STATE OF FLORIDA

Florida Department of Transportation



Independent Project Cost

HANDBOOK

October 2026

Forecasting and Project Cost Office

Tallahassee, Florida

Independent Project Cost Handbook

TABLE OF CONTENTS

1. INTRODUCTION 2
1.1. Purpose 2
1.2. Authority 2
1.3. Scope 2
1.4. Distribution 2
1.5. Glossary of Terms and Abbreviations 2
1.6. Comments or Suggestions for Handbook Revisions 5
1.7. Training 5
1.8. Templates 5
1.9. Attachments 5

2. PROCESS AND RESPONSIBILITIES 5
2.1. Purpose 5
2.2. Districts 5
2.3. Central Office 6
2.4. Consultants 6

3. DEVELOPMENT OF THE IPC 6
3.1. Purpose 6
3.2. IPC Process 7
3.3. Project Milestones for IPC Development 16
3.4. Risk Register Development 21

4. SCHEDULE 25
4.1. Purpose 25
4.2. Project Schedule Assessment 25
4.3. Independent Project Schedule 26

5. TRACKING 27
5.1. Purpose 27

Attachment A – IPC Process Flowchart 28

1. INTRODUCTION

1.1. Purpose

This **Independent Project Cost Handbook (Handbook)** provides instructions for consistent processes in developing an ***Independent Project Cost*** **(*IPC*)** for Florida Department of Transportation (Department or FDOT) projects. The **Handbook** provides technical guidance and techniques for Consultants and Department personnel preparing an ***IPC***.

1.2. Authority

This **Handbook** is authorized under Sections 20.23(4)(a), 334.048, 337.11, and 337.168 of the Florida Statutes (F.S.), which govern the Department's structure, rulemaking, and cost estimation process.

1.3. Scope

Principal users of this **Handbook** will be Department personnel and Consultants involved in developing ***IPCs***. Updates and revisions to this document will be made as processes evolve to reflect new standards and practices.

1.4. Distribution

This **Handbook** is available on the Forecasting and Project Cost Office's website:

https://www.fdot.gov/fpo/fpc/publications/handbooks

1.5. Glossary of Terms and Abbreviations

1.5.1. **Activities:** Specific tasks or actions analyzed individually to determine respective labor, equipment, and material costs. These tasks form the fundamental components needed to compose a ***pay item***, and their costs are aggregated to establish the overall cost of the ***pay item***.

1.5.2. **Allowance:** A value established for an item of work/category or traditional percentage-based item where detailed quantities are not available at the time or will never be developed for estimating purposes. Prices for ***allowances*** may be developed in several ways, the most common being percentage, unit price, or lump sum amount. Examples of percentage-based ***allowances*** include Maintenance of Traffic, Mobilization, ***Project Unknowns***, and Design-Build; examples of Work/Categories that may be assigned ***allowances*** in the initial or scoping phase are ITS, Drainage, Signalization, Unique Structures, and other such items.

1.5.3. **Basis of IPC:** An organized set of data and narrative explaining the logic, methodology, calculations, and assumptions used to define the tasks and determine the ***resources*** needed to construct the scope of work. The ***Basis of IPC*** is documented in the **IPC Summary Memo**.

1.5.4. **Bid-Based Estimating:** A ***parametric estimating*** approach using historical unit costs and quantities from relevant, recently awarded contracts to determine the unit cost for a ***pay item***.

1.5.5. **Bottom-Up Estimating:** A detailed method of cost-based estimating that calculates the cost of a ***pay item*** by breaking it into specific ***activities***. For each ***activity***, quantities for scope constructed, labor hours, equipment hours, and material quantities are developed, with equipment hours factoring in task durations and associated rental or usage periods. This process utilizes production rates to

determine quantity and duration of ***resources*** required. The total ***pay item*** cost is derived by summing the cost of all ***activities***.

1.5.6. **Consultant PM**: The individual responsible for signing and sealing documents prepared by the design team during the design phase and used by construction personnel to build a project.

1.5.7. **Contractor-Owned Risk:** Identifiable conditions or events that may occur but are unplanned, beyond the control of the contractor, and not a compensable change per Department specifications.

1.5.8. **Computer-Aided Design (CAD):** A digital process for creating 2D or 3D design simulations of real-world goods and products, complete with scale, precision, and physical properties, to optimize and perfect designs before construction.

1.5.9. **Cost Breakdown Structure (CBS):** The organizational framework of cost components that may follow Prequalification Work Classes, ***Long Range Estimating (LRE)*** components, or AASHTOWare Project categories as provided by the Department to the ***IPC Team***.

1.5.10. **Cost Driver:** A line item in the ***cost breakdown structure*** that contributes to the grouping of items evaluated in a bottom-up capacity, as guided by the ***Pareto Principle.***

1.5.11. **Department:** When utilized as an entity or agency, it is considered to represent Florida Department of Transportation Central Office personnel.

1.5.12. **Department-Owned Risk:** Identifiable conditions or events that are unplanned, beyond the contractor's control, and deemed compensable by the Department through the change management process. These may include, but are not limited to, plan errors, unforeseen conditions, or situations explicitly addressed in Department specifications or contract documents.

1.5.13. **Design Confidence:** The degree of certainty that a design will meet its performance requirements and function as intended under specified conditions. This involves evaluating the thoroughness of the design process, the accuracy of models, and the reliability of the materials and methods used to produce the design documents and quantities. The ***District Project Cost*** is based on the ***Engineer's Project Cost***, and will be relied upon, by the ***IPC Team***. ***Design Confidence*** is documented in the **Design Confidence Report**, prepared by the ***Consultant PM*** as required by the ***Engineer's Project Cost Handbook***.

1.5.14. **Design Quantities and Estimates (DQE) Application:** A web-based application used during design phases to produce detailed construction cost estimates for roadway and bridge projects. Designers input ***pay items*** and quantities via the Designer Interface, while the District Estimator has access to apply unit prices to generate a ***District Project Cost***.

1.5.15. **District Project Cost:** An assessment of the present-day construction cost of a project, prepared by the District Estimator and provided to the ***IPC Team*** for these processes.

1.5.16. **Direct Cost:** Expenses directly tied to a construction project, such as labor, equipment, temporary and permanent materials, permits, and fees.

1.5.17. **Engineer's Project Cost:** An assessment of the reasonable ***fair market value*** of a construction project, usually produced by the ***Consultant PM*** responsible for the contract plans.

1.5.18. **Fair Market Value:** A value that reflects a balanced determination of project worth, reflective of prevailing market conditions. It is generally represented by the average of the top three ranked bids (1st, 2nd, and 3rd) rather than the low bid alone. This approach, for both evaluating the accuracy of IPCs and for selection of component costs and prices comprising an IPC, ensures that pricing avoids overly aggressive and overly conservative assessments.

1.5.19. **Fixed Cost Pay Item:** A ***pay item*** with a unit cost set by the Department at the project level. The ***pay item*** appears in the proposal and bid documents with a set unit cost. ***Fixed cost pay items*** contain the words "Do Not Bid" in the ***pay item*** description.

1.5.20. **Independent Project Cost (IPC):** An assessment of the present-day, ***fair market value*** for the construction cost of a project, determined and prepared by professional cost estimators not engaged in the design or construction of the project, developed in accordance with this **Handbook**. Escalation is not used in this cost assessment.

1.5.21. **Indirect Cost:** Expenses required for the overall operation of a construction project, such as project management, supervision and administrative salaries, field office, office supplies, yard/staging area(s), utilities, field office rent, bonds, and project-specific insurance.

1.5.22. **IPC Team:** A team of professionals, including consultants or Department staff responsible for developing an ***IPC***. The ***IPC Team*** must meet Department-established minimum qualifications and remain independent from the project.

1.5.23. **Level 3 Schedule:** A schedule that outlines the entire project at one detail level just above the operational detail or ***activity*** level. This schedule provides sufficient detail for clients to review and understand primary components, milestones, and the overall magnitude of the project without including granular ***activity*** details.

1.5.24. **Level 4 Schedule:** A detailed schedule that breaks down the project into individual operational ***activities***, offering one or more levels of detail beyond the ***Level 3 schedule***. This schedule provides a comprehensive breakdown of project level ***activities*** and serves as an effective project management tool.

1.5.25. **Long Range Estimating (LRE) Application:** A web-based application used by Department estimators and Design Consultants to develop potential quantities and provide approximate ***pay item*** unit costs. This application is typically used during early project development and design.

1.5.26. **Major Project**: A project with a present-day, construction value projected to be $100 million or larger but less than $500 million.

1.5.27. **Mega Project**: A project with present-day, construction value projected to be $500 million or larger.

1.5.28. **Overhead:** Also known as General and Administrative (G&A), are the auditable costs associated with the general management and support of a construction company's operations, which are not directly attributable to a specific project. These costs can include off-site personnel salaries, non-project travel expenses, fringe, rent, utilities, insurance maintained by the Contractor as a general cost of doing business, and other administrative expenses.

1.5.29. **Parametric Estimating:** A statistical approach to estimating that uses historical cost data to calculate the expected cost of a particular scope of work or ***activity***.

1.5.30. **Pareto Principle:** A concept developed by Vilfredo Pareto, also known as the 80-20 rule, stating that approximately 80 percent of outcomes are driven by 20 percent of causes. This principle highlights that the relationship between inputs and outputs is

often imbalanced. In cost estimation, this principle is applied to identify approximately 20 percent of ***pay items*** that account for approximately 80 percent of the total project cost.

1.5.31. **Pay Item:** A number representing work in accordance with the **FDOT Standard Specifications for Road and Bridge Construction** or **Contract Documentation**.

1.5.32. **Plans, Specifications, and Estimate (PS&E):** The contract plans, specifications, and project cost package submittal prepared by the ***Consultant PM*** to inform the Department for project authorization, advertisement, and letting.

1.5.33. **Project Unknowns:** The cost component of a project utilized for risk events and project features that lack a discernible quantity or value due to variability, incomplete conditions, or unforeseen factors and would potentially increase project scope, add ***pay items***, and/or increase quantities.

1.5.34. **Resources:** Inputs required for an ***activity*** when developing a ***bottom-up estimate***. These inputs include labor, equipment, and both temporary and permanent materials.

1.5.35. **Work Breakdown Structure (WBS):** The organizational framework of scheduled tasks necessary to complete the construction of the project.

1.6. Comments or Suggestions for Handbook Revisions

Comments or suggestions on the **Handbook** should be sent to the Forecasting and Project Cost Office at CO-ForecastingandProjectCost@dot.state.fl.us.

1.7. Training

Training for this **Handbook** is not required; however, users are expected to be familiar with its content and apply the guidance for project cost development.

1.8. Templates

The following templates from Central Office are available for the ***IPC Team***'s use:

A. **Detailed IPC** (XLSX file)
B. **IPC Summary Memo** (DOCX file)
C. **IPC Risk Register** (XLSX file)

1.9. Attachments

A. **IPC Process Flowchart**

2. PROCESS AND RESPONSIBILITIES

2.1. Purpose

In support of the Department's mission, the primary goal of the ***IPC*** is to accurately and comprehensively assess present-day, ***fair market value*** of construction costs for planning and budgeting purposes. An independent team, meeting construction and project cost development experience requirements, achieves this goal.

2.2. Districts

2.2.1. Estimators within the District offices develop the ***District Project Cost*** in cooperation with District Project Managers and in accordance with the **Estimates Handbook**. District Estimators or Project Managers are responsible for gathering the information listed in Section 3.2.1 and providing this information to Central Office.

2.2.2. District staff will attend meetings associated with ***IPC*** reviews outlined in this **Handbook**. District staff involved in this process may include, but not be limited to, the District Estimator, District Project Manager, and District Subject Matter Experts (SMEs) with insight into project characteristics that may drive the project cost.

2.3. Central Office

2.3.1. Central Office articulates, codifies, and documents processes while directing the development of ***IPCs.***

2.3.2. All projects and project milestones over $100 million require IPC development as determined by Central Office.

2.3.3. Central Office will assign ***IPCs*** and contracts with an ***IPC Team***.

2.3.4. Central Office serves as the sole point of contact for work performance and facilitates all necessary communication between the District and the ***IPC Team***. This includes requesting and providing information listed in Section 3.2.1, arranging meetings between the ***IPC Team*** and the District, and receiving and distributing ***IPC*** updates and deliverables.

2.4. Consultants

2.4.1. **Consultants serving as augmented staff**

Consultants assisting as augmented staff support both Districts and Central Office. These consultants typically have access similar to Department personnel and fulfill responsibilities outlined in Sections 2.1, 2.2, and 2.3, as applicable.

2.4.2. **Design Consultants**

Design Consultants, commonly referred to as consultants, designers, or engineers of record (EOR)**,** may access Department systems and perform functions assigned by the District. These consultants support the District by supplying information listed in Section 3.2.1 and any additional information requested by Central Office to support ***IPC*** development.

2.4.3. **IPC Consultants**

Consultants assisting Central Office with ***IPC*** development engage directly with Central Office and execute the processes outlined in this **Handbook.**

3. DEVELOPMENT OF THE IPC

3.1. Purpose

IPCs are a critical validation of other cost development efforts and aid in budgeting for the Department's Work Program. *IPCs* are developed at each design phase occurring independently from influences such as the District, design consultants, or available funding. The objective is to determine a present-day, ***fair market value*** for the construction cost of a project, using an approach tailored to the level of design development, information available to the ***IPC Team***, and time and budget constraints for the preparation of the ***IPC***. The processes contained herein should be considered as minimum requirements for the ***IPC*** development and may require adaptation of these standards to each project situation.

3.1.1. **Core Fundamentals**

Fundamental FDOT documents and processes must be followed to have the foundational knowledge to prepare an accurate ***IPC*** for FDOT. The ***IPC Team*** must understand FDOT's ***pay item*** structure, standard specifications (including method of

measurement and basis of payment), and standard plans details prior to starting the ***IPC*** process.

3.2. IPC Process

The ***IPC*** Process, as described in this **Handbook**, is depicted in the flowchart provided in Attachment A. The following section outlines the work to be performed by the ***IPC Team***, as specifically depicted in Attachment A.

3.2.1. Document Review and Analysis

The ***IPC Team*** must study the documents provided by the Department to understand the project scope and identify major ***cost drivers*** and potential risks. The ***IPC Team*** will rely on the information provided by the Department as-is. The ***IPC Team*** should expect to receive the following documents prepared by the ***Consultant PM*** or District.

- ***District Project Cost***
- **Project Document Memorandum**
- **Project Document Checklist** & associated project documents
- **Design Confidence Report**
- **Engineer's Risk Assessment**

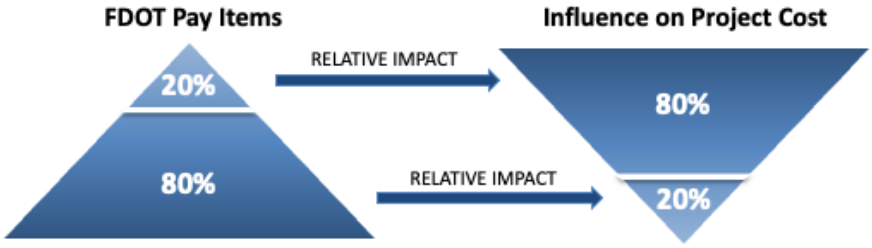
Projects in the early phases of design development will have less project scope depicted on plans and drawings. Early phase ***IPCs***, therefore, may necessitate a meeting prior to the District Meeting described below to understand, collaborate, and make informed assumptions about project scope and details.

3.2.2. Pareto Analysis - Selection of Items for Bottom-Up Estimating

The ***IPC Team*** will apply the ***Pareto Principle*** (see Figure 1) to the ***District Project Cost*** to identify approximately 20 percent of the ***pay items*** that make up approximately 80 percent of the cost. The goal is to select those ***pay items*** with the greatest influence on project cost, which have higher construction variability and are critical and/or schedule-controlling items that a general contractor would typically self-perform. These items will be evaluated using the bottom-up approach. For the purposes of generating an ***IPC***, the ***IPC Team*** should consider the following in deciding which items to select for ***bottom-up estimating***:

- Fixed Cost Items, as discussed above, are generally excluded from adjustment by the ***IPC Team***. In cases where the ***IPC Team*** finds reason for adjustment, the basis for adjustment should be noted in the **IPC Summary Memo**.
- Items that typically see very low variability in unit price should not be included unless, in the professional opinion of the ***IPC Team***, there are circumstances specific to the Project such that choosing these items for ***bottom-up estimating*** would benefit the Project.
- Selecting groups of similar items which, when considered together rather than just selecting a single ***pay item*** in the group, would provide added benefit to the ***IPC*** process.
    - For example, a bridge project may include multiple beam or pile sizes, but only certain related ***pay items*** may meet the 80–20 threshold based on quantity or cost impact. If the ***IPC Team*** determines that greater value would be achieved by preparing a ***bottom-up estimate*** for the entire group, rather than evaluating only the item that meets the 80–20 threshold, the full group of related items may be selected.

While the ***Pareto Principle*** generally suggests that 80 percent of the costs would be represented by 20 percent of the ***pay items***, it is important to understand that this is not a fixed result and should be used as a starting point. A quality Pareto Analysis requires the ***IPC Team*** to apply professional judgement to include or exclude items in a manner that maximizes the value to the Project.



3.2.3. **District Meeting**

The ***IPC Team*** shall hold a kickoff meeting with the Department after reviewing project documents, selecting 80-20 ***pay items***, and identifying ***cost drivers***.

A. Attendees: IPC Project Manager, IPC Chief Estimator, IPC Lead Discipline Estimators, FDOT Project Manager, FDOT District Estimator, FDOT District Subject Matter Experts (SMEs), FDOT/Consultant Design Project Manager, FDOT/Consultant Design Discipline Leads, FDOT Forecasting & Project Cost Engineer and select staff, District / State Structures Design Office.

B. Agenda topics:

- FDOT/Consultant will present project scope and project geographic limits.
- FDOT/Consultant will convey a level of ***design confidence*** and completion on the **Design Confidence Report**, specifically highlighting areas where design is not well developed or is highly subject to change. They will also provide an overview of the basis for quantity development.
- FDOT District Estimator will present the basis for ***District Project Cost***, specifically the source of unit price selection.
- ***IPC CBS*** review: ***IPC*** will default to the ***District Project Cost CBS*** unless otherwise agreed to by the ***IPC Teams*** and District Estimator.
- ***IPC Team*** should restate their understanding of the project scope, project geographic limits, existing conditions, and specific requirements.
- ***IPC Team*** will present the percentage of items selected for ***bottom-up estimating*** and percentage of the ***District Project Cost*** those items comprise.
- ***IPC Team*** will present and get concurrence with the project documents to rely upon for pricing each work discipline.
- ***IPC Team*** will provide a list of additional documentation or questions needed to develop the ***IPC***, either during or shortly following the meeting, as needed.

3.2.4. **Quantity Take-offs**

The ***IPC Team*** will perform quantity take-offs focused on quantities for the 80-20 ***pay items*** identified through ***Pareto*** analysis.

A. Only those ***pay item*** quantities taken off by the ***IPC Team*** shall be reported in the ***IPC*** and quantity delta columns on the **Detailed IPC**.

B. The ***IPC Team*** shall prepare a quantity comparison summary table that reports quantity discrepancies that have a meaningful impact on the ***IPC***.

C. The ***IPC Team*** must also take-off activity-based quantities related to these ***pay-items*** to be used for ***bottom-up estimating***.

3.2.5. **Quantity Reconciliation Meeting**

If the ***IPC Team*** finds quantity discrepancies in performance of take-offs per Section 3.2.4 that will generate meaningful differences in the IPC as compared to the Department, the ***IPC Team*** will request a quantity reconciliation meeting with the District and designer to discuss meaningful variances in quantity take-offs. The goals for this meeting are to confirm the construction scope is properly understood by the ***IPC Team*** and captured in the ***pay items*** and quantities. Discussions will focus on take-off approaches, documents used, and assumptions made in the interest of utilizing ***pay items*** and quantities that are most reflective of the project scope.

A. Attendees: IPC Project Manager, IPC Chief Estimator, IPC Lead Discipline Estimators, FDOT Project Manager, FDOT District Estimator, FDOT/Consultant Design Project Manager, FDOT/Consultant Design Discipline Leads, FDOT Forecasting & Project Cost Engineer and select staff, District / State Structures Design Office.

B. Agenda topics:

- The ***IPC Team*** will present a summary of quantity take-offs and consequential variances determined by the Department. When determining which variances are consequential, consideration should be given to those variances that could indicate the project scope is not clearly understood or fully captured. Additionally, variances with a meaningful impact on the ***IPC***, beyond what the ***project unknowns*** percentage accounts for at the given stage of design development, should be addressed.
- The FDOT/Consultant Design Team must be prepared to discuss the basis of its quantities for any variances observed.
- The ***IPC Team*** and FDOT/Consultant Design Teams should use this meeting to resolve quantity discrepancies. If additional investigations or follow-up meetings are necessary to reach an agreement on quantities, they should be held and conducted within one week of the initial Quantity Reconciliation Meeting.

3.2.6. **Vendor Pricing**

To obtain the most accurate project pricing, the ***IPC Team*** should use current local market vendor pricing, specifically for ***bottom-up estimating***. Priority should be given to materials with both high dollar value and price volatility, such as structural steel, precast elements, temporary structures, concrete, reinforcing steel, asphalt, aggregates, HDPE pipe, and hauling. When requesting vendor pricing, the ***IPC Team*** must avoid disclosing project-specific information that could jeopardize public competitive bidding. Pricing requests must be generalized to include only the project's scope, quantity, and general geographic location. No project-specific information, including plans, drawings, reports, or other documentation may be shared with vendors.

3.2.7. Bottom-Up Estimating

To perform accurate ***bottom-up estimating***, the ***IPC Team*** must understand the project scope, as well as the ***activities*** and ***resources*** required to complete the project. This includes understanding required construction sequencing, haul routes, accessibility, work hours, production rates, crew sizes, equipment requirements, permit restrictions, existing conditions, and any other factors influencing the cost of performing the work. When preparing ***bottom-up estimates***, the ***IPC Team*** must:

A. Determine the ***activities*** required for each individual ***pay item*.**

B. Determine quantities for each ***activity*.**

C. Determine ***resources*** and costs needed for each ***activity***. ***Resource*** considerations must include the following:

I. Labor

a) Determine crew composition and size required to perform each ***activity*** within the allowable time frame.

b) Determine and apply wage rates for each crew or crew member. Davis-Bacon wage rates may be used; however, the ***IPC Team*** will verify that Davis-Bacon accurately represents local labor wage rates.

c) Labor burden, work schedules, and overtime rules must be considered in the total cost of labor.

II. Equipment

a) Determine the equipment type, size, quantity, and duration required to complete each specific ***activity***.

b) Determine and apply equipment rates. Blue Book rates may be used; however, they must be verified to ensure they accurately reflect local equipment rates.

III. Materials

a) Determine both temporary and permanent materials needed for each ***activity*** (e.g., formwork, shoring, trestle, and falsework).

b) Waste must be accounted for. Applying a wasting percentage factor is acceptable, as waste factors vary depending on material type and use. When determining the waste percentage, considerations should include the ability to control waste through construction means and the selection of optimal material lengths and sizes when procuring materials.

c) Small tools and supplies must be accounted for. This category includes costs associated with hand tools, small power tools, personal protective equipment, and other consumables required to support day-to-day construction operations. The application of a unit cost per direct construction labor hour associated with construction labor is accepted practice.

d) Material costs should reflect current pricing at the time of the ***IPC***. See Section 3.2.6 for instructions on sourcing vendor pricing if the ***IPC Team*** does not have recent, relevant pricing.

D. Sum the cost of ***resources*** to perform each ***activity***.

E. Sum the cost of ***activities*** to calculate the total cost for each ***pay item***.

F. Apply a markup to the sum of ***direct costs*** to account for ***indirect costs, overhead***, and profit, yielding the final price for each ***pay item***. To provide consistency between ***IPCs***, the standard markup shall be 22 percent. If the ***IPC Team*** determines that this standard markup does not accurately reflect the ***fair market value*** of the project, an alternative markup should be discussed with FDOT prior to completing the ***IPC***.

3.2.8. **Parametric Estimating for Unit Pricing**

To perform accurate ***parametric estimating***, the ***IPC Team*** must understand how construction sequencing, haul routes, accessibility, work hours, production rates, crew sizes, equipment requirements, permit restrictions, existing conditions, and other factors could influence the project cost. When preparing ***parametric estimates***, the ***IPC Team*** must:

A. Determine criteria for selecting historical unit price references that best represent the ***fair market value*** for each ***pay item*** in the project. Historical bid averages may be sourced from multiple datasets but must include applicable FDOT Market Area and Statewide data for projects of similar scope and size. Ideally, the ***IPC Team*** should review historical data within six and 12-month time frames to limit the influence of escalation on price history. However, if historical bid data is not available within the prior 12-month time frame, data may be obtained from older sources. Such pricing data shall be escalated to present-day cost. Adjustments to historical data are intended to normalize costs to present-day conditions and are not considered escalation for forecasting purposes.

B. Evaluate historical unit prices. Historical unit price data for each ***pay item*** should be analyzed to remove cost outliers. The relevance of historical prices is determined by the ***pay item*** quantity, geographic proximity, recency, and other comparisons between the project being assessed and the reference projects from which the historical pricing is sourced.

C. Select an appropriate unit price for each ***pay item***. The ***IPC Team*** must consider how similar the historical pricing data is to the project being assessed and determine whether to use the average historical price for the project or adjust from the average based on the relevance of the historical price data.

D. Avoid applying additional markups. Historical unit prices are fully inclusive of all markups. No additional markup should be applied, as is done for items developed through the bottom-up approach.

3.2.9. **Fixed Cost Pay Items**

The ***IPC Team*** will carry the District's cost for any "Do Not Bid" ***pay items***.

3.2.10. **Determination of Allowances**

The Department customarily carries ***allowances*** for Maintenance of Traffic, Mobilization, ***project unknowns***, and Design-Build Design Costs, which are derived by applying a percentage to the subtotal of ***pay items***. The determination of ***project***

unknowns is addressed in Section 3.4. In some cases, a work category (e.g., drainage, ITS, signalization, etc.) in the ***District Project Cost*** may be accounted for with an ***allowance***.

These categories may not be sufficiently detailed in the design for the ***IPC Team*** to develop quantities, so the ***IPC Team*** may also need to use an ***allowance***. When applying percentages to a construction cost subtotal to establish an ***allowance***, the order of operations and the items included in the subtotal are important. The general steps are as follows:

A. Sum all applicable previous ***pay items*** to determine the construction price subtotal that will be used.

B. Determine an appropriate percentage to apply for the ***allowance***. These percentages are often based on the ***IPC Team's*** experience and professional judgment.

C. When using this method to establish the price for Mobilization, the calculation should be based on the construction price subtotal for all other items on the project, excluding risk-related costs such as ***project unknowns*** and Contingency.

3.2.11. **Determine Total IPC**

The total ***IPC*** amount shall be the sum of the prices for each ***pay item***, including bottom-up ***pay items***, parametric-based unit price ***pay items***, ***fixed price pay items***, and ***allowances.***

3.2.12. **IPC QA/QC Process**

As part of its QA/QC process, the ***IPC Team*** should prepare the deliverables listed in Section 3.2.13. Qualified individuals or quality control personnel within the ***IPC Team*** must internally review these documents. The review should verify that proper processes were followed, the deliverables are complete and clearly understandable, and the final costs are reasonable for the project, scope, size, location, complexity, and other cost considerations discussed below. Referencing the ***IPC*** Task Work Order, one quality control (QC) plan per ***IPC*** contract shall be submitted for Department review.

A. Geographic

The location of a project significantly impacts the cost of completing the work. Unit costs should reflect local market conditions while also accounting for project-specific characteristics, such as whether the project is in an urban, suburban, or rural area. These geographic considerations also influence other factors discussed below.

B. Restrictive Work Hours or Constructability

The ***IPC Team*** should be informed of any contractual work-hour restrictions. Schedule or constructability factors may also require special work hours, which must be included in the ***IPC***. Restricting ***activities*** to specific times of the day or requiring operations outside of normal operating hours will impact productivity and should be considered in the cost.

C. Quantity

The quantity of a given material or ***activity*** on a project impacts the cost of supplying the material and/or constructing that item (e.g., economy of scale).

Material quantities influence options for sourcing, delivery, and handling, all of which affect costs. Similarly, the volume of work (e.g., placement of precast wall elements) and opportunities for streamlining will influence productivity and operational efficiency.

D. Project Phasing, Construction Sequencing, and Scheduling

The ***IPC Team*** should be aware of any commitments or contractual requirements that require the project to be delivered in specific phases or whether strict schedule requirements exist. Similarly, the ***IPC Team*** should review project-specific characteristics and requirements that may necessitate less-than-optimal construction sequencing to meet unique schedule constraints.

E. Material Availability/Lead Times

Material availability and lead times are influenced by factors such as the project's location or the quantity of material needed. Material shortages, long lead-time items, and supplier pricing strategies can also introduce risks. These risks may vary depending on the project's delivery method. The ***IPC Team*** should provide unit costs that account for these factors as they would apply to the specific project.

F. Site Conditions and Constraints

Complicated site conditions and constraints can increase construction costs and must be reflected in the ***IPC***. Examples include poor soil conditions; piles placed under water; work near active railroads, wetlands, or waterways; and/or nearby historical buildings (potentially fragile); construction on or near parks; culturally significant or environmentally hazardous sites; and areas with limited space for construction. The ***IPC Team*** may need to consult data from nearby projects, planning studies, environmental documents and permits, or the Project Commitment Record (PCR) to fully understand site-specific constraints or impacts.

G. Contractor, Subcontractor, and Craft Labor Availability

The ***IPC Team*** may need to consider the availability of pre-qualified contractors in the area. The work class breakdown for the contract may also be a factor. When the construction market is at or near capacity or when qualified contractors are unavailable, costs may increase due to reduced competition and higher contractor risk. Skilled and unskilled labor and subcontractor availability are other considerations.

H. Specialty Work

Specialty items are unique and have a limited pool of qualified contractors capable of executing the scope. These items may require specialized construction methods with greater variability in scheduling and pricing, which increases risk. Examples of specialty work include directional drilling, transportation handling and setting of oversized loads, and certain accelerated bridge construction methods.

I. Construction Delivery Method

The construction delivery method must be considered when evaluating the costs associated with the contractor's general conditions. The complexity of the delivery method directly impacts contractor responsibilities, which in turn affect

the overall staffing plan, ***project unknowns***, risk, and markup applied to the project.

3.2.13. **Deliverables**

The following deliverables shall be prepared and submitted to the Department upon completion of ***IPC*** development:

A. IPC Summary Memo

The **IPC Summary Memo** provides a summarized version of the ***IPC***, including narrative sections that describe the approach used, relevant assumptions, clarifications, exceptions, and exclusions. Additional summaries unique to each ***IPC*** and requested by the Department should also be included. The **IPC Summary Memo** template is provided to ***IPC Teams*** as a guide for presenting this information to the Department.

B. Detailed Independent Project Cost

The **Detailed Independent Project Cost** will be delivered as a spreadsheet, formatted to comply with the **Detailed IPC** Template provided to ***IPC Teams***. The line items shown, and their organization should match the ***District Project Cost***.

C. IPC Risk Register – Refer to Section 3.4 for risk assessment deliverables.

D. Schedule – Refer to Section 4 for schedule-related deliverables.

Upon receipt of the ***IPC*** deliverables, the Forecasting and Project Cost Office will distribute ***IPC*** deliverables to executive management, CO and District leadership, CO and District Work Program staff, District Estimates, Project Manager, and project staff as appropriate.

3.2.14. **IPC Central Office Review Meeting**

After reviewing the ***IPC Team's*** deliverables, the Department may schedule a review meeting. The ***IPC Team*** is not required to prepare a formal presentation for this meeting but will review the **IPC Summary Memo** and other deliverables with the Department and address any questions.

A. Attendees: IPC Project Manager, IPC Chief Estimator, FDOT Project Manager, FDOT Forecasting & Project Cost Engineer and select staff, District/State Structures Design Office.

B. Agenda topics:

- ***IPC Team*** will present a summary of the design documents relied upon, the basis of quantity take-offs, and the results of quantity reconciliation efforts.
- ***IPC Team*** will present a summary of critical construction means and methods assumed during ***IPC*** development.
- ***IPC Team*** will present a summary of the items selected for bottom-up cost development and their contribution to the ***IPC*** percentage.
- ***IPC Team*** will present the basis for the percentages applied as ***allowances***, such as those for Maintenance of Traffic or Mobilization.
- ***IPC Team*** will present a summary of the risk register or observed high-risk items that influenced prices and/or ***project unknowns***.
- ***IPC Team*** will answer any questions from the Department regarding the ***IPC***.

3.2.15. IPC District Review Meeting

The Department will schedule a review meeting with the District at a time of its choosing. The purpose of this meeting is to report similar information to the District as was presented by the ***IPC Team*** during the Central Office Review Meeting. This meeting will review the approach, assumptions, and construction methods used for cost development. The ***IPC Team*** may not be required to attend this meeting. However, if invited, they must be prepared to present the same information presented in the Central Office Review Meeting.

If any part of the ***IPC*** is found to be based on invalid data or assumptions, FDOT Central Office will instruct the ***IPC Team*** to update the ***IPC*** accordingly.

A. Attendees: IPC Project Manager, IPC Chief Estimator, IPC Lead Discipline Estimators, FDOT Project Manager, FDOT District Estimator, FDOT District Subject Matter Experts (SMEs), FDOT Forecasting & Project Cost Engineer and select staff, District/State Structures Design Office.

B. Agenda Topics:

- Summary of the design documents relied upon, the basis of quantity take-offs, and the results of quantity reconciliation efforts.
- Summary of critical construction means and methods assumed for ***IPC*** development.
- Summary of the items selected for ***bottom-up estimating*** and the percentage of the ***IPC*** they comprise.
- Basis of the percentages applied to ***allowances*** such as Maintenance of Traffic or Mobilization.
- Summary of the risk register or observed high-risk items that influenced prices and/or ***project unknowns***.
- If invited, the ***IPC Team*** will answer any questions from the Department regarding the ***IPC***.

3.2.16. Project Review Board Meeting

After the Central Office has reviewed the deliverables with the District, the District will develop a plan to reconcile the Department's estimate with the ***IPC*** and adjust the budget and programming accordingly. The Project Review Board meeting will be used to review the District plans for approval to move forward with project development. The ***IPC Team*** may be invited to participate in this meeting to review the **IPC Summary Memo** with the Department and answer any questions.

A. Attendees:

- ***Major Projects***: Chief Engineer of Operations, Chief Engineer of Production, Director of the Office of Work Program and Budget, and District Secretary from Project District and a District Secretary from another district.
- ***Mega Projects***: Assistant Secretary of Engineering and Operations, Assistant Secretary of Finance and Administration, and District Secretary from the Project District and a District Secretary from another district. (Note: The District Secretary members may rotate from project to project.)

B. Agenda topics:

- Summary of the design documents relied upon, the basis of quantity take-offs, and the results of quantity reconciliation efforts.

- Summary of critical construction means and methods assumed for ***IPC*** development.
- Summary of the items selected for ***bottom-up estimating*** and the percentage of the ***IPC*** they comprise.
- Basis of the percentages applied to ***allowances*** such as Maintenance of Traffic or Mobilization.
- Summary of the risk register or observed high-risk items that influenced prices and/or ***project unknowns***.
- If invited, the ***IPC Team*** will answer any questions from the Department about the ***IPC***.

3.3. Project Milestones for IPC Development

The process described in Section 3.2 for developing an ***IPC*** is applicable and shall be followed regardless of the level of design development. The project milestones outlined below represent increasing levels of design development as a project transitions from early planning phases to final construction documents. The objective of identifying 80 percent of the project cost and performing a ***bottom-up estimate*** remains consistent across all stages. To achieve this objective, design details and resulting quantities must initially be approximated through collaboration among the ***IPC Team***, the Department, and the PD&E or Design Consultant in the early phases of design development, with those approximations being replaced with definitive design details and quantities in subsequent ***IPCs***. Approximating quantities introduces uncertainty and risk, which are addressed in Section 3.4 and should be documented in the **IPC Risk Register** and accounted for in ***project unknowns*** at each milestone.

As the design progresses from scoping level to 100% completion, the project cost and quantity take-offs gain confidence and reliability due to the increased level of detail in the plans. This progression allows for greater granularity in quantity breakdowns and better alignment with project design elements.
The approach taken by the ***IPC Team*** evolves as well. At the scoping level, the process is more conceptual, focusing on establishing a fundamental understanding of the project scope and ***cost drivers***. Assumptions and ***project unknowns*** play a significant role in offsetting the cost impacts associated with limited design information.

As design development advances, the ***IPC Team's*** methodology shifts to a more detailed, data-driven approach. This evolves into a highly definitive process incorporating nearly all the design elements. The progression from conceptual to definitive quantities results in the cost impact of assumptions and ***project unknowns*** contributing less to the overall project cost. This is accomplished by a portion of the ***project unknowns*** transferring to defined and quantified project cost, assumptions gaining definition allowing assumed quantities or scope to be verified and formalized as defined ***pay items***. Throughout this iterative process, costs move from project risk and unknowns to base project cost and get retired from the risk register resulting in increased cost confidence. This process is reflected by costs being transferred from the **IPC Risk Register** to the **Detailed IPC** as design stage progresses.

The following sections describe the anticipated level of design development for each project milestone and provides corresponding guidelines for developing each ***IPC***.

3.3.1. Initial IPC (Initial Phase 52 Programming)

A District's first project cost is developed as the Initial Project Cost to substantiate the initial Phase 52 programming of project funds. ***IPC Teams*** will be engaged to develop an ***IPC*** for the Initial Project Cost. This phase of ***IPC*** is prepared with minimal project investigations or scope definition established because the PD&E phase will not be complete. The ***IPC Team*** will be provided with an ***LRE*** and an accompanying project scope exhibit or early planning documents. The ***IPC Team*** shall use the information made available to them and gain a more detailed understanding of the project scope and appropriate assumptions necessary to complete the ***IPC*** during the District meeting, and additional meetings thereafter as necessary. While the project scoping documents may be insufficient for a traditional quantity take-off, it is still expected that the ***IPC Team*** will review and develop approximate takeoff quantities of major ***cost drivers*** based on the project definition and scope provided. ***IPC Teams*** shall follow the general principles of this **Handbook**, document the necessary assumptions made, and make a thorough evaluation of project unknowns when developing the ***Initial IPC***. ***IPC Teams*** shall also evaluate the District's Initial Project Cost for missing information or costs and add ***allowances*** for such pay items or work classifications.

3.3.2. Scope IPC (PD&E)

A Scope ***IPC*** is prepared when a project has undergone minimal project investigations or scope definition during the PD&E phase, following selection of the preferred alternative but prior to Location & Design Concept Acceptance (LDCA). Typically, during this stage studies will have been performed in accordance with **FDOT PD&E Manual** Part 2 Chapter 3 Engineering Analysis, resulting in a preferred horizontal alignment. The development of a vertical alignment may be limited or nonexistent, and no structural design has been completed at this stage. ***IPC Teams*** should therefore expect to receive documents such as the Project Engineering Report, the Pond Siting Report, and Bridge Development Report to serve as the basis of the IPC effort. Where IPCs are required for a project, the initial IPC should be performed prior to entering the construction phase into the Work Program to confirm the required programmed amount.

For bridge development, the preferred alternative should include enough detail (e.g., high-level fixed bridge) before proceeding with an ***IPC***, as changes in bridge type, span length, substructure, foundations, and other factors will have a significant effect on the ***IPC*** outcome. Also, because vertical profile information is limited or nonexistent, the ***IPC Team*** must be prepared to make significant assumptions regarding profile and resulting earthwork excavation/embankment quantities. Furthermore, in many complex projects, the master signing plan will not yet be completed, so the ***IPC*** will need to assume locations for placement of signage and other traffic control devices, including overhead and cantilever trusses, signal mast arms, and other miscellaneous structure types (e.g., monotube vs. conventional tri-chord structures). Other key considerations in complex projects include:

- Noise wall location/type
- Drainage conveyance open vs. closed/piped drainage
- Pond locations/size/depth
- Utility relocation and its effect on project schedule
- MOT development

- Temporary critical walls to support construction
- Foundation type/size/depth
- Contamination remediation
- Project commitments (e.g., constructing a wall first to reduce construction noise exposure to the public)

Once the ***IPC Team*** develops these assumptions, the 80-20 ***cost drivers*** for the project can be determined. As the level of detail advances in these key considerations, the ***IPC*** should move into either ***parametric*** or ***bottom-up cost*** analysis as appropriate, and in accordance with Section 3.2.

In this phase, the ***IPC Team*** should schedule a meeting with the Department, as described in Section 3.2.1, prior to the District Meeting to define major scope elements, such as earthwork, roadway, drainage, structures, signalization, lighting, complex signing and pavement markings, and/or Intelligent Transportation Systems (ITS), and to identify ***pay items*** for ***cost drivers***. Once major elements of work are identified, quantify those elements and apply the ***bottom-up cost estimating*** method to determine project cost. While the full scope of the project is not defined, it is nevertheless possible to complete the ***IPC*** with known unknowns, such as drainage, lighting, pavement marking, signing, ITS, and signalization. The information the ***IPC Team*** expects to receive at this stage can be found in the **FDOT Design Manual (FDM) 901 Sequence of Plans Preparation**.

3.3.3. Phase I IPC

A Phase I ***IPC*** is typically prepared when roadway design is approximately 30% complete and a Bridge Development Report (BDR) has been completed for the structures. Similar to the Scope ***IPC***, the ***IPC Team*** should develop quantities based on these documents while continuing to account for known unknowns. At this phase, available roadway design information should allow the ***IPC Team*** to perform take-offs for the ***cost drivers.*** However, because the BDR typically lacks structural details and foundations have not yet been designed, the ***IPC Team*** should schedule a meeting with the Department, as described in Section 3.2.1, to make informed assumptions about the structural elements necessary for developing the bottom-up project cost. These assumptions should be clearly documented in the **IPC Summary Memo**. At this stage of design, the ***IPC Team*** can expect to receive project documents consistent with those described in **FDM 901**. The Phase I design information includes:

- **Key Sheet**: Basic project details, including financial project IDs, and administrative details.
- **Typical Sections**: Proposed typical section layouts, including right-of-way lines and traffic data.
- **Model Management and Project Control:** Preliminary benchmarks, reference points, and control points.
- **Roadway Plan-Profile**: Initial plan and profile views, including existing topography, utilities, preliminary horizontal geometrics, and profile grade lines.
- **Drainage Map**: Preliminary drainage information, including drainage areas, flow direction, and existing structures.
- **Temporary Traffic Control Plans**: Initial typical sections and phasing sequences.
- **Landscape Plans**: Conceptual landscape plans.

- **Toll Facility Plans**: Initial site development, civil, architectural, and structural elements.

3.3.4. Phase II IPC

A Phase II ***IPC*** is typically prepared when roadway design is approximately 60% complete and the structures design is approximately 30% complete. By this phase, major items should ideally be defined and detailed. While some smaller design elements are still not yet defined, the ***IPC Team*** should have to make fewer assumptions at this stage. If, after review of the project documents, there remain questions about the project scope or details, the ***IPC Team*** must schedule a meeting with the Department, as described in Section 3.2.1, to further define missing project details. It should be anticipated that this meeting will be necessary for structures and foundations items, at a minimum. At this stage of design, the ***IPC Team*** can expect to receive the following information from the **FDM 901**:

- **Key Sheet**: Indexes and lists of plans.
- **Signature Sheets**: Sections for each Professional of Record.
- **Typical Sections**: Complete proposed typical sections, including right-of-way (R/W) lines, special details, and traffic data.
- **Model Management**: Now complete.
- **Project Control**: Complete benchmarks, reference points, and control points.
- **Roadway Plan-Profiles**:
    - **Plan View:** Begin & end stations, curb return numbers, proposed drainage structures, proposed R/W lines, preliminary horizontal geometrics, and limits of wetlands, retention and detention ponds, pond number, and area size.
    - **Profile View:** Final profile grades, mainline storm drainpipes, special ditch gradients, special gutter grades, nonstandard superelevation transitions, highwater elevations, and existing utilities.
- **Traffic Monitoring Sites**: Now complete.
- **Drainage Structures**:
    - **Drainage tabular information:** Vertical and horizontal scale, special sections at conflict points.
    - **Plan View**: Centerline of construction, all roadway template elements, proposed drainage system, underground utilities.
    - **Profile View**: Sectional view along pipe runs, existing and proposed surfaces, underground utilities.
- **Temporary Traffic Control Plans**: Expanded details on phasing sequences and necessary worksheets.
- **Landscape Plans**: Conceptual.
- **Toll Facility Plans**: Includes site development, civil, architectural, and structural elements.

3.3.5. Phase III IPC

A Phase III ***IPC*** is typically prepared when roadway and structural designs are 90% complete. At this stage, all major items are fully detailed, and any remaining known unknowns are minimal. The ***IPC Team*** should develop detailed quantities for roadway and structural items by performing precise take-offs and thoroughly

breaking down each item. ***Activities*** at this stage should reflect the highest level of design development. Information provided to the ***IPC Team*** at this stage can be found in the **FDM 901** and the **Structures Design Guidelines (SDG)** and includes:

- **Roadway Plan-Profile:** Finalized alignment, profile, and cross-sections with precise quantity take-offs.
- **Earthwork Calculations:** Verified cut-and-fill quantities for accurate earthwork assessment.
- **Detailed Roadside Safety Features**: Detailed designs for barriers, clear zones, and other roadside safety measures.
- **Traffic Design Details:** Finalized lane widths, pavement markings, signalization plans, and other traffic-related design elements.
- **Structure Design:** Nearly complete structural design documents with detailed information on bridges, retaining walls, and other structures.
- **Utility Design:** Comprehensive utility design, including any required adjustments or relocations.
- **Pedestrian and Bicycle Facilities:** Fully designed pedestrian and bicycle facilities.
- **Final Stormwater Management Plans:** Complete stormwater management designs, addressing all runoff and drainage requirements.
- **Temporary Traffic Control Plans:** Detailed plans for maintaining traffic flow during construction ***activities*** to minimize disruptions.
- **Issued environmental permits**
- **Utility Work Schedules**

3.3.6. Phase IV IPC

A Phase IV ***IPC*** is prepared when the design reaches 100% completion, marking the final stage of ***IPC*** development where all scope elements are identified, and quantities are verified. At this stage, no known unknowns with probability and value remain, although known unknowns arising from external conditions without probability and value should be documented in the **IPC Risk Register** including, but not limited to, natural disasters, pandemics, political changes, regulatory changes, and supply chain disruptions. Information provided to the ***IPC Team*** at this stage is outlined in the **FDM 901** and the **SDG** and includes the following:

- **Complete Roadway Geometrics**: Finalized alignment, profile, and cross-sections, allowing for detailed quantity take-off.
- **Final Earthwork Calculations:** Final cut-and-fill quantities, allowing for refined and detailed quantity development.
- **Comprehensive Hydraulic Data:** All necessary hydraulic data and permits should be obtained and included in the design documents.
- **Final Roadside Safety Features:** Complete designs for barriers, clear zones, and other roadside safety measures.
- **Completed Specification Package Materials:** All required project-specific Technical Special Provisions (TSPs) and Modified Special Provisions (MSPs), fully developed, reviewed, and signed/sealed as required for incorporation into the Phase IV PS&E package.

- **Traffic Design Details:** Finalized lane widths, pavement markings, signalization plans, and other traffic-related design elements.
- **Complete Structure Design:** Full detailed structural design documents, providing detailed information on bridges, retaining walls, and other structures.
- **Utility Design:** Final utility design, including any required adjustments or relocations.
- **Pedestrian and Bicycle Facilities:** Fully designed pedestrian and bicycle facilities.
- **Final Stormwater Management Plans:** Complete stormwater management designs, addressing all runoff and drainage requirements.
- **Temporary Traffic Control Plans:** Finalized plans for maintaining traffic flow during construction ***activities***, minimizing disruption.
- **Issued environmental permits**
- **Utility Work Schedules**
- **Contract Duration:** Construction Time memo with anticipated contract duration.

3.4. Risk Register Development

The ***IPC Team*** will determine a project risk value, a portion of which will be incorporated into the **Detailed IPC** and supported by the **IPC Risk Register**. The ***IPC Team*** will structure the risk register to classify project risk items as either ***project unknowns, Department-owned Risk,*** or, in some cases, ***Contractor-owned Risk***.



Figure 2. Process for Development of Project Risks

The following guideline defines and addresses project risk through a systematic process. As outlined in Figure 2, the framework begins with an evaluation of the project scope of work and its current project phase. Using this information, the ***IPC Team*** identifies potential project impacts. The goal of this process is to establish a justifiable value for project risk. Risks should be detailed and specific to the unique conditions of the project. Avoid cost duplication by ensuring the base project cost does not contain undue conservatism for any given ***pay item***. Excess conservatism in the base project cost leads to cost duplication associated with risk. Items are included in the risk register because it is uncertain whether they will occur or align with the assigned value. Therefore, each item must be assigned a probability of occurrence that is informed by the collective experience of the ***IPC Team***. Overvaluing the base cost and probability of occurrence inflates the risk value, leading to an increased

total project cost. When evaluating potential risks, the considerations below should be accounted for.

3.4.1. Global Parameters

Global risk parameters help the ***IPC Team*** assess the impacts of project risks.

A. Assess Project Design Stage

As the design progresses from initial concept to detailed plans, the scope of the project becomes more defined, and the potential for project risks decreases. In the early design stages, uncertainties and assumptions are more prevalent, leading to significant cost variances. As the design matures, these uncertainties are resolved, resulting in improved cost accuracy. The ***IPC Team*** evaluates various factors, including the level of detail in design documents, the extent to which all project components are accounted for, and the clarity of specifications. Greater design detail and definition reduce the likelihood of unforeseen issues during construction, enhancing cost certainty.

B. Approach to IPC Development

The ***IPC Team's*** cost development approach should be considered, as their methods for quantity development impacts project cost certainty. In the early design stages, limited details may require the ***IPC Team*** to rely on judgement and analogy-driven approaches for developing quantities, resulting in higher uncertainty. As the design matures, the ***IPC Team*** can transition to a detailed take-off method, providing more precise and accurate cost development.

C. Confidence in Bid Documents

To evaluate confidence in project documents, the ***IPC Team*** will review the clarity and completeness of the current design documents and the **Design Confidence Report** provided by the ***Consultant PM***. By understanding the design status and supporting deliverables at each milestone, the ***IPC Team*** can identify ***project unknowns*** and other project risks. Assessing the clarity of design plans and insights from the ***Consultant PM***, the ***IPC Team*** builds confidence in the documents. Figure 3 illustrates the progression of a project's life cycle and the relationship of quantifiable scope cost versus risk and unknowns.

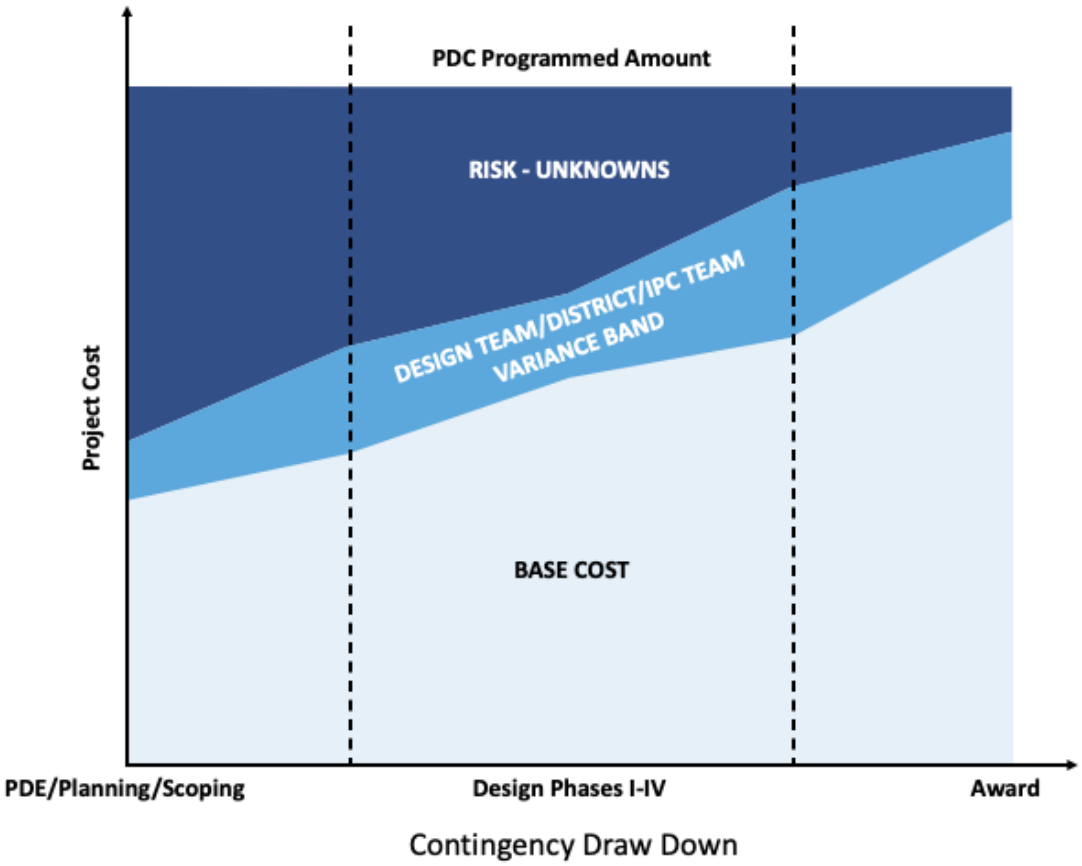


Figure 3. Project Cost Development through Design Progression

3.4.2. Develop Project Risk Register

A. Develop the Project Risk Register

The IPC Team shall identify relevant risk events and assess the potential impact and the probability of occurrence for each event. The ***IPC Team*** will evaluate the risk register provided by the ***Consultant PM***, and the Cost Schedule Risk Analysis (CSRA) for the project when applicable, to support the development of the **IPC Risk Register**. To support the development of a thorough risk register, the ***IPC Team*** will collaborate with the District and ***Consultant PM*** for review and input during each stage.

B. Identify Project Unknowns and Risk Events

Following assessment of the process and approach to ***IPC*** development, the ***IPC Team*** will identify ***project unknowns*** and other risk events potentially resulting in cost or schedule impacts. The risks identified by the ***IPC Team*** should be compared and correlated with those identified by the ***Consultant PM***. While risks are unique to each project, general risk categories to consider are provided with the **IPC Risk Register** Template. Each risk event must be classified as a ***project unknown***, ***Department-owned Risk,*** or a ***Contractor-owned Risk***. If it is determined that the probability of a risk event is 100 percent, then the event is no longer classified as a risk, and the cost of the event is moved to the base project cost.

C. Identify Probability of Risk Events

Following the identification of ***project unknowns*** and other risk events, the ***IPC Team*** will determine the probability of each event occurring, expressed as a percentage assigned for each respective event. There are multiple options for determining the probability of occurrence of a risk event. Options include historical data from prior projects, probabilistic cost models such as Monte Carlo simulations, collaborative risk workshops, and use of risk matrices.

D. Determine Cost Carried by Risk Events

Each ***project unknown*** and risk event should be evaluated to determine its overall cost impact on the base ***IPC***. After developing the cost or schedule impact of each risk item, the ***IPC Team*** will populate the **IPC Risk Register** and apply the probability percentage to calculate the total risk impact on the project. The assumptions made to develop the cost or schedule impact must be documented as well.

E. Reporting of Risk Impacts

The **IPC Risk Register** will document each risk event as being a ***project unknown, Contractor-owned Risk, or Department-owned Risk***.

- The total risk impact of ***project unknowns*** is then incorporated into the ***IPC*** on the "Project Unknowns" line-item.
- The total risk impact of ***Department-owned Risk*** should be reported in the **IPC Summary Memo** and not incorporated into the ***IPC***. This total will inform any District and/or Statewide contingency amounts held for the project.
- ***Contractor-owned Risk*** will be distributed to ***direct costs*** within the ***IPC.*** Whether explicitly documented as a risk on the **IPC Risk Register** or not, the **IPC Summary Memo** must include discussions about how these risks influenced pricing decisions. This must be documented as notes in the **Detailed IPC** and in the section of the **IPC Summary Memo** titled "Discussion of Cost Differences" when it may have been a contributing factor. The ***IPC Team*** must also include a section in the **IPC Summary Memo** that outlines opportunities to reduce ***Contractor-owned Risk*** and may provide cost savings.

F. Draw Down of Project Unknowns through Design Progression

As the project scope is refined through continued design development, ***project unknowns*** should either transfer into the base cost or be removed from the overall project cost, as depicted in Figure 4. This process does not represent an increase in project scope, but rather the refinement of details from earlier design stages.

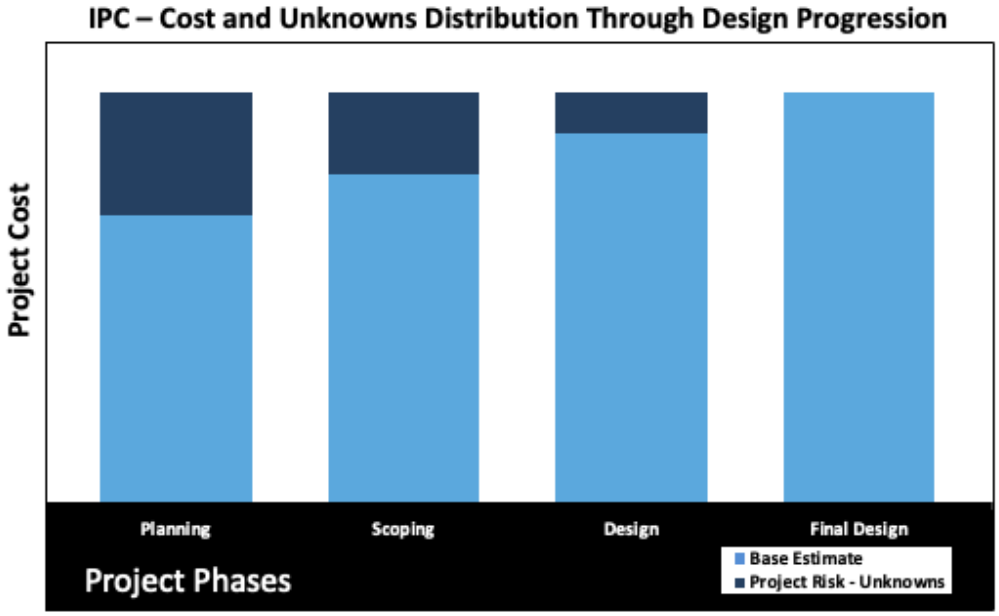


Figure 4. Unknowns Draw Down Process

4. SCHEDULE

4.1. Purpose

IPC Teams may be asked to perform a schedule assessment to validate the ***IPC Team's*** assumptions, provide a basis for time-phasing the Department's Work Program budget, and improve the reliability of information shared with the public. The goal is to reliably forecast the project schedule. Two types of schedule assessments are presented herein: 1) **Project Schedule Assessment**; and 2) **Independent Project Schedule**. Department needs may vary by project, and a blend or an adaptation of these two approaches may be used. The Department will direct the ***IPC Team*** on whether a schedule assessment is needed and which approach to use.

4.2. Project Schedule Assessment

4.2.1. The **Project Schedule Assessment** is the simpler of the two approaches. It may be developed in any commercially available software package, including spreadsheet tools, to depict a simplified Gantt chart of major construction milestones and ***activities***.

4.2.2. The **Project Schedule Assessment** must depict ***Level 3 schedule*** information and may require Level 4 reporting to validate the ***IPC*** and establish a reliable project **schedule**. ***Level 3 schedules***, also referred to as Project Coordination Schedules,

typically summarize ***Level 4 schedules***. At a minimum, ***Level 3 schedules*** must report the timing and duration of the following major ***activities***:

- mobilization
- traffic shifts
- contamination remediation
- clearing and grubbing
- earthwork
- drainage
- paving
- barrier wall construction
- foundations
- substructures
- superstructures
- lighting/signalization/ITS
- signing and pavement markings
- architectural and landscaping

These ***activities*** should be reported for each roadway segment and structure in accordance with the project's traffic control sequencing. If no traffic control sequence has been established, the ***IPC Team*** must develop a high-level sequencing plan and include a description of it with the **Project Schedule Assessment**.

4.2.3. While not all items may be directly reported or included in schedule logic, the **Project Schedule Assessment** must consider project quantities, production rates, and typical labor and equipment ***resources*** consistent with the ***basis of the IPC***. The schedule must also account for typical seasonal conditions that may affect the project's critical path.

4.3. Independent Project Schedule

The **Independent Project Schedule** is the more comprehensive of the two approaches. It will be developed using commercially available, industry-standard software and include ***Level 4 schedule*** diagrams (Gantt chart) and schedule data reflecting how a Contractor may complete the work. ***Level 4 schedules***, also referred to as Execution Schedules or Project Working Level Schedules, show ***activities*** at a more detailed level than ***Level 3 schedules***. The ***activity*** level in this schedule will generally align with the ***activity*** level used in the bottom-up project cost.

The ***WBS*** or project ***activity*** codes for the schedule must align with the ***IPC's CBS***. The schedule should account for utility work schedules and show the interdependence of the utility work as influenced by concurrent scheduled operations.

4.3.1. The **Independent Project Schedule** must comply with the following content guidelines:

A. The schedules must include the sequence, order, and interdependence of major construction milestones and ***activities***. This should include the procurement of project-specific materials and equipment, particularly those requiring submittals that are not readily available, long-lead time items, and key milestones either identified by the Department or deemed materially important by the ***IPC Team***.

B. Show the sequence, order, and interdependence of ***activities*** necessary to accomplish the work. In addition to construction ***activities***, the schedule must include contractor submittals, material procurement, and Department or utility ***activities***.

5. TRACKING

5.1. Purpose

To achieve the objectives of developing ***IPCs*** for major projects within the Department's Work Program, the Department will track final ***IPCs*** relative to the bids and/or proposals received. Final ***IPCs*** refer to those prepared closest to the opening of bids or proposals. Records of variances between the final ***IPC*** and the average bid of all bidders or proposers, as well as the winning bid, may be maintained.

Attachment A – IPC Process Flowchart

Flowchart illustrating the IPC development process, beginning with document review and kickoff meeting, followed by quantity reconciliation and multiple cost development approaches (bottom-up, parametric, and fixed cost). The process includes vendor pricing, unit price development, draft deliverables, quality control review, corrections, and concludes with final IPC deliverables and review.

