

OPTIMIZED AND INTEGRATED PROJECT SCHEDULE MANAGEMENT
METHODOLOGY FOR ENSURING SUITABILITY, FEASIBILITY, AND
ACCEPTABILITY OF A COST-CONSTRAINED AFFORDABLE HOUSING PROGRAM IN
ANCHORAGE, ALASKA

By

Fitzgerald Umah, M. Ed

A Project Submitted in Partial Fulfillment of the Requirements

for the Degree of

MASTER OF SCIENCE

in

Project Management

University of Alaska Anchorage

May 2023

APPROVED:

Roger K. Hull, B.S., PMP, Committee Chair
LuAnn Piccard, M.S., PMP, Committee Member
Ojeifoh Okosun, MBA, Committee Member
LuAnn Piccard, M.S., PMP, Chair
Department of Project Management
Kenrick Mock, Ph.D., Dean
College of Engineering

TABLE OF CONTENTS

	Page
TABLE OF CONTENTS	2
ABSTRACT	6
ACKNOWLEDGMENTS.....	6
INTRODUCTION	7
BACKGROUND	8
<i>Exhibit 1: Housing’s contribution to GDP.....</i>	<i>9</i>
CHALLENGES IN CONSTRUCTION SCHEDULING METHODOLOGY	9
CREATE PRACTICAL SCHEDULES WITH BUFFERS BUILT-IN	10
INVEST IN A PLATFORM FOR INTEGRATED COMMUNICATION AND SCHEDULING.....	10
CREATE METHODOLOGIES AND TOOLS FOR INTER-TEAM COORDINATION	10
STREAMLINE THE PROCESSES AND WORKFLOWS	10
INVEST IN THE RIGHT TOOLS AND TECHNOLOGY	10
PROJECT SCOPE STATEMENT	11
PROJECT MANAGEMENT APPROACH.....	11
PROJECT OBJECTIVES	11
PROJECT SCOPE	12
MILESTONE.....	12
CONSTRAINTS	13
PROJECT DELIVERABLES	13
KEY MILESTONES	13
<i>Exhibit 2: Key milestone table.....</i>	<i>13</i>
SCHEDULE BASELINE AND WORK BREAKDOWN STRUCTURE	14
CHANGE MANAGEMENT PLAN.....	14
<i>Exhibit 3: Risk Register</i>	<i>15</i>
COMMUNICATIONS MANAGEMENT PLAN	15
<i>Exhibit 4: Communication plan table.....</i>	<i>16</i>
PROJECT TEAM DIRECTORY FOR COMMUNICATIONS	16
<i>Exhibit 5: Communication directory.....</i>	<i>16</i>
<i>Exhibit 3: Stakeholder Register</i>	<i>20</i>
QUALITY MANAGEMENT PLAN.....	20
RISK REGISTER.....	22
<i>Exhibit 7: Risk Register</i>	<i>22</i>
STAFFING MANAGEMENT	22
STAFF REQUIRED.....	22
RESOURCE CALENDAR	23

COST BASELINE23
Exhibit 8: Cost baseline.....23

QUALITY BASELINE23
Exhibit 9: Quality baseline.....24

RESEARCH CONDUCTED24
 METHODOLOGY24
 SURVEYS/ QUESTIONNAIRES24
Exhibit 10: US Housing Affordability by County Map25
Exhibit 11: Alaska Housing profile.....26
Exhibit 12: Anchorage 2040 Land Use Plan Map.....27

LITERATURE REVIEW27
 PERMAFROST IN ALASKA28
 COSTS OF LAND AND LOCATION28
 PERMITS29
 AFFORDABLE VERSUS LUXURIOUS HOUSING29
 MATERIALS AND LABOR COSTS29
 EXTRA CHARGES OR SOFT COSTS30
 RETURNS AND EQUITY30
 EXPECTED RATES OF OCCUPANCY30

RESEARCH ANALYSIS.....31
 SURVEY ANALYSIS31
Exhibit 13: Survey Analysis Chart.....31
 SURVEY RESULT32
Exhibit 14: Survey Result Graph32
Exhibit 15: Showing responses for questions No 1 and no 2.....33
Exhibit 16: Shows responses for questions No 3 and No 4.....34
Exhibit 17: Shows responses to questions No 5 and No 6.....35
Exhibit 18: Shows responses for questions No 7 and No 8.....36
Exhibit 19: Shows responses for questions No 9 and No 10.....37

RESEARCH OUTCOME.....38
Exhibit 20: Resource delivery and cost workflow drawing38
Exhibit 21: Resource delivery and cost interface.....39
 RESOURCE DELIVERY ESTIMATION39
Exhibit 22: Software interface using Excel.....40
 RESOURCE COST ESTIMATION40
Exhibit 23: Final Deliverable Software interface using Excel.....41
Exhibit 25: Strategic Planning Flow Diagram.....42

CONCLUSIONS43

RECOMMENDATIONS44

FUTURE RESEARCH.....45

KNOWLEDGE AREAS SELECTION, DESCRIPTION, AND LESSONS LEARNED45
 PROJECT SCHEDULE MANAGEMENT:45
 PROJECT COMMUNICATION MANAGEMENT:.....46

LESSONS LEARNED.....46
Exhibit 26: Lessons Learned47
 RISK MANAGEMENT PLAN47

<i>Exhibit 27: Risk Register</i>	48
APPENDICES	49
<i>Appendix A: Resource delivery and cost workflow drawing.</i>	49
<i>Appendix B: Resource delivery and cost interface.</i>	49
<i>Appendix C: Software interface using Excel.</i>	50
<i>Appendix D: Final Deliverable Software interface using Excel.</i>	50
<i>Appendix E: Project Scheduling Steps</i>	51
<i>Appendix G: Housing shortage tracker</i>	52
<i>Appendix H. WBS</i>	53
<i>Appendix I: This is a sample diagram of our Risk Management Plan</i>	54
<i>Appendix J. Gantt Chart</i>	55
<i>Appendix K. Questionnaire</i>	59
<i>Appendix L. Response to Questionnaire</i>	61
<i>Appendix P: Door Shipping Schedule</i>	77
<i>Appendix P1: Door Shipping Schedule and cost</i>	78
<i>Appendix P2: Tile Shipping Schedule and cost</i>	80
<i>Appendix Q: General Operating Information on Anchorage Housing</i>	83
REFERENCE	86

List Of Exhibits

EXHIBIT 1: HOUSING’S CONTRIBUTION TO GDP.	9
EXHIBIT 2: KEY MILESTONE TABLE.	13
EXHIBIT 3: RISK REGISTER	15
EXHIBIT 4: COMMUNICATION PLAN TABLE.	16
EXHIBIT 5: COMMUNICATION DIRECTORY.	16
EXHIBIT 3: STAKEHOLDER REGISTER	20
EXHIBIT 7: RISK REGISTER	22
EXHIBIT 8: COST BASELINE.	23
EXHIBIT 9: QUALITY BASELINE.	24
EXHIBIT 10: US HOUSING AFFORDABILITY BY COUNTY MAP	25
EXHIBIT 11: ALASKA HOUSING PROFILE.	26
EXHIBIT 12: ANCHORAGE 2040 LAND USE PLAN MAP	27
EXHIBIT 13: SURVEY ANALYSIS CHART	31
EXHIBIT 14: SURVEY RESULT GRAPH	32
EXHIBIT 15: SHOWING RESPONSES FOR QUESTIONS NO 1 AND NO 2	33
EXHIBIT 16: SHOWS RESPONSES FOR QUESTIONS NO 3 AND NO 4.	34
EXHIBIT 17: SHOWS RESPONSES TO QUESTIONS NO 5 AND NO 6.	35
EXHIBIT 18: SHOWS RESPONSES FOR QUESTIONS NO 7 AND NO 8.	36
EXHIBIT 19: SHOWS RESPONSES FOR QUESTIONS NO 9 AND NO 10.	37
EXHIBIT 20: RESOURCE DELIVERY AND COST WORKFLOW DRAWING	38
EXHIBIT 21: RESOURCE DELIVERY AND COST INTERFACE.	39
EXHIBIT 22: SOFTWARE INTERFACE USING EXCEL.	40
EXHIBIT 23: FINAL DELIVERABLE SOFTWARE INTERFACE USING EXCEL.	41
EXHIBIT 25: STRATEGIC PLANNING FLOW DIAGRAM	42
EXHIBIT 26: LESSONS LEARNED	47
EXHIBIT 27: RISK REGISTER	48
APPENDIX A: RESOURCE DELIVERY AND COST WORKFLOW DRAWING.	49
APPENDIX B: RESOURCE DELIVERY AND COST INTERFACE.	49
APPENDIX C: SOFTWARE INTERFACE USING EXCEL.	50
APPENDIX D: FINAL DELIVERABLE SOFTWARE INTERFACE USING EXCEL.	50
APPENDIX E: PROJECT SCHEDULING STEPS	51
APPENDIX G: HOUSING SHORTAGE TRACKER	52

APPENDIX H. WBS	53
APPENDIX I: THIS IS A SAMPLE DIAGRAM OF OUR RISK MANAGEMENT PLAN	54
APPENDIX J. GANTT CHAT	55
APPENDIX K. QUESTIONNAIRE	59
APPENDIX L. RESPONSE TO QUESTIONNAIRE	61
APPENDIX P: DOOR SHIPPING SCHEDULE	77
APPENDIX P1: DOOR SHIPPING SCHEDULE AND COST	78
APPENDIX P2: TILE SHIPPING SCHEDULE AND COST	80
APPENDIX Q: GENERAL OPERATING INFORMATION ON ANCHORAGE HOUSING	83

Abstract

The housing deficit in Alaska is growing annually. The Municipality of Anchorage is in dire need of Affordable Housing. The housing sector has been the bedrock of most developed nations' economies. Housing construction indices are vital for measuring economic developments in emerging countries. Urban dwellers make up about 55% of the global population. This share is predicted to rise dramatically by 2030, adding 1.6 billion people to urban regions. Asia and Sub-Saharan Africa, particularly India, China, and Nigeria, will account for 90% of this rise. (U.N. 2020).

The building sector wants to alleviate Alaska's affordable housing shortfall, but government regulations, an ailing economy, and a dysfunctional appraisal system impede the process. Land, weather, and construction materials limit affordable housing deliveries.

This research investigates how project management might create affordable homes, focusing on scheduling, stakeholder management, budget, risk, and quality. To ensure the acceptability and viability of a cost-constrained affordable housing program in Anchorage, Alaska, this project will optimize and integrate project schedule management. It will address the following:

- Create a strong scheduling plan to build 500 to 1000 dwelling units in 12 months
- Develop an efficient schedule management approach and communication tools plan to assist contractors, vendors, city officials, and stakeholders in affordable housing development

Acknowledgments

I carry out this work, I have received help from many people, and organizations that without them this work would not have been achieved.

I would like to express my profound gratitude to all those who helped me during the research work and preparation of this thesis.

Particularly, I would like to express my thanks to my academic advisor, Professor LuAnn Piccard, for her guidance, support, and inspiration, She was on the long haul with me during my admission process and was there throughout the program to ensure that I succeeded in the program, I also thank her for her capstones feedback.; To my project advisor, Assistant Professor Roger Hull, for the time he spent reviewing my work, His encouragement, insights, and suggestion, and finally the late-night meetings and calls. I am really thanking you for all contribute to the final deliverable/product.

I am grateful to have joined the DDC Division of Design and Construction University of Alaska in the course of this research and would like to thank Cameron Wohlford, your contributions made the difference. I would also like to thank my team members, Sasha Hart, and Annick Ouedraogo. those

meetings and calls were helpful, I learned a lot from you. And to my friends, and many others who have generously assisted, encouraged, and accompanied me over the past two years, I am sincerely grateful for our support.

A special thank you to my children, Fitzgerald, Claire, and Richard for your patience for continuous support, and to my wife, the love in my life, for your continuous support.

This study is dedicated to the residents of Alaska. I would like to thank those that participated in my survey for sharing their insights and experience. My hope is that this research contributes to affordable housing solutions and Alaska's social benefits.

Introduction

In recent years, the rate of homelessness in the world has grown at an alarming rate, and the urgent need to address the issue of housing cannot be overemphasize more than 1.8 billion people worldwide do not have access to decent and adequate housing, an estimated 15 million people are forcibly evicted every year, and 150 million more are living in homelessness – according to Housing and Land Right Network (HLRN).

In Los Angeles, homelessness grew 25 percent in the United States from 2018 to 2020. Nonetheless, the growth slowed due to policy measures taken during the corona virus pandemic.

Homelessness is still on the rise. Also, deaths and homeless people increased to 56 percent between 2020 -2021. The Chief of Homeless Service in the Los Angeles Council resigned, citing a failure by elected officials to address root causes of this crisis, such as lack of affordable housing and wage stagnation. Without timely intervention, existing conditions will lead to mass eviction throughout the city.

Over 975,000 individuals have perished, and approximately 80 million have been infected in the United States since the epidemic started to spread around the globe three years ago (CDC, 2022a). The consequences of the virus have been felt disproportionately by homeless people. Due to their incapacity to socially isolate themselves, people living in overcrowded housing or homeless shelters are likely to have an infection (Ghosh et al., 2021; Emeruwa et al., 2020; Chapman et al., 2020).

Additionally, the pandemic has significantly disrupted the economy, particularly for low-wage people, who have seen income losses and an uneven economic recovery (Dalton et al., 2021). Home insecurity still affects millions of lower-income renters who work low-wage jobs and have experienced a severe lack of affordable homes before the pandemic. As a result, over 5.5 million renter households were still behind on their rent in March 2022, more than a year after almost 8 million renters reported being behind on their rent in January 2021. People of color and those with lower incomes comprise a disproportionate number of these tenants. More than two-thirds of renter homes with yearly payments under \$35,000 are in arrears

on their rent, compared to 10% of white renter households. Additionally, 20% of Black renter households, 16% of Latino, and 15% of Asian renter households are in arrears.

This thesis will look into the causes of delay in affordable housing delivery and create a practical schedule management methodology for delivering affordable housing in Anchorage, Alaska.

Background

The United States has not built homes in recent decades the shortage is among the reasons homes are unaffordable for many Americans. It could potential contribution to another issue. – Like equality, Low birth rate, and climate change. The State of Alaska in the United States is one of the states with extreme housing shortage rental Affordable homes. And available to the extremely low-income (ELI) households, whose income is the powering guideline or 30% of their area median income, most of these people are severely burdened by spending almost 50% of their income on Housing: - Natural Low Income Housing Coalition).

While Alaska has one of the biggest housing shortages in the United States. The State is also hit with delays in housing delivery given its location, extreme weather conditions, poor infrastructure, and ground a lot of Alaska workers are facing a service crisis in housing. In order to address this, some employers hope to build houses for their employees. Exhibit 1: shows Housing's contribution to GDP of Countries. This shows the importance of the construction industry and housing in world economy.

Housing's contribution to GDP

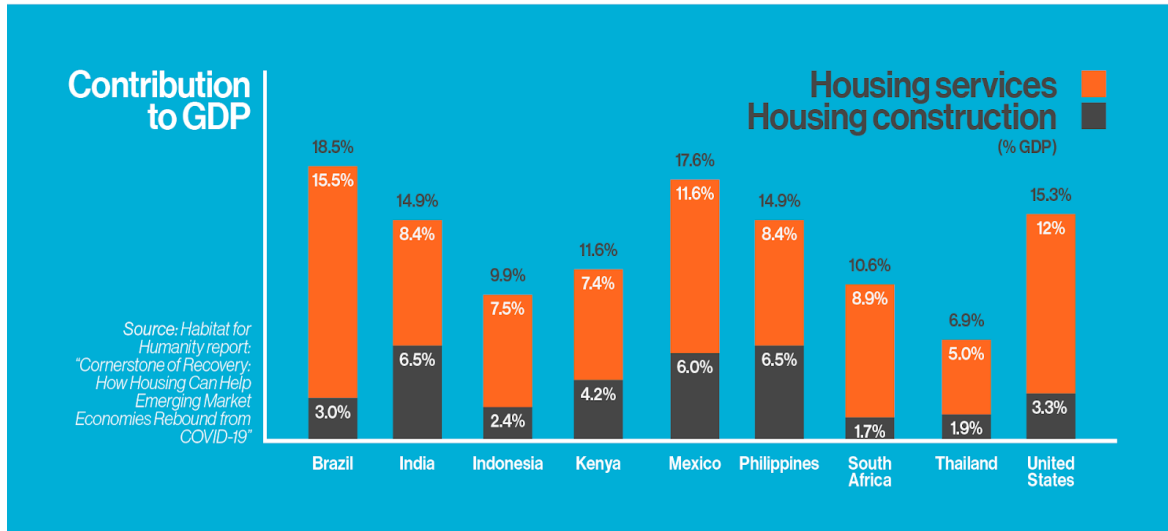


Exhibit 1: Housing's contribution to GDP.

Understanding affordable housing's impact: Housing's contribution to GDP Image: Habitat for Humanity report, Cornerstone of Recovery: How Housing Can Help Emerging Market Economies Rebound from COVID-19

Challenges in Construction Scheduling Methodology

It is common knowledge that the construction sector has scheduling issues. 88% of building firms reported delays or cancellations in 2021. However, that does not imply that we must continue to experience these scheduling issues without developing a solution.

Due to its intricacy and the nature of the work to be done, construction scheduling is complicated. There must be a way to handle the unexpected while still scaling. However, scheduling problems during construction might result in substantial cost overruns and dissatisfied clients.

Here are some of the most typical scheduling issues in construction:

- Unrealistic planning and scheduling
- Misunderstandings and scheduling problems
- Ineffective construction crew and managements
- Inappropriate use of technology and equipment
- Inefficient workflows and procedures

Create Practical Schedules with Buffers Built-In

The fact that construction planning and timetables are frequently unrealistic is one of their most prevalent issues. This may be due to several things, like underestimating how long it would take to do particular activities or failing to account for anticipated delays, or even delivery of materials.

When the timeline is unrealistic, we ask the team to review each task to determine how long it will take. Additionally, one may want to allow extra time to accommodate unexpected delays. Risks in the supply chain is a big problem that will continue to be a problem if it is not addressed adequately.

Invest in a Platform for Integrated Communication and Scheduling

Miscommunication and scheduling mistakes brought on by using several disconnected systems, such as two separate software platforms or two sheets of paper, are another frequent problem. Team members may become frustrated and perplexed, which could ultimately cause delays.

Invest in a centralized communication and scheduling platform that everyone can access and update in real-time. Everyone remains in sync when they receive real-time updates.

Create Methodologies and Tools for Inter-Team Coordination

It can be disastrous when there is a breakdown in coordination and communication amongst several teams (including subcontractors). Do you know when one unit enters the field and when the other leaves it?

Would the following team know of a delay if one group does not finish their work?

Make it simpler for teams to connect by creating a clear, concise communication plan. Store project and task updates on a centralized platform so everyone on the team can view the project's status.

Streamline the Processes and Workflows

If the construction timetable consistently gets thrown off, it may be because of inefficient workflows and procedures. How are work schedules made for employees? What duties do they have to perform?

Use workflows and procedures to assign tasks smartly. There is no accountability if team members are unaware of the responsibilities for which they are accountable. Additionally, they would be unable to do their assignments if they are constantly traveling.

Invest in the Right Tools and Technology

Software for scheduling construction projects can be an excellent tool for coordination and organization. However, this does not imply that organizations should invest in technology for good progress.

The program itself starts to be a problem. Small contractors could make unnecessary technology investments. Alternatively, building firms might assemble disorganized digital content from various technologies.

Consider IT requirements carefully, identify any gaps, and consolidate. Find a system that tracks employee time, prevents scheduling conflicts, and gathers project and task data in construction labor tracking software.

Project Scope Statement

This scope statement provides a general overview for defining the scope of the proposed affordable housing project for Anchorage, Alaska. Included in the statement are descriptions of the project deliverables, required work to provide the deliverables, and establishing a common framework of the scope of work among all stakeholders. All work referenced in this scope statement will directly support the final project deliverables. All project scope or schedule changes were addressed with the project team and processed via the approved project change management process (es). The completion date for this project is April 24, 2023.

Project Management Approach

The project manager led the project management team, manage, and execute this project following project plan and its subsidiary management plans. Personnel from the following consultants will make up the project team:

- Project Manager
- Project Assistant
- Architect
- Civil Engineer

To complete project planning, the project manager collaborated with the team members. The project sponsor reviewed and approved all project and subsidiary management plans. The project manager and the client made all funding choices. Delegated authority approved by the project manager was in writing and signed by the project sponsor and manager.

The project team was a matrix, with team members from each organization reporting to their respective organizational management throughout the project. The project manager was in charge of informing corporate managers about the status and performance of each project resource.

Project Objectives

This project seeks to establish and build a schedule management approach for the affordable housing project to construct the houses that will aid in delivering the house on time and within budget. The goal also includes:

- Provide home financing for the people of Anchorage, which will increase homeownership.
- Increase homeownership for low-income earners.
- Create an enabling environment and platform for native Alaskans to own their houses through “Rent to Own.”

Project Scope

This project's scope is to develop an optimized and Integrated project schedule management methodology for ensuring the suitability and feasibility of a cost constrained affordable housing program in Anchorage.

The affordable housing strategy will address the following:

- To develop a strong scheduling plan to enable and facilitate the construction of 500 to 1000 housing units within 12 months.
- Create an effective schedule and communication resources plan to help contractors, vendors, city officials, and stakeholders.
- It identifies key performance indicators (KPIs) which will be used to monitor the strategy's progress.
- Create communication channels among clients, contractors, municipalities, and Alaska corporative.
- Create an implementation scheduling plan with budget estimates and potential funding sources.
- Developing the steps involved in managing schedules.

Milestone

The affordable housing project for Anchorage City project has been approved to meet the housing need of the people of Anchorage. The following requirements were fulfilled to maintain satisfactory project progress and successful performance.

1. Contractor selections and initial testing will be completed by December 2023.
2. Contractor cost budgets, and all engineered plans will be completed by November 2022.
3. Site Acquisition by October 2023.
4. Project Houses construction will be completed by November 2023.
5. Sale by December 2023.

The chart below lists the significant milestones for this affordable housing project. This chart comprises only major project milestones, such as the completion of a project phase or gate review. There may be smaller milestones that are not included here but are included in the project schedule. The project manager will communicate any approved milestone changes or dates to the team. If scheduling delays

impact a milestone or delivery date, the project manager must be notified immediately so proactive measures may be taken to mitigate slips in dates.

Constraints

- Project schedule must not be exceeded.
- Project delivery date must exceed must not April 24th. 2023.
- Project scope must not change without formal approval.
- Final project cost must not exceed budget Cost.

Project Deliverables

The project's expected deliverables are listed below.

- To develop a scheduling management methodology plan for affordable housing project.
- To develop scheduling management software to track housing /construction projects in Anchorage to predict delay and cost variation.
- To provide recommendations for procurement management in construction projects in Anchorage, Alaska.

Key Milestones

Milestones and Deliverables	Planned Finish Date*
Methodology	October 16, 2022
Finalize selection of tools and techniques for scheduling methodology	October 30, 2022
Commence scheduling meetings and interviews with stakeholders.	November 18, 2022
Complete documentation of Lessons Learned	November 25, 2022
Complete the questionnaire using online tools.	January 31, 2023
Commence development of model	March 2023
Handover	May 1, 2023

Exhibit 2: Key milestone table.

Schedule Baseline and Work Breakdown Structure

The WBS for the affordable housing project comprises work packages that ensured the efficient delivery of the project execution plan. Project team members and stakeholders work closely together to develop work packets, with input from functional managers and analysis of previous projects.

All of the work packages for the Smart Voice project are defined in the WBS dictionary. These definitions cover all duties, materials, and outputs. The WBS dictionary defines each work package in the WBS, which helped in resource planning, task completion, and verifying that deliverables adhere to project requirements. More information was given as the project developed.

Change Management Plan

An organization change control procedure for the Affordable Housing project consists of the following steps:

Step #1 Determine the need for change (any stakeholder) in step one. The requestor sent the project manager a finished affordable housing change request form.

Step #2 (Project manager): Entered the change in the change request registry. The project manager recorded all change requests throughout the project.

Third Step: Assess the modification (project manager, project team, requestor, client). The project manager assessed how the modifications affected cost, risk, schedule, and scope.

Step #4: Submitted change request to the project manager's Change Control Board (CCB). The modification request and analysis sent to the CCB for review by the project manager were sent to Change Control Board's (CCB) for decision.

Step #5. Based on all material given, the CCB discussed the proposed change and determine whether or not it will be authorized before implementing the change.

Step #6 (Project Manager). The project manager ensured any changes were communicated to the team and stakeholders and update and rebase line project documentation as appropriate before the CCB approved a modification.

Any team member or stakeholder that made a change request for the project, whether accepted or rejected, the project manager recorded all change requests in the change control register and follow through to completion. The CCB presided over by the Client, Alaska Housing, and any modifications to the project's scope, price, or timeline had permission.

Project Risk

Serial No	Risk Area	Likelihood	Mitigation Plan
1	Construction delays due to the supply of material	High	Project Schedule to allow for this, i.e., enable contingency time. Most materials will be procured in advance for shipping and freighting to Anchorage.
2	Construction delays due to inadequate tradesmen workforce	High	Contractors to be prequalified and Contract awarded on time to allow contractors to recruit workers ahead.
3	Architectural design change	Low	Design Team, Client all trades relevant stakeholders to commence collaboration early to incorporate possible changes at the design stage.
4	Construction delays due to inclement weather	Medium	Project Schedule to allow for this, i.e., enable contingency time. A significant part of the task is to be completed during summer.
5	Regulations by state control boards	Medium	Obtain all necessary building permit early; design team to engage with the Building Plan Approval Board to ensure all regulations and requirement are met before the project commences

Exhibit 3: Risk Register

Communications Management Plan

This communications management plan established the basis for this project's communications. Throughout the project, it acted as a communication guide and was modified as communication needs evolved. The roles of the affordable housing project team members as they relate to communications were identified and defined in plan. A communications matrix that mapped the communication needs of this project to the communication done for meetings and other types of communication is also included. A project team directory was created and published to offer contact information for all project participants.

The project manager led the team to ensure good communication on this project. The Communications matrix was guide on how to communicate with whom, when, and what information and to whom. The communications matrix shown below contains a list of the communications requirements.

Communication Type	Description	Frequency	Format	Participants/ Distribution	Deliverable	Owner
Weekly Status Report	Email summary of project status	Weekly	Email	Project Sponsor, Team, and Stakeholders	Status Report	Project Manager
Weekly Project Team Meeting	Meeting to review action register and status	Weekly	In-Person/ Virtual	Project Team	Updated Action Register	Project Manager
Project Monthly Review (PMR)	Present metrics and status to team and sponsor	Monthly	In-Person/ Virtual	Project Sponsor, Team, and Stakeholders	Status and Metric Presentation	Project Manager
Project Gate Reviews	Present closeout of project phases and the kick-off of subsequent phases	As Needed	In-Person/ Virtual	Project Sponsor, Team, and Stakeholders	Phase completion report and phase kick-off	Project Manager
Technical Design Review	Review of any technical designs or work associated with the project	As Needed	In-Person/ Virtual	Project Team	Technical Design Package	Project Manager

Exhibit 4: Communication plan table.

Project team directory for communications

Name	Title	Company	email
H Kellie	Client Representative	AFHC	Hkellie@ahc.com
Fitzgerald Umah	Project Manager	UAA	fcumah@alaska.edu
Sasha Hart	Associate Project Manager	UAA	shart13@alaska.edu
Kadidiatou Ouedraogo	Civil Engineer	UAA	kouedraogo@alaska.edu

Exhibit 5: Communication directory.

Communications

Meetings:

Each meeting was scheduled to start on schedule and include all participants. The project manager distributed a meeting agenda at least two days before any scheduled meeting, and all participants were expected to review the agenda before all the meeting. Meeting minutes were made available within 24 hours of each meeting's conclusion. The timekeeper ensured that everyone kept to the scheduled times for all project meetings, and the recorder took all meeting notes for delivery to the team after the meeting.

Email:

All communications related to the affordable housing project was formal, error-free, and short. Based on its content, emails were sent to the appropriate project participants using the communication matrix above. All attachments followed specified formats and be in the organization's standard software products. If the email is to raise a concern, it was forwarded it to enable us talk about the issues, give a brief history, and offer suggestions for resolving the problem. Any emails about the project were forwarded to the project manager.

Informal Communications:

While informal communication is a part of every project and is necessary for successful project completion, any issues, concerns, or updates that came from an informal discussion between team members were communicated to the project manager that appropriate actions were taken.

Plan for Cost Management

Throughout the project's lifespan, the project management team oversaw and report on the project's costs. During the monthly status meeting, the project manager reviewed and presented the project's cost performance. The project manager was responsible for accounting for cost variances and providing the project sponsor with options for bringing the project back on budget using Earned Value calculations. The client, Alaska housing, oversaw all budgetary authorities and choices, including budget modifications. The project manager provided the client with a monthly report of valuations' Cost and Schedule Performance Index (CPI and SPI, respectively). Any corrective measures were first documented in a project change request and approved by the CCB that were put into practice. Where there were signs that the Earned Value calculations may go close to or pass a critical point before a later meeting, the project manager compiled them and reported them during the monthly project status meeting. In that situation, the project manager informed the client and the team immediately.

Management Plan for Procurement

The project management team supervised and managed all procurement operations related to this project. The project manager collaborated with the project team to determine any goods or services that must be purchased to complete the project successfully. The project manager then ensured those purchases were vetted by the PMO (Program Management Office) and made available to the purchasing and contracting groups. The purchasing and arrangements groups examined procurement actions, decided whether it was better to produce or purchase goods or services internally or externally based on resource requirements and start the vendor selection, purchasing, and contracting processes. The project manager supervised selected vendor or external resource where procurement was required. Additionally, the project manager tracked vendor performance regarding providing necessary products and services and shared the information with the purchasing and contracts teams.

Plan For Scope Management

The project management team solely managed scope management for the Alaska housing project. To measure the project scope, the project manager, sponsor, and stakeholders created and approved documentation that included deliverable quality checklists and work performance measurements. The Work Breakdown Structure (WBS), WBS dictionary, and scope statement for this project were all defined there. Proposed scope adjustments were initiated by the project manager, stakeholders, or any project team member. The project manager received all change requests and reviewed any desired scope changes. As soon as the scope modification request were approved, the project manager submitted them to the change control board and project sponsor for approval. Following the Change Control Board's and the project sponsor's approval of scope adjustments, the project manager updated all project documentation and notified all stakeholders of the change. The project sponsor approved the final project deliverables and scope based on comments and input from the project manager and stakeholders. This approval was contingent upon examining all project paperwork, test results, and beta trial results, as well as finishing all tasks and making all areas suitable for their intended use. The project management team and the client's responsibility were to formally accept the project's final deliverables.

Plan for Managing Schedules

The Alaska housing project schedules was created using M.S. Project, starting with the deliverables identified in the project's Work Breakdown Structure (WBS). The precise work packages that were carried out to complete each deliverable were specified in the activity specification. The order of work packages and the linkages between project activities were decided by activity sequencing. Calculating the activity length determined how many work periods are necessary to finish each job package. To complete

schedule development, resource estimation was distribute based on resources to work packages. Once created, the project team and any resources provisionally assigned to project tasks assessed the preliminary schedule. Both the project team and the available resources approved the suggested work package assignments, durations, and timetable. The project sponsor evaluated, approve, and baseline the schedule once they were accomplished. For all project timelines, the following organizational standards were regarded as milestones: Completion of scope definition, Baseline project schedule, approval of the final project budget, Project kick-off, approval of roles and responsibilities, Requirements definition approval, Project implementation, acceptance of final deliverables.

The following were the roles and duties involved in developing a schedule:

The project manager was in charge of assisting the project team with work package definition, sequencing, and resource and duration estimation. After receiving the project sponsor's approval, the project manager baselined the schedule. Additionally, the project manager used MS Project 2019 to examine the project schedule and confirm it with the client, stakeholders, and project team. The project team was responsible for each work package's definition, ordering, timing, and resource estimation. Following approval, the project team completed its allocated tasks and review and validate the suggested timetable. Before the schedule was baselined, the project sponsor evaluated the recommended schedule and give final approval. The project's stakeholders took part in evaluations of the proposed schedule and help to validate it. Plan for managing stakeholders based on an analysis of the needs, interests, and potential effects on project success, the stakeholder management plan developed appropriate management techniques to involve stakeholders throughout the project lifetime effectively.

Plan for Stakeholder Management

Participants in the project or people that the project affected are known as stakeholders. A stakeholder is any person, team, or organization whose project results will impact.

Project stakeholders, as the name suggests, are those with a stake in the project's success who may work for or be affiliated with the sponsoring organization. It is important to determine the major stakeholders and develop a stakeholder management plan to satisfy their needs because stakeholder relationships can have a good or negative impact on the life cycle of a project. An intelligent method to stay organized and ensure the project stakeholders were happy and productive to keep track of them using project management software. Creating a stakeholder register enabled the project manager to know who needs what information and be able to communicate based on their interest. The Key Stakeholders in this Project are shown in Stakeholder Register (see Exhibit 3: Stakeholder Register). They are categorized (internal and external) and identify their power and appeal.

Project Stakeholder Register							
Fitzgerald Umah							
Stakeholder Name	Title	Role	Category	Power (H/M/L)	Interest (H/M/L)	Expectations	Requirements
Alaska Housing Finance corporation	Sponsor	Lead Project and Provide approval and funding for the project	Internal	H	H	All documents and Permits	Project Progress Information
Fitzgerald Umah	Project Manager	Project Promoter. Responsible for managing relationship with key stakeholders and create benchmarks for success and deliverables (Including managing Schedule, Budget and Subscribers.	Internal	H	H	Ensuring the Project Schedule is met. Running a profitable budget, assigning the right Resources to tasks and being able to make tough decisions	Project Progress following Schedule, Cost, material specification and guides
Kadidiatou Ouedraogo	Engineer	Determines Project Responsibilities by Phases and reviewing bids from contractors	Internal	M	M	Product design and Works control	Get the Software and Information need for the Product design
Fitzerald Umah	Architect	Oversee the design and Constuction	Internal	M	M	Designs and Architectural plans	be Informed of the land Information and any Information about the Plans
US Department of Energy	State representative	Review permit, license for energy and provide Renewable Energy resource	Internal	M	L	Maintenance of legal bounds	All state and local regulations are followed.
US Department of Housing and Urban Development	State representative	Review permit, license, contract submissions for state/local regulations	Internal	M	L	Maintenance of legal bounds	All state and local regulations are followed.
Alaska CDC	Customers/Subscribers	Represent Alaska Low-income people and other subscribers.	Internal	M	M	Local/state regulations will require a larger budget than expected by senior leadership.	Minimal negative impact on community
Alaska Native Association Represent	Social Service	Represent the community Interest	External	H	M	good presenting on project progress and results	Consistent flow of information through progress/status reports Weekly meetings

Exhibit 3: Stakeholder Register

Quality Management Plan

The quality management process will involve participation from every member of the Alaska Housing project team. The team was responsible for ensuring that all deliverables—from individual work packages to the final product—were delivered with sufficient quality. The quality Management duties and responsibilities for the Project were as follows:

The project management team approved all quality criteria for the Alaska housing project. The project manager examined all project tasks and deliverables to ensure they adhered to defined and approved quality standards. The final acceptance of the project deliverable also received the project sponsor's approval.

Throughout the project's lifecycle, the project manager-controlled quality control. The project manager was responsible for carrying out the Quality Management Plan and ensuring that all activities, procedures, were written and materials adhere to the plan. To develop appropriate criteria, the project manager collaborated with knowledgeable specialists. The project manager also informed the project team and stakeholders of and kept track of all quality standards.

The project manager and the quality specialists collaborated to create and carry out the Quality Management Plan. The tools, procedures, and standards for measuring quality and setting acceptable quality thresholds will be suggested by quality specialists. The quality specialists established and kept up with quality control and assurance logs throughout the project.

Helping the project manager and quality specialists define acceptable quality standards were the responsibility of the remaining project team members and the stakeholders. Additionally, they verified that all quality requirements were satisfied and let the project manager know if they had any quality-related concerns.

Tools and procedures were used in the project's quality control to ensure all project deliverables adhered to agreed quality standards. Establishing a formal procedure where quality standards are evaluated and acknowledged to fulfill the demands and expectations for deliverables were part of our goal. The project manager ensured that all quality standards and quality control procedures were followed throughout the project. The project manager worked with the Quality Specialists to ensure that each deliverable met all requirements. Assume that the project sponsor and CCB agreed to any suggested changes. The project manager was in charge of informing the project team of the changes and updating all project plans and documents.

Quality control ensured that all procedures to finish the Alaska housing project adhered to acceptable quality standards. These procedural requirements were implemented to increase project efficiency and reduce waste. With the assistance of the Quality Specialists, the project manager monitored and assessed the quality of each method used throughout the project, ensuring that all quality criteria were satisfied. The project manager was in charge of informing the project team of the changes and updating all project plans and documents once the Project Sponsor and CCB agree to adjust.

Plan for Risk Management

To proactively identify hazards in advance so that a mitigation strategy may be implemented from the start of the project. The project team identified, rates, and ranks the various risks using a systematic process as part of the risk management strategy for the Alaska housing project. Most likely risks have been included in the project schedule to ensure that the assigned risk managers performed the necessary actions to implement the mitigation reaction immediately during the program. In the biweekly project team meetings, risk managers gave status updates on the dangers they have been tasked with, but only when the sessions cover the risk's anticipated timeframe.

During the closure, the project manager evaluated each risk and the risk management procedure. Based on this research, the project manager determined any enhancements that can be made to the risk management procedure for subsequent projects. These improvements were being documented as part of the knowledge base of lessons learned.

Risk Register

Serial No	Risk Area	Likelihood	Mitigation Plan
1	Construction delays due to the supply of material	High	Project Schedule to allow for this, i.e., enable contingency time. Most materials will be procured in advance for shipping, barging, and fighting to Anchorage.
2	Construction delays due to inadequate merchants in the workforce.	High	Contractors being prequalified and contracts awarded on time to allow contractors to recruit workers ahead
3	Architectural Design Change	Low	Design team, client all trades relevant stakeholders to commence collaboration early to incorporate possible changes at the design stage
4	Construction delays due to inclement weather	Medium	Project schedule to allow for this, i.e., enable contingency time. A significant part of the task is to be completed during summer, while all design works and negotiations with contractors, vendors, and suppliers are being made during winter.
5	Regulations/State control boards	Medium	Obtain all necessary building permit early; design team to engage with Building Plan Approving Board to ensure all regulations and requirement are met before the project commence. All the above is to be done preferably during winter

Exhibit 7: Risk Register

Staffing Management

Staff Required

The roles and responsibilities of the members of this project were essential to its success. All team members clearly understand their roles and responsibilities to ensure the successful completion of the project. For the Anchorage affordable housing project, the following project team roles and responsibilities have been established:

Project Manager (PM) (Responsible for the project's overall success. The PM authorizes and approves all project expenditures. The PM was also responsible for approving that work activities meet established

acceptability criteria and that fall within acceptable variances. The PM reported the project status following the communications management plan. The PM assessed the performance of all project team members and communicate their performance to functional managers. The PM possessed the following skills: leadership/management, budgeting, scheduling, and effective communication.

Project Advisor: Responsible for giving required feedback on PPM deliverables, communicating, reviewing, and providing input on PM's suggested changes for the project's duration.

Advisory Committee Member: Responsible for giving required feedback on PPM deliverables, communicating, reviewing, and offering input on PM's suggested changes for the project's duration.

Further information on the staffing management for this project were stated in the staffing management plan.

Resource Calendar

The Alaska housing project required all project team members for the duration of the project, even though levels of effort varied as the project progresses. The project is planned to last four months with provision to work Saturday to meet timeline deliverables.

Cost Baseline

The cost baseline for the Alaska housing project includes all budgeted costs for the successful completion of the project.

Project Phase	Budgeted Total	Comments
Planning	\$250,000	Includes the time spent by each member of the project team gathering requirements and preparing the project.
Design	\$1,000,000	Includes the hours each project team member worked on the project's construction and design.
Execution	\$3,000,000	Includes all work hours for on-site construction for project work
Monitoring/Control/Testing	\$1,000,000	Includes all effort hours for test runs of all aspects of project work
Transition and Closeout	\$750,000	Includes all effort hours for transition to operations and project closeout

Exhibit 8: Cost baseline.

Quality Baseline

The Alaska housing project must meet the quality baseline's parameters. The project's acceptable quality levels are provided by the quality baseline, which was the baseline in question. To be successful, the interior spaces and overall atmosphere of the structures must match or exceed the quality baseline standards.

Item	Acceptable Level	Comments
Design of Layout/Spatial Flow	Good	Satisfactory
Methodology of construction	Good	Satisfactory
Quality of Finishes Materials	Good	Satisfactory
Quality of Workmanship	Good	Satisfactory

Exhibit 9: Quality baseline.

Research Conducted

Methodology

Surveys/ Questionnaires

Questions have been designed to capture the demography of Alaska and Anchorage's population and their preference regarding House type.

- Causes of delay in Housing Construction
- Construction materials that cause delay.

In January 2023, a quantitative survey was conducted in Fairbanks and Anchorage areas. See Exhibit 10 and 11

US HOUSING AFFORDABILITY BY COUNTY

Based on Median Home Price vs Median Household Income

Data sources late June / Early July 2022

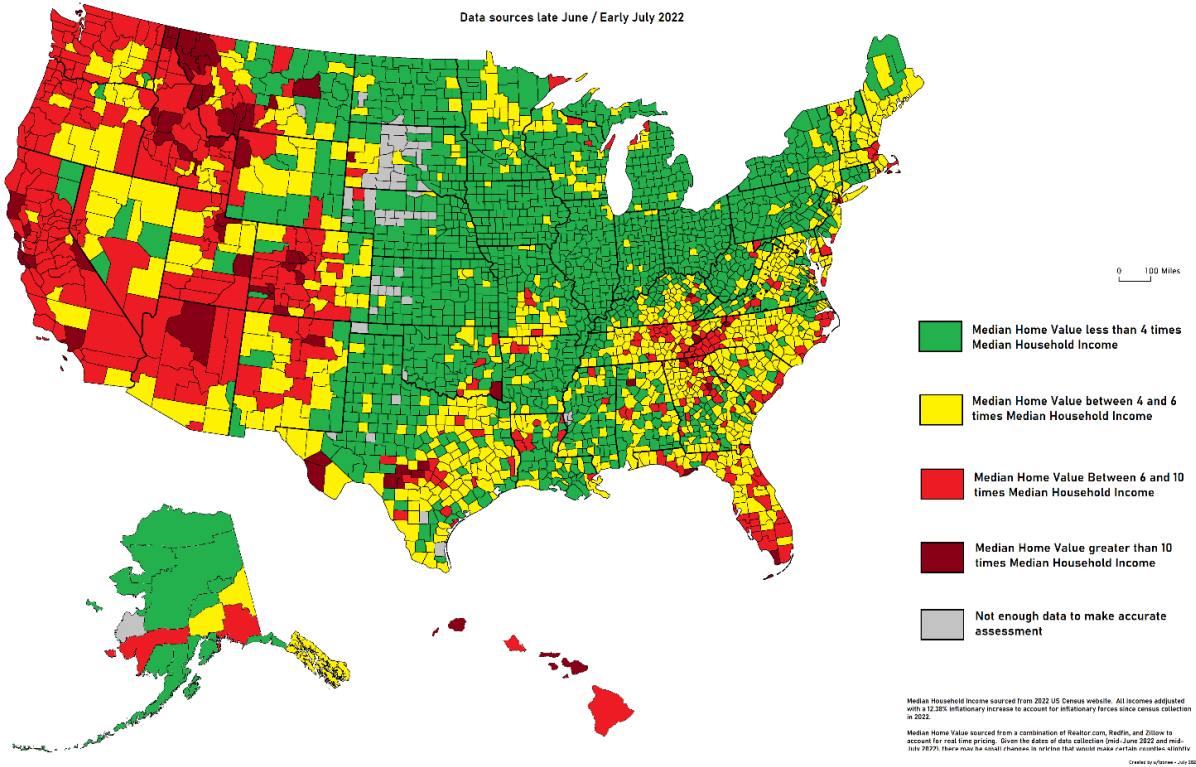


Exhibit 10: US Housing Affordability by County Map

The Location of affordable housing is very important because if it is not properly located the goal may be lost, Exhibit 10: US Housing Affordability by County Map. In making the study more representative and persuasive, the questionnaires were distributed to professionals in the built environment, like Architects, Civil Engineers, Mechanical Engineers, Electrical Engineers, and Project Managers in the construction industry.

In summary, a Survey questionnaire was distributed to 31 participants that live in Alaska. About 60% of the participants who worked at the design and construction division of the University of Alaska, Fairbank, Architects, and other Consultants in Anchorage also participated. The reason for distributing this to them is that they are actively working on construction projects and face these challenges daily.

The survey contained questions regarding the causes of delay in the affordable housing project, e.g.,

What do you think is the cause of the housing shortage in Anchorage?

What do you think is responsible for the delay in housing construction?

What construction materials are the major causes of delay in housing construction in Anchorage?

2023 ALASKA HOUSING PROFILE



Across Alaska, there is a shortage of rental homes affordable and available to extremely low income households (ELI), whose incomes are at or below the poverty guideline or 30% of their area median income (AMI). Many of these households are severely cost burdened, spending more than half of their income on housing. Severely cost burdened poor households are more likely than other renters to sacrifice other necessities like healthy food and healthcare to pay the rent, and to experience unstable housing situations like evictions.

SENATORS: Lisa Murkowski and Dan Sullivan

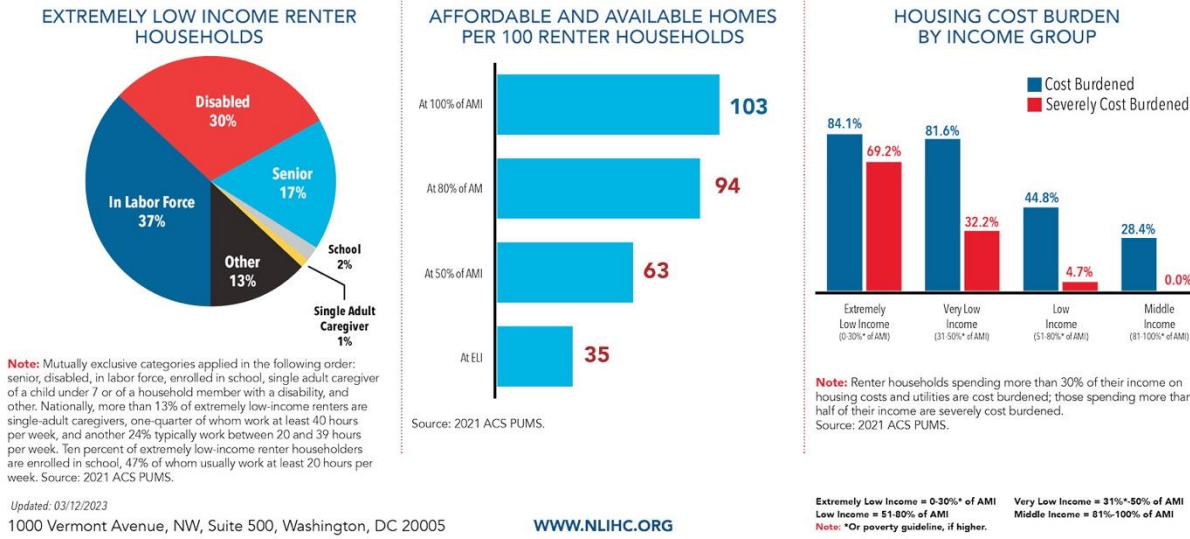


Exhibit 11: Alaska Housing profile.

The questionnaire has multiple-choice answers which participants had the opportunity to choose from; the exact copy of the survey questionnaire is in Appendix K.

After cleaning the raw data and tabulating the statistical data, the causes of delay were identified. Then investigated what contributed to the delay and further identified the construction materials responsible for the delay and what could be done to mitigate this. Also found out about other causes of housing shortly in Anchorage.

- What finishing material causes a delay in housing construction?
- What other building components cause delays in housing construction?
- Do you think the importation of building materials outside Alaska is a significant cause of delay in a construction project?

In addition, other causes of delay in affordable housing that are not related to construction materials were investigated:

- How can cost be controlled in affordable housing project?
- What incentives, programs, or actions should the municipality of Anchorage take to encourage the development of homes for all income levels?

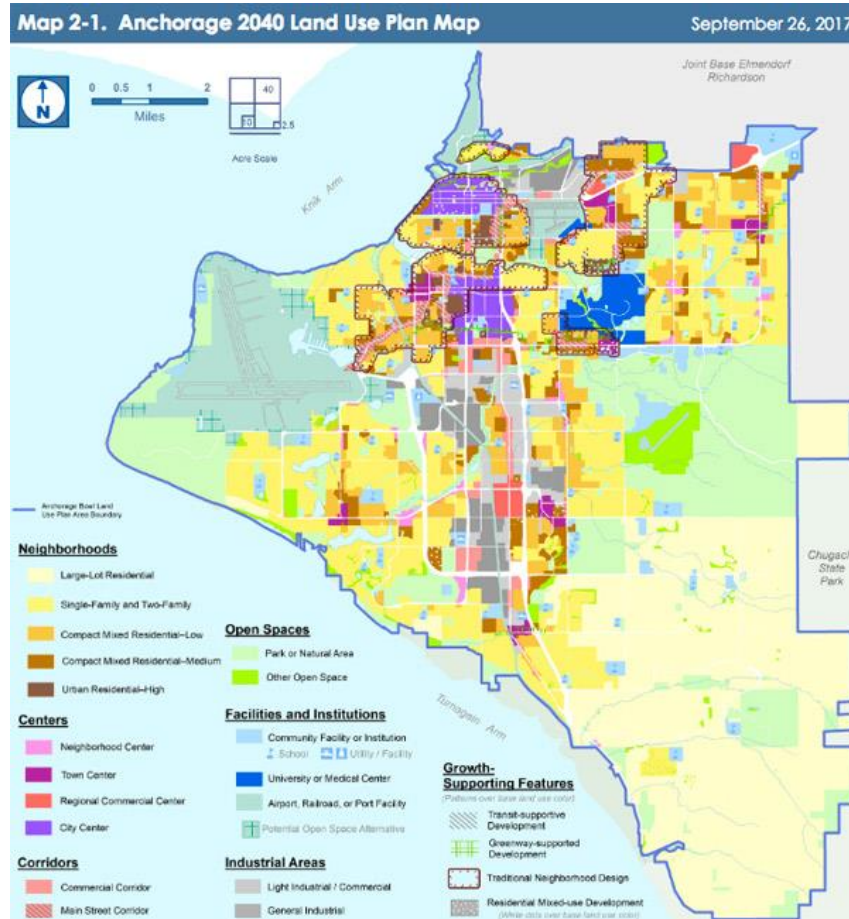


Exhibit 12: Anchorage 2040 Land Use Plan Map

After a series of hypothesis testing, the data gathered were examined to see how they contribute to the cause of delay in affordable housing and which materials are the major causes of delay. How it can be reduced, and what can be done to ensure a lasting solution to the problem; lastly, the role of government in legislation was also investigated and what role project management can play to help the professional in the built environment plan avert this delay.

Literature Review

Several organizations were contacted before completing this project, including the Division of Design and Construction, University of Alaska Fairbanks also gathered information from the website of Alaska Housing. The built environment professional association, and the American Institute of Architects Alaska

Chapter members were also contacted. The aim was to learn what people think is the biggest obstacle to the affordable housing project's schedule. What challenges are they encountering in their current home or accommodations, and how may delays be avoided? According to popular consensus, there is a housing shortage in Alaska, construction projects frequently experience delays, and construction materials are a significant factor in these delays.

During this engagement, it was learned that many people want decent housing. Still, few affordable housing schemes are available, despite the Alaska housing corporation's best efforts to ensure that housing is accessible to all. Part of the problem is the weather conditions in Alaska, as the construction season is only from April to September, which deters investment in this sector. Also, some people prefer to live in urban areas, despite being a small group, these individuals impact the housing market. It is concerning how many people are homeless in Anchorage. The government must enhance its budgetary funding to encourage public engagement in projects of this nature. In addition, new housing assistance programs must be developed to assist Alaskans.

If the government does address this issue, it will significantly negatively affect Alaska's economy. At the Project Management Institute Alaska Chapter Annual Conference in Anchorage in November 2022, the mayor of Anchorage, David Branson, recently stated that although some businesses are willing to relocate there, the housing crisis needs to be solved.

Permafrost in Alaska

Any engineer's first worry should be how to deal with the permafrost in Alaska. The department of Natural Resources Geological & Geophysical Surveys estimate that about 85% of Alaska is covered with permafrost. While the state's southeastern part receives a welcome break with little to no permafrost beneath the ground, the northernmost part is almost totally covered with permafrost. Alaska's permafrost can be up to 2,000 feet deep in certain places, offering technical problems unique to frigid regions do not present elsewhere. What is the cost to build an apartment complex? Considerations for building an apartment complex. There are many factors to examine and consider while calculating your costs and profits.

Costs of Land and Location

One of the most crucial considerations when figuring out how much it will cost to build an apartment is located. Land expenses make up about 10% to 20% of the budget, according to the Metropolitan Policy Program at Brookings, a nonprofit public policy organization, and local costs significantly impact that percentage. For example, land purchases in urban regions are more expensive than those in rural areas,

and the particular city also has a significant impact. Prices in major cities like New York will be significantly more than in a secondary city like Denver.

Permits

How simple or challenging it is to obtain zoning permits for apartment complexes is another aspect to consider, according to D'Amato. In certain circumstances, one can purchase a "permitted site" where someone else has already received all the necessary approvals to construct units. D'Amato used the example of a plot of land you plan to buy that has already been permitted to build 200 apartments. There are, however, some plots of land that are not currently zoned for multifamily buildings. One might purchase them to apply for the necessary licenses and zoning approvals. Unfortunately, it is not always a task to accomplish.

Because of this, one might want to study the procedure for obtaining zoning permits in your area before buying a plot of land not already approved for an apartment complex.

The first thing to think about is how difficult it is to obtain permits. How much time will it take? What is the procedure I must follow? Do I need political ties to succeed? How much money will I be spending? Do I have that much cash? D'Amato elucidated.

Affordable Versus Luxurious Housing

When constructing an apartment complex, you must decide if you are developing luxury apartments, economical housing, or both. The construction costs are comparable depending on the features you add to the apartment building; however, affordable housing has lower rent. Because of this, most U.S. localities have inclusionary zoning laws, which mandate that some affordable housing accompany any market-rate housing.

Some affordable housing is required under inclusionary zoning regulations, so "your market rate rents need to make up for the fact that you also have restricted rents," D'Amato said.

Rents for cheap housing typically do not cover the costs. However, governments offer financial incentives to "bridge the gap," continued D'Amato. When is affordable housing, there are tax deductions, subsidies, density incentives, and low-cost financing options accessible. Explore inclusionary zoning in your region to calculate your expenditures and overhead when comparing affordable housing to luxury apartments.

Materials and Labor Costs

Once you have determined the expenses of your property and permits, you can determine the cost of labor and materials, sometimes known as "hard costs" or, as D'Amato phrased it, "the physical cost to put up

the building." The majority of your budget will consist of the prices of supplies, labor, and contractor fees.

Extra Charges or Soft Costs

Costs, including architectural fees, legal fees, interior design fees, furniture, fixtures, and equipment (FF&E) fees, and any other supplemental fees you may incur along the process, should all be included in your budget. According to Brookings estimates, these expenses might account for 20% to 30% of your budget.

Returns and Equity

To "justify development," D'Amato advised considering equity holdings and if one can get a fair return on investment before creating an apartment complex. "By justifiable development, he meant that it must be funded, that equity must be purchased, and that it must be profitable. Apartment will not be developed if it is too expensive to build and return on investment cannot be guaranteed.

To estimate expected return on investment, it is important to look at the rental market in the area before starting development. D'Amato noted that while rent prices are soaring nationwide, so are the costs of building and hiring workers. Calculate your equity and possible returns to decide whether your spending is necessary and will result in a profit.

Expected Rates of Occupancy

Its anticipated occupancy rate is fundamental to consider while developing an apartment complex. How many apartments are to be constructed, and is expectation is for immediate occupation? How much per square foot will be charged? To determine occupancy and vacancy rates, one should consider comparable buildings in the neighborhood.

More than 9.1 million renter households have low incomes (i.e., incomes between 51% and 80% of AMI). 35.7 million rental homes are affordable to the 9.1 million low-income renters. Low-income renters can afford the 16.7 million homes affordable to extremely low-income and very low-income renters, and they can afford an additional 19 million more expensive rental homes. Approximately 4.6 million renters are middle-income (i.e., incomes between 81% to 100% of AMI). Middle-income renters can afford all the homes that low-income renters can afford, plus an additional 5.7 million more expensive rental homes. Consequently, this group's total supply of affordable rental housing is 41.4 million units.

Research Analysis

Survey Analysis

This Chapter Analyses the responses gathered from all the participants. See Exhibit 13. Using the Quantitative method to analyze the survey.

AFFORDABLE HOUSING PROJECT FOR MUNICIPALITY OF ANCHORAGE

This Survey is being carried out for academic research purposes. Your Participation will provide with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a plate for use by other throughout Alaska. Your input on topics related to affordable housing for the state of Alaska, with a focus on anchorage, will be appreciated. Affordable housing questionnaire

ID		1	2	3	4	5	6	7	8	9	10	11	12	TOTAL REPOSES	% TOTAL RESPONSES
1	What do you think is the cause of the housing shortage in Anchorage														
	A. Not enough land		x		x	x				x				4	33.30%
	B. Lack of investment		x	x			x		x			x	x	6	50.00%
	C. Not enough market							x			x			2	16.60%
	D. Low rental cost														
2	What do you think is responsible for the delay in housing construction														
	A. Lack of human resources				x									1	0.00%
	B. Lack construction materials		x	x		x	x					x		5	41.66%
	C. Short barging time							x		x				2	16.60%
	D Other (Specify)	x							x	x			x	3	25.00%
3	What housing fund strategy can help solve address housing shortage Anchorage														
	A. Federal funding		x	x				x						3	25.00%
	B. State funding		x										x	2	16.60%
	C. Private funding		x		x		x			x	x	x		6	50.00%
	D. Investment funding		x	x		x			x					4	33.30%
4	What construction materials are the major causes of delay in housing construction in Anchorage ? Check all that apply.														
	A. Wood			x	x			x			x	x	x	6	50.00%
	B. Cement					x				x				2	16.66%
	C. Steel		x				x		x					4	33.33%
	D.Blocks				x	x								1	8.30%
	E. Gypsum												x	1	8.30%
5	What finishing materials cause a delay in housing construction? Check all that apply.														
	A. Tile					x				x	x	x		4	33.33%
	B. Sanitary wears										x	x		2	16.66%
	C. Door hard wear						x	x	x	x	x	x		6	50.00%
	D. Electrical fittings		x	x	x	x			x				x	7	58.33%
	E. Ceiling boards										x			1	8.33%
6	What other building component cause delays in housing construction? Check all that apply.														
	A. Doors		x	x	x	x	x		x		x	x		8	66.66%
	B. Windows		x	x	x	x	x		x	x	x	x	x	11	91.66%
	C. Kitchen Cabinets			x						x	x	x	x	5	41.66%
	D. Heating Equipment								x					1	8.33%
7	Do you think the importation of building materials outside Alaska is a significant cause of delay in construction projects?														
	A. Yes		x	x	x	x	x	x	x	x	x	x	x	11	91.66%
	B. No		x											1	8.33%
8	What can be done to avoid delays in construction projects in Alaska? Check all that apply.														
	A. Procurement of materials on time		x	x			x		x	x	x	x	x	8	66.66%
	B. Production of building materials in Alaska				x	x	x			x	x	x	x	7	58.66%
	C. Adoption of fast construction method (Please suggest any)														
	D. Others (Specify)	x				x		x						3	25.00%
9	How can cost be controlled in affordable housing project? Check all that apply.														
	A. Legislation												x	1	8.33%
	B. Reduction of cost of land by the government													1	8.33%
	C. Reduction of cost of material			x		x	x		x	x	x	x	x	7	58.33%
	D. Alternative construction method	x	x		x			x	x		x	x	x	8	66.66%
10	What incentives, programs, or action should the municipality of Anchorage take to encourage the development of housing affordable to all income level ?														
	A. Partner with affordable housing developer		x		x			x				x	x	5	41.66%
	B. Develop city land					x								1	8.33%
	C. Loan / Grant program		x		x	x			x	x	x	x		8	66.66%
	D. Expedited permit review			x									x	4	33.33%
	E. Fee waivers								x		x			2	16.66%
	F. Other														

Exhibit 13: Survey Analysis Chart

Survey Result

From the chart below (exhibit 14). It shows the different causes of delay in delivering affordable housing development. This result shows the role of the Federal Government and the municipality council government. It further shows how significant causes of a delay from weather to construction materials from the result, it shows that barging time to Alaska and importation of materials are the major causes of delay.

Further analysis reveals the specific materials that cause delays in the construction of affordable Houses though these causes are responsible for construction generally in Alaska. All the questions were analyzed.

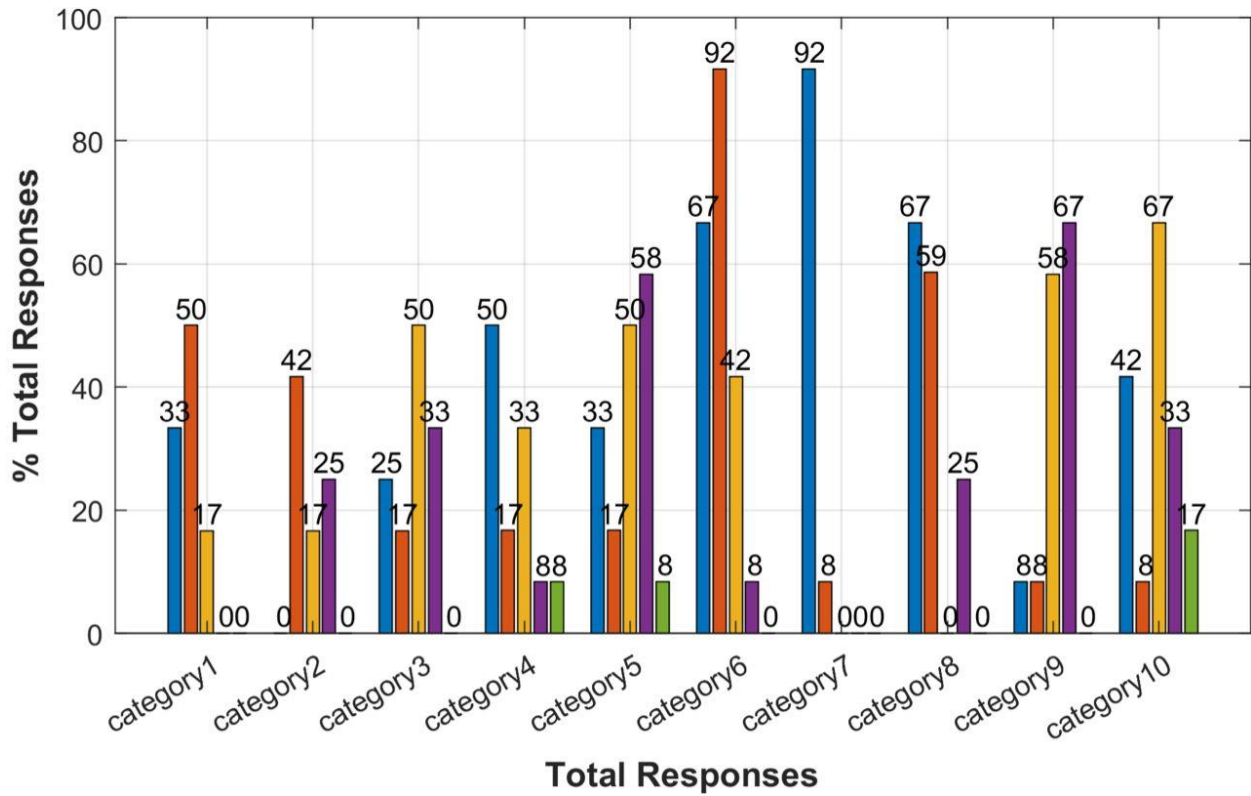


Exhibit 14: Survey Result Graph

Exhibit 14, a chart showing percentage responses from all participants category here refers to the questions; category 1 refers question 1 on the chart.

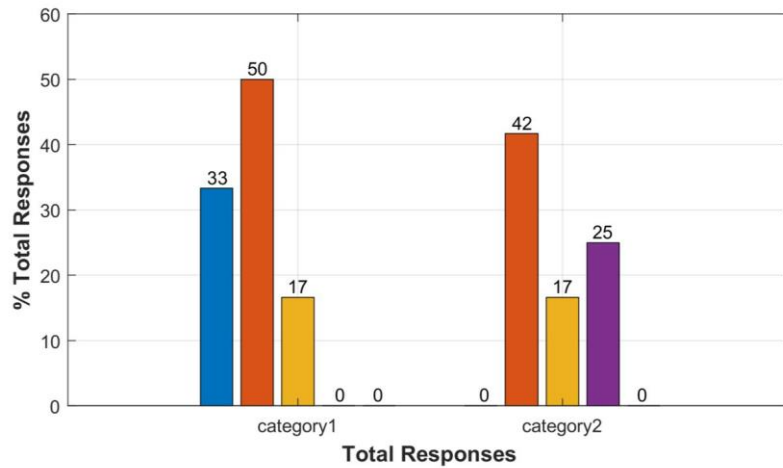


Exhibit 15: Showing responses for questions No 1 and no 2

1. What is the primary cause of the housing shortage in Anchorage
 - A. Not enough land
 - B. lack of investment
 - C. Not enough market
 - D. Low rental cost

2. What is primarily responsible for delays in housing construction
 - A. lack of human resources
 - B. lack of construction materials
 - C. Short barging time
 - D. Other (specify)

What is the cause of the housing shortage in Anchorage? See Exhibit 13

From the responses collected, 50% say lack of investment is the primary cause of the shortage. This show there is not enough investment in affordable housing, but some say the result is not encouraging given the investment.

The Survey participant, lack of construction materials is the cause of delay, short barging time (May – October) is the primary cause of uncertainty, the weather in Alaska can be very tough, and the sea/ river freeze in water, making it difficult for the vessel to come into Alaska to deliver goods. The Barging is very short between May – October, which means any goods that cannot come between May and October, will be till the filling year, making it difficult for goods to get into Alaska. See Exhibit 15

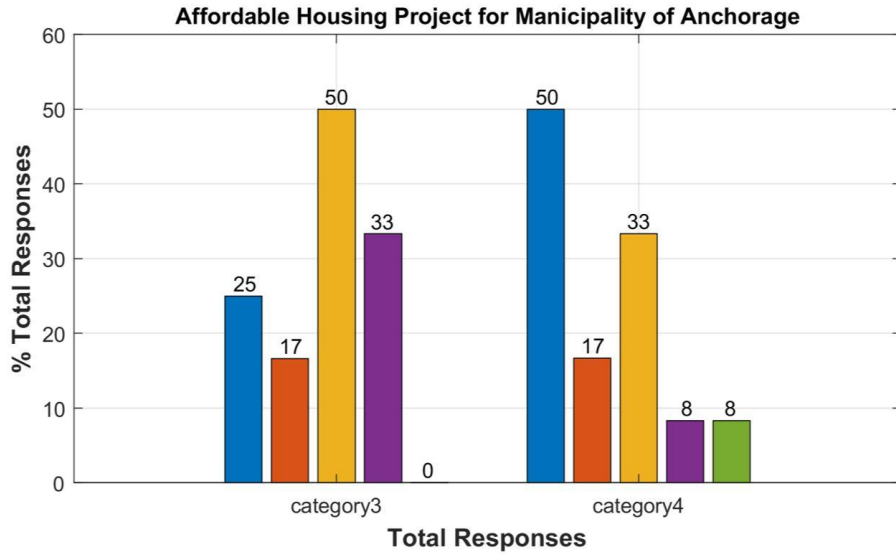


Exhibit 16: Shows responses for questions No 3 and No 4.

1. What housing fund strategy can help address the housing shortage in Anchorage?
 - A. Federal funding
 - B. State funding
 - C. Private funding
 - D. Investment funding

2. What construction materials are the major causes of delay in housing construction in Anchorage?
Check all that apply.
 - A. Wood
 - B. Cement
 - C. Steel
 - D. Blocks
 - E. Gypsum board

What Housing fund strategy can help solve/address the Housing shortage in Anchorage? Most responders say private funding can help address the housing shortage and that private investors must invest more in Affordable housing. Exhibit 16

What Construction materials are the major causes of delay in Housing construction in Anchorage? 50% of the responders, which is the majority, said wood is the primary cause of delay, and the material is the most in construction works, see Exhibit 16

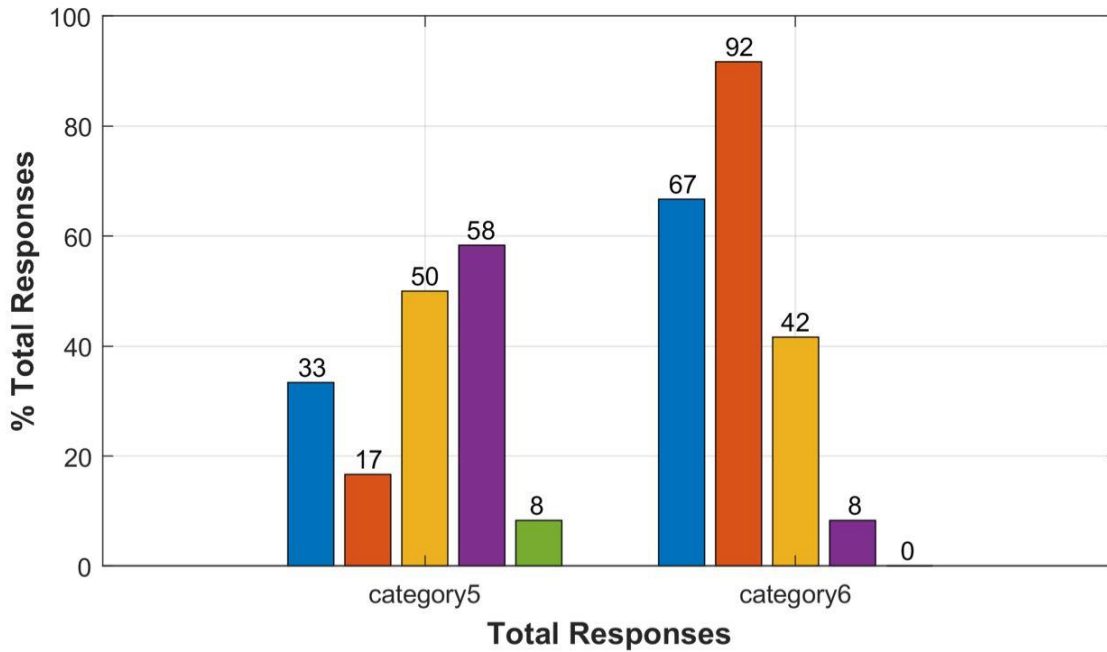


Exhibit 17: Shows responses to questions No 5 and No 6.

5. What finishing materials cause a delay in housing construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door Hardware
 - D. Electrical fittings
 - E. Ceiling boards

6. What other building components cause delays in housing construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen cabinets
 - D. Heating equipment

What finishing materials cause delay in Housing Construction majority of the responders say electrical fittings followed by door hardware, other building component causes a delay in Housing construction. 91% said individuals, among other components that cause delay, and 66% said doors.

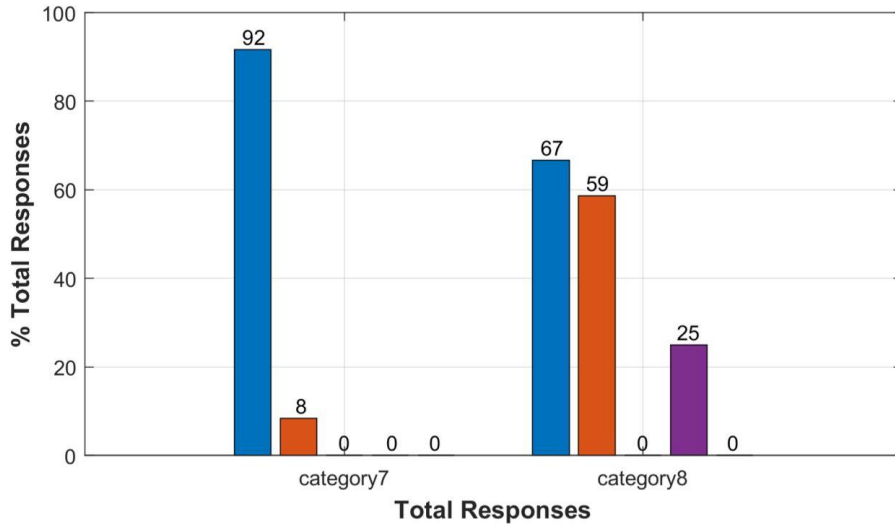


Exhibit 18: Shows responses for questions No 7 and No 8.

7. Is importing building materials outside Alaska a significant cause of construction project delays?

- A. Yes
- B. No

8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.

- A. procurement of materials on time
- B. production of building materials in Alaska
- C. Adoption of fast construction methods (Please suggest any)
- D. Others (specify)

Do you think the importation of building materials outside Alaska is a significant cause of delay in construction Projects? 91% said YES. These mean materials are mainly imported from the lower 48 states of the United States or Canada; the barging time is so short that this will be a significant factor in Affordable Housing delivery—Exhibit 18.

What can be done to avoid delays in construction projects in Alaska? Most respondents said material procurement was on time, while some said production of materials in Alaska.

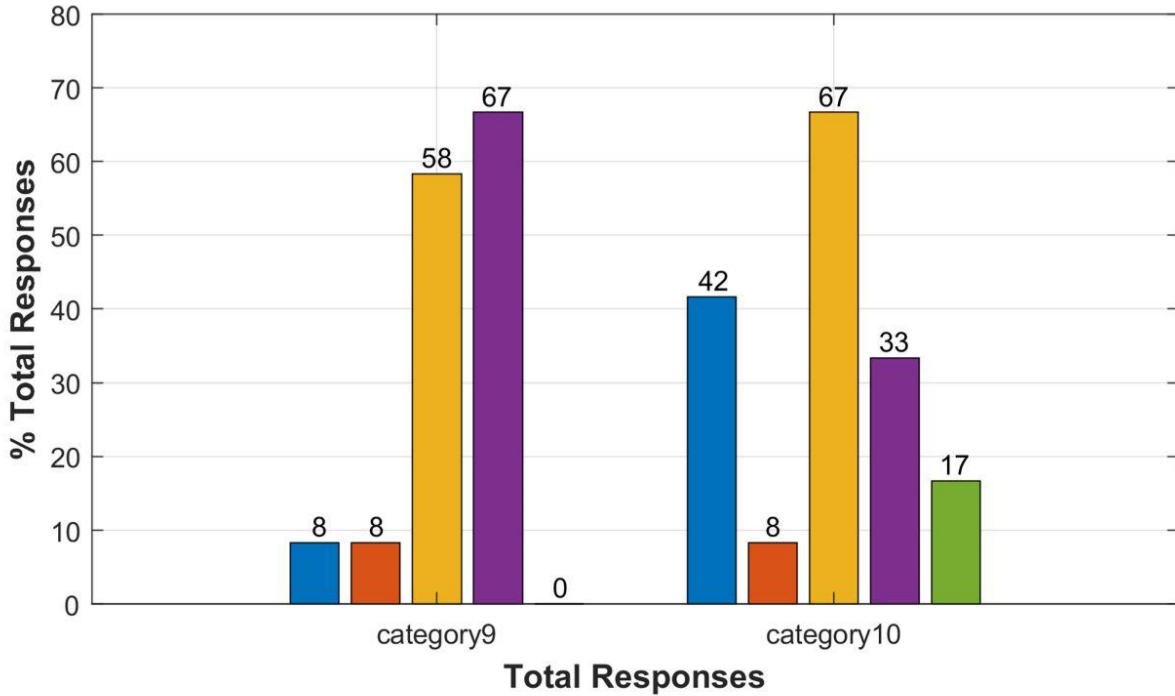


Exhibit 19: Shows responses for questions No 9 and No 10

9. How can cost be controlled in affordable housing projects? Check all that apply.
 - A. Legislation
 - B. Reduction of cost of land by the government
 - C. Reduction of material costs
 - D. Alternative construction method

10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?
 - A. Partner with affordable housing developers
 - B. Develop city land
 - C. Loan/grant programs
 - D. Expedited permit reviews
 - E. Fee waivers
 - F. Other

How can cost be controlled in Affordable Housing Project? The majority said Alternative Construction Method. What Incentives program or action should the municipality of Anchorage take to encourage

affordable housing development for all income levels? The loan/ Grant Program was the majority's preference, while some preferred that the municipality partner with private developers.

Research Outcome

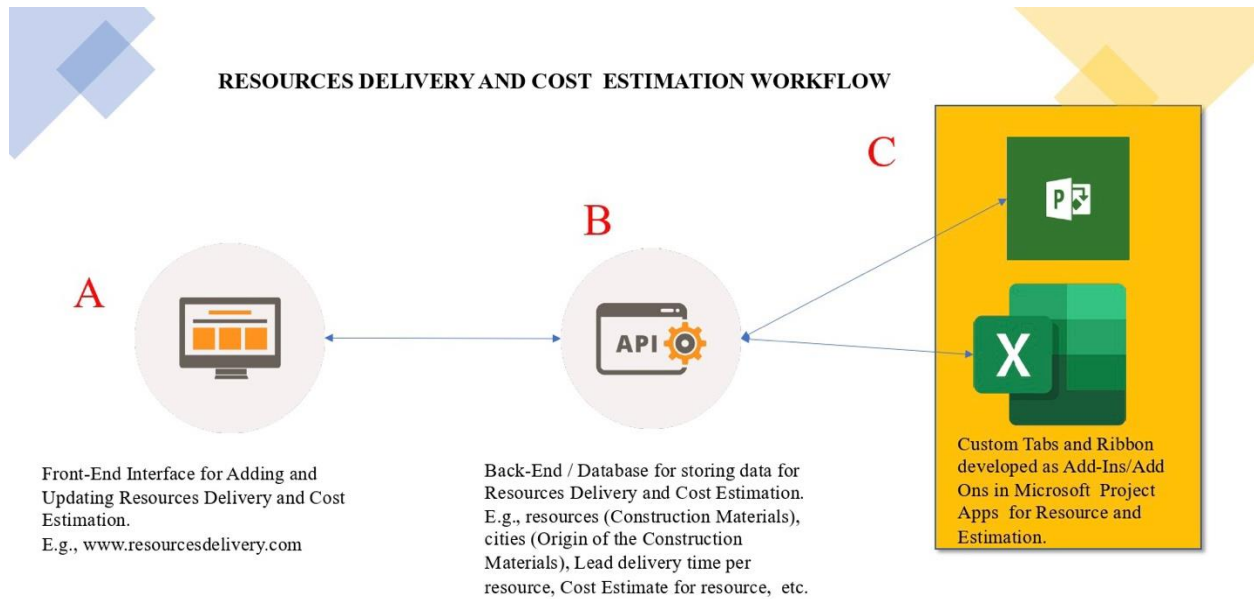
The product for the research is a scheduling methodology concept and software that predict building construction delivery period, cost, and possible cost increase using expected materials delivery time and anticipated cost of materials.

The software is developed with three different parts; see Exhibit 20

Part A is the front-end interface for adding and updating resources delivery and cost estimation, e.g., www.resourcedeliverycost.com.

Part B – API – Application Programming Interface; this is the back end/database for storing data and cost estimation. E.g., resources (construction materials), Cities (Origin of the materials), lead delivery time per resource (in days), and cost estimation for resources.

Part C- Custom Tabs and Ribbon developed as Add-Ins/Add Ons in Microsoft Project or Excel Apps for Resource and Estimation.



This is Customized Add-In built using the model/workflow above for estimating delivery and cost of resources and in turn estimating project completion and possible cost increase when there is supply chain delay.

Exhibit 20: Resource delivery and cost workflow drawing

This is a Customized Add-In built using the model/workflow above for estimating delivery and cost of resources and, in turn, estimating project completion and possible cost increase when there is a supply chain delay.

This product is developed using Microsoft Projects or Excel. Additional ribbons are created on the Microsoft platform to have the followings. See Exhibit 21

- Resource delivery estimation
- Resource cost estimation



This is Customized Add-In built using the model/workflow above for estimating delivery and cost of resources and in turn estimating project completion and possible cost increase when there is supply chain delay.

Exhibit 21: Resource delivery and cost interface.

Resource Delivery Estimation

This ribbon contains all the construction materials with estimated time built in (this estimates the delivery time to Alaska cities from any part of the United States or North America). There will be a drop-down menu bar on the ribbon with a list of constructions; each material will have an estimated delivery, like 20 days or 30 days, depending on where they are coming from (Appendix P – P2: showing Door and Tile shipping schedule and cost).

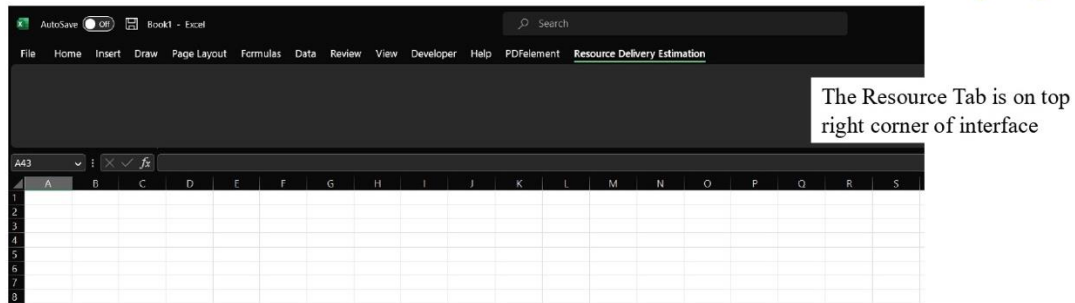
What does that do? It gives the production time of all construction materials so when a user prepares a schedule; the program will automatically predict the minimum estimated completion of the project based

on the expected lead time of the construction materials. Below is a list of some of the construction materials to be in store in the program.

- Windows
- Doors
- Kitchen Cabinet
- Electrical Fittings
- Door Hardware
- Steel and
- Tile
- Ceiling Boards
- Heating Equipment
- Cement
- Wood and Blocks



THE SOFTWARE INTERFACE USING EXCEL



This is an example of the software interface using Microsoft Excel as a Platform



Exhibit 22: Software interface using Excel.

Resource Cost Estimation

This ribbon contains all the construction materials with estimated prices built-in (this estimated price includes the cost of delivery to Alaska cities from any part of the United States or North America). There

will be a drop-down menu bar on the ribbon with a list of construction; each material will have estimated prices depending on where they are coming from. What this does it give the cost of the construction materials, so when the user prepares a schedule, the software will automatically give the estimated cost of the materials for the project based on the predicted prices of the construction materials. Above is a list of some of the construction materials to be in store in the program.

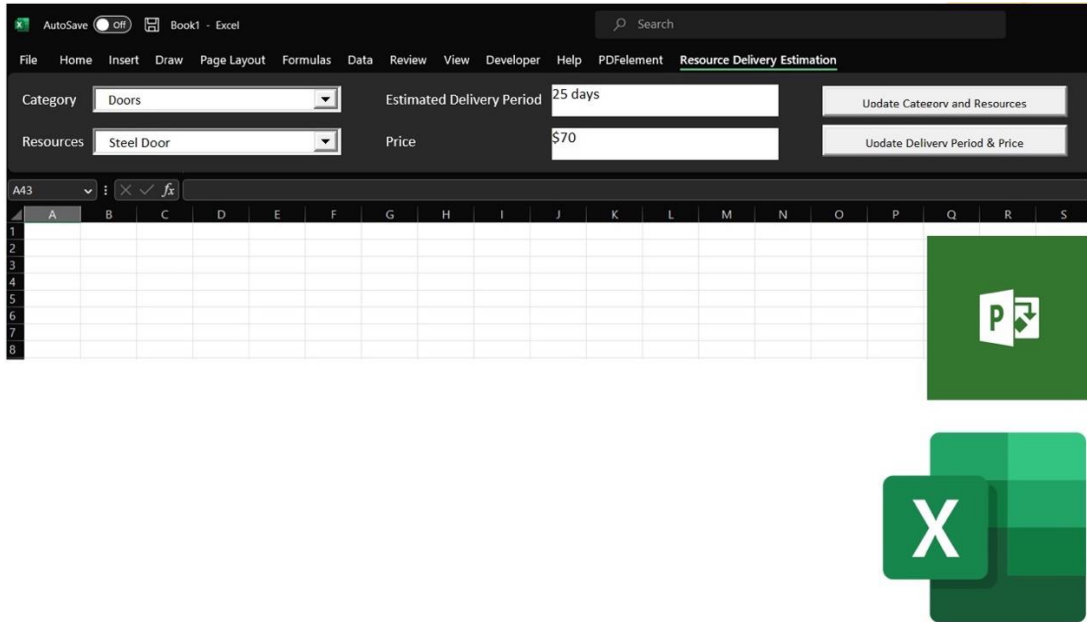


Exhibit 23: Final Deliverable Software interface using Excel.

Appendix P – P2: shows examples where data for the materials are gotten for cost and delivery estimation (Door and Tile shipping schedule and cost are show in Appendix P – P2).

Below are samples of the Strategic Planning Templates that can be used for planning before using the above software. See exhibit 24 and 25.



Exhibit 24: Project Scheduling Steps

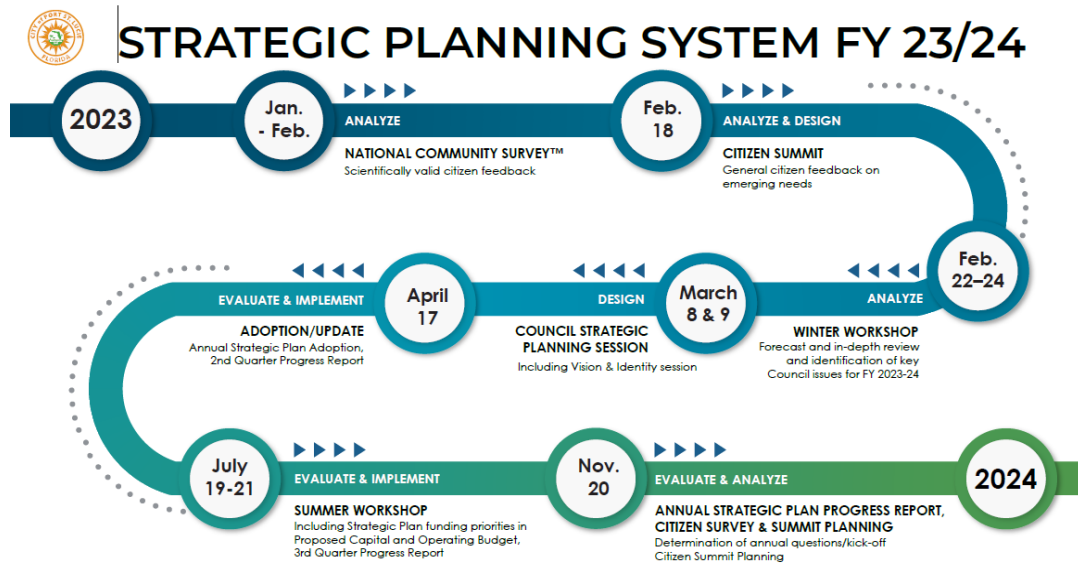


Exhibit 25: Strategic Planning Flow Diagram

Conclusions

In 2020, the world witnessed supply chain disruptions, both skilled labor and Construction materials shortages, affecting the construction industry until today. Four common construction challenges have not been talked about as often. Industrialization, Increased complexity and project volume, Sustainability and Standardization, and the digitalization of planning and processes

Residential construction faces new difficulties as modular construction is popular among homebuilders and purchasers. Due to the urgency of addressing the backlog in housing buildings, this is becoming increasingly popular. Nearly \$138 billion was spent on modular construction worldwide in 2021, which is anticipated to reach \$271 billion by 2030. This rise makes industrialization possible, forcing many residential construction firms to adopt an off-site, product-based strategy and produce building components in a more controlled setting. However, although industrialization can assist lower construction costs and shorten construction timelines, many businesses find it difficult to follow suit due to a shortage of experienced personnel and building supplies.

Residential builders will have to take on more projects and deal with generally more complicated processes since the size of the global residential construction sector is projected to snowball. There is more rivalry among construction businesses submitting bids for projects, which is one of the acute effects of this growth. The issues competition offers are even more problematic for unspecialized builders who lack target markets to develop a true competitive edge.

Most frequent issues in residential construction, including inadequate time management for repetitive jobs, poor communication on the job site, and declining labor productivity, can be resolved using digital technologies.

The demand for new homes is at an all-time high, which puts the residential building at a crossroads due to labor shortages, supply chain bottlenecks, and other issues that housebuilders continuously deal with. Even with all these difficulties, there has never been a more significant window of opportunity for development. However, it is time for the Construction Industry to accept that the previous project management method is no longer effective. The construction industry needs more than Microsoft Projects, Excel, and work documentation to remain competitive. Additionally, many professionals polled by Association Professional Builder ranked deploying universal cloud applications as their top goal for 2022. These applications save time and boost productivity.

These findings provide bases for developing a scheduling program that will help improve affordable housing delivery in Anchorage and Alaska. This program is, without a doubt, a solution to these problems in house construction in Alaska. This Advance Project Management software will revolutionize how Houses will be constructed, and here is what Anchorage's affordable housing delivery needs to adapt to keep up.

Recommendations

The data gathered from the research shows that construction materials are the major causes of delays in the delivery of affordable housing projects. Still, the land is also a factor because the nature of the land in some areas of the Municipality of Anchorage is not buildable; this is a problem in that it reduces the size of land that can be used for building construction. Furthermore, the short barging time is a factor that affects the supply chain because materials are often time shipped by sea, and during winter, the waters are frozen. Ships cannot come in, thereby causing delays in material delivery.

Following the above, it means that,

- Construction projects must be awarded beforehand to allow enough time to procure construction materials and deliver construction equipment.
- Upon award of the project, the Project Manager must identify the lead time on tasks and materials along the critical path and ensure that procurement of the materials and job consider early to ensure the arrival site is early enough to avoid delay.
- Scheduling of work with a buffer built in to ensure real-time.
- There must be a consolidated communication and scheduling template that will deal with the issues of miscommunication and scheduling errors. This will ensure that team members work in sync with each other and are not frustrated with miscommunication and mistakes.
- The Workflow should also be well streamlined to ensure that workers are well scheduled for their tasks because beyond the delivery of materials, if construction activities are not well streamlined with good sequence, this can lead to frustrations. The use of software can be of great value in addressing this kind of problem.

Overall, it is recommended that Professionals in the Built environment in Alaska, Architects, Engineers, Quantity Surveyor, Building Estimators, and Project Managers should use this scheduling methodology concept developed in this research because it will help them predict project estimated completion period, cost, and budget increase when there is a change in the market. The pandemic that struck in 2020 and disrupted the world supply chain should how dynamic the world is and how fragile the construction

industry is. As project managers, we must be able to see the future now, and this is what the research is all about.

Future Research

It was challenging to collect data for all of the construction materials for affordable housing when doing the research for this reason.

- The timeframe for the research work
- The logistics of moving around in Alaska are due to road connections as most of the villages in Alaska are not connected by road, and the only way to connect is by air, which is very expensive.
- It was also challenging to get data. Only about 31% answered my questionnaire, and it was not easy getting people to give information.

Future studies should collect more building material dates, pricing, and a computer program that might potentially update the forecasted information in this work. This will be a more robust software capable of providing online real-time information to build environment professionals.

Knowledge Areas Selection, Description, And Lessons Learned

The 3 Key Knowledge Areas this Project will be focusing on are:

Project Schedule Management:

Nearly all projects rely on several different timelines and multiple people's schedules. Some team members may overestimate how long it will take to complete a project to leave a cushion and not feel hurried.

Others may underestimate their time. Furthermore, of course, unexpected problems will also throw off your timeline. However, these variables are exactly why effective Schedule management is so critical. Schedule Management is the primary FOCUS of this Project. The plans will determine which tasks can be adjusted and how the team's resources will be allocated and managed throughout the project. At least 80% of jobs during the project execution was completed on time despite challenges faced, which was measured against the baseline duration. To ensure the project was completed on time, as this is a constraint. Also ensured that additional time was created as a buffer in case there was a slip in the timeline.

Project Communication Management:

How much have you heard the phrase: "Keep me in the loop?" There is a fine line between under and over-communication. Nevertheless, when changes happen, maybe important stakeholders are left out. Communications management plan is crucial to help identify who needs to know what and when before your project starts.

In this project, good stakeholder engagement via communication, Phone Calls, Emails, and Project reports. Stakeholder engagement during project execution was measured against the stakeholder communications plan and matrix. This was also be updated accordingly, as stated in the communication management plan.

Project Stakeholder Management

The Failure or Success of any project depends on the delivery to the stakeholders. Nevertheless, who are your stakeholders? The stakeholders are those that are affected by the project directly or indirectly. Stakeholders include the project requester and team members who have worked on the project, contractors, suppliers, customers or the public, and many other people internal and external to the organization. Not all stakeholders are equal in the eyes of the project.

Identifying who is a stakeholder in a project and how they are involved in the process will ensure everyone gets the information they need to know — no more, no less.

In Carrying out this Project, All the Stakeholders were identified and maintained good communication throughout the project's life cycle. By doing this, the project execution seamless because all the stakeholders were updated with information regarding the project and issues were resolved in expeditiously when they were escalated. They also were aware of the delays, delivery time the final deliverable of the Project.

Lessons Learned

Project Schedule Management, Communication Management, and Stakeholders are the Project Management knowledge areas to work on for the project.

Schedule management includes processes required to ensure the timely completion of the project.

Based on the work required, we developed a preliminary schedule, as shown below.

Following Preliminary Project Schedule, some Tasks were late, while some Tasks had underestimated the time; if we continue with this schedule, the project will be behind schedule.

Procurement of Materials

Material procurement, was omitted from the schedule, giving the nature of Alaska, it is essential to include this in the schedule to ensure close monitoring and control.

Stakeholder management

Stakeholder Engagement was omitted from the project schedule. There is no way the project will succeed without engaging with the stakeholders.

Lessons Learned					
ID	Date	Project	Description	Activity	Recommendations
1	27/09/2022	Affordable Housing Project Anchorage Alaska	Site Identification	Initiation and Planning	Ensure planning commences as soon as problem is identified
2	27/09/2022	Affordable Housing Project Anchorage Alaska	Stakeholder Engagement	Initiation and Planning	Timely identification of stakeholders and ensuring their engagement in Project Schedule
3	27/09/2022	Affordable Housing Project Anchorage Alaska	Using tools for activity duration estimating	Schedule Development	The use of scheduling tools for schedule development
4	27/09/2022	Affordable Housing Project Anchorage Alaska	Procurement of Material	Schedule Control	Include it in the schedule.

Exhibit 26: Lessons Learned

Risk Management Plan

The approach for managing risks for this project includes a systematic process by which the project team identifies, scores, and ranks the various risks. Every effort will be made to proactively identify risks ahead of time to implement a mitigation strategy from the project's onset. Risk managers will provide status updates on their assigned risks in the bi-weekly project team meetings, but only when the meetings include their risk's planned timeframe. The most likely and highest impact risks were added to the project schedule to ensure that the assigned risk managers took the necessary steps to implement the mitigation response at the appropriate time during the schedule.

Upon completing the project, the project manager will analyze each risk and the risk management process during the closing process. Based on this analysis, the project manager will identify any improvements that can be made to the risk management process for future projects. These improvements will be captured as part of the lessons learned knowledge base.

Project Risks

S/No	Risk Area	Likelihood	Implementation Response
1	Delay in meeting my project deliverable for PPM#3 due to a planned trip to Nigeria in March 2023	High	Mitigate, Project Schedule to allow for this, i.e., allow contingency time. Most of the tasks in PPM#3 are to be carried out ahead of time to prevent delay.
2	Questionnaire Expected delay in getting a response from Participants.	High	Avoid. Make the questionnaire short and avoid ambiguous questions. Reach out to Participants via Phone calls and email. Furthermore, send reminders to ensure feedback comes in good time.
3	Insufficient response from Participants.	Low	Mitigate. Plan to interview additional Participants and make a contingency plan in Project Schedule.
4	Delay in meeting my project deliverable for PPM#4 due to a planned trip to Italy to attend a conference from April 17- 24, 2023.	High	Mitigate, Project Schedule to allow for this, i.e., allow contingency time. Most of the tasks in PPM# are to be carried out ahead of time to prevent delay.

Exhibit 27: Risk Register

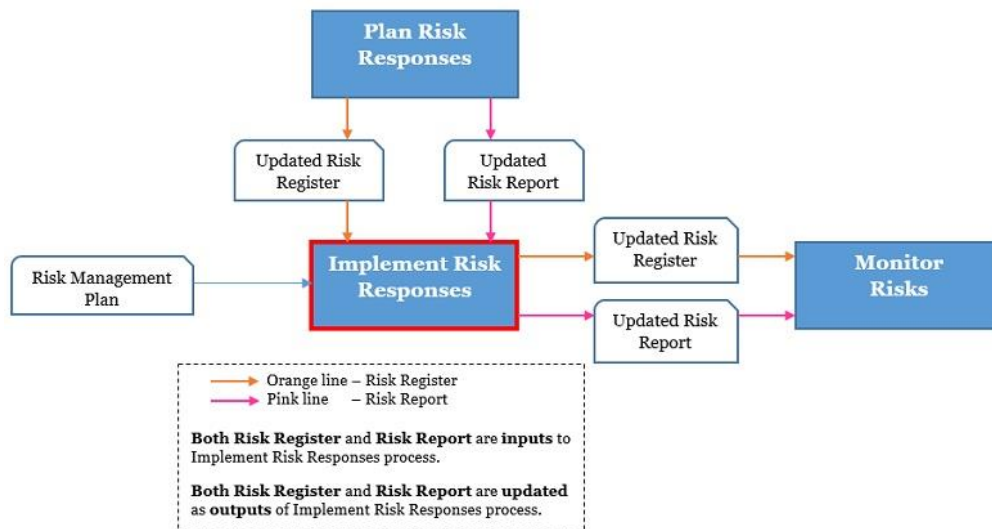
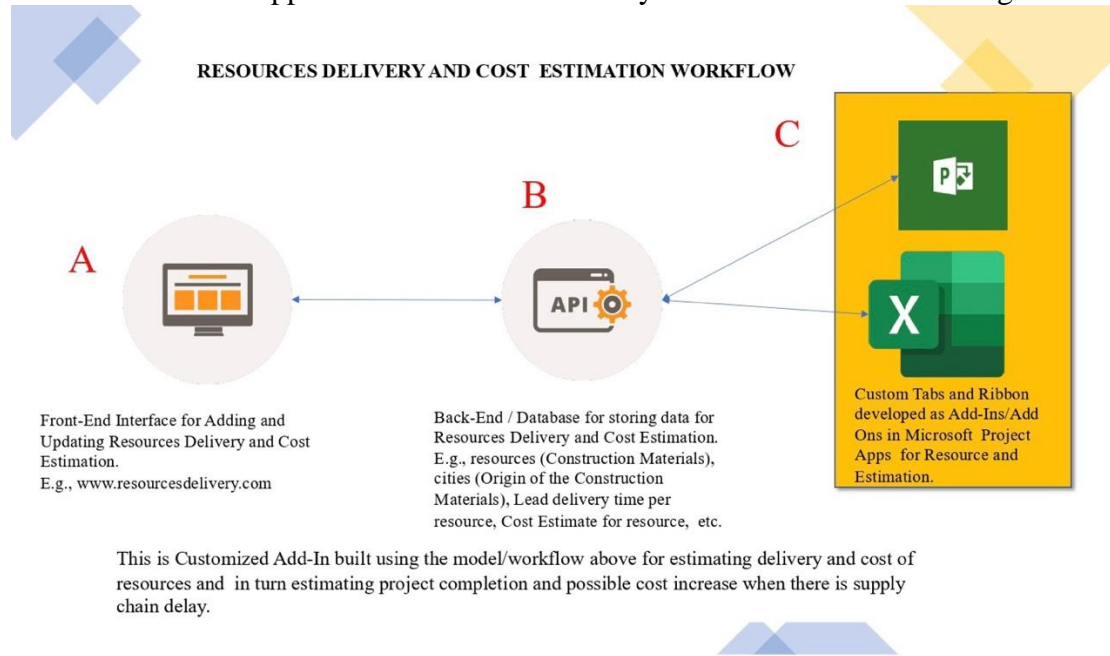


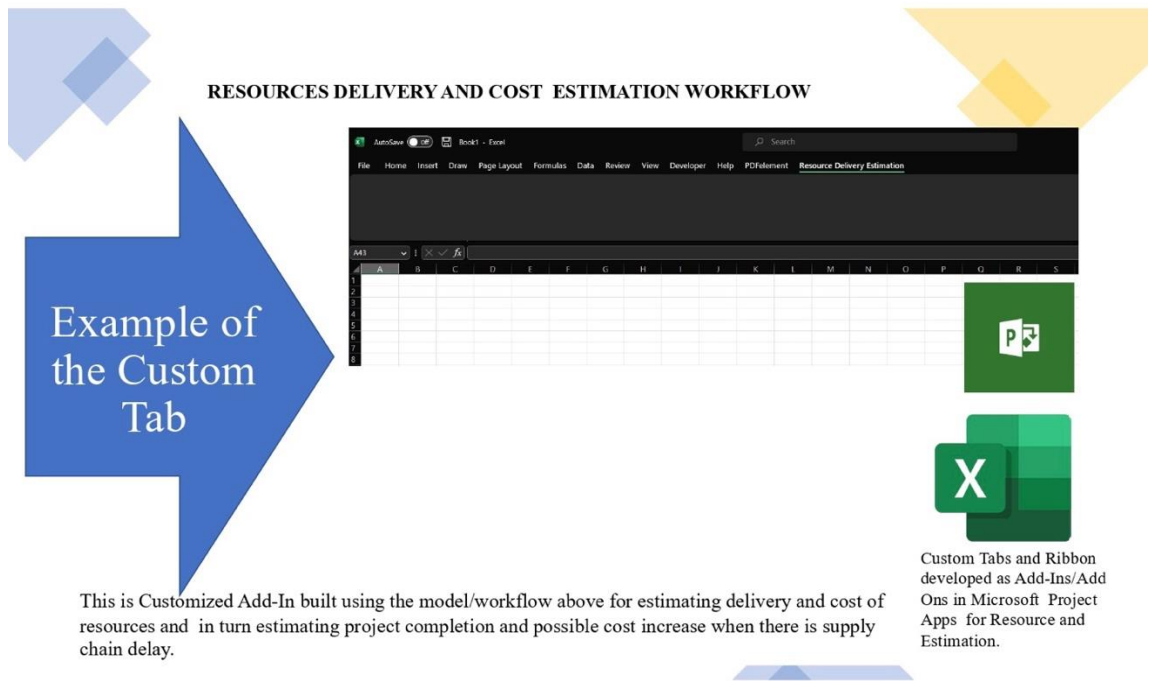
Exhibit 28: This is a sample diagram of our Risk Management Plan

APPENDICES

Appendix A: Resource delivery and cost workflow drawing.



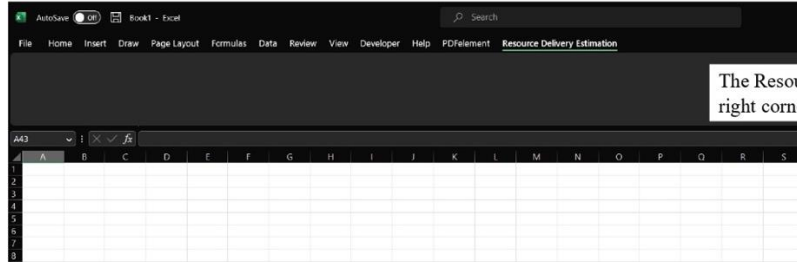
Appendix B: Resource delivery and cost interface.



Appendix C: Software interface using Excel.



THE SOFTWARE INTERFACE USING EXCEL

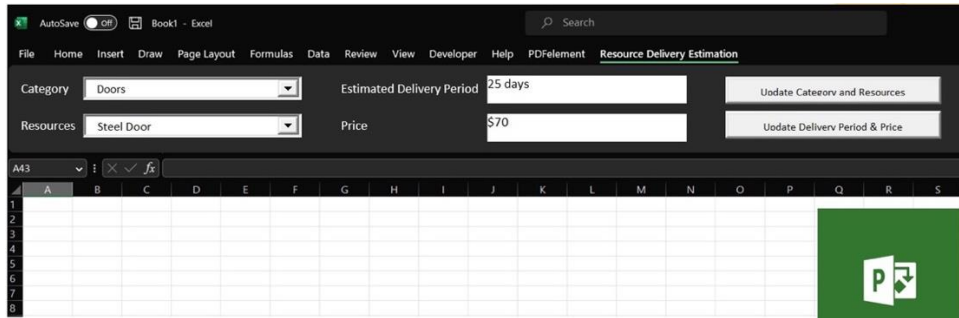


The Resource Tab is on top right corner of interface

This is an example of the software interface using Microsoft Excel as a Platform



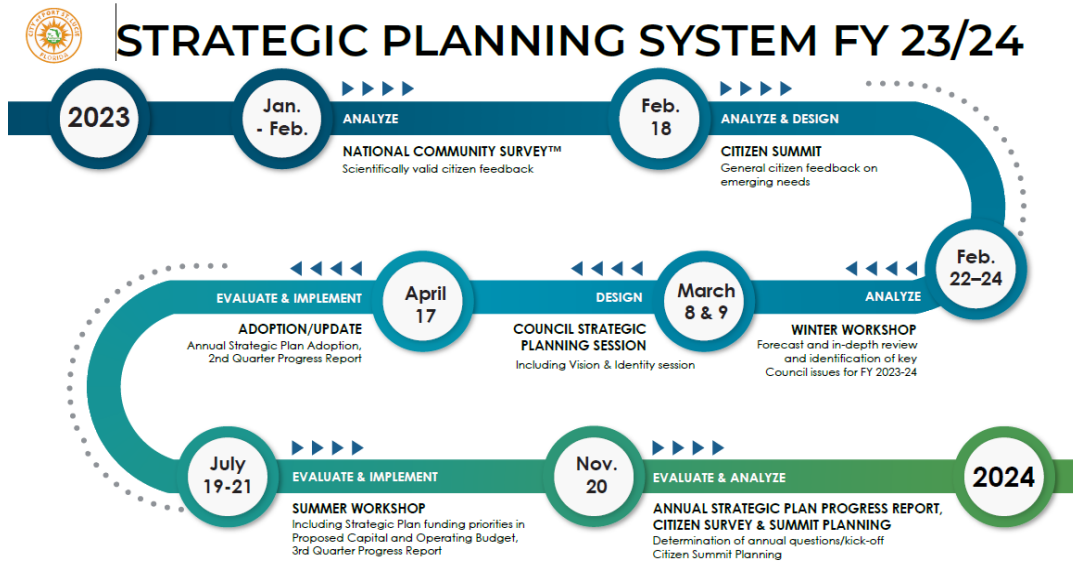
Appendix D: Final Deliverable Software interface using Excel.



Appendix E: Project Scheduling Steps



Appendix F: Strategic Planning Flow Diagram



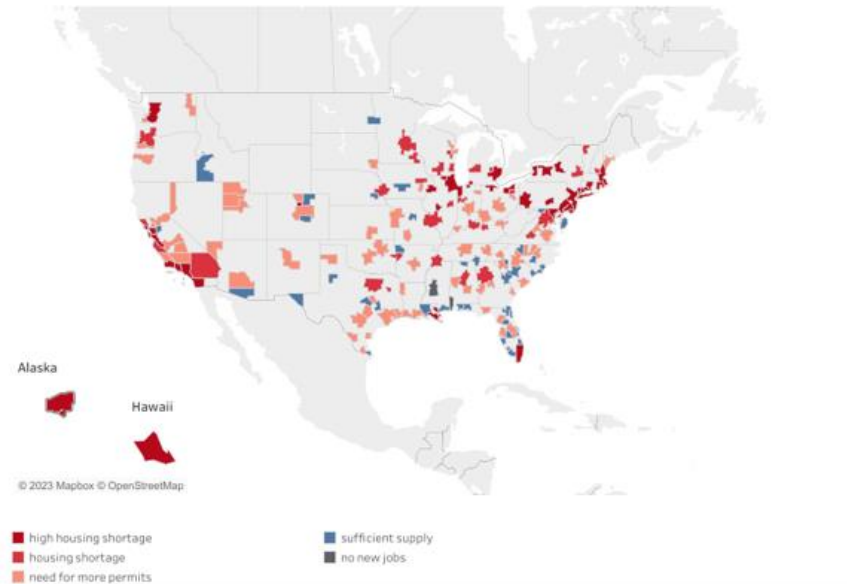
Appendix G: Housing shortage tracker



The **Housing Shortage Tracker** computes how many new permits are issued for every new job in 174 metropolitan areas. **Based on the historical average, 1 permit is issued for every 2 new jobs.** However, that is not the case for many metropolitan areas.

See below which metropolitan areas need to build more houses in order housing supply to keep up with the increa..

Select number of units for permits
single-family unit permit



Anchorage, AK

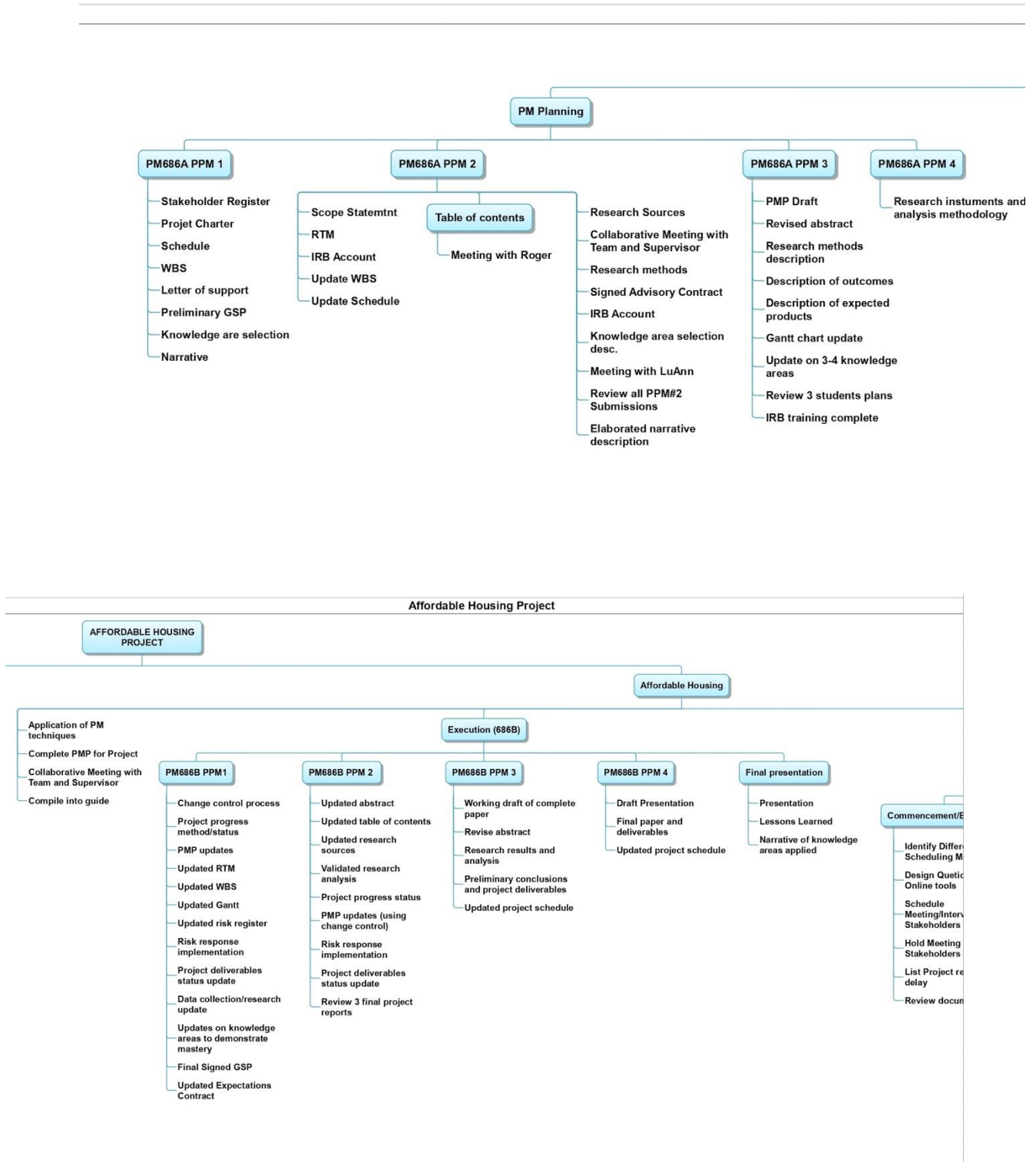
Permits (single-family units)	Permits (total units)	New jobs
782	1,114	8,100

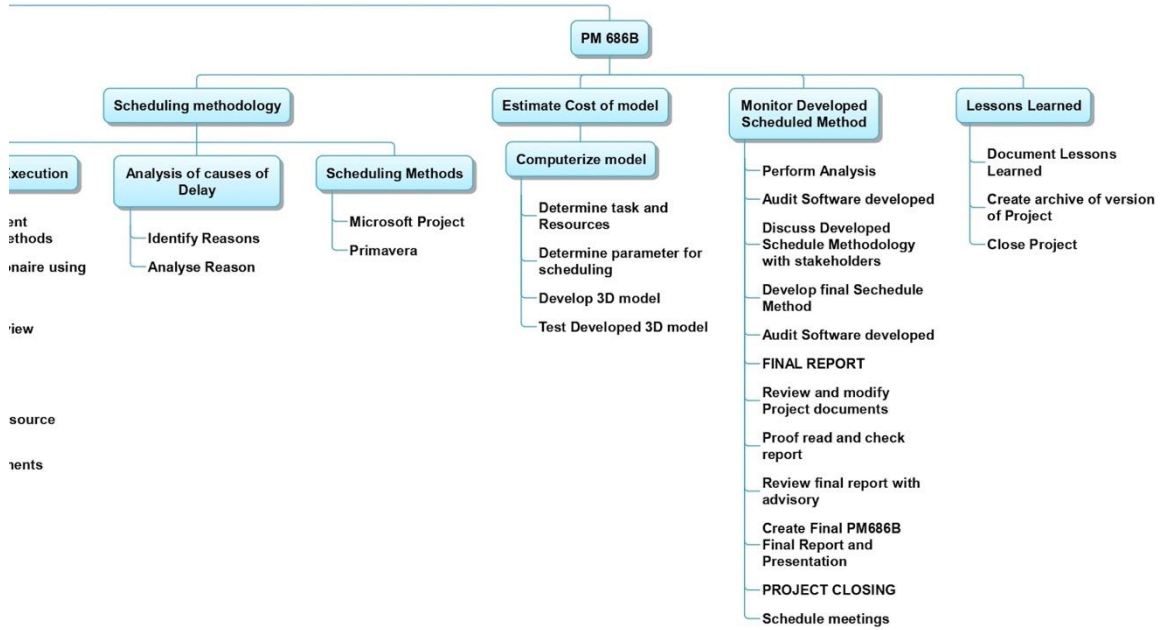
- Notes
1. A negative ratio shows that there were job losses in the area
 2. We compared the 1-year job creation (ending in September 2022) with the number of permits issued in the same period.

Sources: U.S. Census Bureau, U.S. Bureau of Labor Statistics, NAR Calculations

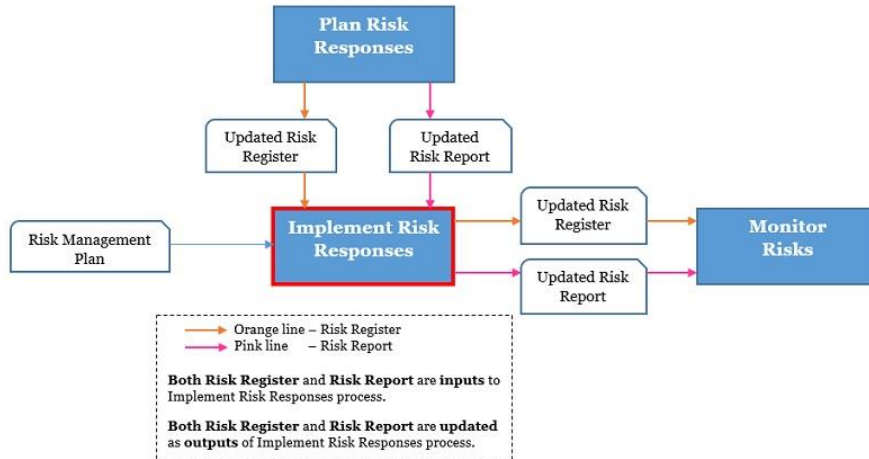


Appendix H. WBS

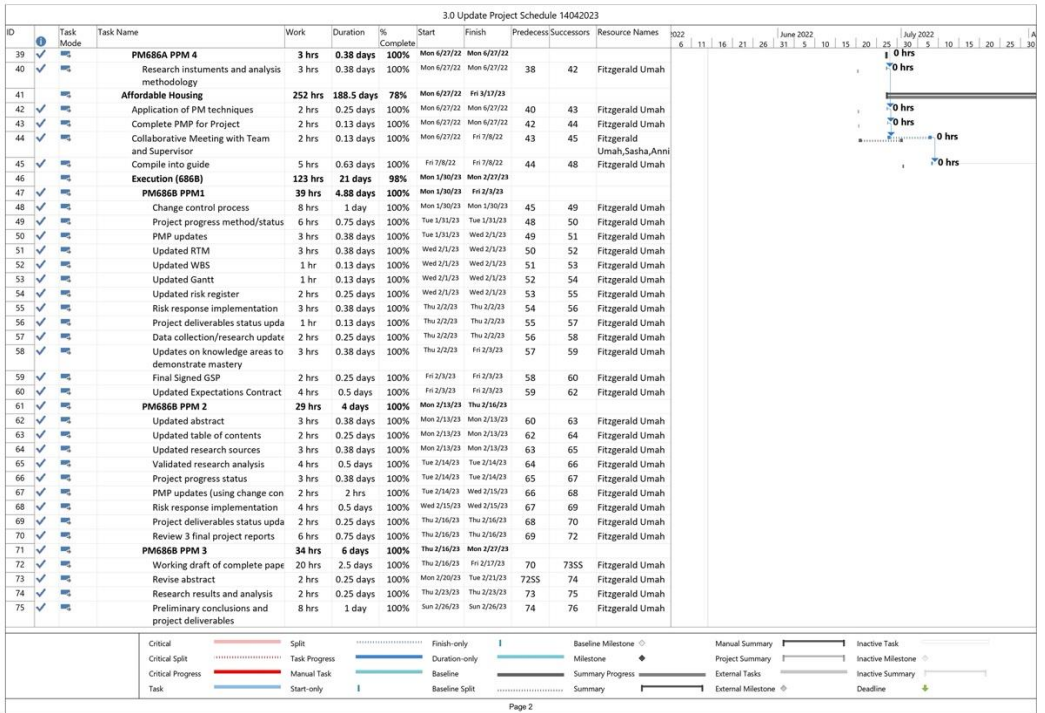
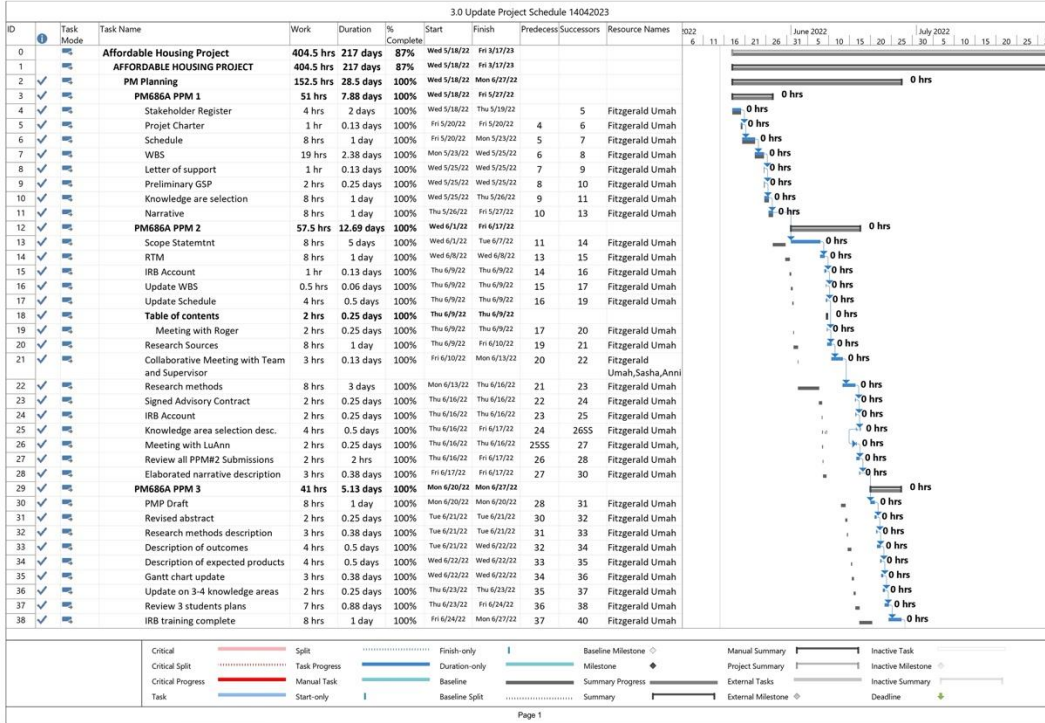




Appendix I: This is a sample diagram of our Risk Management Plan



Appendix J. Gantt Chat



3.0 Update Project Schedule 14042023										
ID	Task Mode	Task Name	Work	Duration	% Complete	Start	Finish	Predecessors/Successors	Resource Names	1022
76	✓	Updated project schedule	2 hrs	0.25 days	100%	Sun 2/26/23	Mon 2/27/23	75	78 Fitzgerald Umah	6 11 16 21 26 31 5 10 15 20 25 30 5 10 15 20 25 30
77	✓	PM6888 PPM 4	8 hrs	0 days	100%	Mon 2/27/23	Mon 2/27/23			
78	✓	Draft Presentation	3 hrs	0.38 days	100%	Mon 2/27/23	Mon 2/27/23	76	79 Fitzgerald Umah	
79	✓	Final paper and deliverables	3 hrs	0.38 days	100%	Mon 2/27/23	Mon 2/27/23	78	80 Fitzgerald Umah	
80	✓	Updated project schedule	2 hrs	0.25 days	100%	Mon 2/27/23	Mon 2/27/23	79	82 Fitzgerald Umah	
81	✓	Final presentation	13 hrs	1 day	83%	Mon 2/27/23	Mon 2/27/23			
82	✓	Presentation	3 hrs	0.38 days	60%	Mon 2/27/23	Mon 2/27/23	80	83 Fitzgerald Umah	
83	✓	Lessons Learned	4 hrs	0.5 days	90%	Mon 2/27/23	Mon 2/27/23	82	84 Fitzgerald Umah	
84	✓	Narrative of knowledge areas applied	6 hrs	0.75 days	90%	Mon 2/27/23	Mon 2/27/23	83	88 Fitzgerald Umah	
85	✓	PM 6888	118 hrs	13 days	61%	Mon 2/27/23	Fri 3/1/23			
86	✓	Scheduling methodology	37 hrs	3 days	94%	Mon 2/27/23	Thu 3/2/23			
87	✓	Commencement/Execution	26 hrs	1.38 days	100%	Mon 2/27/23	Wed 3/1/23			
88	✓	Identify Different Scheduling Methods	2 hrs	0.25 days	100%	Mon 2/27/23	Mon 2/27/23	84	89 Fitzgerald Umah,Roger Hull	
89	✓	Design Questionnaire using Online tools	16 hrs	2 days	100%	Mon 2/27/23	Wed 3/1/23	88	90 Fitzgerald Umah	
90	✓	Schedule Meeting/Interview Stakeholders	3 hrs	0.09 days	100%	Wed 3/1/23	Wed 3/1/23	89	91 Annick,Fitzgerald Umah,Roger	
91	✓	Hold Meeting Stakeholders	1 hr	0.08 days	100%	Wed 3/1/23	Wed 3/1/23	90	93,92 LuAnn Piccard,Ar	
92	✓	List Project resource delay	2 hrs	0.25 days	100%	Wed 3/1/23	Wed 3/1/23	91	93 Fitzgerald Umah	
93	✓	Review documents	2 hrs	0.08 days	100%	Wed 3/1/23	Wed 3/1/23	91,92	95,99 Fitzgerald Umah,	
94	✓	Analysis of causes of Delay	7 hrs	0.89 days	100%	Wed 3/1/23	Thu 3/2/23			
95	✓	Identify Reasons	4 hrs	0.5 days	100%	Wed 3/1/23	Wed 3/1/23	93	96 Fitzgerald Umah	
96	✓	Analyse Reason	3 hrs	0.38 days	100%	Thu 3/2/23	Thu 3/2/23	95	98 Fitzgerald Umah	
97	✓	Scheduling Methods	4 hrs	1.63 days	50%	Wed 3/1/23	Thu 3/2/23			
98	✓	Microsoft Project	2 hrs	0.25 days	100%	Thu 3/2/23	Thu 3/2/23	96	102 Fitzgerald Umah	
99	✓	Primavera	2 hrs	0.25 days	0%	Wed 3/1/23	Wed 3/1/23	93	104,105 Fitzgerald Umah	
100	✓	Estimate Cost of model	14 hrs	1.5 days	81%	Wed 3/1/23	Fri 3/3/23			
101	✓	Computerize model	14 hrs	1.5 days	81%	Wed 3/1/23	Fri 3/3/23			
102	✓	Determine task and Resource	6 hrs	0.75 days	100%	Thu 3/2/23	Fri 3/3/23	98	103 Fitzgerald Umah	
103	✓	Determine parameter for scheduling	3 hrs	0.38 days	100%	Fri 3/3/23	Fri 3/3/23	102	107 Fitzgerald Umah	
104	✓	Develop 3D model	3 hrs	0.38 days	50%	Wed 3/1/23	Wed 3/1/23	99	105 Fitzgerald Umah	
105	✓	Test Developed 3D model	2 hrs	0.17 days	25%	Wed 3/1/23	Wed 3/1/23	99,104	107 Fitzgerald Umah,	
106	✓	Monitor Developed Scheduled Method	54 hrs	9.41 days	55%	Fri 3/3/23	Thu 3/16/23			
107	✓	Perform Analysis	2 hrs	0.25 days	0%	Fri 3/3/23	Fri 3/3/23	105,103	108 Fitzgerald Umah	
108	✓	Audit Software developed	6 hrs	0.5 days	20%	Fri 3/3/23	Fri 3/3/23	107	109 Fitzgerald Umah,	
109	✓	Discuss Developed Schedule Methodology with	0 hrs	3 days	100%	Fri 3/3/23	Wed 3/8/23	108	110	
110	✓	Develop final Schedule Method	8 hrs	1 day	100%	Wed 3/8/23	Wed 3/8/23	109	111 Fitzgerald Umah	

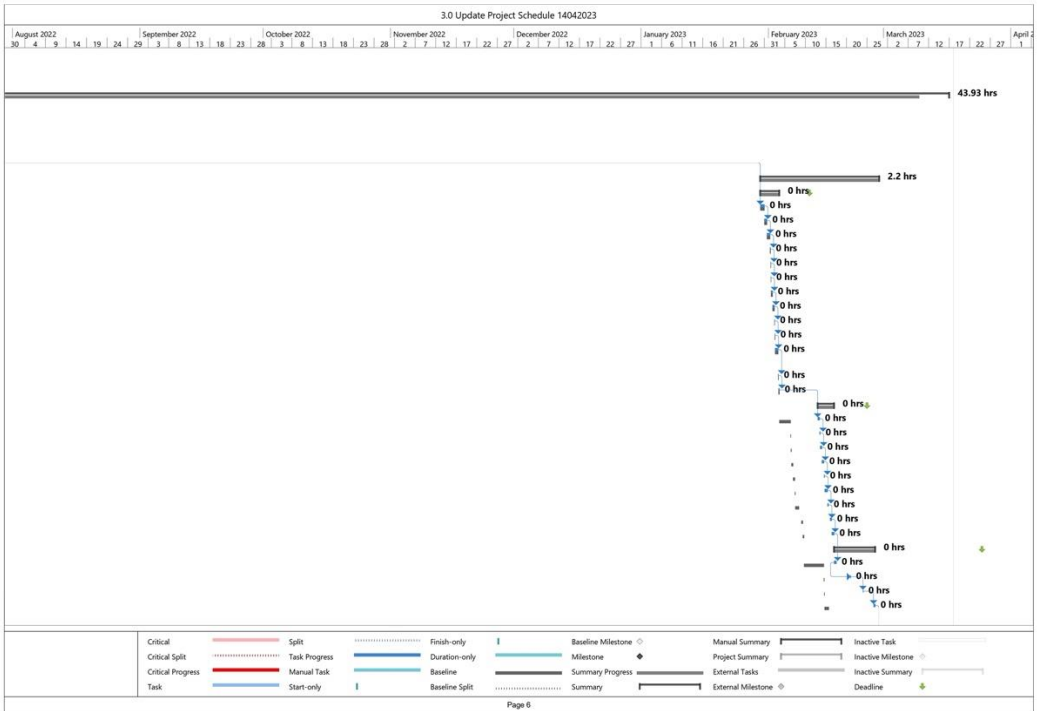
Legend for task types and progress indicators:

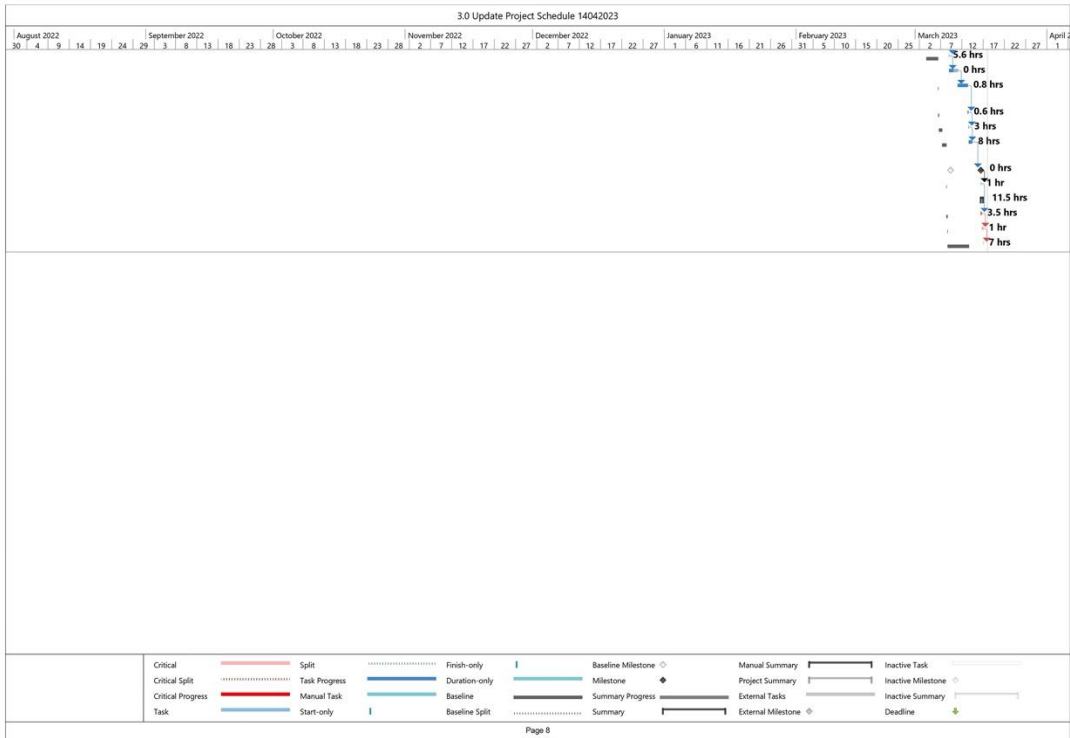
- Critical: Red line
- Critical Split: Red dashed line
- Critical Progress: Red line with blue fill
- Task: Blue line
- Split: Dotted line
- Task Progress: Blue line with blue fill
- Manual Task: Blue line with blue fill
- Start-only: Blue line with blue fill
- Finish-only: Blue line with blue fill
- Duration-only: Blue line with blue fill
- Manual Task: Blue line with blue fill
- Baseline Split: Blue line with blue fill
- Baseline Milestone: Blue diamond
- Milestone: Blue diamond
- Summary Progress: Blue line with blue fill
- Summary: Blue line with blue fill
- External Milestone: Blue diamond
- Manual Summary: Blue line with blue fill
- Project Summary: Blue line with blue fill
- External Tasks: Blue line with blue fill
- Inactive Task: Blue line with blue fill
- Inactive Milestone: Blue diamond
- Inactive Summary: Blue line with blue fill
- Deadline: Green arrow

3.0 Update Project Schedule 14042023										
ID	Task Mode	Task Name	Work	Duration	% Complete	Start	Finish	Predecessors/Successors	Resource Names	1022
111	✓	Audit Software developed	7 hrs	0.88 days	20%	Wed 3/8/23	Thu 3/8/23	110	112 Fitzgerald Umah	6 11 16 21 26 31 5 10 15 20 25 30 5 10 15 20 25 30
112	✓	FINAL REPORT	0 hrs	2 days	50%	Thu 3/9/23	Fri 3/10/23	111	113	
113	✓	Review and modify Project documents	4 hrs	0.25 days	60%	Fri 3/10/23	Mon 3/13/23	112	114 Fitzgerald Umah,Ojefoh	
114	✓	Proof read and check report	3 hrs	0.38 days	80%	Mon 3/13/23	Mon 3/13/23	113	115 Fitzgerald Umah	
115	✓	Review final report with advisor	3 hrs	0.38 days	0%	Mon 3/13/23	Mon 3/13/23	114	116 Fitzgerald Umah	
116	✓	Create Final PM6888 Final Report and Presentation	20 hrs	2.5 days	60%	Mon 3/13/23	Tue 3/14/23	115	117 Fitzgerald Umah	
117	✓	PROJECT CLOSING	0 hrs	2 days	0%	Tue 3/14/23	Thu 3/16/23	116	118	
118	✓	Schedule meetings	1 hr	0.03 days	0%	Thu 3/16/23	Thu 3/16/23	117	120 Annick,Fitzgerald	
119	✓	Lessons Learned	13 hrs	0.59 days	12%	Thu 3/16/23	Fri 3/17/23			
120	✓	Document Lessons Learned	5 hrs	0.63 days	30%	Thu 3/16/23	Thu 3/16/23	118	121 Fitzgerald Umah	
121	✓	Create archive of version of Pro	1 hr	0.13 days	0%	Thu 3/16/23	Thu 3/16/23	120	122 Fitzgerald Umah	
122	✓	Close Project	7 hrs	0.88 days	0%	Thu 3/16/23	Fri 3/17/23	121	Fitzgerald Umah	

Legend for task types and progress indicators:

- Critical: Red line
- Critical Split: Red dashed line
- Critical Progress: Red line with blue fill
- Task: Blue line
- Split: Dotted line
- Task Progress: Blue line with blue fill
- Manual Task: Blue line with blue fill
- Start-only: Blue line with blue fill
- Finish-only: Blue line with blue fill
- Duration-only: Blue line with blue fill
- Manual Task: Blue line with blue fill
- Baseline Split: Blue line with blue fill
- Baseline Milestone: Blue diamond
- Milestone: Blue diamond
- Summary Progress: Blue line with blue fill
- Summary: Blue line with blue fill
- External Milestone: Blue diamond
- Manual Summary: Blue line with blue fill
- Project Summary: Blue line with blue fill
- External Tasks: Blue line with blue fill
- Inactive Task: Blue line with blue fill
- Inactive Milestone: Blue diamond
- Inactive Summary: Blue line with blue fill
- Deadline: Green arrow





Appendix K. Questionnaire

AFFORDABLE HOUSING PROJECT FOR MUNICIPALITY OF ANCHORAGE AFFORDABLE HOUSING QUESTIONNAIRE

This Survey is being carried out for academic research purposes. Your participation will provide essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, is appreciated.

Affordable Housing Questionnaire

1. What is a primary cause of the housing shortage in Anchorage
 - A. Not enough land
 - B. Lack of investment
 - C. Not enough market
 - D. Low rental cost

2. What is primarily responsible for delays in housing construction
 - A. Lack of human resources
 - B. Lack of construction materials
 - C. Short bargaining time
 - D. Other (specify)

3. What housing fund strategy can help address housing shortage in Anchorage
 - A. Federal funding
 - B. State funding
 - C. Private funding
 - D. Investment funding

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood
 - B. Cement
 - C. Steel
 - D. Blocks
 - E. Gypsum board

5. What finishing materials cause a delay in housing construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door hardware
 - D. Electrical fittings
 - E. Ceiling boards

6. What other building components cause delays in housing construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen cabinets
 - D. Heating equipment

7. Is importation of building materials outside Alaska a significant cause of delay in construction projects?
 - A. Yes
 - B. No

8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.
 - A. Procurement of materials on time
 - B. Production of building materials in Alaska
 - C. Adoption of fast construction methods (Please suggest any)
 - D. Others (specify)

9. How can cost be controlled in affordable housing projects? Check all that apply.
 - A. Legislation
 - B. Reduction of cost of land by government
 - C. Reduction of material costs
 - D. Alternative construction method

10. What incentives, programs, or actions should Municipality of Anchorage take to encourage development of housing affordable to all income levels?
 - A. Partner with affordable housing developers
 - B. Develop city land
 - C. Loan/grant programs
 - D. Expedited permit reviews
 - E. Fee waivers
 - F. Other

Appendix L. Response to Questionnaire

AFFORDABLE HOUSING PROJECT FOR MUNICIPALITY OF ANCHORAGE

AFFORDABLE HOUSING QUESTIONNAIRE

This Survey is being carried out for academic research purposes. Your participation will provide me with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Your input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, will be appreciated.
Affordable Housing Questionnaire

1. What do you think is the Cause of the Housing shortage in Anchorage
 - A. Not enough land
 - B. Lack of Investment
 - C. Not enough Market
 - D. Low rental Cost

2. What do you think is responsible for the delay in Housing Construction
 - A. Lack of Human Resources
 - B. Lack of construction materials
 - C. Short Barging time
 - D. Other (specify) High cost of construction.

3. What Housing Fund strategy can help solve the address Housing shortage in Anchorage
 - A. Federal funding
 - B. State Funding
 - C. Private Funding
 - D. Investment Funding
 (All of the above are needed.)

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood
 - B. Cement
 - C. Steel
 - D. Blocks
 - E. Gypsum Board
 (None of the above. My understanding is all of these materials are available now.)

5. What Finishing Materials cause a delay in Housing Construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door Hardware
 - D. Electrical Fittings
 - E. Ceiling Boards
 (None of the above. My understanding is all of these materials are available now.)

6. What other Building components cause delays in Housing Construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen Cabinets
 - D. Heating Equipment

Fitzgerald Umah

1

Department of Project Management UAA

7. Do you think the importation of Building Materials outside Alaska is a significant cause of delay in Construction Projects?
- A. Yes
 - B. No
8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.
- A. Procurement of materials on Time
 - B. Production of Building Materials in Alaska
 - C. Adoption of Fast construction Method (Please suggest any)
 - D. Others (Specify) General Contractor/Construction Manager (GC/CM) design approach. Early collaboration with the contractor is essential. Design/Bid/Build cannot account for changing availability and pricing of materials.
9. How can cost be controlled in Affordable Housing Project? Check all that apply.
- A. Legislation
 - B. Reduction of cost of land by the Government
 - C. Reduction of cost of material
 - D. Alternative Construction method.
10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?
- A. Partner with Affordable Housing Developers
 - B. Develop City Land
 - C. Loan/Grant Program
 - D. Expedited Permit Review
 - E. Fee Waivers
 - F. Other

This Survey is being carried out for academic research purposes. Your participation will provide me with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Your input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, will be appreciated. Affordable Housing Questionnaire

1. What do you think is the Cause of the Housing shortage in Anchorage
 - A. Not enough land
 - B. Lack of Investment
 - C. Not enough Market
 - D. Low rental Cost

2. What do you think is responsible for the delay in Housing Construction
 - A. Lack of Human Resources
 - B. Lack of construction materials
 - C. Short Barging time
 - D. Other (specify) Perceived risk of low return on investment due to high inflationary costs and market volatility.

3. What Housing Fund strategy can help solve the address Housing shortage in Anchorage
 - A. Federal funding
 - B. State Funding
 - C. Private Funding
 - D. Investment Funding

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood
 - B. Cement
 - C. Steel
 - D. Blocks
 - E. Gypsum Board

5. What Finishing Materials cause a delay in Housing Construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door Hardware
 - D. Electrical Fittings
 - E. Ceiling Boards

6. What other Building components cause delays in Housing Construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen Cabinets
 - D. Heating Equipment

7. Do you think the importation of Building Materials outside Alaska is a significant cause of delay in Construction Projects?
- A. Yes
 - B. No
8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.
- A. Procurement of materials on Time
 - B. Production of Building Materials in Alaska
 - C. Adoption of Fast construction Method (Please suggest any) Modular, factory-built units.
 - D. Others (Specify)
9. How can cost be controlled in Affordable Housing Project? Check all that apply.
- A. Legislation
 - B. Reduction of cost of land by the Government
 - C. Reduction of cost of material
 - D. Alternative Construction method.
10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?
- A. Partner with Affordable Housing Developers
 - B. Develop City Land
 - C. Loan/Grant Program
 - D. Expedited Permit Review
 - E. Fee Waivers
 - F. Other

This Survey is being carried out for academic research purposes. Your participation will provide me with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Your input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, will be appreciated. Affordable Housing Questionnaire

1. What do you think is the Cause of the Housing shortage in Anchorage
 - A. **Not enough land**
 - B. Lack of Investment
 - C. Not enough Market
 - D. Low rental Cost

2. What do you think is responsible for the delay in Housing Construction
 - A. **Lack of Human Resources**
 - B. Lack of construction materials
 - C. Short Barging time
 - D. Other (specify)

3. What Housing Fund strategy can help solve the address Housing shortage in Anchorage
 - A. Federal funding
 - B. State Funding
 - C. **Private Funding**
 - D. Investment Funding

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood
 - B. **Cement**
 - C. Steel
 - D. Blocks
 - E. Gypsum Board

5. What Finishing Materials cause a delay in Housing Construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. **Door Hardware**
 - D. Electrical Fittings
 - E. Ceiling Boards

6. What other Building components cause delays in Housing Construction? Check all that apply.
 - A. Doors
 - B. **Windows**
 - C. **Kitchen Cabinets**
 - D. Heating Equipment

7. Do you think the importation of Building Materials outside Alaska is a significant cause of delay in Construction Projects?
- A. Yes
 - B. No
8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.
- A. Procurement of materials on Time
 - B. Production of Building Materials in Alaska
 - C. Adoption of Fast construction Method (Please suggest any)
 - D. Others (Specify)
9. How can cost be controlled in Affordable Housing Project? Check all that apply.
- A. Legislation
 - B. Reduction of cost of land by the Government
 - C. Reduction of cost of material
 - D. Alternative Construction method.
10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?
- A. Partner with Affordable Housing Developers
 - B. Develop City Land
 - C. Loan/Grant Program
 - D. Expedited Permit Review
 - E. Fee Waivers
 - F. Other

Kaife

AFFORDABLE HOUSING PROJECT FOR MUNICIPALITY OF ANCHORAGE

AFFORDABLE HOUSING QUESTIONNAIRE

This Survey is being carried out for academic research purposes. Your participation will provide me with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Your input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, will be appreciated. Affordable Housing Questionnaire

1. What do you think is the Cause of the Housing shortage in Anchorage
 - A. Not enough land
 - B. Lack of Investment
 - C. Not enough Market
 - D. Low rental Cost

2. What do you think is responsible for the delay in Housing Construction
 - A. Lack of Human Resources
 - B. Lack of construction materials
 - C. Short Barging time
 - D. Other (specify)

3. What Housing Fund strategy can help solve the address Housing shortage in Anchorage
 - A. Federal funding
 - B. State Funding
 - C. Private Funding
 - D. Investment Funding

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood
 - B. Cement
 - C. Steel
 - D. Blocks
 - E. Gypsum Board

5. What Finishing Materials cause a delay in Housing Construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door Hardware
 - D. Electrical Fittings
 - E. Ceiling Boards

6. What other Building components cause delays in Housing Construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen Cabinets
 - D. Heating Equipment

7. Do you think the importation of Building Materials outside Alaska is a significant cause of delay in Construction Projects?
- A. Yes
 - B. No
8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.
- A. Procurement of materials on Time
 - B. Production of Building Materials in Alaska
 - C. Adoption of Fast construction Method (Please suggest any)
 - D. Others (Specify) *not investing in labor force recruitment and efficient pre-built construction methods.*
9. How can cost be controlled in Affordable Housing Project? Check all that apply.
- A. Legislation
 - B. Reduction of cost of land by the Government
 - C. Reduction of cost of material
 - D. Alternative Construction method.
10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?
- A. Partner with Affordable Housing Developers
 - B. Develop City Land
 - C. Loan/Grant Program
 - D. Expedited Permit Review
 - E. Fee Waivers
 - F. Other

David Hooper

This Survey is being carried out for academic research purposes. Your participation will provide me with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Your input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, will be appreciated. Affordable Housing Questionnaire

1. What do you think is the Cause of the Housing shortage in Anchorage
 - A. Not enough land
 - B. Lack of Investment
 - C. Not enough Market
 - D. Low rental Cost

2. What do you think is responsible for the delay in Housing Construction
 - A. Lack of Human Resources
 - B. Lack of construction materials
 - C. Short Barging time
 - D. Other (specify)

3. What Housing Fund strategy can help solve the address Housing shortage in Anchorage
 - A. Federal funding
 - B. State Funding
 - C. Private Funding
 - D. Investment Funding

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood
 - B. Cement
 - C. Steel
 - D. Blocks
 - E. Gypsum Board

5. What Finishing Materials cause a delay in Housing Construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door Hardware
 - D. Electrical Fittings
 - E. Ceiling Boards

6. What other Building components cause delays in Housing Construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen Cabinets
 - D. Heating Equipment

7. Do you think the importation of Building Materials outside Alaska is a significant cause of delay in Construction Projects?

- A. Yes
- B. No

8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.

- A. Procurement of materials on Time
- B. Production of Building Materials in Alaska
- C. Adoption of Fast construction Method (Please suggest any)
- D. Others (Specify) *not investing in labor force recruitment and efficient pre-built construction methods.*

9. How can cost be controlled in Affordable Housing Project? Check all that apply.

- A. Legislation
- B. Reduction of cost of land by the Government
- C. Reduction of cost of material
- D. Alternative Construction method.

10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?

- A. Partner with Affordable Housing Developers
- B. Develop City Land
- C. Loan/Grant Program
- D. Expedited Permit Review
- E. Fee Waivers
- F. Other

Matt Machalk

AFFORDABLE HOUSING PROJECT FOR MUNICIPALITY OF ANCHORAGE

AFFORDABLE HOUSING QUESTIONNAIRE

This Survey is being carried out for academic research purposes. Your participation will provide me with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Your input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, will be appreciated.

Affordable Housing Questionnaire

1. What do you think is the Cause of the Housing shortage in Anchorage
 - A. Not enough land - Likely need more apartment style
 - B. Lack of Investment
 - C. Not enough Market
 - D. Low rental Cost

2. What do you think is responsible for the delay in Housing Construction
 - A. Lack of Human Resources
 - B. Lack of construction materials - Larger buildings for apartment complexes
 - C. Short Barging time
 - D. Other (specify)

3. What Housing Fund strategy can help solve the address Housing shortage in Anchorage
 - A. Federal funding
 - B. State Funding
 - C. Private Funding
 - D. Investment Funding

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood - Likely few plants in town
 - B. Cement
 - C. Steel - shipped in
 - D. Blocks
 - E. Gypsum Board

5. What Finishing Materials cause a delay in Housing Construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door Hardware
 - D. Electrical Fittings - Both are shipped in
 - E. Ceiling Boards

6. What other Building components cause delays in Housing Construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen Cabinets
 - D. Heating Equipment

7. Do you think the importation of Building Materials outside Alaska is a significant cause of delay in Construction Projects?

- A. Yes
- B. No

8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.

- A. Procurement of materials on Time
- B. Production of Building Materials in Alaska
- C. Adoption of Fast construction Method (Please suggest any)
- D. Others (Specify) - Larger supplier/distributor warehouses

9. How can cost be controlled in Affordable Housing Project? Check all that apply.

- A. Legislation
- B. Reduction of cost of land by the Government
- C. Reduction of cost of material
- D. Alternative Construction method.

10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?

- A. Partner with Affordable Housing Developers
- B. Develop City Land
- C. Loan/Grant Program
- D. Expedited Permit Review
- E. Fee Waivers
- F. Other

This Survey is being carried out for academic research purposes. Your participation will provide me with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Your input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, will be appreciated. Affordable Housing Questionnaire

1. What do you think is the Cause of the Housing shortage in Anchorage
 - A. Not enough land
 - B. Lack of Investment
 - C. Not enough Market
 - D. Low rental Cost

Actually, I don't believe that everyone wants a home!

2. What do you think is responsible for the delay in Housing Construction
 - A. Lack of Human Resources
 - B. Lack of construction materials
 - C. Short Barging time
 - D. Other (specify)

3. What Housing Fund strategy can help solve the address Housing shortage in Anchorage
 - A. Federal funding
 - B. State Funding
 - C. Private Funding
 - D. Investment Funding

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood
 - B. Cement
 - C. Steel
 - D. Blocks
 - E. Gypsum Board

5. What Finishing Materials cause a delay in Housing Construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door Hardware
 - D. Electrical Fittings
 - E. Ceiling Boards

6. What other Building components cause delays in Housing Construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen Cabinets
 - D. Heating Equipment

7. Do you think the importation of Building Materials outside Alaska is a significant cause of delay in Construction Projects?
- A. Yes
 - B. No
8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.
- A. Procurement of materials on Time
 - B. Production of Building Materials in Alaska
 - C. Adoption of Fast construction Method (Please suggest any)
 - D. Others (Specify)
9. How can cost be controlled in Affordable Housing Project? Check all that apply.
- A. Legislation
 - B. Reduction of cost of land by the Government
 - C. Reduction of cost of material
 - D. Alternative Construction method.
10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?
- A. Partner with Affordable Housing Developers
 - B. Develop City Land
 - C. Loan/Grant Program
 - D. Expedited Permit Review
 - E. Fee Waivers
 - F. Other

This Survey is being carried out for academic research purposes. Your participation will provide me with essential information to develop a scheduling methodology for developing affordable housing for Anchorage and forming a template for use by others throughout Alaska. Your input on topics related to affordable housing for the State of Alaska, with a focus on Anchorage, will be appreciated. Affordable Housing Questionnaire

1. What do you think is the Cause of the Housing shortage in Anchorage
 - A. Not enough land
 - B. Lack of Investment
 - C. Not enough Market
 - D. Low rental Cost

2. What do you think is responsible for the delay in Housing Construction
 - A. Lack of Human Resources
 - B. Lack of construction materials
 - C. Short Barging time
 - D. Other (specify) Perceived risk of low return on investment due to high inflationary costs and market volatility.

3. What Housing Fund strategy can help solve the address Housing shortage in Anchorage
 - A. Federal funding
 - B. State Funding
 - C. Private Funding
 - D. Investment Funding

4. What construction materials are the major causes of delay in housing construction in Anchorage? Check all that apply.
 - A. Wood
 - B. Cement
 - C. Steel
 - D. Blocks
 - E. Gypsum Board

5. What Finishing Materials cause a delay in Housing Construction? Check all that apply.
 - A. Tile
 - B. Sanitary wares
 - C. Door Hardware
 - D. Electrical Fittings
 - E. Ceiling Boards

6. What other Building components cause delays in Housing Construction? Check all that apply.
 - A. Doors
 - B. Windows
 - C. Kitchen Cabinets
 - D. Heating Equipment

7. Do you think the importation of Building Materials outside Alaska is a significant cause of delay in Construction Projects?
- A. Yes
 - B. No
8. What can be done to avoid delays in construction projects in Alaska? Check all that apply.
- A. Procurement of materials on Time
 - B. Production of Building Materials in Alaska
 - C. Adoption of Fast construction Method (Please suggest any) Modular, factory-built units.
 - D. Others (Specify)
9. How can cost be controlled in Affordable Housing Project? Check all that apply.
- A. Legislation
 - B. Reduction of cost of land by the Government
 - C. Reduction of cost of material
 - D. Alternative Construction method.
10. What incentives, programs, or actions should the Municipality of Anchorage take to encourage the development of housing affordable to all income levels?
- A. Partner with Affordable Housing Developers
 - B. Develop City Land
 - C. Loan/Grant Program
 - D. Expedited Permit Review
 - E. Fee Waivers
 - F. Other

Appendix P: Door Shipping Schedule

4/21/23, 10:06 AM Door Hardware - DoorKnobsOnline.com

Knobs4Less DoorKnobsOnline CoolTiles BathFashion JustBathBathplates NewLighting JerseyHome

DoorKnobsOnline.com My Account Sign In or Register Customer Service Live Chat 516-333-4386

Search items, brands and more...

Door Hardware Finishes Materials Themes Our Brands Hot Deals

Shipping Policy

No Cancellations Will Be Allowed After 24 Hours Of Order Placement

Economy shipping for only \$6.95 per Manufacturer, any size order in the Continental U.S.!

If an order consists of items from multiple manufacturers, there will be an additional \$6.95 shipping fee per manufacturer. This is done only when more than one package has to be shipped to complete your order.

Shipping Method	Delivery Time
Economy Saver (\$6.95)	7-10 business days*
UPS Ground (\$8.95)	3-5 business days*
UPS Next Day Air (\$49.00)	1 business day*
UPS 2nd Day Air (\$39.00)	2 business days*

*plus mtg lead times

**** FREE ECONOMY SAVER ON ORDERS OVER \$48.00****

- These delivery options apply to transit time only. Standard manufacturer lead times still apply and will affect the arrival time of your order.
- The above prices quoted are per manufacturer, each additional manufacturer will incur a separate shipping charge.
- *Tile and Lighting Orders are not eligible for Expedited Shipping. Call for Quote*
- Larger orders that require shipment via common carrier or freight only qualify for curbside delivery. Lift gate service available for additional fee.
- Tile and Lighting orders shipping to Alaska, Hawaii and Puerto Rico require an additional shipping and handling fee. Please call for a quote.

Shipping Information

- Most orders ship UPS.
- Expedited Shipping Available upon request at customers expense.
- Can not ship to PO or PM Box.
- All Non Lighting and Tile orders shipping to Hawaii, Alaska or Puerto Rico will incur an additional \$30.00 shipping and handling fee. Please add 3-5 days to projected delivery time.
- All Non Lighting and Tile International Shipments (excluding Canada) are shipped Via UPS Global. We will email you with the actual shipping amount for your approval prior to processing your order. We do not accept credit cards issued outside the United States because we are unable to verify the information. Orders with this information will be flagged and put on hold. You will receive a separate email with the additional shipping charges and instructions on where to send payment. Payment must be sent in the form of an international money order or bank check.

https://www.doorknobsonline.com/page/shipping/?sessionid=58FD6316C32C12A7D759F18119C56612.worler1

4/21/23, 10:06 AM Door Hardware - DoorKnobsOnline.com

- All Non Lighting and Tile shipments to Canada are sent via UPS Surface and will incur an additional \$49.00 shipping and handling fee. Please add 3-5 days to projected delivery time. Your purchase may be subject to additional duties and charges collected by UPS on behalf of your country at the time of delivery. Knobs4Less.com is not responsible for collection or reimbursement of any of these charges.

Missing or Damaged Merchandise

All orders are inspected prior to shipment. If a product is received damaged or missing, please contact us in writing (E-mail or Fax) within 48 hours. We will replace all missing or damaged merchandise immediately.

BACK TO TOP

Sign Up for Email to receive special offers and promotions! Enter your email

My Account: Account Overview, Order History, Project Lists, Logout

Shopping Help: Accessibility, Samples, Shipping, Wholesale Application, Site Map, Sales Tax

Customer Service: Order Status, Contact Us, Visit our Showroom, Return Policy, Privacy Policy, FAQ's, Find a Project List

Contact Us: Knobs4Less, 14 Bayville Ave, Bayville, NY 11709, Phone: 516-333-4386

37,500+ 5 STAR RATINGS, DPHA Decouplix Plumbing & Hardware Association, Trustwave Trusted Commerce

This site is protected by reCAPTCHA and the Google Privacy Policy and Terms of Service apply.

Copyright © 2023 Knobs4Less. All Rights Reserved.

https://www.doorknobsonline.com/page/shipping/?sessionid=58FD6316C32C12A7D759F18119C56612.worler1

Appendix P1: Door Shipping Schedule and cost



Questions? Call Us: 520-514-2046

EXTERIOR DOORS INTERIOR DOORS EXTERIOR DOUBLE INTERIOR DOUBLE HARDWARE Account

Shipping Lead Times

Our goal has always been to provide the best shipping options for our customers and ensure that they arrive in their new home as quickly as possible. Our selection of products includes pre-hung doors and stained wood slabs. Our order processing time is dependent on the time of day, but most orders ship within 6 weeks of being ordered. In addition, we offer free customer support and our trained staff will be happy to give any advice or assistance you may need.

Estimated Production Time on In-stock Doors.
Slabs

Pre hung unfinished 3 business days

Stain orders 5 business days

Orders with 3+ doors add extended lead time



**Lead times are based on door availability, not all doors are in stock ready to ship. Contact Customer Service for estimated lead times.*

* REVIEWS

Featured Products



Text with one of our door experts now.



Craftsman Knotty Alder 6 Lite Dentil Shelf Exterior Door
From \$1,301.81



Knotty Alder 2 Panel Square Top Exterior Door
From \$666.13



Modern Farmhouse Knotty Alder 4 Lite Dutch Door
From \$2,593.84



* REVIEWS

Douglas Fir 9 Lite Clear Glass Exterior Door
From \$1,120

Krosswood Doors

- [About Us](#)
- [Privacy Policy](#)
- [Terms of Use](#)
- [California Proposition 65](#)
- [CARB II Certification](#)
- [Overhang Requirements](#)
- [Return Policy](#)
- [Careers](#)

Door Collections

- [Exterior Doors](#)
- [Interior Doors](#)
- [Exterior Double](#)
- [Interior Double](#)
- [Hardware](#)

Contact Us

- [Contact Us](#)
- [520-514-2046](#)
- info@krosswood.com
- [Door Warranty](#)
- [Krosswood Owner's Guide](#)
- [Krosswood Door Catalog](#)
- [Krosswood Reviews](#)
- [Door Install Problems? Click here](#)

Resources

- [Frequently Asked Questions](#)
- [Getting Started](#)
- [How To Measure For New Doors](#)
- [How to Install doors](#)
- [Shipping Lead Times](#)
- [The Perfect Door Delivered](#)
- [Blog](#)
- [Installation](#)
- [Warranty Claim](#)
- [Warranty \(Fr\)](#)

Be in the Know

Stay in the loop with Krosswood

Your email



Powered by YOTPO

REVIEWS

REVIEWS

Follow us



Appendix P2: Tile Shipping Schedule and cost

4/21/23, 10:10 AM Tile Shipping Speed – Tile Support

Jobit has joined Tile! Please search your question or browse the FAQs for Jobit.

tile by Life360 Tile Store Jobit Store

🔍 Search our help center

TILE SUPPORT > TROUBLESHOOTING > ORDERS > ORDERS AND SHIPPING (NON EU)

Tile Shipping Speed

Relevant to: **tile**

Once you place your order, you will receive a confirmation email from us within an hour of your purchase. Express orders are shipped the next business day and standard orders typically ship within 2 business days after purchase.

Once your order is shipped, you will receive an email with your tracking information and estimated delivery date. You can sign up for text alerts, which notify you the day before your package arrives and the day it has been delivered.

Delivery time frames based on country and method of shipment chosen:

Country	Standard	Express
United States	5 - 7 Business Days	2 - 3 Business Days
Canada	7 - 9 Business Days	3 - 4 Business Days
United Kingdom	2 - 4 Business Days	1 - 3 Business Days

<https://tileteam.zendesk.com/hc/en-us/articles/201013508-Tile-Shipping-Speed> 1/5

4/21/23, 10:10 AM Tile Shipping Speed – Tile Support

Country	Standard	Express
Germany	2 - 4 Business Days	1 - 3 Business Days
Austria	2 - 4 Business Days	1 - 3 Business Days
Belgium	2 - 4 Business Days	1 - 3 Business Days
Czech Republic	2 - 4 Business Days	1 - 3 Business Days
Denmark	2 - 4 Business Days	1 - 3 Business Days
Luxemburg	2 - 4 Business Days	1 - 3 Business Days
Poland	2 - 4 Business Days	1 - 3 Business Days
Romania	Up to 5 Business Days	1 - 3 Business Days
Sweden	2 - 4 Business Days	1 - 3 Business Days
Bulgaria	2 - 4 Business Days	Not Available
Estonia	2 - 4 Business Days	Not Available
Finland	2 - 4 Business Days	Not Available
France	2 - 4 Business Days	Not Available
Greece	2 - 4 Business Days	Not Available
Ireland	2 - 4 Business Days	Not Available
Iceland	2 - 4 Business Days	Not Available

<https://tileteam.zendesk.com/hc/en-us/articles/201013508-Tile-Shipping-Speed> 2/5

4/21/23, 10:10 AM Tile Shipping Speed – Tile Support

Italy	2 - 4 Business Days	Not Available
Latvia	2 - 4 Business Days	Not Available
Lithuania	2 - 4 Business Days	Not Available
Netherlands	2 - 4 Business Days	Not Available
Norway	2 - 4 Business Days	Not Available
Portugal	2 - 4 Business Days	Not Available
Slovakia	2 - 4 Business Days	Not Available
Slovenia	2 - 4 Business Days	Not Available
Spain	2 - 4 Business Days	Not Available
Switzerland	2 - 4 Business Days	Not Available
Australia and New Zealand	2 - 5 Business Days	Not Available

To see the shipping options for your country, enter your address during [checkout](#).

Also in this section X

<https://tileteam.zendesk.com/hc/en-us/articles/201013508-Tile-Shipping-Speed>

3/5

4/21/23, 10:10 AM

Tile Shipping Speed – Tile Support

Tile Order Status

Tile U.S. and International Shipping

[Tile Shipping Speed](#)

reTile Program

Add Tiles to an Existing Order

Tile made it easy for me to handle my issue.



[Return to top](#) ^

Need more help?

[Chat with Us](#)

[Submit a ticket](#)

CONNECT WITH US

DOWNLOAD THE APP



<https://tileteam.zendesk.com/hc/en-us/articles/201013508-Tile-Shipping-Speed>

4/5

4/21/23, 10:10 AM

Tile Shipping Speed - Tile Support

[Privacy Policy](#) [Terms of Service](#) [Cookies Settings](#) [Do Not Sell Personal Info](#) [Limit the Use of My Personal Information](#) [Your Personal Data Use Opt-Out Right](#)

© 2013–2023 Tile Inc. TILE and the TILE design are trademarks of Tile, Inc.

Apple and the Apple logo are trademarks of Apple Inc., registered in the U.S. and other countries. App Store is a service mark of Apple Inc. Google Play, the Google Play logo, and Android are trademarks of Google Inc. The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Tile, Inc. is under license. All other trademarks and trade names are properties of their respective owners.

[English \(US\)](#)

<https://tileteam.zendesk.com/hc/en-us/articles/201013508-Tile-Shipping-Speed>

5/5

Appendix Q: General Operating Information on Anchorage Housing

5. **Reorient Voucher Programs to Meet Changing Community Needs.** Evaluate the changing housing needs of communities, individuals and landlords, and develop new programs or revise existing ones to meet those needs.
6. **Develop Framework to Assess the Long Term Viability of Owned Properties.** Build and foster skill sets and infrastructure that are required to assess the financial condition of individual properties and evaluate financing alternatives.
7. **Increase Affordable Housing Opportunities.** Increase statewide affordable housing capacity by leveraging resources and using flexibilities of the Moving to Work (MTW) program and the Alaska Corporation for Affordable Housing (ACAH).

II. GENERAL OPERATING INFORMATION

A. Housing Stock Information

A.1 Planned New Public Housing Units

AMP Name and Number	Bedroom Size						Total Units	Population Type*	Section 504 Accessible Units	
	0/1	2	3	4	5	6+			Mobility	Hearing/Vision
N/A	0	0	0	0	0	0	0	N/A	0	0
N/A	0	0	0	0	0	0	0	N/A	0	0
N/A	0	0	0	0	0	0	0	N/A	0	0
Total Public Housing Units to be Added in the Plan Year								0	0	0

If "Population Type" is "Other" please describe:
N/A

A.2 Planned Public Housing Units to be Removed

AMP Name and Number	Number of Units to be Removed	Explanation for Removal
Anchorage South 271	1	Disposition - see Activity 2019N-1
N/A	0	N/A
N/A	0	N/A
Total to be Removed		1

Due to the COVID-19 pandemic, AHFC was unable to move forward with this disposition in 2021. AHFC has vacated five of the six units and plans to complete this action during FY2023.

A.3 Planned New Project-Based Vouchers

Property Name	Number of Vouchers to be Project-Based	RAD?	Description of Project
N/A	0	N/A	N/A
N/A	0	N/A	N/A
Total to be Added		0	

A.4 Existing Project-Based Vouchers

Property Name	Number of Project-Based Vouchers	Planned Status at End of Plan Year	RAD?	Description of Project
1248 E 9 th Ave	4	Leased/Issued	No	see 2011-5
Alpine Terrace	30	Leased/Issued	No	see 2011-5
Loussac Place	60	Leased/Issued	No	see 2010-7
MainTree Apts.	10	Leased/Issued	No	see 2010-7
Ridgeline Terrace	63	Leased/Issued	No	see 2014-4
Susitna Square	18	Leased/Issued	No	see 2014-4
Planned Existing PBV		185		

A.5 Planned Other Changes to MTW Housing Stock Anticipated During the Plan Year

See Activity 2021-1 for a pilot program for voucher families.

A.6 General Description of All Planned Capital Fund Expenditures During the Plan Year

- Projects are identified consistent with the AHFC statewide Physical Needs Assessment (PNA) process and our MTW plan.
- Funds are allocated to projects based upon priority and complexity.
- Funded Projects will be, but not limited to, statewide: roof replacements, window replacements, siding projects, HVAC repairs/replacements, health & life safety systems (fire detection/suppression, CCTV, Access Control), elevator repairs, unit interior refreshment, parking lot repair/replacement, property equipment and vehicle replacements.
- Any remaining funds are to be put toward funding new housing units in the affordable housing development program as laid out in this plan.

There is no plan at this time to relocate existing tenants to perform activities listed above. Any interior activities will be performed when a tenant vacates a unit. All other activities can be accomplished while tenants are in residence.

B. Leasing Information

B.1 Planned Number of Households Served

Planned Number of Households Served Through:	Planned Number of Unit Months Occupied/Leased	Planned Number of Households to be Served
MTW Public Housing Units Leased ¹	14,535	1,211
MTW Voucher (HCV) Units Utilized ²	51,779	4,315
Local, Non-Traditional: Tenant-Based ³	5,821	485
Local, Non-Traditional: Property-Based ⁴	1,555	130
Local, Non-Traditional: Homeownership	0	0
Planned Total Households Served	73,690	6,141

1 - Public Housing (Planned 98% of 1,236).
 2 - Voucher Units (Planned 98% of 4,403); includes Homeownership, Project-Based, and Tenant/Enhanced Protection.
 3 - Local, Tenant-Based (Planned 90% of 539): Empowering Choice Housing Program (254), Mainstream 811 (10), Making A Home (40), Moving Home Program (150), and Returning Home (85).
 4 - Local, Property-Based (Planned 90% of 144): Karluk Manor (46), Forget-Me-Not Manor (56), Dena'ina House (25), and Bridgeway (17).
 Note: Emergency Housing Voucher (194), Foster Youth to Independence (25), Mainstream (65), Non-Elderly Disabled (45), and Veterans Affairs Supportive Housing (354) vouchers' administrative costs are supported with MTW funds; however, these are not included in the totals.

Local, Non-Traditional Category	MTW Activity Name/Number	Planned Number of Unit Months Occupied/Leased	Planned Number of Households to be Served
Tenant-Based	ECHP - 2013-2	2,743	229
Tenant-Based	Moving Home - 2010-10	1,620	135
Tenant-Based	Returning Home - 2010-9	918	76
Tenant-Based	Mainstream 811 - 2016-1	108	9
Tenant-Based	Making A Home - 2013-2	432	36
Project-Based	Karluk - 2012-4	496	41
Project-Based	Dena'ina - 2018-2	270	23
Project-Based	Forget-Me-Not - 2018-1	605	51
Project-Based	Bridgeway - 2021-2	184	15
Homeownership		0	0
Planned Totals		7,376	615

B.2 Discussion of any Anticipated Issues/Possible Solutions Related to Leasing

Housing Program	Description of Anticipated Leasing Issues and Possible Solutions
MTW Public Housing	Staff resignations, retirements, and sick leave combined with COVID-19 impacts on moving families through the eligibility process have hampered PHD's ability to quickly house new families when units are vacated. PHD's new strategic plan identifies understaffed offices as a bottleneck, and we will be seeking improved methods for recruitment, retention, and succession planning.
MTW Housing Choice Voucher	The COVID-19 pandemic and eviction moratorium has caused most of the rental markets in Alaska to tighten. Although AHFC has been extremely generous with its shopping deadlines (120 days initially, two possible extensions of 60 days each), we are finding that local rental markets are slow to recover. We are hoping that the addition of the Security Deposit Assistance Program activity will encourage landlords to rent to our voucher holders as AHFC will be guaranteeing payment of a portion of the security deposit.
Homeownership	N/A

C. Waiting List Information

C.1 Waiting List Information Anticipated

As of February 1, 2022, the following families are on AHFC waiting lists.

Waiting List Name	Description	Number of Households on Waiting List	Waiting List Open, Partially Open or Closed	Plans to Open the Waiting List During the Plan Year
Anchorage Housing Choice Voucher	Community-Wide, Family	3,197	Closed	No
Anchorage Public Housing	Community-Wide, Family	1,346	Partially Open	Yes
Anchorage Public Housing-Senior	Community-Wide, Senior/Disabled	586	Partially Open	Yes
Bethel Public Housing	Community-Wide, Family	165	Open	Yes
Cordova Public Housing	Community-Wide, Family	2	Open	Yes
Fairbanks Housing Choice Voucher	Community-Wide, Family	490	Open	Yes
Fairbanks Public Housing	Community-Wide, Family	129	Open	Yes
Fairbanks Public Housing-Senior	Community-Wide, Senior/Disabled	410	Open	Yes
Homer Housing Choice Voucher	Community-Wide, Family	158	Open	Yes
Juneau Housing Choice Voucher	Community-Wide, Family	116	Open	Yes

Waiting List Name	Description	Number of Households on Waiting List	Waiting List Open, Partially Open or Closed	Plans to Open the Waiting List During the Plan Year
Juneau Public Housing	Community-Wide, Family	166	Partially Open	Yes
Juneau Public Housing: Senior	Community-Wide, Senior/Disabled	24	Open	Yes
Ketchikan Housing Choice Voucher	Community-Wide, Family	196	Open	Yes
Ketchikan Public Housing	Community-Wide, Family	84	Open	Yes
Ketchikan Public Housing: Senior	Community-Wide, Senior/Disabled	65	Open	Yes
Kodiak Housing Choice Voucher	Community-Wide, Family	68	Open	Yes
Kodiak Public Housing	Community-Wide, Family	56	Open	Yes
Mat-Su Housing Choice Voucher	Community-Wide, Family	458	Open	Yes
Mat-Su Public Housing: Senior	Community-Wide, Senior/Disabled	91	Open	Yes
Nome Public Housing	Community-Wide, Family	13	Open	Yes
Petersburg Housing Choice Voucher	Community-Wide, Family	4	Open	Yes
Sitka Housing Choice Voucher	Community-Wide, Family	33	Open	Yes
Sitka Public Housing	Community-Wide, Family	59	Open	Yes
Sitka Public Housing: Senior	Community-Wide, Senior/Disabled	28	Open	Yes
Soldotna Housing Choice Voucher	Community-Wide, Family	330	Open	Yes
Valdez Housing Choice Voucher	Community-Wide, Family	18	Open	Yes
Valdez Public Housing	Community-Wide, Family	14	Open	Yes
Wrangell Housing Choice Voucher	Community-Wide, Family	5	Open	Yes
Wrangell Public Housing	Community-Wide, Family	37	Open	Yes

Please describe any duplication of applicants across waiting lists:
 Applicant families may apply to any open waiting list in any community. A community's waiting lists are independent of other communities.

C.2 Planned Changes to Waiting List in the Plan Year

Waiting List Name	Description of Planned Changes to Waiting List
N/A	N/A
N/A	N/A

Each community monitors the applicants on its lists and determines when a list or a particular bedroom size on a waiting list is opened or closed. Waiting list statuses are advertised in local media and available on AHFC's web site.

AHFC's waiting lists will be gradually available through an electronic application process in conjunction with Activity 2023N-2.

III. PROPOSED MTW ACTIVITIES

2023-1 Covenant House Sponsor-Based Rental Assistance (SBRA)

1. Description

AHFC issued a Request for Information for an AHFC Sponsor-Based Rental Assistance Program targeting Housing Assistance for Homeless Youth with Supportive Services in April 2020. Covenant House Alaska was a successful bidder with an award of rental assistance for 20 units.



The units are new construction and were initially targeted to be ready in Winter 2021. The units are now slated for completion in March 2022. AHFC will need to conduct its preliminary HQS inspection and review the Tenant Selection Plan. Configuration of standard units is 270 square feet with a bed, closet, bathroom with toilet and shower, and kitchenette including cabinet space, a small sink, microwave, countertop, and under-counter refrigerator (see drawing below).

Reference

1. The GAP - A Shortage of Affordable Homes - National Low-Income Housing Coalition - April 2022.
2. Alaska-affordable-housing-development-workbook
3. Planning and Scheduling of Low-Income Housing Scheme Project by Line of Balancing Method by Amey Satish Darange Department of Civil Engineering, Maharashtra Institute of Technology, Pune, India Mahesh B. Sonawane Assistant Professor, Department of Civil Engineering, Maharashtra Institute of Technology, Pune, India
4. <https://www.pmi.org/learning/library/modern-project-management-affordable-housing-9048>
5. Berg, P. L. (1994). Making affordable housing attainable through modern project management. *PM Network*, 8(8), 12–18
6. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://uli.org/wp-content/uploads/2012/07/TP_AffordableHousing.ashx_.pdf
7. The GAP - A Shortage of Affordable Homes - National Low-Income Housing Coalition - April 2022
8. nlihc.org/housing-needs-by-state/alaska
9. www.workyard.com/blog/construction-scheduling-problems-most-common-fixes-wy
10. www.letsbuild.com/blog/common-challenges-of-residential-construction-projects
11. <https://www.doorknobsonline.com/?jsessionid=0D7D2B32B22675C19DD5842D25F323C7.worker1>.
12. https://www.krosswood.com/?gad=1&gclid=Cj0KCQjw6cKiBhD5ARIsAKXUdybDGNxU61yYN8W7YYKg_gWmUbgdjFdW9tDAE1Ja1YmAGcQFB5-Fx7MaAs41EALw_wcB.
13. <https://tileteam.zendesk.com/hc/en-us/articles/201013508-Tile-Shipping-Speed>
14. Roles and Responsibilities - Project Management Docs. [//www.projectmanagementdocs.com/wp-content/uploads/2018/08/Human-Resource-Plan.docx](http://www.projectmanagementdocs.com/wp-content/uploads/2018/08/Human-Resource-Plan.docx)

15. Project Manager's Guide to Implementing a Compliance Program.
<https://thedigitalprojectmanager.com/projects/pm-methodology/implementing-compliance-programs/>
16. Moving to Work Plan FY2023 Public Housing Division by Alaska Housing Finance Corporation
17. Government regulations make home building hard in Alaska - By Karen Kassik- Michelsohn
Updated: June 17, 2018Published: June 17, 2018, Anchorage Daily News.
18. Challenges of Designing and Building Bridges in Alaska - LESLIE K. DAUGHERTY, P.E., S.E.
Alaska Department of Transportation & Public Facilities Bridge Section, Juneau, AK
19. Think you have supply chain woes? Try building in rural Alaska, where prices are high, and the season is short. By Kavitha George, Alaska Public Media - Anchorage February 21, 2022