

# A “Bucketed” Approach to Contingency Development

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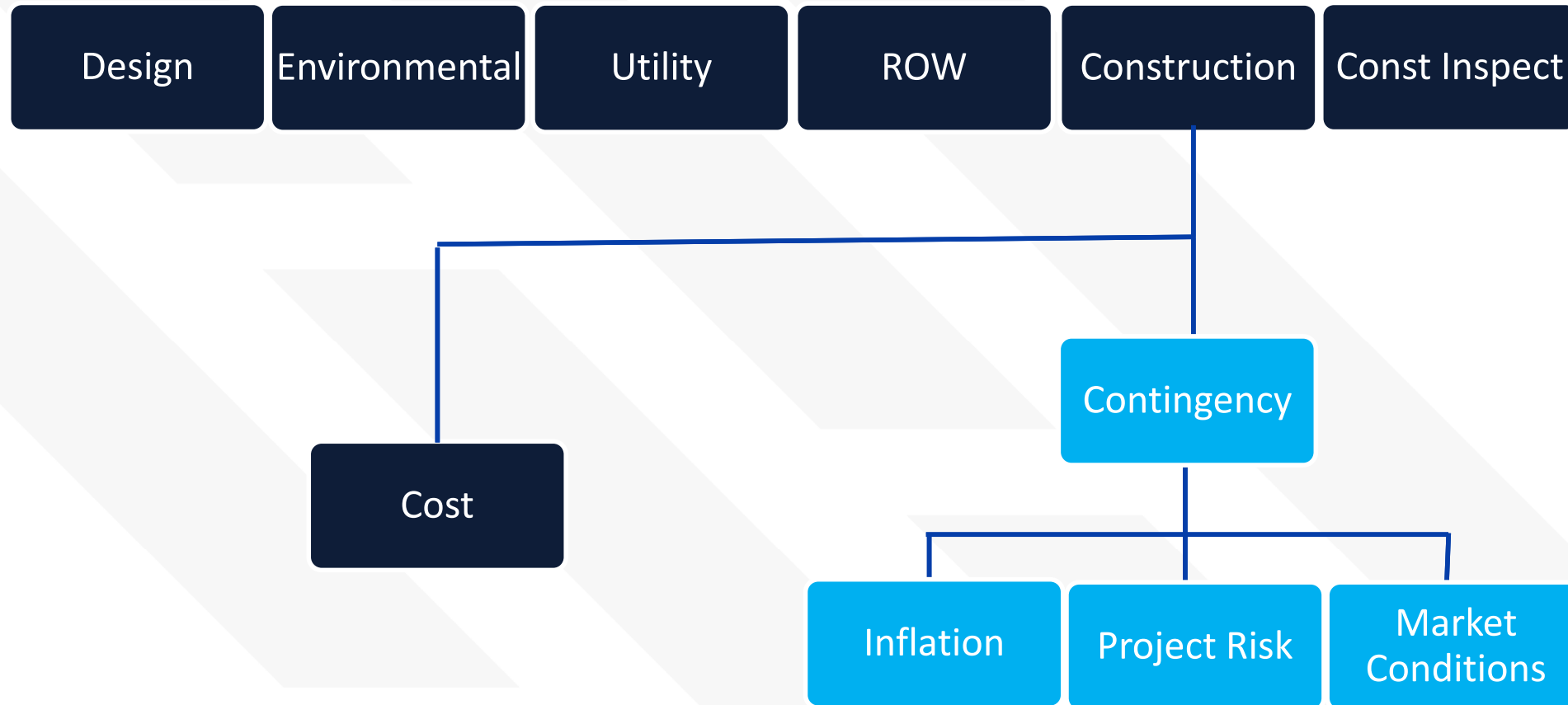


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# Agenda

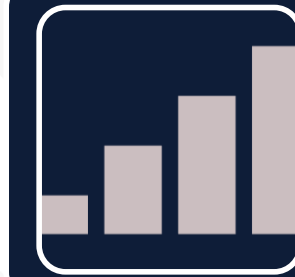
- Safety Moment
- Contingency Development Overview
- The Buckets
  - Inflation
  - Project Specific Risk
  - Market Conditions
- Summary & Questions

# Contingency – “Buckets”



# Contingency – “Buckets”

- Contingency is used as a financial mitigant for many forms of risk
- The process includes three forms of contingency



## Inflation

- Macroeconomic factor
- Tracked historically through CPI and other indices
- **Recommendation: Formula**

## Project Risk

- Project specific factors
- Contingency plans can be developed
- **Recommendation: Define**

## Local Market Conditions

- Only applied to region and risk is not
- Flexibility to address future risks
- **Recommendation: Specific application**

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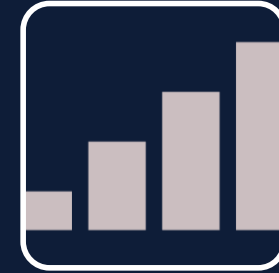
- Project specific factor
- Mitigation plans can reduce project risk
- **Recommendation: Defined Process**

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- Flexibility to address future risks
- **Recommendation: Case application**

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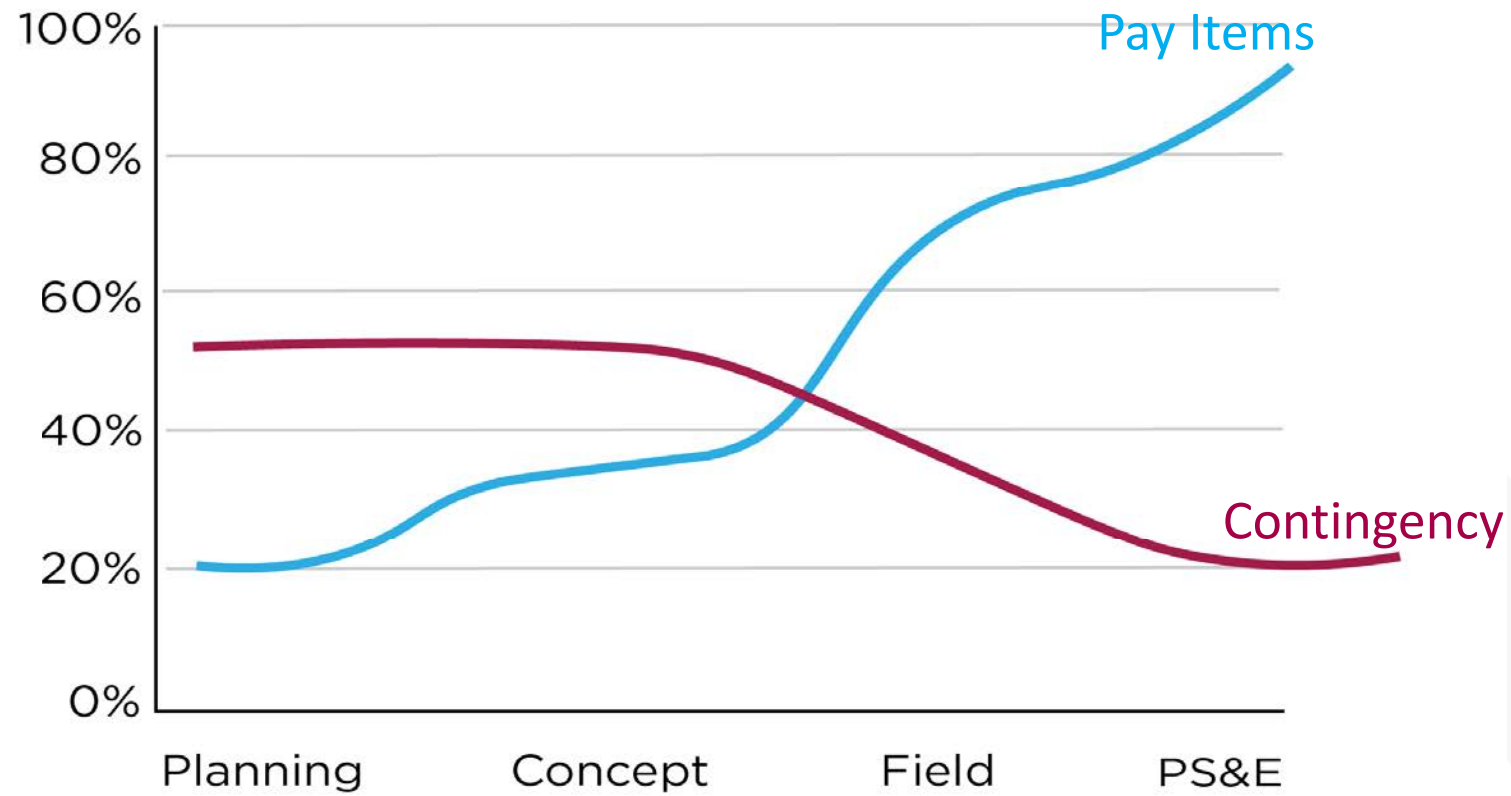
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## Local Market Conditions

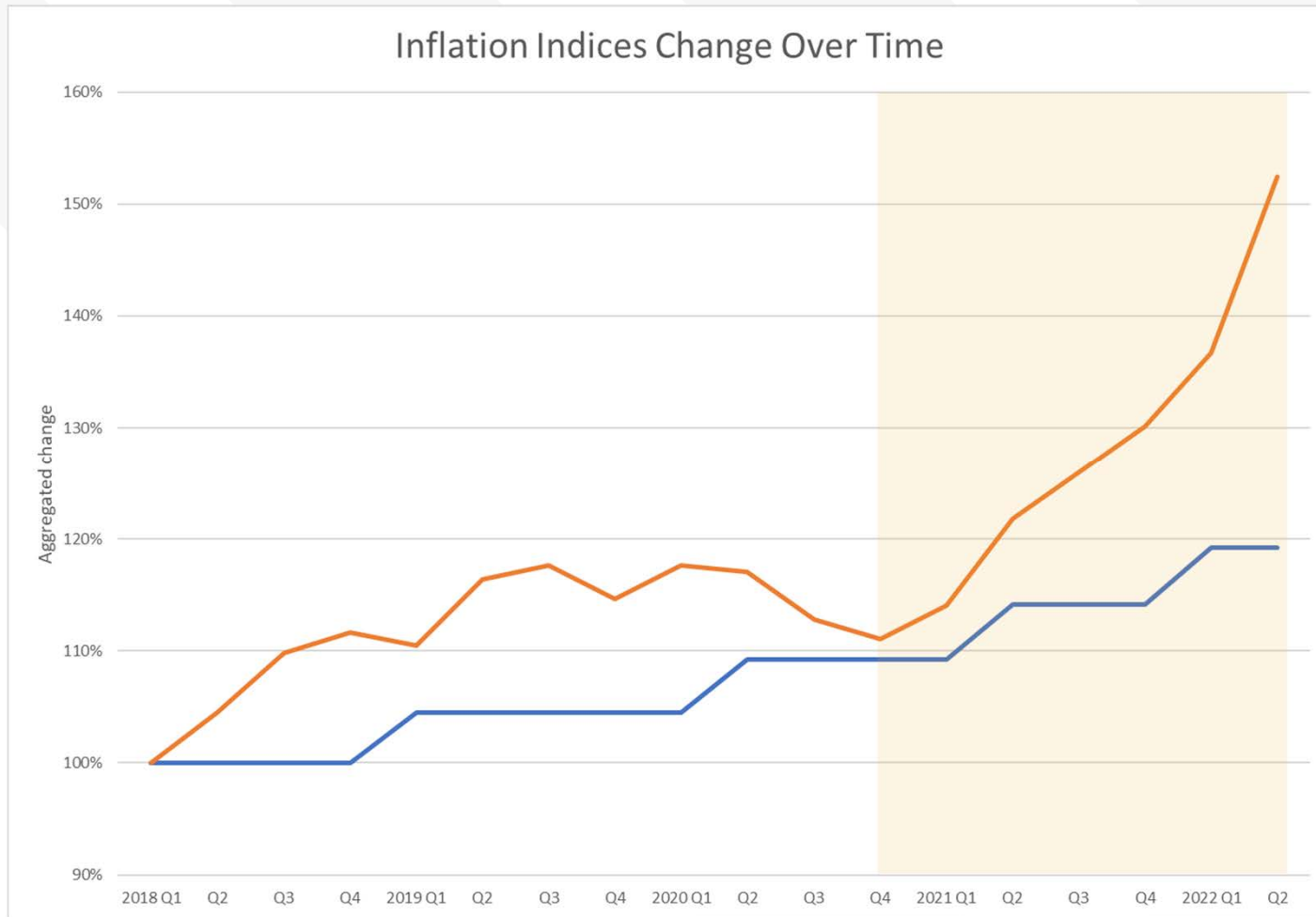
- Only applied if inflation and risk is not adequate
- Flexibility to accommodate future risks
- **Recommendation: Subjective application**

# Cost/Contingency Progression





# Importance of Accounting for Cost Risk



FHWA Construction Cost Index

Example DOT Inflation / Contingency

# Inflation

## Benchmarks

- There are many indices that track inflation of costs over time. Each index tracks materials, services and goods to provide an overall cost index that is adjusted as costs for each item changes over time. All benchmarks track historical costs but do not forecast future changes.
- Our process tracks a weighted average of the following:

Benchmark	Frequency of Update	Link
Consumer Price Index (CPI)	Monthly	<a href="https://www.bls.gov/cpi/">https://www.bls.gov/cpi/</a>
Producer Price Index (PPI)	Monthly	<a href="https://www.bls.gov/ppi/">https://www.bls.gov/ppi/</a>
ENR Construction Cost Index (ENR)	Monthly	<a href="https://www.enr.com/economics">https://www.enr.com/economics</a>
FHWA National Highway Construction Cost Index (FHWA)	Quarterly (delayed)	<a href="https://www.fhwa.dot.gov/policy/otps/nhcci/">https://www.fhwa.dot.gov/policy/otps/nhcci/</a>

# Inflation

Current Market Approach - Taper Down Assumed Over Time

- We have assumed that recent inflation trends (10.0%) will return to the long-term trend (3.0%) over three years on a straight-line basis.

Timeframe into Future	0-12 months	12-24 months	24-36 months	36+ months
Inflation Assumed	10.0%	7.7%	5.3%	3.0%

- Inflation assumption should be revisited and revised annually

# Project Specific Risk

- ▶ Recommend performing a risk assessment for the most complex projects. This could include projects that are:
  - Alternative delivery
  - High in cost
  - Entail unique project risks
  - High profile

# Project Specific Risk

## Approach:

- ▶ Run a pre-risk analysis to quantify risk
- ▶ Identify risks that threaten delay to the project
- ▶ Plan risk response and assign owners
- ▶ Investigate background project information, analysis, and team focus
- ▶ Run base estimate analysis for cost comparison
- ▶ Develop a Monte Carlo simulation model and input the project-based cost and schedule information
- ▶ Summarize the result of the project-based contingency analysis

# Project Specific Risk

## Lower Risk Examples

- Limited/simple structures
- Preservation (mill & overlay)
- Multiple jurisdictions
- Access and Egress impacts

## Higher Risk Examples

- Unbalanced site
- Complex Structures
- ROW acquisition
- Utility relocations
- Complex MOT

# Project Specific Risk

## Cost Analysis Process:

- ▶ Download construction projects average low bid for similar project type/location
- ▶ Develop list of potential subcontractors or material suppliers that could be engaged on the project
- ▶ Develop pay items related to project-specific components
- ▶ Run average unit prices per pay item as a (3-6 month average) per district
- ▶ Develop a breakdown of total construction cost comparison without contingency
- ▶ Review preliminary estimate for potential items of scope missed
- ▶ Perform 20%-80% cost analysis for major items utilizing a resource-based bottom-up estimate

# Project Specific Risk

## Risk Management Process:

- ▶ Best practice risk management techniques minimize unnecessary changes to a project during execution by identifying, monitoring, and assessing potential risk to the DOT and contractor.
- ▶ Utilize a Risk-Register for the project. The Risk-Register consists of three components, one for each corresponding level of risk management.
  - ▶ Level 1: Identification
  - ▶ Level 2: Deterministic Analysis
  - ▶ Level 3: Probabilistic Analysis
- ▶ Proactively identifies, avoid, or prevent risk events, and/or mitigates negative outcomes from such events, to make the project successful
- ▶ Implement a quantitative risk analysis workshop with key stakeholders
- ▶ Develop Monte Carlo simulation using the Probabilistic Risk-Based Estimating tool



# Market Conditions

- ▶ Undefined risks – Contingencies for inflation and project risks may not capture everything specific to projects/programs.
- ▶ Optional – Market condition contingency may not be necessary but allow the project team to evaluate the market on a regular basis to consider risks that are not captured through evaluation of inflation and project specific risk.

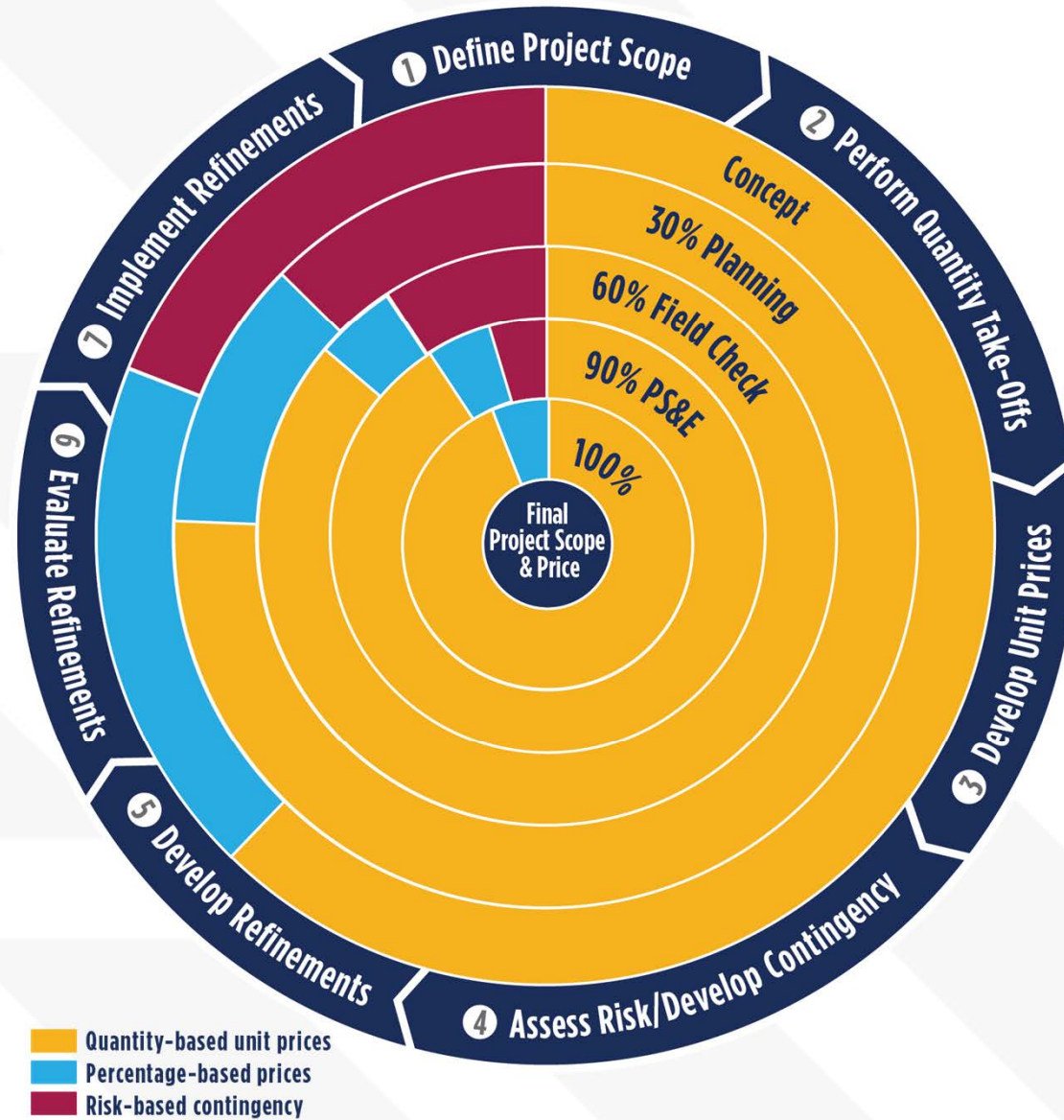
## *Example: Peak Years*

*In peak demand times the local contractor market may reach its capacity requiring additional out of state resources with higher mobilization costs. This could translate to a market condition premium of 5% or more during the peak years.*

# Benefits of the Bucketed Approach

- ▶ Current process may not breakdown buckets of cost and contingency, making it difficult to analyze for future adjustment.
- ▶ The bucket approach provides:
  - ▶ Transparency and clarity into contingency components of the estimate
  - ▶ Provides a consistent application of inflation and project risk
  - ▶ Provides a platform for analysis of contingency components over time

# Closest to the Pin Mentality





**Questions?**

