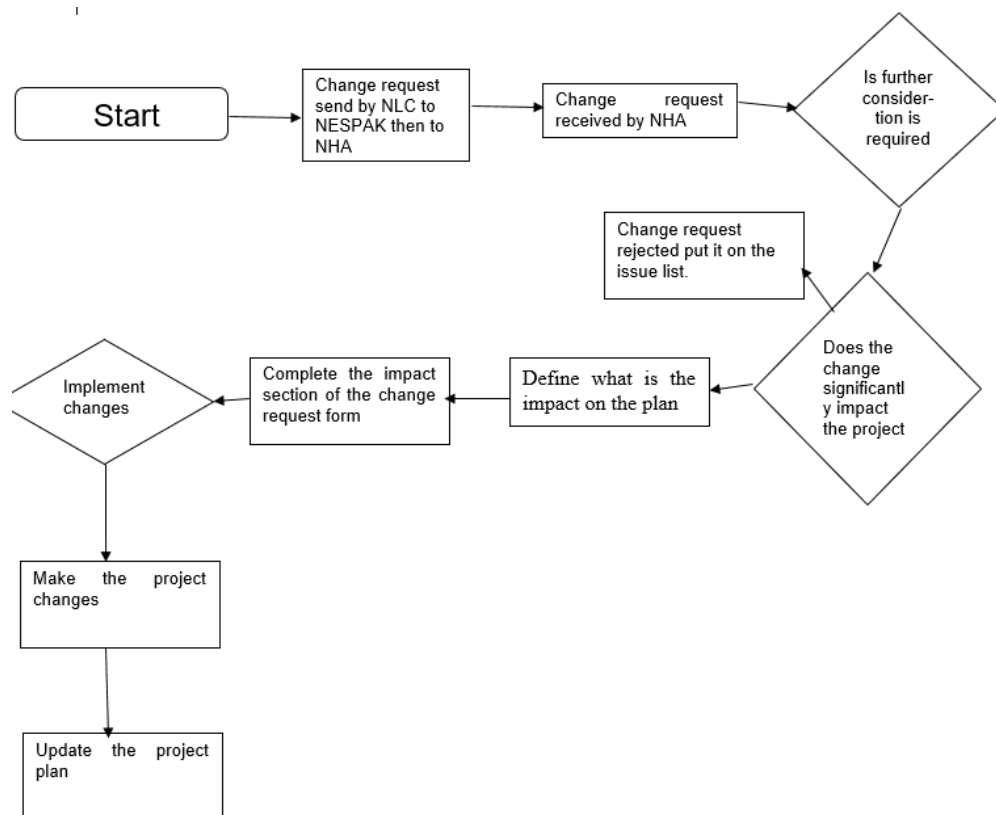


FIGURE 2.1: Flow Chart

2.2.1 Change Request Process

The change request process will begin with chosen contractor sending a change request to the consultant from consultant will make amendments to the change

request and forward this onto the project client from here a shop drawing letter will be sent from the contractor to consultant the change process will finally be complete when the consultant will send to customer.

NESPAK Consultant Director will confirm the change and choose either change is needed or not request is given by project director of the NESPAK onto the project director of the NHA.

Project Director will verify the problem and check whether it will affect current scope or it will increase risk, the project manager will be responsible for making assessments of issues that occur relating to the project and making amendments as required. Once its determined that some changes are required with the project the change will then go to the CCB for pending approval. If the change request is excluded by the change request board or the project manager with respect to metro project the change request was completed by the NHA and designed by NESPAK. Any amended that are required for the change request are made by NHA then this is forwarded to the client.

2.3 Change Log Register

A change log is mostly set of record of all the changes that occur in a project and is responsible for doing the work or analyzing the change and the outcome as well and to make it easier for users and contributors to see exactly what noteworthy changes have been made during each release of the project.

- Change log usually includes records.
- Change presence demanded.
- Impacted changes should be accepted.
- Change approval facts, and position of the support in project.
- Change execution list date and time.
- Present position of all variations in project.

Change log is live document which will record the change decisions regardless of if they are approved or rejected. The change log will also highlight changes to cost, quality and scope of the project. The change log can be used as a reference point to view what changes have been made and at what point within the project.

1st request received from Pakistan Environment Agency (PEA) on 10th of June, 2017. The issue is green belt not using as a track (scope change). This request is approved by National Engineering Services Pakistan (NESPAK).

2nd request received from National Highway Authority (NHA) on 20th of June, 2017. The request is new track add in H11, this request is approved by National Engineering Services Pakistan (NESPAK).

2.4 Change Request Form

TABLE 2.1: Change Request Form

Change Request Form	Change Request Number	
Change Request Status	Date	By Whom
Issued By		Date
Configuration ID	Configuration Name	
Configuration Item		
Type of Change		
Reason for Change		
Description		
Priority	Reasons	
Category (Tick One)		
Affected Area of Work		
Estimated Efforts		
Impact on Schedule		
Estimated Costs		
General Impact		

Chapter 3

Scope Description

Scope of this project is to provide easy journey for the people of Rawalpindi and Islamabad and specifically those community and huge amount of people who lived in Fateh Jhang and working in Rawalpindi and Islamabad. It is a best opportunity for them and they have easy access to come in twin city through metro bus project and also people of twin city have easy reach to NIIA by using metro bus service and the main purpose of this project is to complete according to within budget and scope.

3.1 Scope Statement

To start a metro bus project that make it easy for the resident of Islamabad and Rawalpindi to travel as well for the traffic safety.

3.2 Scope Description

New metro bus service that will provide easy journey for the resident of Rawalpindi and Islamabad and to reduce the complexity of traffic and they can easily reach to their destinations the metro bus service it is for all people even poor or rich and project process to achieve the objectives.

3.3 Work Breakdown Structure

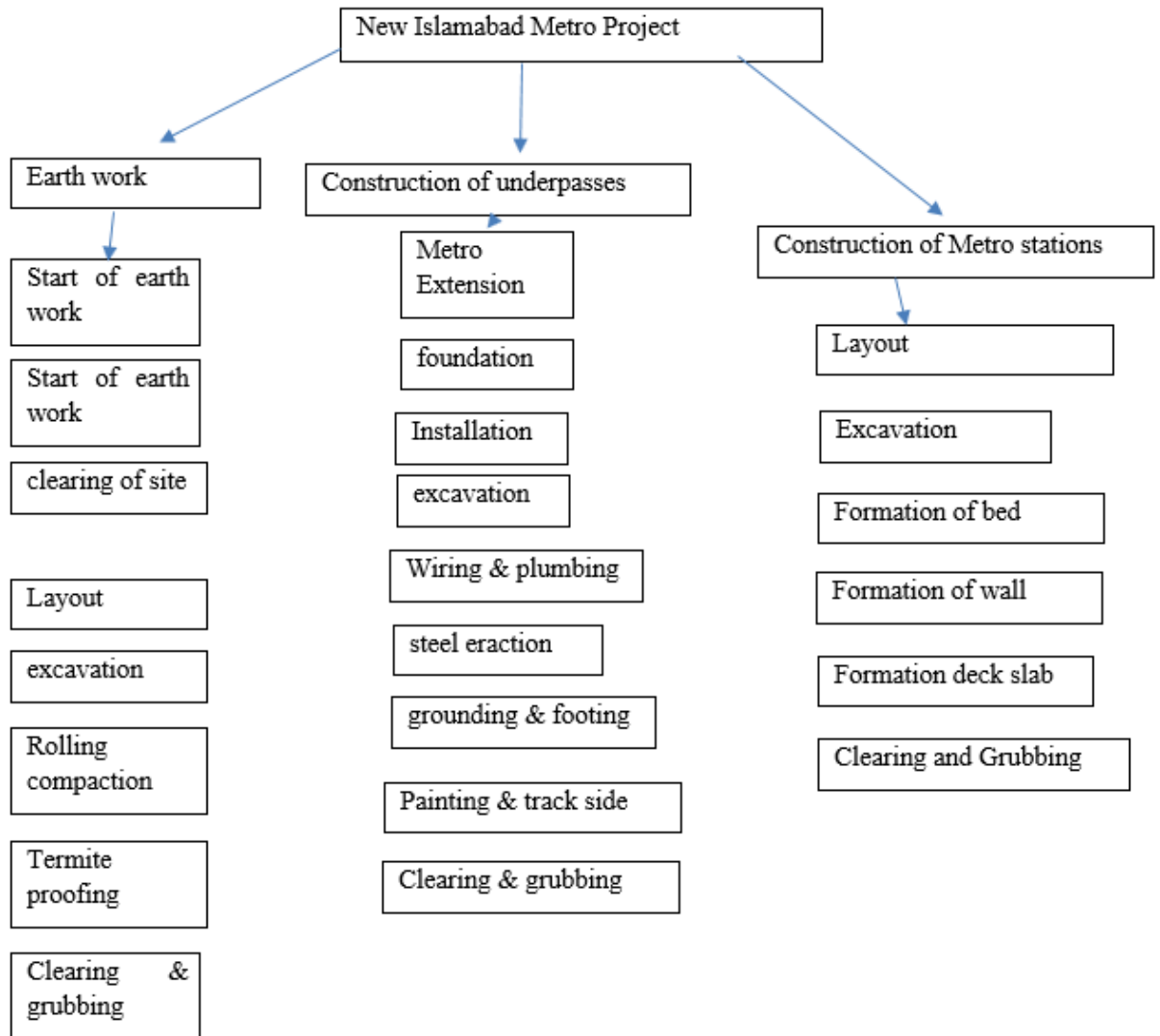


FIGURE 3.1: Work Break Down Structure

3.4 Summary Milestone Schedule

Schedule of milestones

Soil check 27 May —27 September

Bus station 27 July—27 March)

Structure of underpasses

1st June to 1st October

3.5 Project Exclusions

Project exclusions are similar possessions that outside the project limits that is not included in the project (Ulgen, 1991). Look at previous lesson learned, issues from the Lahore Metro Project, and see if it would be possible to apply the same fixes and finally where necessary.

3.6 Assumptions

- The new G10 bus station is on the same main route that commuters would take to get to Islamic university.
- Conflict between the proposed bus station and police line signal.
- The proposed bus station is close to the intelligence agencies wire, so may cause interference.
- Other infrastructure such as gas and water lines that serve the district may be an issue.

3.7 Constraints

Constraints are limitations. They set a limit for project manager to complete project within described constraints. A project which is completed within constraint that is an indicator of successful project. With any project there are three major constraints and these can be applied to any project regardless of its size:

- Time
- Cost
- Scope

3.7.1 Solution Constraints

Successful projects regular monitoring and evaluation is required useful way to evaluate if the project is on time and within cost and scope is to follow activities within the proposed projects gantt chart and see if the activities meet the milestone (Murphy, 2011).

3.8 Product Deliverables and Acceptance Criteria

Valid things practical features, handler participation, message, management support, difference among technology provider and receiver. There are different deliverables in our project. The list of these deliverables and their Acceptance Criteria is following:

Bus Stations: Availability of clean water and friendly environment and proper seating arrangements.

Pedestrian Bridge: Stairs distance should be minimized so aged people can walk easily.

Underpasses: High quality of lights, water resistance and heavy load bearing capacity.

Culverts: Flow of water is smooth and their life time is high.

Waiting Area: Maximum accessibility of water, heaters and seats. Accessibility of firefighting equipment.

Lifts: Quality material used in lifts are good. Backup option is available in case of load shedding.

Ticket Booth: Male and female ticketing booths are separated.

Chapter 4

Project Schedule and High-Level Budget

One of the most important factor is time within a project. It is the key constraint that can determine if the project has been deemed a success or failure some of the activities that can be useful when defining time against a project are as follows:

- Management plan
- Time Management Plan
- The time allocated to the activities that make up the project
- The sequence of all activities
- Time required for each individual activity
- Required resources

4.1 Scheduling Method

The two main methods that will be used within this project are PERT analysis and CPM. PERT will be used to schedule the individual activities while CPM is used to outline the time table for all project.

4.1.1 PERT

To discover the time and also hazard related with them and task of the manager of project and contractor with his team workers will observe the Program Evaluation Review Technique (PERT). The formula is: $PERT\ mean = (O+4R+P) / 6$

Where

O = Optimistic estimate

ML = Most likely estimate

P = Pessimistic estimate

4.1.2 CPM

CPM stands for Critical Path Method this technique is discover the longest path that is essential to complete the project.

4.2 Tool for Scheduling

Primavera

Microsoft Project

4.3 Processes of Scheduling

The schedule process can be defined as the Work Breakdown Structure. The WBS is carried out by the project scheduler to schedule the various activities and deliverables that can be found in the project.

4.4 Scope Description

New metro bus service that will provide easy journey for the resident of Rawalpindi and Islamabad and to reduce the complexity of traffic and they can easily reach

to their destinations the metro bus service. And it is for all people even poor and rich.

Scope statement is used to provide a Metro bus service to the residences of both Islamabad and Rawalpindi; that is both efficient low-cost services, with the outcome of increasing productivity within the region.

4.5 Define Activities

With the nature of such a large project it is not possible to define every activity but around of the principle activities involved within the project are as follows: Forthcoming activities are registered below.

- Activity Survey
- Activity Layout
- Activity Excavation
- Activity Reducing and Filling
- Activity Shuttering and Construction of Shape
- Activity Folding
- Activity Concrete Pouring
- Activity Removal of Shuttering

4.6 Sequence Activities

The process of classifying and documenting relationships to project activities sequencing can be completed the use of project management different software. Sequence have two types, these are following:

- Ascending
- Descending

4.7 Develop Schedule

Developing the project includes studying activity sequences, periods necessities schedule limitations to create the project. CPM was implemented to know the project general schedule and that turned out to be 6 months.

4.8 Report Schedule

Project supervisor overview and replace the project time table every monday and thursday. Workers of the project team offer the actual performance and complete documentation records to project supervisor.

PROJECT APPROVAL THE PROJECT PROVED SHOULD BE A SUCCESS PROJECT AS TURNED INTO IN TIME MEETING THE TESTED SCOPE VIA THE CUSTOMERS

signing below, I, _____ in my ability as project Sponsor approve of this project management Plan

Name:

Title: _____

Signature

The project manager will evaluate the actual information of the schedule baseline and calculate the of entirety probabilities and any variances. The project supervisor will distribute the real schedule facts in line with the phrases set forth in the verbal communication management plan.

where necessary, the project supervisor will meet with the project group members to determine the purpose of any variance and speak up in suitable corrective measures. where plan adjustments are essential, the project supervisor will publish a change request according with the change management plan.

Chapter 5

Quality Management Plan, Project Organization and Resources

The Quality management plan describes an suitable level of criteria, which is usually defined by the customer and describes how the project will ensure its quality and the quality of these levels in the work process (J, Sangiuliano, & M.Davies, 2018).

Past Projects

- Lahore Metro Bus Project
- Rawalpindi Metro Bus Project

5.1 Quality Control

Quality control in production is branched from the quality control management as the responsible party to make sure that merchandise and facilities comply with necessities and established standards.

Quality is an crucial aspect when it comes to any product or services. Quality control is important to constructing a effective business that offers products that meet or exceed customers expectations. It additionally an efficient enterprise that minimizes waste and operates at excessive ranges of productivity.

5.2 Project Organization and Resources

The project-based organizations explain the project's human infrastructure, the project is designed to outline the enterprise charts, roles and project team relations in the reality organizational shape identifies the role and duties of each position, increases the definition of existing positions where it is essential to cover all the tasks the project resource used in this step provides a popular set of customized roles and duties for a selected mission.

5.3 Team Structure of Project

Project director in organization

DPD in organization

PM in organization

Assistant PM in organization

Site supervisor site engineer in organization

5.4 Major Roles and Responsibilities in Project Organization

Project Director will check, offer input to the schedule through the change control process and oversee reports provided by the Project Scheduler of schedule status.

Final baseline schedule will be reviewed and approved by Project Manager and through the schedule change control process only significant changes.

Project Scheduler and Project Manager will be notified by Deputy Project Manager that workload changes may affect the schedule. The Team Lead will also review and approve time estimates provided by staff for the schedule.

In the beginning and completion of work as well as status reports on the achievement of those times, Assistant Project Manager provides accurate time estimates. Schedule management effort, sponsor task tracking activities, facilitate schedule status communication, maintain the projects scheduling tool and supporting documentation will be lead by site supervisor and site engineer. The Project Scheduler will make recommendations to the Project Manager to avert schedule variances that may adversely affect the project budget, expenditures, or critical path.

5.5 Organization Chart

Structure of an organization is like the diagram that shows the relationships and relative ranks of its types and position jobs.

RACI Chart

RACI chart is a linear matrix utilized to attribute roles and responsibilities for all tasks, milestone, or decision on a project. RACI stands for Responsible, Accountable, Consulted, Informed.

5.6 Equipment and Training Needs

Equipment: Numbers of individual resources

Concrete Batching plant

Transit Mixture

Tractor

Loader

Dumper

TABLE 5.1: RACI Chart

Focus area	Project Director	Project Manager	Deputy Project Manager	Assistant Manager
Project purpose	R	A	C	I
project scope	R	A	C	I
project deliverables	A	C	R	C
stakeholder matrix	A	C	R	C
Implementation approach	A	C	R	C
Risk and issues	A	I	R	C
Define Project modules	R	I	A	C
Define Reporting modules	R	I	C	A
Define Configuration modules	R	C	A	C
Customer login	R	I	A	I
Customer rights	R	I	A	C

5.6.1 Training

The following training will be provided to all staff regardless of rank, this may be delivering on off site depending on the needs of the project.

- Safety control
- Team leading
- Team union
- Project progress

Chapter 6

Communication Plan and Stakeholder Analysis

Communication plan is a policy pushed approach to presenting stakeholders with statistics the plan officially defines who must take delivery of unique records, whilst that facts must be brought and what communication channels may be used to deliver the facts a powerful communications management plan anticipates what statistics will need to be communicated to specific target audience segments. The plan also deals with who has the authority to talk personal or sensitive information and how statistics must be disseminated electronic mail, web sites, revealed reports, and displays sooner or later, the plan outline what verbal exchange channels stakeholders will use to solicit comments and how the communication will be documented and archived (Poulin, Leclerc, Dessau, & Arsenault, 2017).

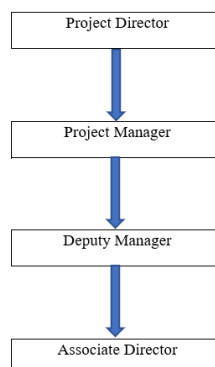


FIGURE 6.1: Communication Flow

6.1 Stakeholder Communications Requirements

There are different Types of Communication used in project these are following:

- Meeting (Daily Basis)
- Kickoff Meeting (Once)
- Status Reports (Monthly)

Format used in these Meetings are verbal hard copy.

Medium Communication Channel are:

- Discussion program
- Discussion on progress reports
- Face to face
- Email

Content Author of these meetings are:

- Internal staff
- Quality assurance team
- Contractor
- Project manager

Review Approver in Communication are:

- Client NHA
- Project Director
- Assistant Director

- Deputy Project Director

Audience in these Meetings are:

- Contractor
- Project Sponsor
- Stakeholders
- Project Team
- Project Management Office

6.2 Escalation Procedures for Resolving Communication Issues

At the highest degree differences can cause the solution to the large amount of cash through legal channels and expenses organization a good project director knows when intervening and taking action during the conflict if the conflict over belief degree cannot be treated, then it may be essential for the reaction / behavioral degree cycle to try and break

Avoidance

Conflicts are not mentioned because the manager also thinks that the problem is not worthy of the solution currently resolved.

Compromise

Includes a look for a way that is the Mutually acceptable (to get and get to medium floor). If the overall deal is not possible, then compromise may be an excellent way of managing conflicts.

Competition

Objectionable offensive strategy to solve this conflict. One of the criticisms of the competition is that it enjoys the strengths of the Opposition as well as enjoying different strategies and processes of neutral nature.

6.3 Stakeholder Analysis

Stakeholder analysis a tool for explicitly defining key stakeholders for a project or other activities, is a tool for stakeholders to stand up and develop collaboration between stakeholders and the project team (Meo & Hamunen, 2015).

Chapter 7

Project Risk Management

Project risk is an indefinite event or circumstance which, if it has an impact on at least one project objective, if it occurs risk management focuses on identifying and managing the risks of projects and managing those risks which have negative impact (Junior & Monteiro, 2015).

Sources of Project risk and their categories are as follows:

Sources of project risk are:

- Schedule
- Scope
- Resources
- Quality
- Cost
- Technological risk
- Delivery risks
- Resource risks

Risk categories are:

- Operational
- Strategic
- Financial
- Compliance

7.1 Risk Register

Risk register provide project managers with a list of identified risks, have been clearly mentioned and assessed as their importance to meet the project objectives, risk register can lead to direct risks such as risk reduction.

TABLE 7.1: Risk Register

S. No	Rank	Category	Risk Name	Description
1	1	Natural Disaster	Earthquakes	Its natural disaster
2	1	Strategic	Lack of Technical Expertise	Employees knowledge does not enough
3	2	Compliance	Unrealistic Deadlines	Unrealistic Planning
4	2	Finance	Underestimation of Budget	Budget may low to carry the risk
5	4	Operational	Electrical power	No electrical connection
6	5	Compliance	Scope Creep	Changes are not met
7	3	Operational	Show working Strategy	Not enough stock

7.2 Risk Planning Steps

1. Recognize the essential elements in handling with project risk.
2. Identify the processes for figuring out project risk.
3. Identify the processes for evaluating risk.
4. Identify the processes for mitigating risk.

7.3 RBS in Project Management

To facilitate planning and controlling of project Risk Breakdown Structure is a hierarchical listing of sources related by feature and useful resources type.

7.4 8/80 Rule in Project Risk Management

8/80 rule as a good rule of thumb that confirms no task is much less than eight hours or extra than eighty hours inside the WBS than it needs to be decomposed further into work packages.

Chapter 8

Procurement Management Plan

The project management plan describes part of the overall project management plan in the document that how the items will be collected during the project and the method you use to manage the vendors in the project inclusion in specific areas involves procurement process.

8.1 Procurement Selection Criteria

The Initial bid to procure this project was based on the selection criteria being comprised of 70% technical and 30% of it being a financial element.

8.1.1 Short List

After the evaluating the vendors technical elements and financial elements of the bid every supplier was given a rating out of one hundred the result from the selection criteria based on the overall performance and ratings score 3 dealers have been shortlisted from the procurement

8.1.2 Selection Source

1. Ideal business private limited

2. Echo business private limited
3. Muskho's electronics private limited

8.2 Make/Buy/Lease Analysis and Procurement Needs

All procurement needs start with the perception of a requirement. The need to cross a body of water could create a requirement to build a bridge, a ferry, or other transportation systems. There are also needs for goods and services, and those should also undergo an analysis to clearly define requirements.

TABLE 8.1: Procurement Management Plan

Describe Items or Services essential for project success that could be Made, Purchased or Leased.						
Item or Service to be Procured	Description / Technical Information	Why is item / Service Needed	Make Buy Lease	Type of Contract	Need By Date	Purchase Approval Authority
Excavator	Excavate the soil	To Excavate the soil		Express	18 th may,2017	Ugalco Construction Company
Grader	Do Grade the surface	It will use Do Grade the surface		Express	20 th May,2017	Ugalco Construction Company
Dumper	To Carry load	It will use To Carry load		Express	10 th may,2017	Ugalco Construction Company
Tractor	To carry load of Material	It will use To carry load of Material		Express	8 th August,2017	Ugalco Construction Company
Concrete Batching plant	For Batching of concrete	It will use to For Batching of concrete		Express	9 th September,2017	Ugalco Construction Company
Transit Mixture	To Carry concrete	It will use to Carry concrete		Express	25 th Oct,2017	Ugalco Construction Company

8.3 Vendor Performance Management and Close-out

Can be defined as tool that is used to examine the performance of suppliers the following criteria are used within VPM.

- Cost Analysis
- Risk Analysis
- Continuous Improvement Analysis

In our project the VPM method was used to gage the overall performance the supplier was monitored on regularly basis and work was evaluated to see if it was still up to the required standards.

Vendor performance management will be used to evaluated the outcomes of the contract by suppliers to see if they had been met this is to ensure that the supplies have performed to a high standard and that cost where kept to a minimum throughout the life cycle of the project once this had been signed out the suppliers were paid though cheques and key milestones (Kumar, Benedikt, & Kumar, 2014).

Chapter 9

Monitoring, Control Procedures and Conclusion

9.1 Monitoring in Metro Project

- Monitoring is achieved to test the projects position towards its pre-determined plan.
- The ways in which monitoring can be accomplished in our project is as follows
- Target Monitoring Activity Monitoring
- Schedule Monitoring
- Budget Monitoring
- Scope Monitoring

9.2 Target Monitoring

Here target monitoring refers to testing i.e. to check that either the result is being achieved or not also called as activity monitoring as the outputs of a process are measured against the expected outcomes Here target monitoring refers to testing

i.e. to check that either the result is being achieved or not also called as activity monitoring as the outputs of a process are measured against the expected outcomes (Limonciel, Moenks, Stanzel, L.Truisi, & Parmentier, 2015). .

9.3 Schedule Monitoring

It is to make sure that the activities are on-time i.e. the activities scheduled to be completed in the defined span are on track or not. One of the indicators used to monitor is SPI (Cui, Demeulemeester, Bie, & Li, 2016).

9.4 Budget Monitoring

It is done to find the following questions related to project

How much budget you have spent?

How much is remaining

Is there any revised budget needed to complete the work or not?

Indicators for this type of monitoring used in the project are CPI and BAC.

9.5 Scope Monitoring

It is to monitor that either the implementation phase revolves around the defined scope or not. Scope monitoring is essential. After monitoring there will be evaluation of scope as project is alligned to scope or not. WBS and SRS document are reviewed time and again to assure the only requirements to be completed change management system was developed to incorporate the necessary changes and avoid scope creep so as to measure the variance between planned project scope and actual project scope (Staley, et al., 2016).

9.6 Conclusion

Peshawar Mor to New Islamabad Airport Metro Bus Project comes out to be a successful project. If it would meet the increasing transit demand as well as sustainable mode of public transport effectively. It have completed according to triple constraint. In time Completion of this project would resulted in form of better management with greater speeds as well economic.

The quality of buses includes air conditioning along with stop announcement system, emergency exits and with wide space for seating which results in comfort, hence it is concluded that BRTS project is not being completed on time which resulted in failure to achieve the triple constraint. Due to excavation of green belt and cutting of trees has impacted the environment.

9.6.1 Recommendations for future suggestion

There was no use of EVM tools during the execution of the project (Planned vs Actual) and quad triple constraints was totally violated in metro project so in future to get the similar project execution on time and in future proper evaluation techniques should be used. The execution of metro project was not properly planned due to the negligence of poor planning.

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Appendix-A

TABLE 9.1: Description

Description	Package 01	Package 02	Package 03	Package 04
Length	08 KM	3.8KM	8.3KM	5.5KM
Cost	6.5 Billions	5.5 Billions	3.84Billions	3.781Billions
Bus stations	05	02	03 (Future)	02 (Future)
Bridges	01	01	04	02
Culverts	08	01	11	07
Underpasses	06	01	04	03
Commencement	May,2017	May,2017	June,2017	June,2016
Completion	Nov,2017	Nov,2017	Dec,2017	Nov.2017
Client	NHA	NHA	NHA	NHA
Consultant	NESPAK	NESPAK	NESPAK	NESPAK
Contractor	NLC	MATRACON- CBFG -TTC (JV)	FWO	NLC
Progress (%age)	60%	35%	35%	80%

TABLE 9.2: Business Objectives

Reference No.	Business Objective Description	Specific Goal
1	To reduce Cost and track cost records of Lahore and pindi metro project.	Cost reduction
2	Safe traffic	Road safety
3	Economical for all type of people	Economical
4	Passenger easiness to move from one side to the other side from pindi to Islamabad	Passenger easiness
5	The ratio of traffic accident will be reduced due to metro bus services.	Traffic safety
6	New job for the people of pindi and Islamabad	Job intro

TABLE 9.3: Log Register

Sr NO	Change report\Details	Requestor	Date	Decision	Remarks
1	Scope (change in road track) No use of green belt as a track	Pakistan environment Agency	10-june-2017	Approved	A change is made on the request of PEA
2	Addition of track on H11	Client NHA	20-june-2017	Approved	A change is made on the request of NHA (client)

TABLE 9.4: Deliverables and Acceptance Criteria

Deliverables	Date Available	Acceptance Criteria
Bus Stations	17 th july,2018	Good seating for passenger and availability of water & good environment.
Pedestrian Bridge	8 th july,2018	Quality material, Stairs distance should be low so aged people can easily move
Underpasses	16 th October,2017	Good Lighting, water proof, Good Life time, Maximum load carrying capacity.
Culverts	21 st September 2017	Smooth flow of water, barring power live load, high lifetime, dead load.
Waiting Area	25 th August,2018	Availability of seats, Availability of water cooler, Availability of Heater, Ac with respect to weather, Availability firefighting equipment
Lifts	10 th july,2018	Good quality of material, Good Lifetime, Connection b/w Federal electric company & Electric generator.
Ticket Booth	2 nd july,2018	Good Quality, Separate Ticketing booth for males & females

TABLE 9.5: Budget Summary

Budgeted Item	Time Period 01	Time Period 02	Time Period 03	Time Period 04	Total
Pedestal wall	May,2017				400 Million
Culverts		August,2017			1.75 Billion
Underpasses			September, 2017		1.8 Billion
Road work			August,2017		1.25 Billion
Bus stations				June,2018	4.4 Billion
Pedestrian Bridge			July,2018		800 Million
Bill 7					900 Million
Time Period Total	14th Months				
Accumulating Total	7.3 Billion				

TABLE 9.6: Quality Management Plan

Quality Assurance focuses on Project Processes. Think about quality assurance are kind of activities that help to avoid quality problems while developing project outcomes. Quality assurance ensures that your project processes are appropriate and consistently followed According to quality management plan.			
Project Process/Procedure Subject to Quality Assurance (Activities you will use to help avoid the need for rework)	Quality Standards for Process / Procedure ¹	Quality Assurance Activity and Frequency ² (Audits, Process Reviews, Process Analysis, Assessments, etc.)	Who is Responsible for performing Assurance Activity and reporting results
Monitoring & Inspection	Standard should meet the Planned Activities	Client Do Audits(NHA)	Inspector of Consultant
Evaluation	Quality Standard Should meet the past projects	Client monitoring team visit on project site.	Assistant resident Engineer of Consultant
Evaluation	//	Monitoring team Analysis and assess the project Evaluation	GM of Consultant

TABLE 9.7: Quality Control

Quality Control focuses on Project Deliverables. Quality control is a set of activities designed to evaluate project deliverables. Quality control focuses on finding defects in deliverables verifying that requirements are being achieved.				
Deliverable Name	(Attribute that will be measured)	Performance Quality Standard	Quality Measurement	Who is Responsible for activity
Pedestrian wall	Square Meter	Good Quality, Safety	Quality Test (Material)	Project Manager
Underpass	Square Meter	Good Lighting, water proof, Good Life time, Maximum load carrying capacity.	Quality Test (Material)	Project Manager
Culverts	Square Meter	Smooth flow of water, barring power live load, high lifetime, dead load.	Quality Test (Material)	Project Manager
Bus station	Square Meter	Good Material, separate seating for male and female, clean water& clean Environment	Quality Test (Material)	Project Manager

TABLE 9.8: Roles and Responsibilities

Quality Control focuses on Project Deliverables. Quality control is a set of activities designed to evaluate project deliverables. Quality control focuses on finding defects in deliverables / verifying that requirements are being achieved.				
Deliverable Name/Description	Metric (Attribute that will be measured)	Physical or Performance Quality Standard¹	Quality Measurement Activity and Frequency²	Who is Responsible for performing Control Activity and reporting results
Pedestal wall	Square Meter(sm)			
Underpass	Square Meter(sm)	Good Lighting, water proof, Good Life time, Maximum load carrying capacity.	Quality Test(Material)	Project Manager
Culverts	Square Meter(sm)	Smooth flow of water, barring power live load, high lifetime, dead load.	Quality Test(Material)	Project Manager
Bus station	Square Meter(sm)	Good Material, separate seating for male and female, clean water & clean Environment	Quality Test(Material)	Project Manager
Pedestrian Bridge	Meter	Good in material	Quality Test(Material)	Project Manager

TABLE 9.9: Project Organization Major Project Roles and Responsibilities

Names / Roles	Responsibilities
Project Director	Will oversee, provide input to the schedule (via the change control process) and review schedule status reports provided by the Project Scheduler.
Project Manager	will review and approve the final baseline schedule and only significant changes through the schedule change control process.
Deputy Project Manager	Will notify the Project Manager and Project Scheduler of workload changes that may affect the schedule. The Team Lead will also review and approve time estimates provided by staff for the schedule.
Assistant project Manager	Will provide accurate time estimates for the beginning and completion of work as well as status reports on the achievement of those times.
Site Supervisor & site Engineer	Will lead the schedule management effort, sponsor task tracking activities, facilitate schedule status communication, and maintain the projects' scheduling tool and supporting documentation. The Project Scheduler will make recommendations to the Project Manager to avert schedule variances that may adversely affect the project budget, expenditures, or critical path.

TABLE 9.10: Stakeholder Communications Requirements

Communication Type	Frequency of communication	Format	Media channel	Content Author	Reviewer Approver	Audience	Feedback Mechanism
Meeting	Daily	Verbal	Discussion programs and editorial briefings.	Internal staff, Project manager	Client NHA	Contractor	Positive contribution for development
Meeting	weekly	Verbal	Discussion on progress reports	Team lead, Software analyst, Quality assurance team	Project Director to report for progress made in a week	Contractor	Information on implementation, status, and progress of the project
Kickoff Meeting	Once	Hardcopy	Face to Face	Contractor	Asst director to control and initiator	-Project Sponsor -Project Team -Stakeholders	Meeting Minutes
Status Reports	Monthly	Hardcopy	• Email	Project Manager	Project Director and Deputy project director	• Project Sponsor • Project Team • Stakeholders • PMO	• Project Status Report • Project schedule

TABLE 9.11: Risk Management

Sources of Project Risk:	Risk Category
Schedule	Operational
Scope	Operational
Resource	Strategic
Quality	Operational
Cost	Financial
Technological risk	Strategic
Delivery Risks	Compliance
Resource risks	Strategic

TABLE 9.12: Stakeholder Register

Stakeholder Name	Organization	Role/Position (in Current Organization)	Key Project Roles and Responsibilities
Supplier	ROYAL CONSTRUCTIONS	External	Responsible to provide the items ordered within the right time and quality
Project Manager	UGALCO	Manager and Asst. Manager	Responsible to deliver and complete the project successfully keeping in mind the tripple constraints
Project Team	UGALCO	Employee	Responsible to develop the modules as per specifications given within the allocated time frame
QC Team	NESPAK	Employee	Responsible to cross check and test the implemented requirements with SRS and management plans
Users	PUBLIC	External	Are the ones to use the system and are responsible to understand and use it efficiently
Sponsor	NHA	Executive	Responsible for the project initiation and allocation of desired resources whenever required

TABLE 9.13: Stakeholder Analysis

Name	Power / Interest	Current Engagement Level	Desired Engagement Level	Stakeholder Management Strategy	Communication Medium
Supplier	Medium / High	Whenever requested	As engaged	Inform to deliver products a week before needed so as to have a buffer for delays	RFPs Meetings
Project Manager	High / High	Full time	//	It is assured that he is well aware of all the requirements and goals of the project and is accountable for delays if occur	E-Mail Meetings face-to-face communication
Project Team	Medium to Low / High	Full time	//	It is assured that they are provided with the resources they need at the instant to avoid delays and are provided with trainings when needed and are held accountable at their end of work	E-Mail Meetings face-to-face communication
QC Team	Medium to Low / High	Full time as a user	//	It is assured that they are well aware of requirements specification and are accountable if any flaw is found at the deployment stage	E-Mail Meetings face-to-face communication