



The Owners Voice to the Construction Industry
CONSTRUCTION USERS ROUNDTABLE

CURT® Lean Summit

*“Industrial Design Process &
Integrated Form of Agreement Perspectives”*

Industrial IPD (I2PD) Application vs Traditional IPD Approach

Monday May 3rd, 2021

Industrial IPD Application vs Traditional IPD Approach

Presenter – Bruce Burwell



PTAG Bruce Burwell - Partner Capital Projects

Bruce is a Project and Construction Management professional with extensive experience in all industrial sectors. He has held numerous positions with Ontario Power Generation and its predecessor Ontario Hydro throughout a 34-year career before joining PTAG as Partner – Capital Projects leading PTAG’s Industrial Integrated Project Delivery practice (I2PD). He possesses an in-depth knowledge of I2PD projects and skillful understanding of project lifecycle and project development methodologies. He is focused on process improvement and project certainty.

He is proficient in contracting strategies including Alliancing, IPD and Collaborative Contracting projects and was the first to implement Industrial Integrated Project Delivery (I2PD) as a pilot project for Ontario Power Generation. He led the OPG I2PD team in the development of the Multi-Party agreement and the creation of the project processes and templates required for the planning and execution of the project.

He is Chair of the Construction Industry Institute (CII) University of Texas Integrated Project Delivery (I2PD) Research Team, Chair of the CII Power Utilities and Infrastructure Implementation Committee and has presented Collaborative Contracting as an alternative contracting model to organizations and executives all over North America.

Professional Affiliations



Industrial Integrated Project Delivery – I2PD

- Need for Change
- What is I2PD
- History of I2PD
- I2PD Principles
- Evolution of Contracting Methods
- When to use I2PD
- Collaboration and Implementation Methods
- Integrated Delivery Comparison
- Multi-Party Agreement
- Benefits of I2PD



Need for Change

Rewire the contractual framework

- There is a need to move away from the hostile contracting environment that characterizes many construction projects to a system focused on collaboration and problem solving
- To achieve this, tendering processes can be based on best value and past performance rather than cost alone
- Establishing a “single source of truth” on projects for monitoring progress early, supported by collaborative technology, helps to minimize misalignments and enable joint corrective action
- The data already exist to fundamentally improve the accuracy of cost and schedule estimates. Where players continue to use traditional contracts, they should introduce incentives that significantly improve performance and alignment not at a trade or package level, but at the project-outcome level
- To move toward best practices, appropriate alternative contracting models such as integrated project delivery (IPD) help build long-term collaborative relationships. Relational contracts will need to become more prevalent than transactional contracts. Sufficient investments in up-front planning incorporating all parties’ input have been shown to raise productivity substantially

(Source: McKinsey & Company 2017)

*“It is a very sobering feeling to be up in space and realize that one's **safety** factor was determined by the **lowest** bidder on a government contract.”*



Alan Shepard, the first American in space, became the fifth astronaut to walk on the moon as part of the *Apollo 14* lunar landing mission.

Traditional

Start the project like last time but hope for better results

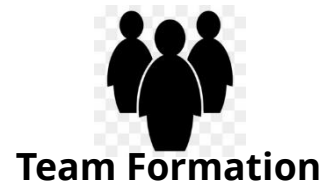
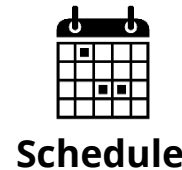
Each trade does their own thing

Always looking for the lowest bidder

Expect some delays and overages.

vs.

Collaborative Contracting



Build better. Set project goals with the project team.

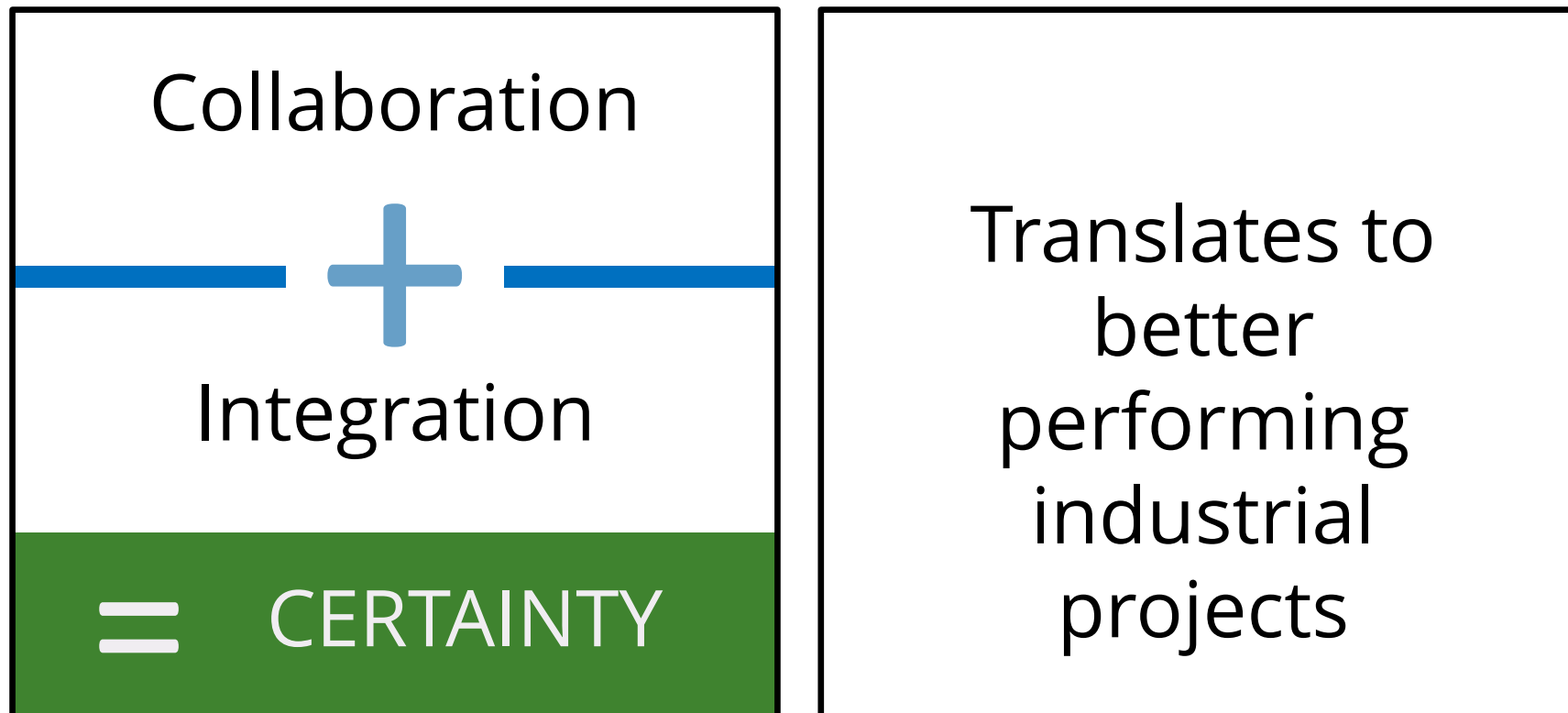
Developed by the team. Adjusted daily by the last planners.

Build a team very early. Use it to drive success.

On time. On Budget. What the client needed.

Industrial Integrated Project Delivery – I2PD

MAJOR GAME-CHANGING RESEARCH DISCOVERY



(Source: CII RT 341 2018)

Industrial Integrated Project Delivery – I2PD

What is I2PD

Contracting Element

- What is **best for the Project** and not what is best for individual contracting party
- **Aligns** objectives and incentives based on performance
- Multiple stakeholder relational project approach with a **single objective** that integrates people, systems, business objectives and practices
- Full **transparency** to cost
- **Balanced** risk-reward scheme

Process

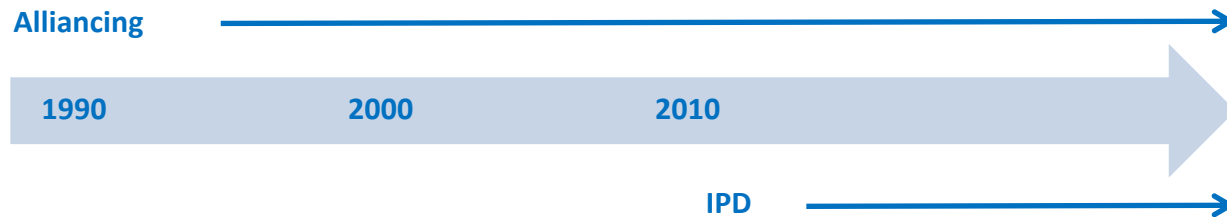
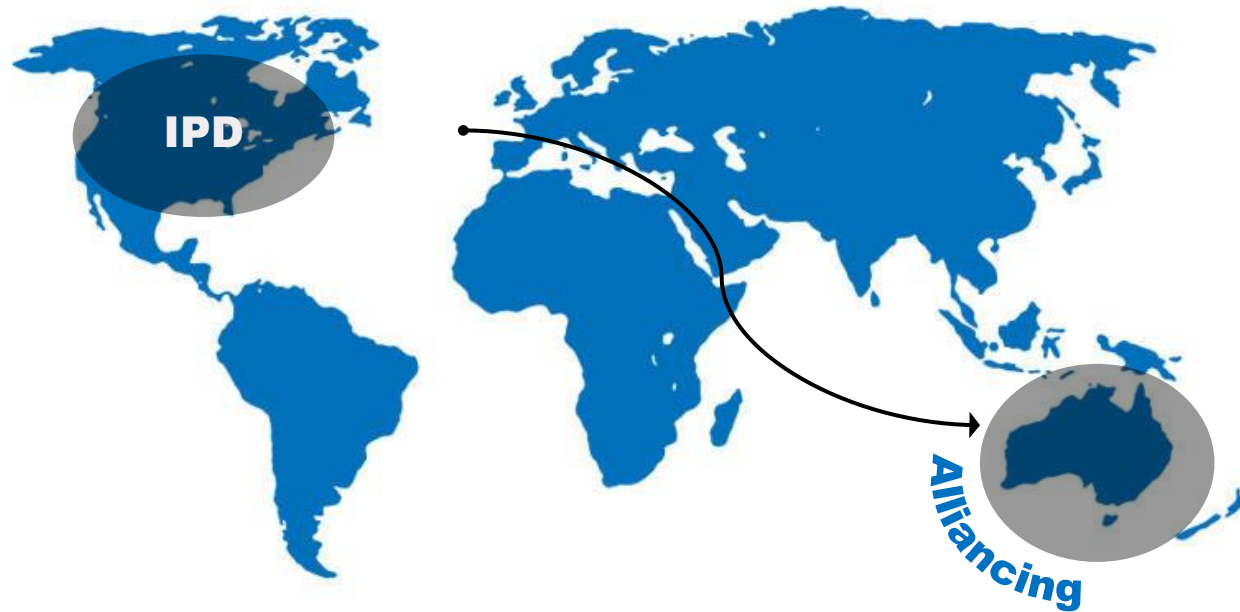
- Employs early **collaboration** and alignment of the **business interests** of the key Project participants
- Designing to **budget** and conditions of satisfaction
- **Lean** tools/techniques with technology reduces waste and optimizes efficiency through all phases of design, procurement, construction, commissioning and transfer of operational control

Behaviours

- Creating a "**One team**" approach early in the project lifecycle of a greater talent pool working across company lines in a highly Collaborative and Integrated team with all participants providing equitable input
- **Communication** and collaboration
- **Flat organizational** structure
- Cross-functional groups tailored to **project goals**

Industrial Integrated Project Delivery – I2PD

History of I2PD



Commercial IPD

- Heavy emphasis on Collaboration to enhance design optimization
- Higher quality facilities faster with no significant cost increase and higher owner satisfaction (Asmar 2013)

Infrastructure Alliancing

- Heavy emphasis on Integration to enhance construction risk management
- 324 alliances in Australia/New Zealand worth ~ \$60 billion since 1996
- Average 3.5% cost savings, 2 to 7% schedule savings, 99.6% success rate (Tamburro et al. 2009)

Both commercial IPD (CIPD) and Civil Infrastructure Alliancing are performance outcome focused delivery methods

(Lahdenpera 2012)

Industrial Integrated Project Delivery – I2PD

Defined as the balancing of nine principle to promote team collaboration and integration of work processes and systems

1. Continuous Communication and Issue Resolution Process
2. Jointly Developed and Validated Targets
3. Access to Shared Information Systems
4. Early Involvement of Stakeholders
5. Collaborative and Equitable Decision Making

COMMERCIAL IPD

Collaboration Principles

6. Financial Transparency among Key Participants
7. Shared Risk and Reward
8. Relational Contracting, Multi-party Agreement
9. Negotiated Risk Distribution



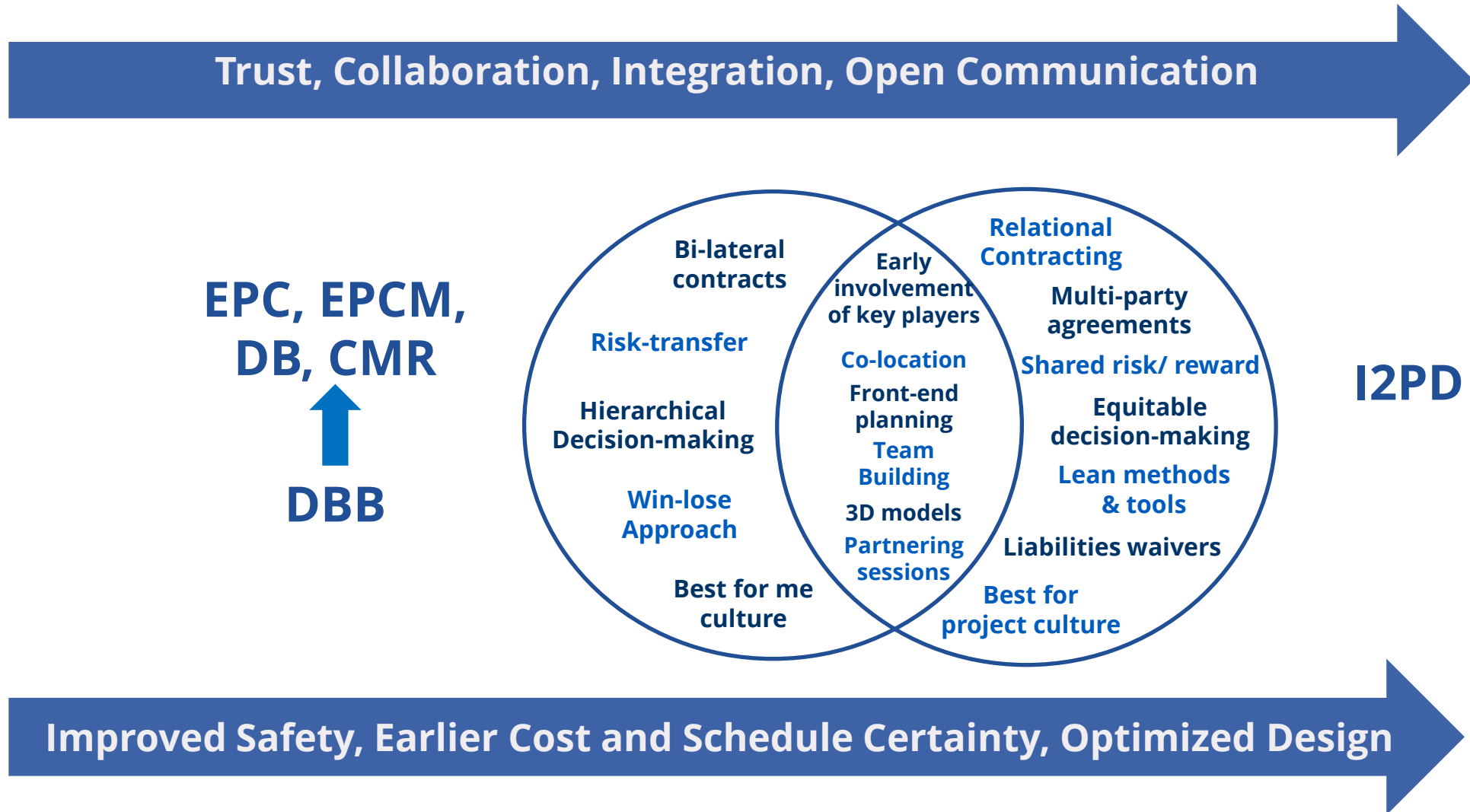
ALLIANCING

Integration Principles

(Source [CII RT 341 2018](#))

Industrial Integrated Project Delivery – I2PD

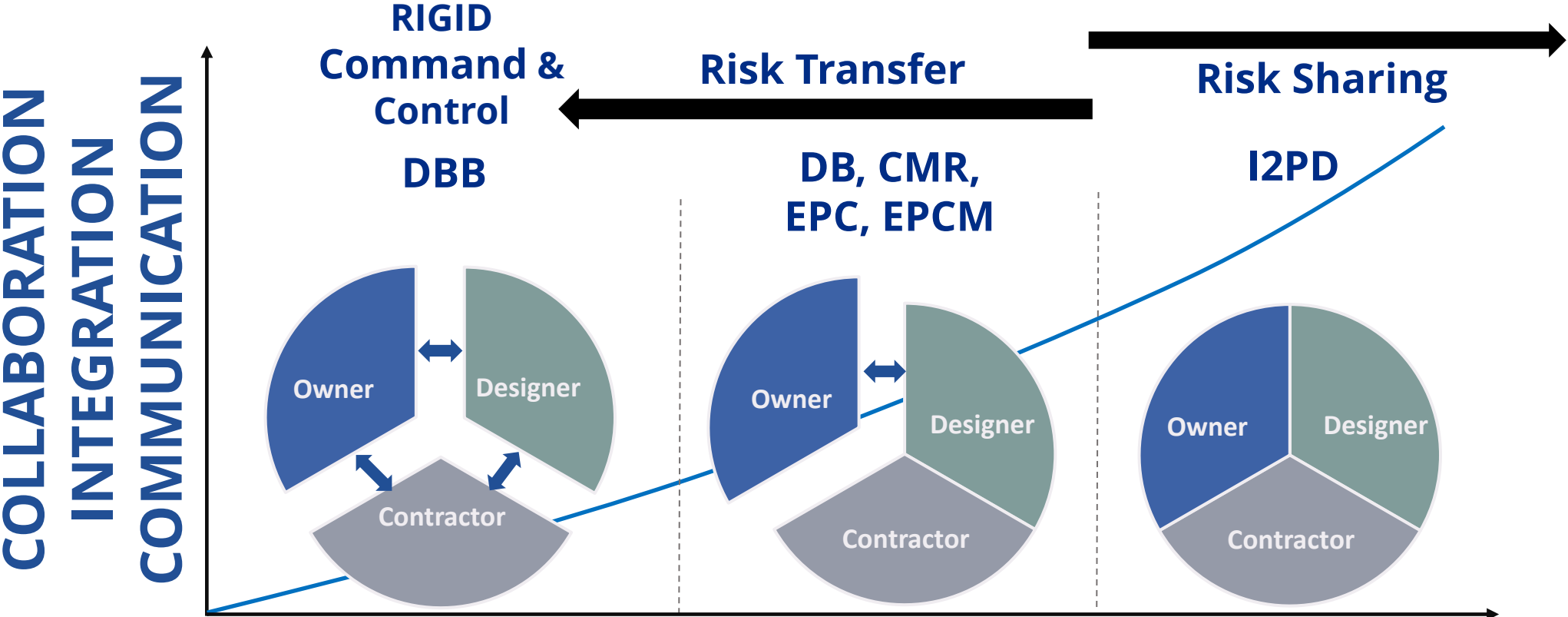
Evolution of contracting methods



(Source CII RT 341 2018)

Industrial Integrated Project Delivery – I2PD

Trust increase as collaboration and integration increases



Level of Trust Increases

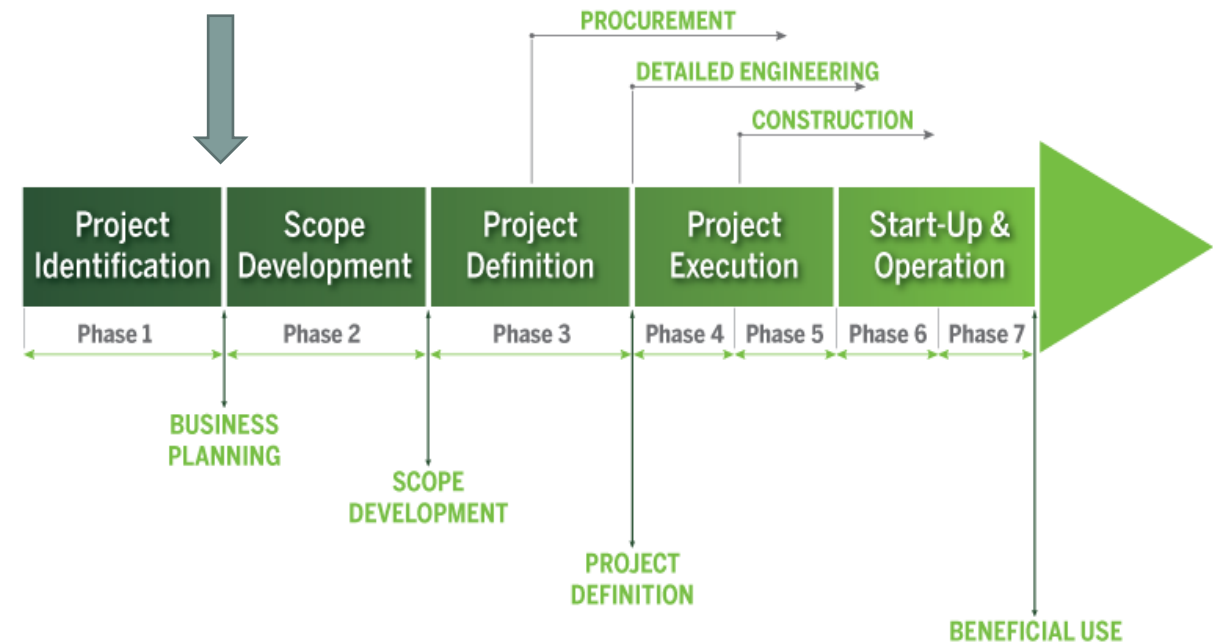
(Source: CII RT 341 2018)

I2PD fundamentally enhances project collaboration and integration

Industrial Integrated Project Delivery – I2PD

When to Use I2PD

- Risks cannot be adequately defined prior to tendering
- The cost of transferring risks to the contractor is prohibitive
- The project needs to start ASAP before the risks or scope can be fully identified
- A collective approach will produce a better outcome than contracted allocation



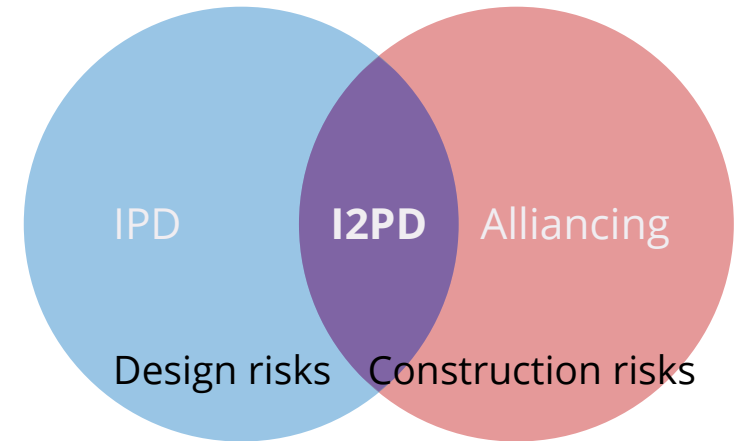
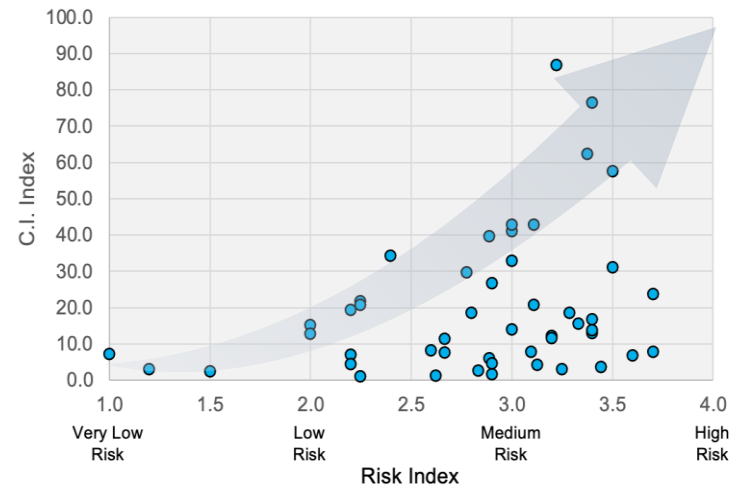
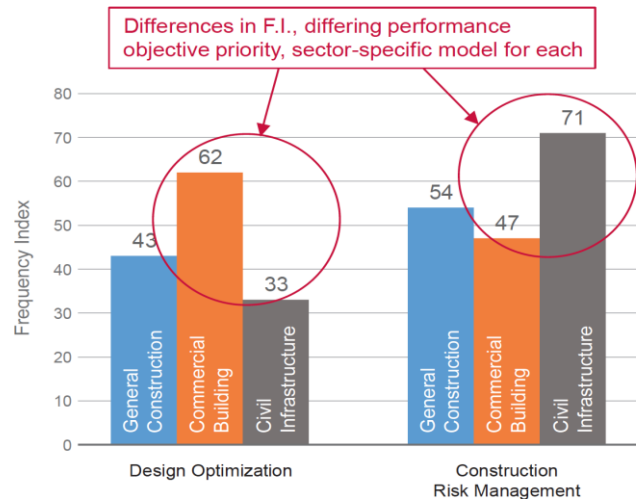
Collaboration and Integration Methods

I2PD Collaboration and Integration Methods	
1. Co-location (Big Room)	11. Design to Cost Approach
2. Constructability Planning in Design Phase	12. Pre-assembly or Modularization
3. Use of Technology as an Integration Tool	13. Value Stream Mapping
4. Front End Planning (PDRI)	14. Standardized Design Techniques
5. Alternate Scheduling Method (Pull-plan)	15. Rapid Process Improvement Workshops
6. Formal Partnering and/or Team Building	16. Multi-party Project Management Team
7. Contract Incentives (Shared Risk/Reward)	17. Multi-party Agreements
8. Strategic Partnerships	18. Quality Improvement Process (Six Sigma)
9. Value Engineering in Design Phase	19. Mutual Liability Waivers
10. Joint Risk Assessment Tool	20. No Dispute Charter
	21. Advanced Work Packaging

(Source [CII RT 341 2018](#))

Related Integrated Delivery Models

How does **I2PD** compare with related integrated delivery in other sectors such as **commercial IPD** and **civil alliancing**? What is the different emphasis of collaboration and integration on industrial, civil infrastructure, and commercial projects.



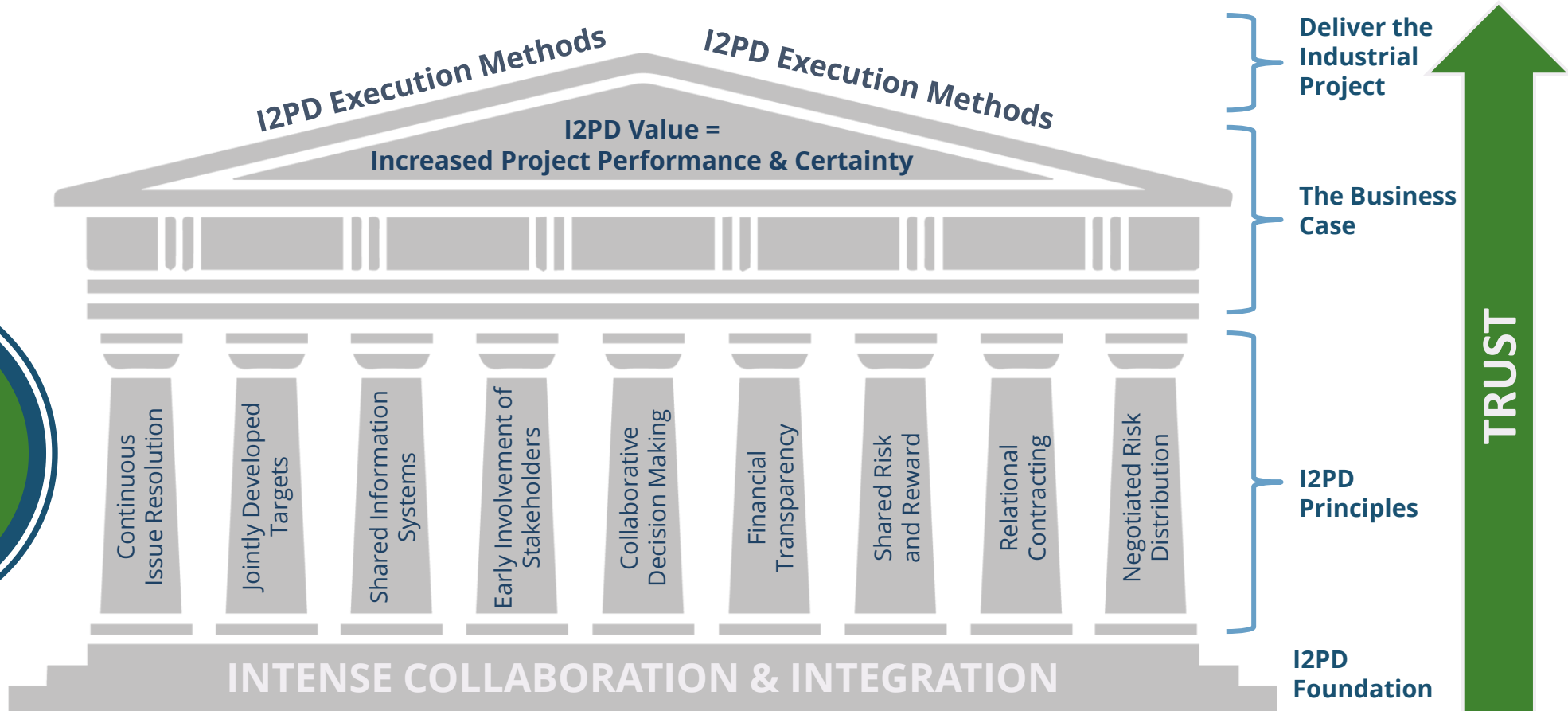
Commercial projects are more closely linked to design optimization, while civil infrastructure projects rely more heavily on construction risk management

Through the preliminary analysis, we found the relationship between project risks and the use of C.I. methods and principles

The different risks in commercial buildings, civil infrastructure, and industrial projects impact the characteristics of IPD, Alliancing, and I2PD

Industrial Integrated Project Delivery – I2PD

Implementation



The Multi-Party Agreement **Ties Together the Parties, Principles and Methods building TRUST** to Plan and Execute based on what is “best for the project”

Multi-Party Agreement

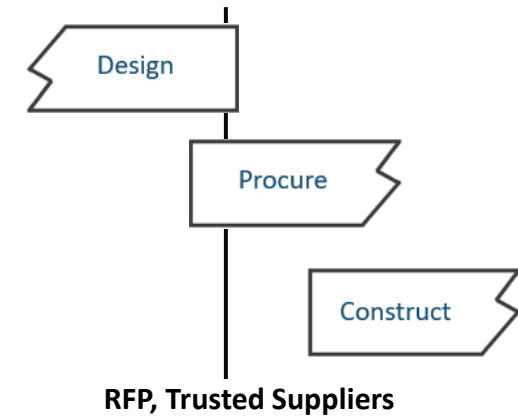
I2PD Collaborative Contracting – Codified thru a multi-party agreement between the owner and key suppliers with defined roles and responsibilities that balances up to nine principles and 21 methods **to promote intense team collaboration and integration of work processes and project systems** with shared risk and reward that severely limits claims.

All parties operate on a what is best for the project basis:

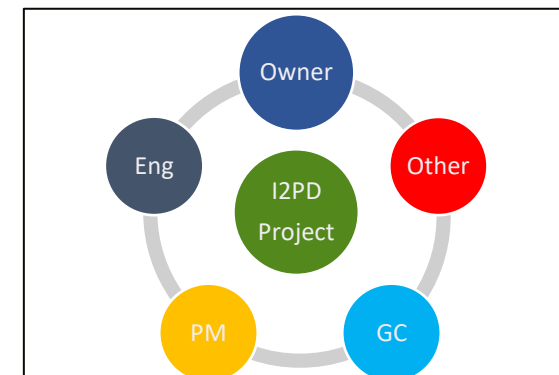
1. Continuous Communication and Issue Resolution Process
2. Jointly Developed and Validated Targets
3. Access to Shared Information Systems
4. Early Involvement of Stakeholders
5. Collaborative and Equitable Decision Making
6. Financial Transparency among Key Participants
7. Shared Risk and Reward
8. Relational Contracting, Multi-party Agreement
9. Negotiated Risk Distribution

Used more and more on highly complex projects that require cooperation, coordination and integration of the Owner and key suppliers. Proven to improve project success rates of other Contracting Methods.

Phase Sequence: Long lead procurement begins during design



Project Team Relationship



Compensation Approaches:

Cost Plus Fixed Fee (Shared Risk Reward)

Industrial Integrated Project Delivery – I2PD

Benefits of I2PD

Protect contractors

Protects contractors due to the cost and schedule certainty as a result of the integrated upfront planning

Incentives

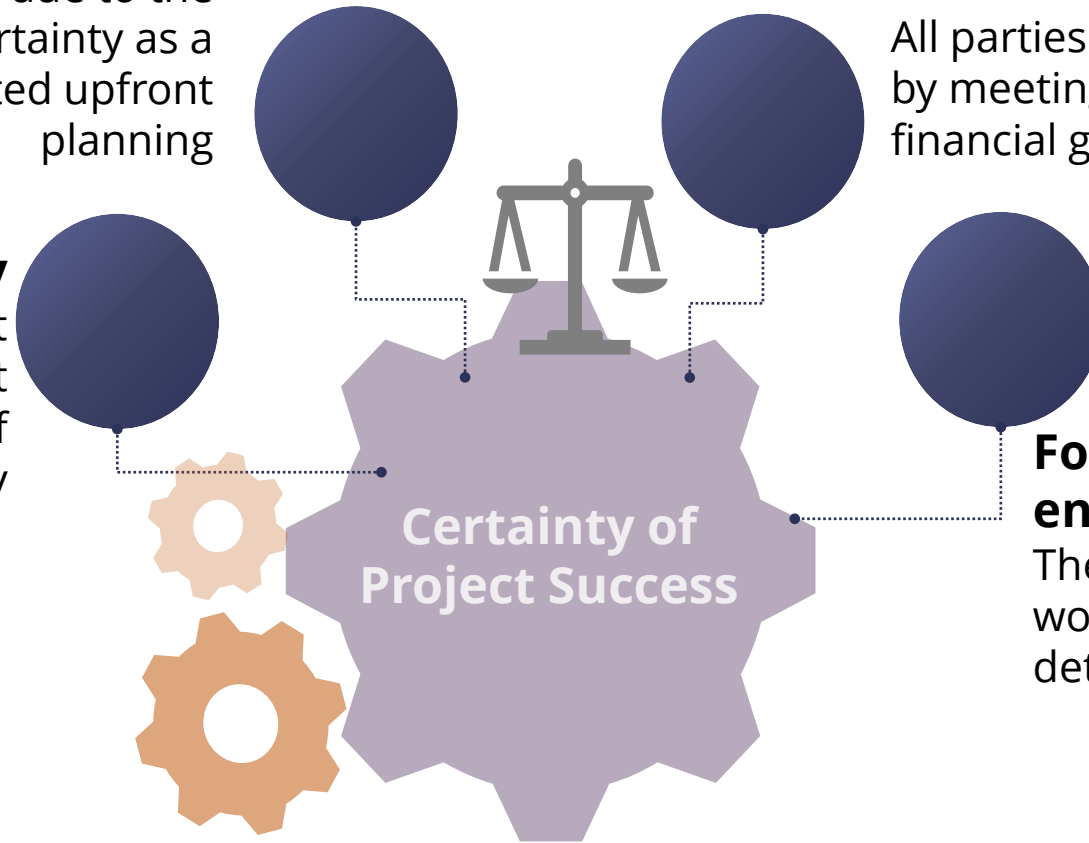
All parties have much to gain by meeting the client's financial goals

Increase certainty

You can begin projects that you otherwise would not because of high levels of uncertainty

Foster collaborative environment

The project team is encouraged to work through changes rather than detail out each party's liabilities



Summary



I2PD increases speed, trust and transparency
as a contracting strategy - delivers project outcome certainty



Optimum &
Faster
designs

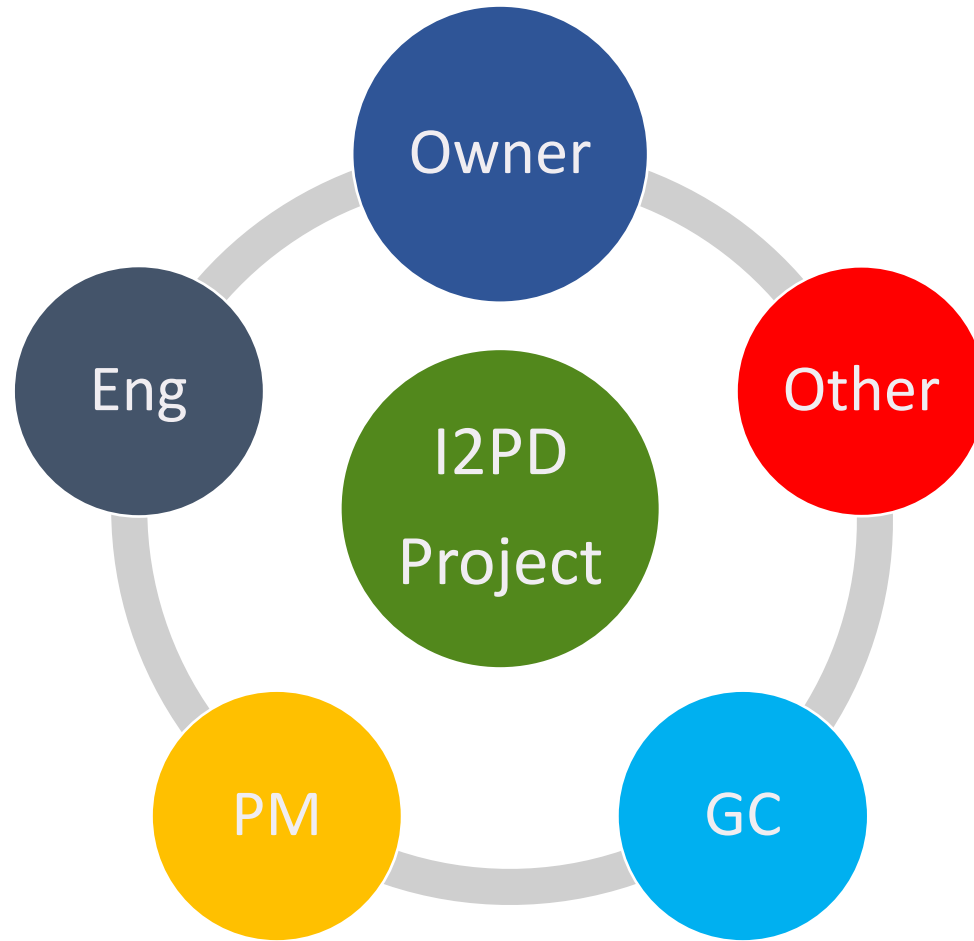
Integrated
and
accelerated
execution

Improved
cost
certainty

Improved
schedule
certainty

I2PD

Questions & Discussion



Thank You