ACI-NA Winter Board & CEO Forum

An Airport Executive Visioning Framework to Guide Capital Development Decisions

February 7, 2019

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Overview

PART 1 - Overview of airport construction activity (2005-2018)

PART 2 - Understanding various delivery structures and methods

PART 3 - Question-based visioning process for the airport executive implementing capital projects

PART 4 - Takeaways

Part 1- Airport construction

Definitions

- **Construction Start:** total construction value of a project expected to occur within 60 days. This value represents the total value of the start irrespective of implementation period. Example: a 4-year $100 million construction start in 2018 is captured as $100 million in 2018. ***NOTE:*** a project may have multiple construction starts comprising the project and no attempt was made to aggregate starts.
- **Construction Expenditure:** construction value amounts expended in a given period. The construction expenditure for the same a 4-year $100 million starting in 2018 and ending in 2022, would only capture the amount expended in the applicable year.
- NOTE: **Construction Start** values do not include soft costs (e.g. design, project management, other professional services not part of construction). Soft costs can range from approx. 15%-50% of construction value and would be additive to Construction Start values.

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Part 1 - Airport construction

Definitions

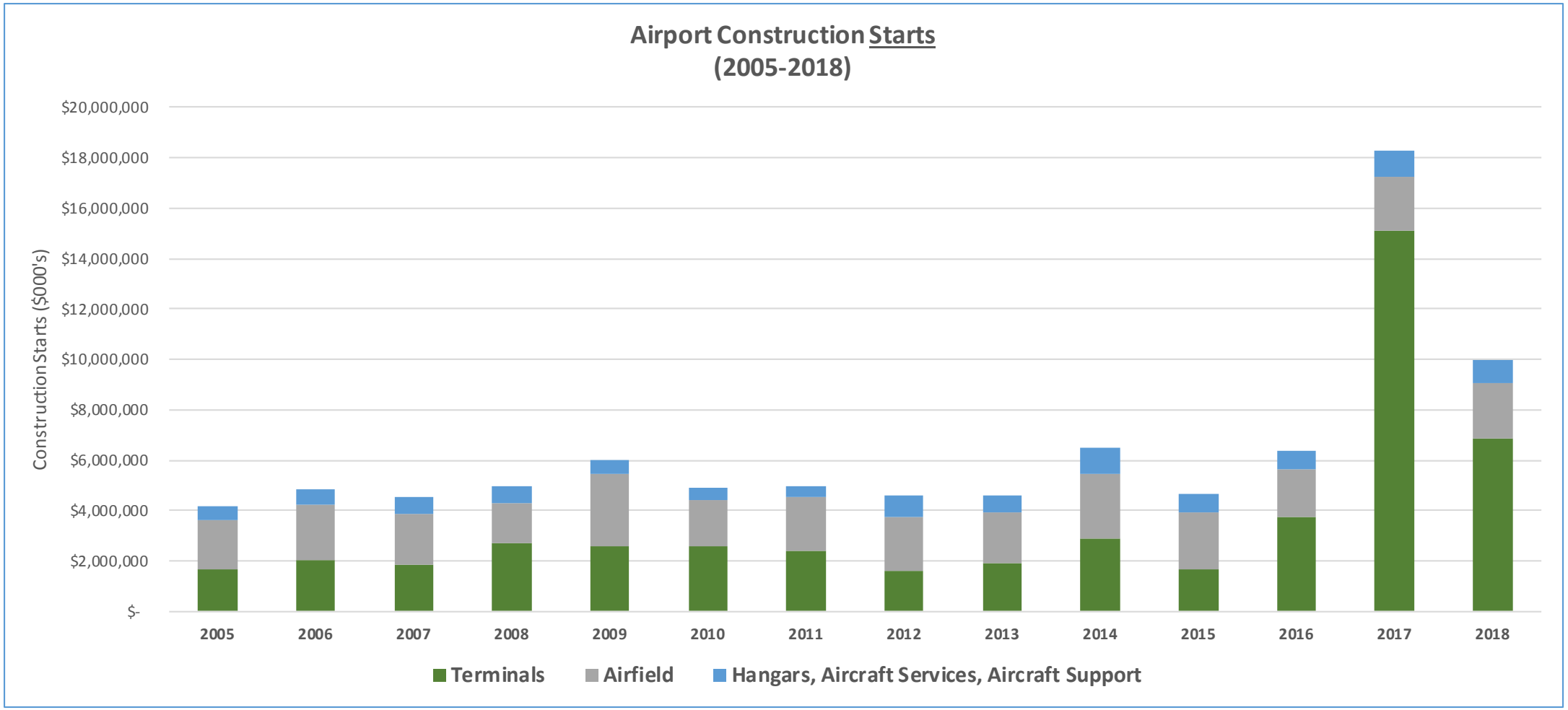
- **Airport construction:** defined as aircraft service + airport terminal + airport airfield
- **Aircraft Service:** airplane hangers & shelter, avionic shop, aircraft maintenance buildings, wash racks
- **Airport Terminal:** landside/airside passenger terminals, operations building, administration building
- **Airport Airfield:** taxiway, runway, apron, other non-building elements
- **Year:** calendar year

Part 1 - Airport construction

Analysis period and some other considerations

- The data and associated analysis is the result of research conducted over the past several months
- The analysis period covers construction starts from 2005-2018 (CY)
- All 50 US states
- Extracted airport construction starts only
- Data analysis/research expected to be completed by end of 2019

Part 1 - US airport construction



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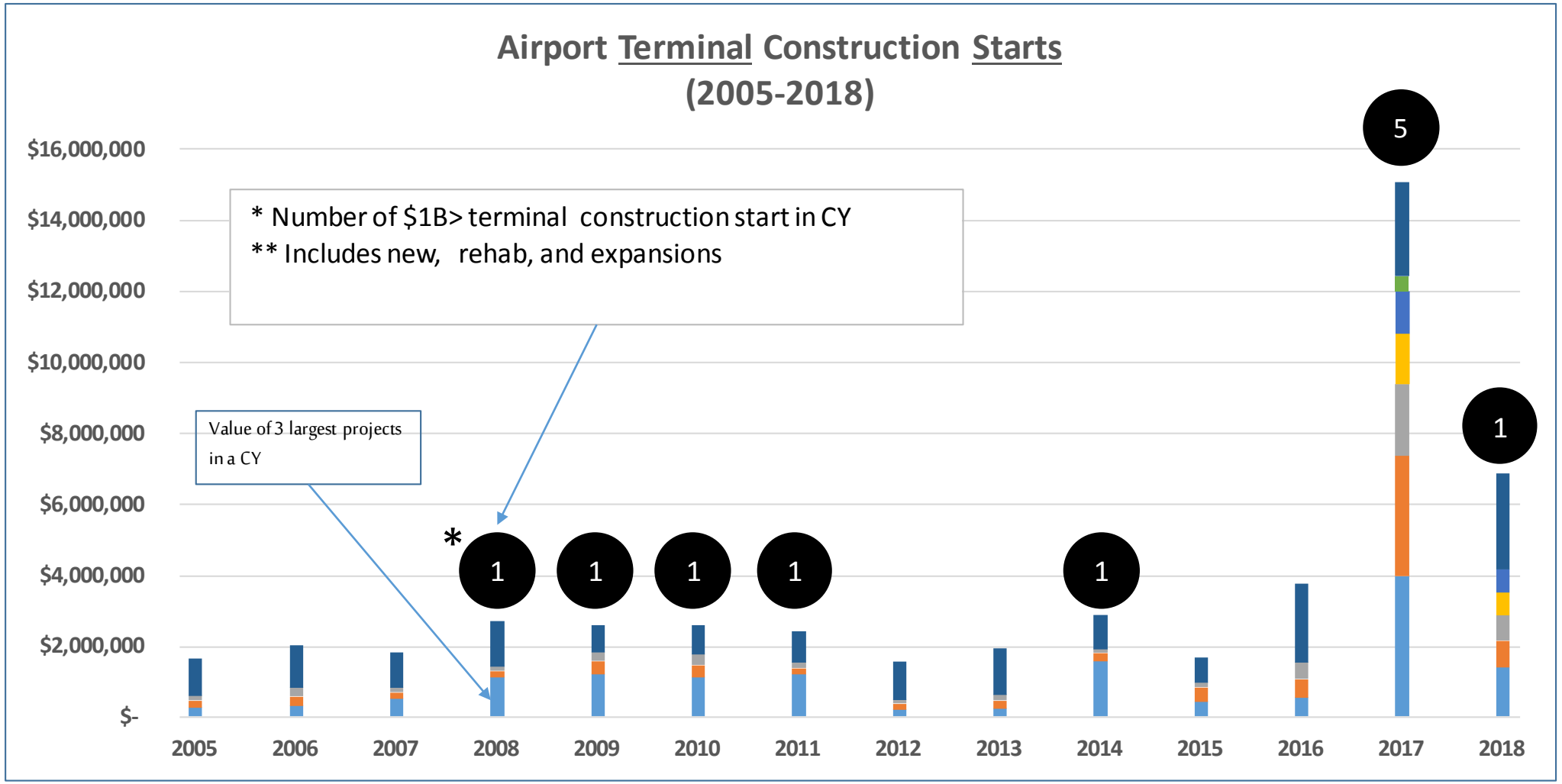
Part 1 - US airport construction



Part 1 - Airport construction

The airport construction market

- CY 2017 and 2018 provided for uniquely high level of construction starts
- And… demand is expected to remain high ($100B 2017-2021, ACI NA Survey)
- High demand creates pressure on ability to get competitive pricing from general contractors and subcontractors (exacerbated in smaller markets) as well as strains ability of designers/PM firms
- Airports use a wide range of complex program structures and delivery methods to implement projects

Part 1- Airport construction

The airport construction market (Continued)

- Contractors are offering a range of products and other features to optimize returns and mitigate risk
- Utilization of building information modeling (BIM) and implications for design, construction, and post-construction
- Contractors are increasingly looking to modify construction contract language in efforts to mitigate performance risk (e.g. limits on liability, liquidated damages, utilization of contingencies within GMPs, pricing on change orders, or savings for example)

Part 1- Airport construction

The airport owner environment

- A wider range of airports are implementing large capital programs some of which have not had significant construction in recent years
- Airports with high level of on-going construction activity are utilizing new delivery methods
- Given a high demand for construction and limited funding, airports have significant challenges finalizing executable plans of finance
- Active regulatory environment (FAA, TSA, local jurisdictions)

Part 1- Airport construction

END PART 1

Part 2- Delivery Structures and Methods

We will now focus on developing working definitions of key terms in the capital development process

- Capital development process – activities completed to plan, design, and build a project
- Owner – the project owner
- Project/Program Manager – a single firm, or set of multiple firms, or in-house airport staff overseeing design and construction activity
- A/E – designer/architect of record (could be a single firm or multiple firms)
- Contractor – the builder of the project (general contractor or construction manager)
- Construction Manager at Risk – a general contractor that is selected to deliver construction which is bid to trade subcontractors and for which a fee is charged to the owner (with some other features) within one of multiple not-to-exceed contracts (Guaranteed Maximum Price)

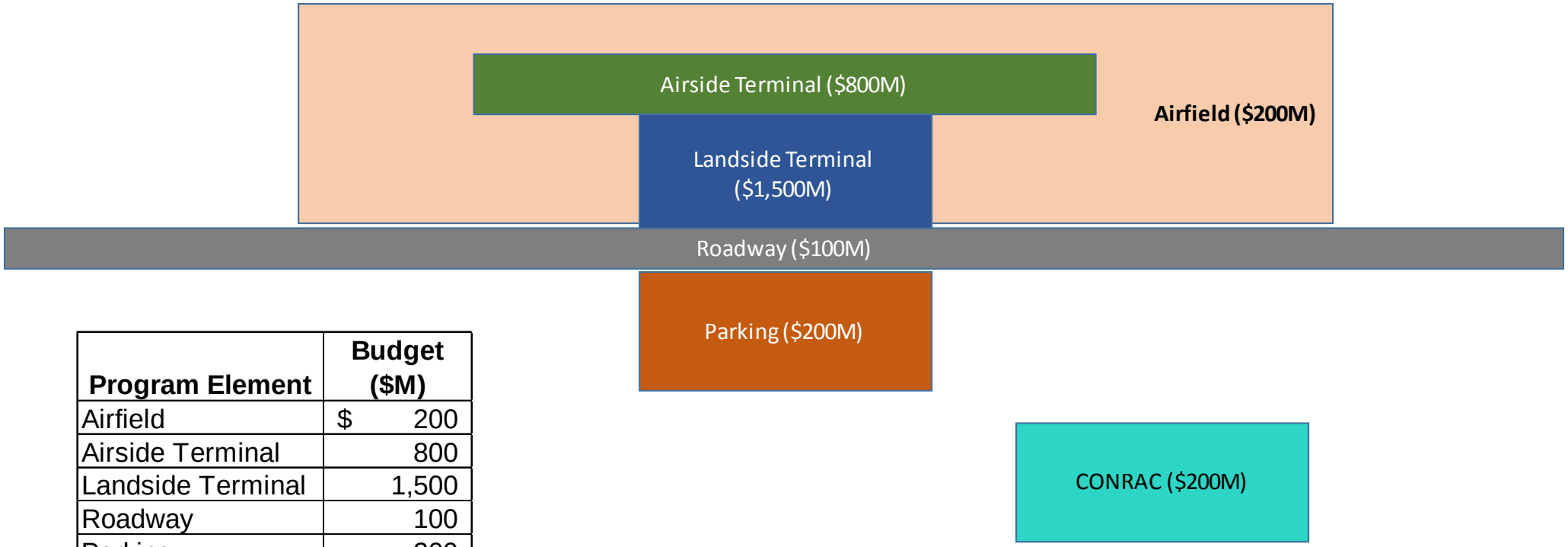
Part 2- Delivery Structures and Methods

Key terms (continued)

- Delivery structure – organization and reporting structures to perform the work
- Delivery method – primarily contractual relationships outlining risk transfer/scope/performance
- Design-Bid-Build – an approach where the owner engages a separate designer and general contractor to design and build a project
- Design-Build – a process by which the owner engages with a single design builder entity (typically a team or JV between an A/E and contractor) to design and build a project
- P3 – a public/private partnership which designs/builds/finances/operates a facility over a term contract for which it receives payment from Owner

Part 2- Delivery Structures and Methods

Generalized Delivery Structures Using a Sample (Fictitious) Project



Program Element	Budget ($M)
Airfield	$ 200
Airside Terminal	800
Landside Terminal	1,500
Roadway	100
Parking	200
CONRAC	200
Total	**$ 3,000**

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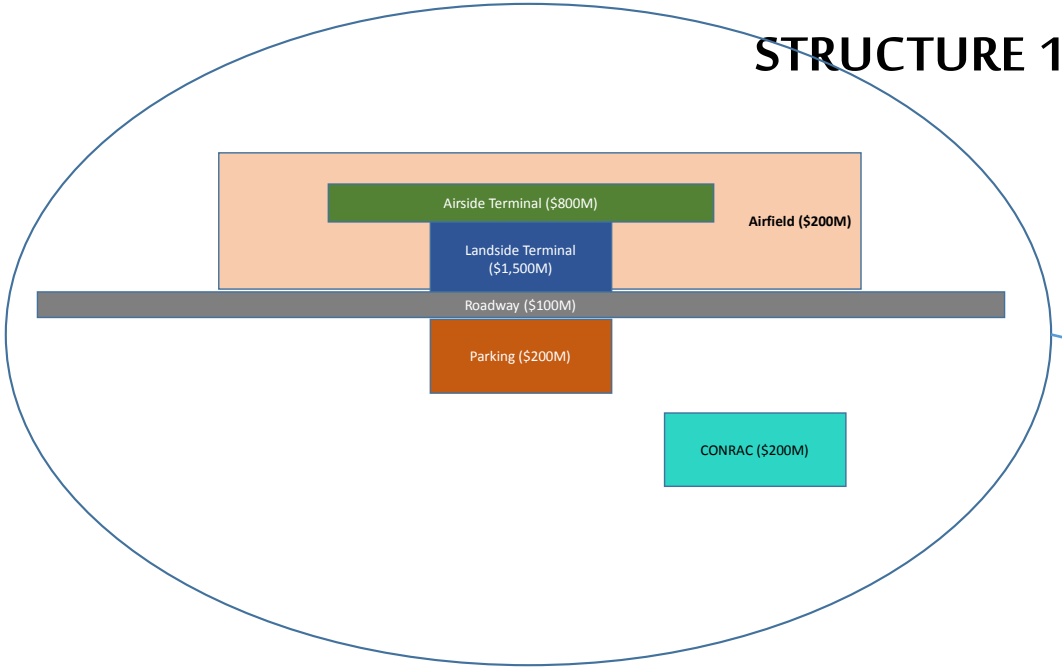
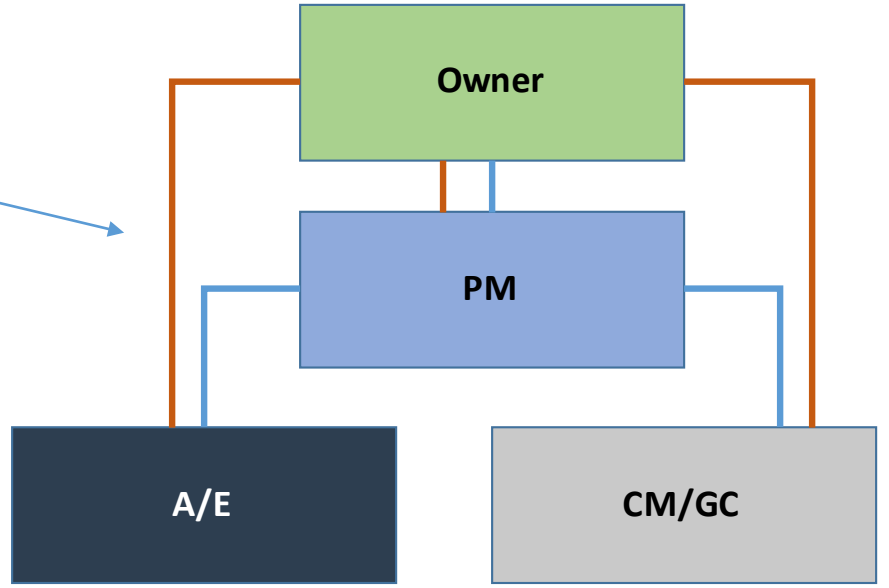
Part 2- Delivery Structures and Methods

STRUCTURE 1 – D/B/B, PM, AE, Cm/GC





Contractual relationship

Reporting relationship

Under this structure there is a single PM team (could be single firm or multiple firms), a single A/E, and a single CM/Gc contracted to design and build all elements. Typically there will be different design packages and associated construction contracts for each element of the work.

Under this structure there would be at minimum three procurements (PM, A/E, and CM/GC)

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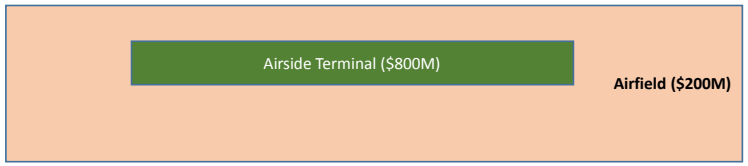
Part 2- Delivery Structures and Methods

STRUCTURE 2 – D/B/B, 2-PM, 2-AE, 2-Cm/GC

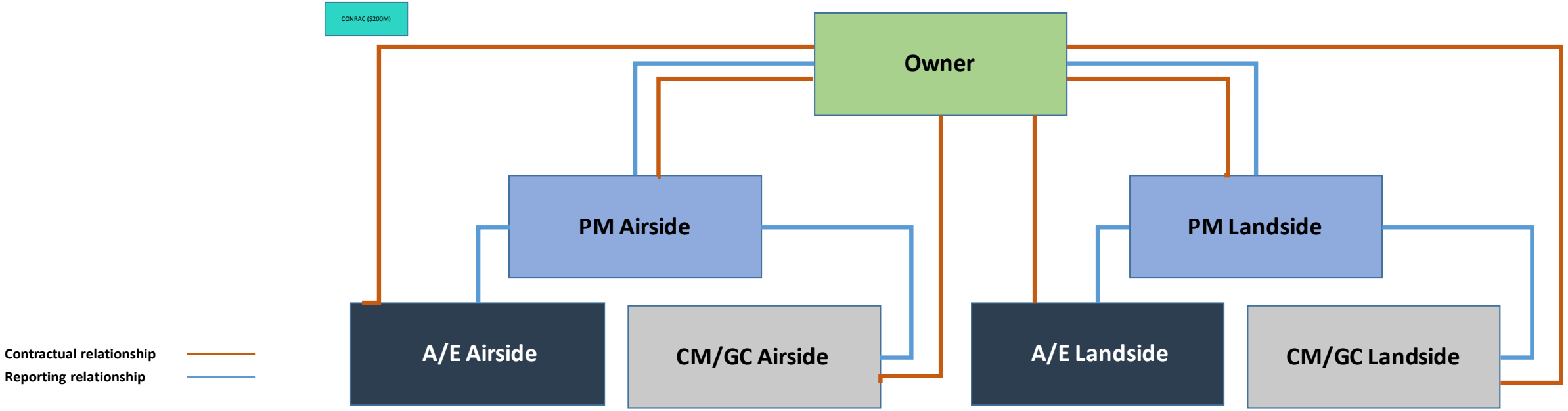


Airside Work

Landside Work

Under this structure the work is divided into two broad elements. Project teams structured to deliver each element.

Under this structure there would be a minimum of 6 procurements.



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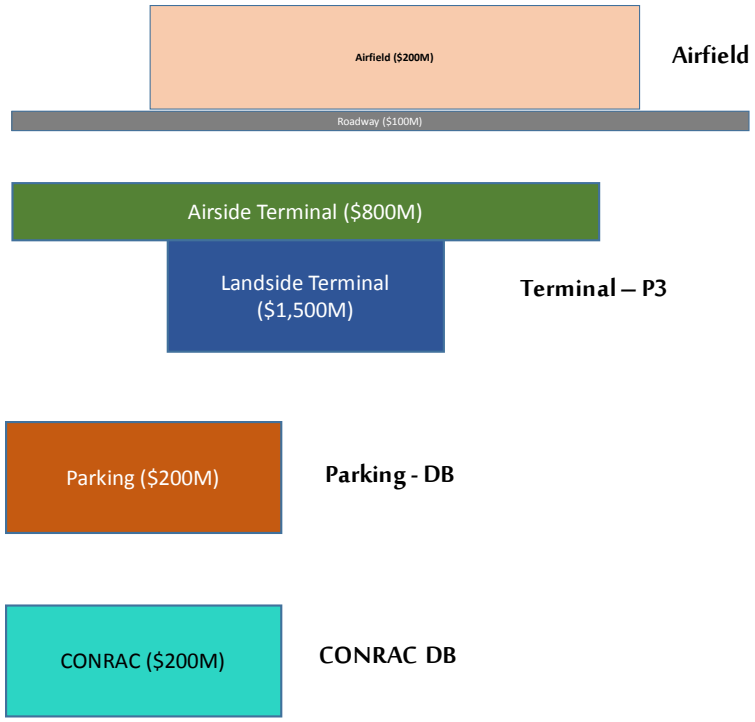
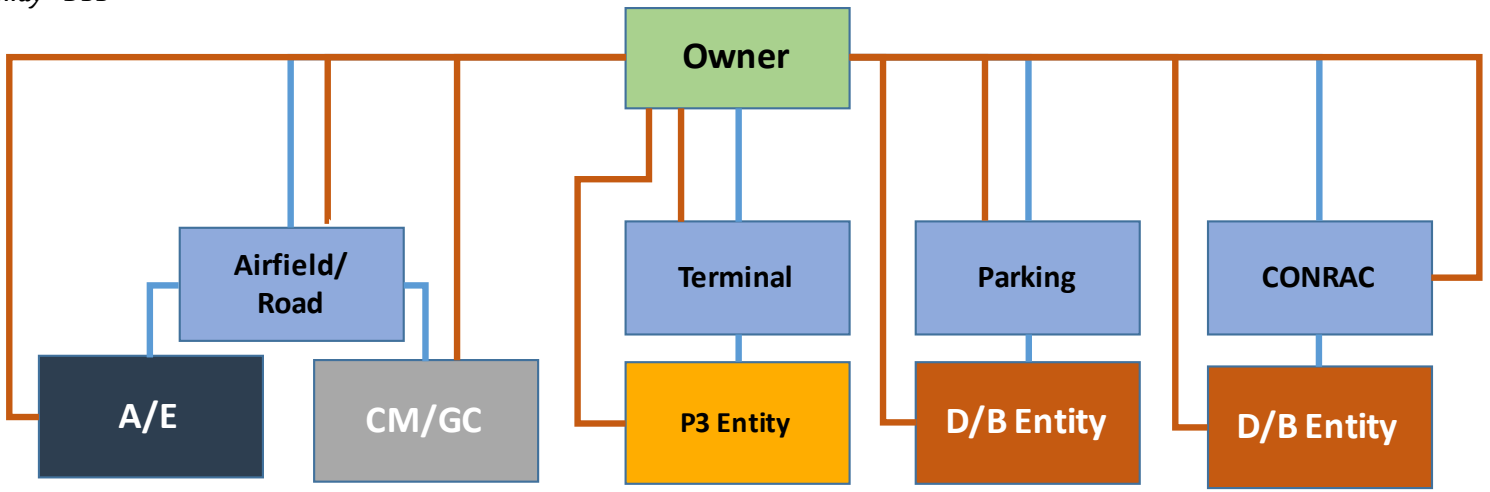
Part 2- Delivery Structures and Methods

STRUCTURE 3 – D/B/B, P3, DB with multiple teams





Under this structure, the work is divided four major scope elements. Project teams are structured to deliver each element as shown in the figure above. Under this structure there would be a minimum of 9 procurements.

Contractual relationship
Reporting relationship

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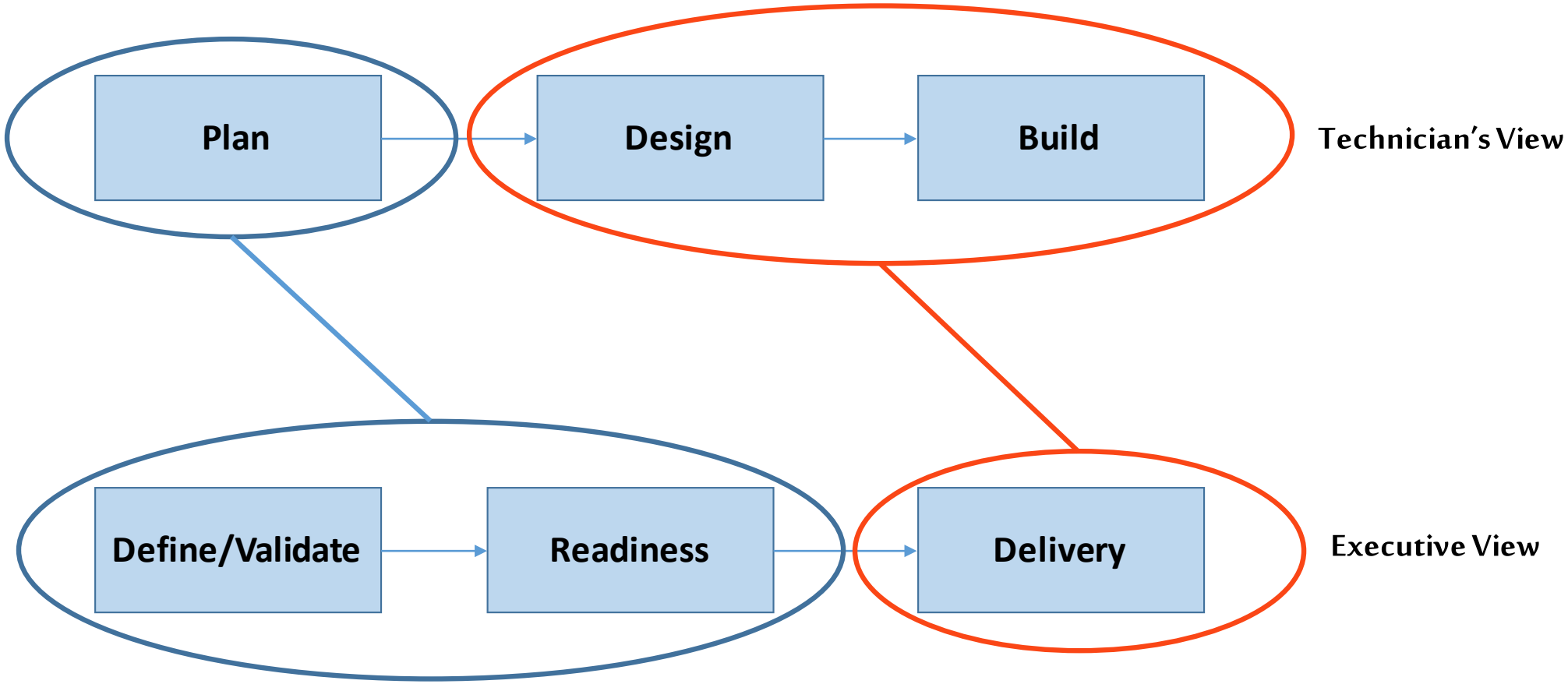
Part 2- Delivery Structures and Methods

END PART 2

Part 3 - Capital development process

Different viewpoints to the same process: both important yet fundamentally different



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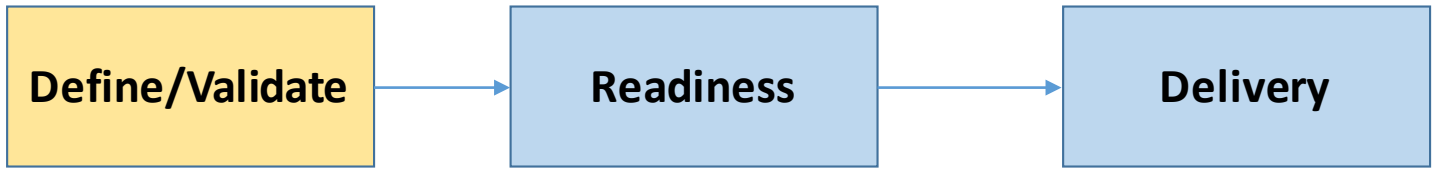
Part 3 - Capital development process

DEFINE / VALIDATE

- When was the scoping for the project performed? (cost, schedule, funding)
- Was the project/CIP part of a financial feasibility study (rates & charges model)? When?

  NOTE: if data is > 12 months then need to update/refresh (See Part 1 – market conditions)

- What cost elements are reflected in the budget? (direct construction, soft costs (a/e, pm, specialty consultants, testing, controls, sustainability, internal project staff)
- Is a specific delivery method assumed in the estimate/budget? If so which one and why? What would be the impact to cost/schedule/funding is a different method utilized?
- Do you have the proper resources to properly define/validate scope, cost, budget, funding, schedule (internal/external)? If not, then what is the process to have needed resources available? Timing?



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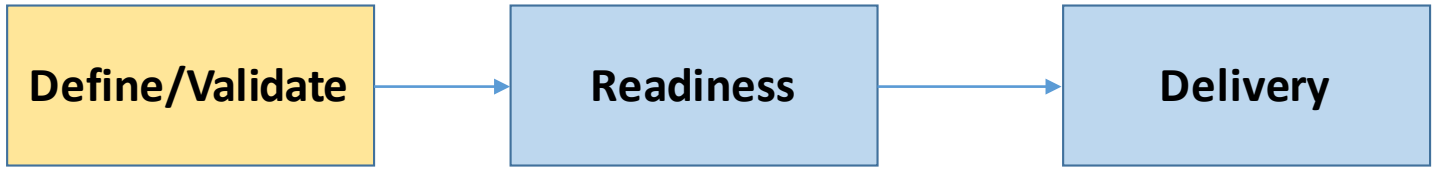
Part 3 - Capital development process

DEFINE / VALIDATE (CONTINUED)

- What expectations have been set for the project/program? (Board, City Council, community, etc.) and are such consistent with the budget/schedule/funding plan?
- How will other considerations such as small business participation, MBE/WBE/DBE, be reflected in the budget?
- Are the funding assumptions utilized (a) reasonable [proper level of PFC, CFC, and Airport Funds]; (b) does plan of finance limit future flexibility; (c) debt service ratios appropriate?
- Do we have a formalized document(s) that captures validated project scoping and if so in what form?
- How will performance of validated data be tracked as project is implemented?
- What are the major risks of the program and how can they be mitigated (through delivery method/contract structures, financing strategies, internal management structure to oversee the project)?



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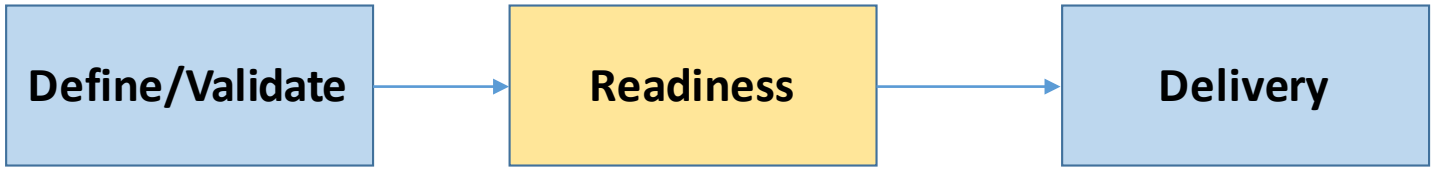
Part 3 - Capital development process

READINESS

- What type of approval is needed to move forward with the project and what is best method to achieve successful outcome? Do we have the right information for success? (refer to DEFINE/VALIDATION)
- Do we have the needed resources to ensure highest probability of approval (internal/external)?
- Do we understand how the organization will be impacted by the implementation of the project? (Finance, Engineering/Construction, Planning, Operations, Maintenance, Other)? What data/information exists that we understand the impact?
- Do we have the needed systems to support and oversee the project? (ERP, PMSS, scheduling, other)? Has a gap analysis been conducted (at least a first pass)?
- Do we have the needed processes to support and oversee the project? (Policy)
- Do we understand and agree on the level of control we seek as the owner organization? (NOTE: see comments on program director/PM preferences)



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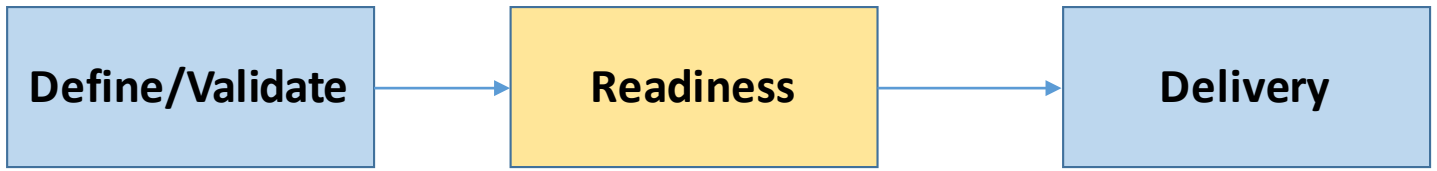
Part 3 - Capital development process

READINESS (CONTINUED)

- Do we agree on the type and level of governance to be utilized in managing and administering this project? (all phases)
- What type of risk mitigation is in place for proposed project from an insurance perspective? How will such be reflected in procurements (PM, A/E, contractor, other consultants)?
- Do we understand how program structure and/or delivery methods affect budget, schedule, procurement, funding, compliance?
- Have we quantified the number and types of new/revised contracts and procurements that will be needed to implement the project? Do we have the resources to support needed procurements?
- Do we understand the risk transfer and associated behaviors with project delivery structure and method?
- Do we understand the funding and compliance implications associated with project delivery structure and method?



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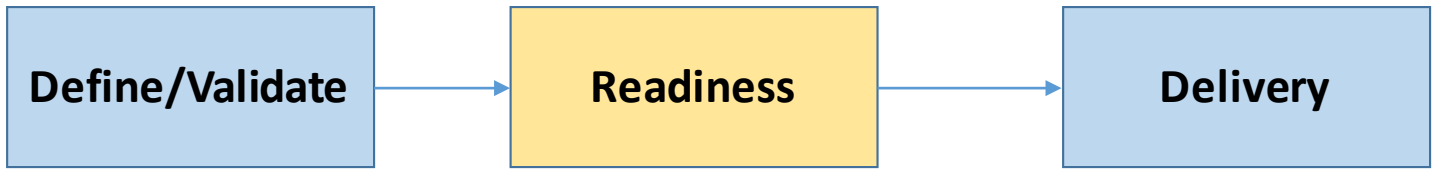
Part 3 - Capital development process

READINESS (CONTINUED)

- How difficult will it be to stop, change course, or accelerate the project given a selected program structure and delivery method?
- How will we measure performance across all levels of the implementing team (PM, A/E, builder (GC, CM), P3?)?
- How will the project achieve sustainability objectives & how is such reflected in the budget?
- Is there agreement on the individual ultimately responsible for delivering technical aspects of the project? Do we have insights into program structure/delivery methods preferences of this individual? Are they consistent with CEO's views/Board? (e.g. a highly involved CEO vs. a very independent project director for example)
- Is there a formal document that captures key program structure/delivery decisions?



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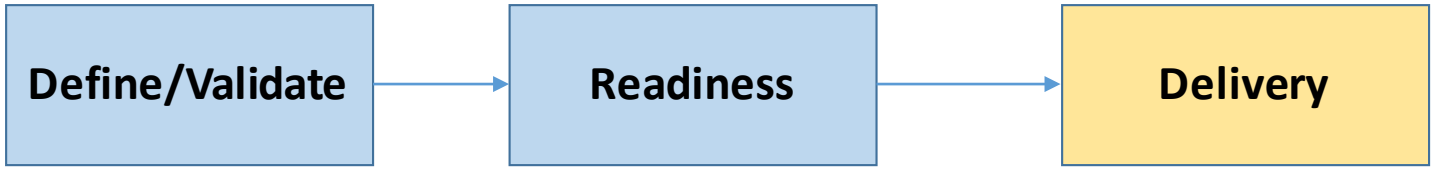
Part 3 - Capital development process

DELIVERY (DESIGN)

ALL DELIVERY METHODS

- What type of designer does the Owner seek (conceptual, production, other)? Are cost implications of each selection understood and reflected in the budget?
- What type of a fee will be negotiated (LS, NTE); how will labor rates be established for base scope of work and modifications? How will travel and reimbursable expenses be handled?
- Does A/E firm have the needed internal PM and delivery staff with the specific required expertise to manage complex teams?
- From what office will work be performed?
- How will owner ensure discipline in scope at all levels of the organization? What process will be used to measure outcomes?



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Part 3 - Capital development process

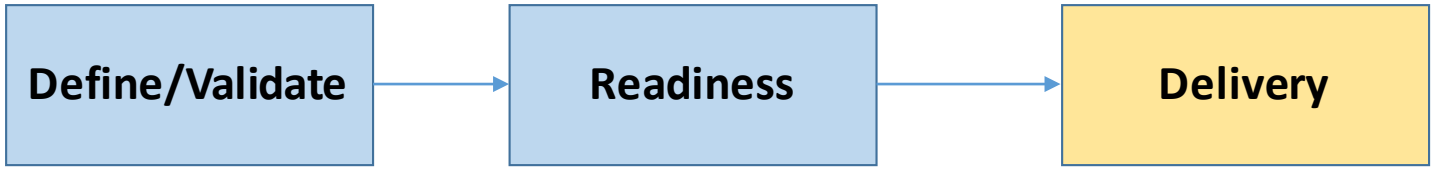
DELIVERY (DESIGN)

ALL DELIVERY METHODS (CONT)

- What process will be used to track, manage, and price bulletins* prior to issuance to contractor? What will be validation process (bulletins can have 1000's of drawings) – back to scope control?

*** Bulletins are akin to change orders in construction: issuance of drawings/specs to clarify design or incorporate new scope**

- Do we have the proper contract terms and conditions in the A/E contract?
- Does owner have the resources to adequately negotiate complex A/E fees/contracts?
- What will be appropriate risk tolerance (insurance) for A/E contract given size/features of project?



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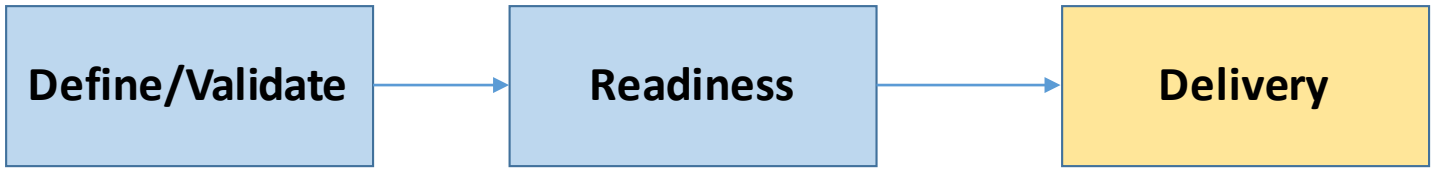
Part 3 - Capital development process

DELIVERY - (DESIGN, D-B-B)

- How will design deliverables be measured and reviewed (Conceptual/30/60/Construction Documents)?
- Was an independent estimate performed at each deliverable (one from owner vs. contractor)? Is there a reconciled estimate and how does it compare to the budget?
- Has value engineering and adequate review time been incorporated into each review cycle/deliverable?
- How will value engineering be conducted?
- Has funding impact been reflected in value engineering? Does rates & charges model need to be updated?

  *Note: airports are funded by asset and builders build by trade – not necessarily aligned
- How will owner explicit and implied decisions be reflected in design? How will owner track and manage scope creep (design review meetings…)
- How will construction administration services be negotiated? What level of service is expected and reflected in the fee?



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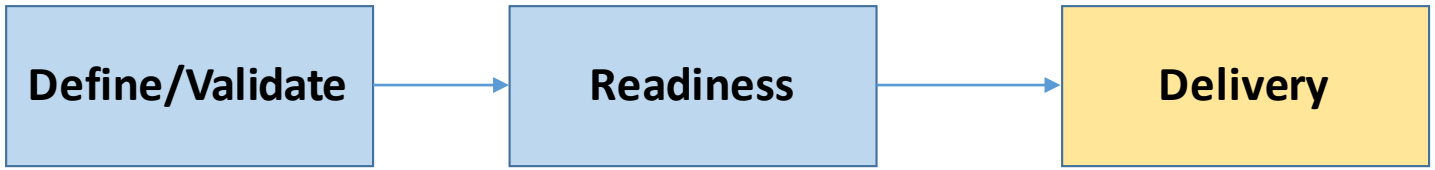
Part 3 - Capital development process

DELIVERY (DESIGN, D-B, see also CONSTRUCTION D-B)

- Does design criteria package properly delineate the scope of work and intent of project?
- Also – refer to prior comments on estimates, reconciliation, and value engineering (in preceding section)
- How comfortable is owner allowing D/B to interpret design intent and to what level?
- What controls are in place to ensure owner discipline to modify design intent after award of D/B agreement?
- How will design progress be measured within a D/B agreement?
- How will modifications to the design criteria package be evaluated and processed?
- Is the manner in which the project being designed consistent with plan of finance, assets, cost centers and resulting rates & charges?
- What is process for validating that requested changes were not part of base scope of work?



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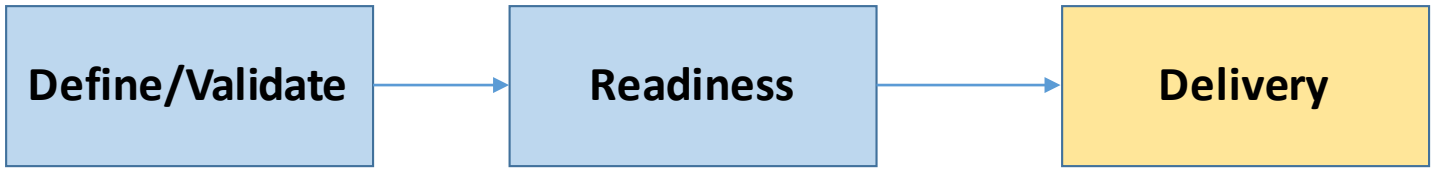
Part 3 - Capital development process

DELIVERY (CONSTRUCTION, D-B-B, CM)

- How will CM be selected? (experience, team, fee, other)
- Do we have a CM contract that addresses risk/risk transfer (contingency, allowable cost, trade bids, small business participation, federal procurement requirements, CCIP, liquidated damages, fee)?
- Do we have the resources to support such a complex procurement process? If PM selected, how will owner ensure PM is performing to achieve project objectives?
- What risk (limits of liability) is owner willing to accept?
- Schedule vs. cost (sometimes slowing down is better than speeding up & vice versa) – really understand the implications
- How to address implied decision making ("we need a decision now otherwise we will have to stop the job")
- Is the PM team ready to fully enforce contract terms and conditions?



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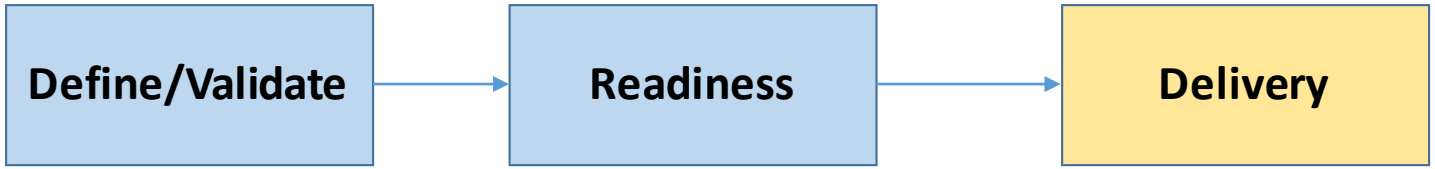
Part 3 - Capital development process

DELIVERY (CONSTRUCTION, D-B-B, CM) - Continued

- How will the trade subcontractor bid process work? Does the owner agree and will such process impact other Owner procurement practices?
- What level of preconstruction services are to be expected? And how will performance be measured?
- When will GMPs be set (prior to 100% design or only at 100% design)?
- How will GMP be managed from a compliance perspective and funding?
- Terms and conditions within GMPs and order of precedence in CM agreements?
- How will changes be evaluated within a GMP?
- How will general conditions, preconstruction services, and construction requirements be priced?



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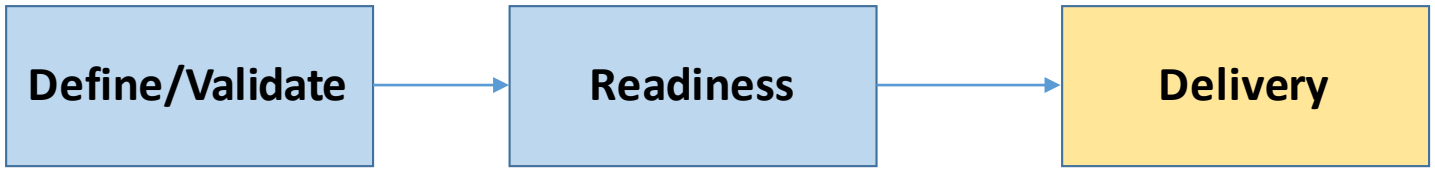
Part 3 - Capital development process

DELIVERY (CONSTRUCTION, D-B, CM) - Continued

- How will design be priced by D/B entity, e.g. design GMP then construction? Other method?
- When will GMP be established?
- How will changes be evaluated?
- How will general conditions, preconstruction services, and construction requirements be priced?
- How will design changes be made?
- How will contingency be accessed?
- How will budget be evaluated at each design deliverable stage?
- How will GMP be managed and funding / compliance implications (line item, overall, other)?
- How will bulletins be reviewed and priced?



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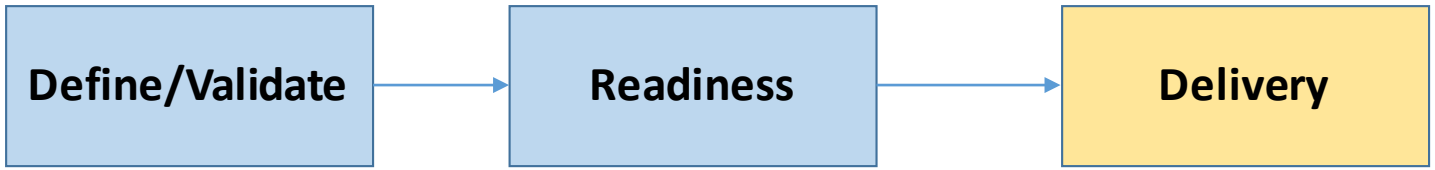
Part 3 - Capital development process

DELIVERY (P3)

(Programming)

- Has the owner properly defined the project (to be part of P3)?
- What about enabling projects? How much flexibility on implementation dates for enabling projects?
- Does the scope align with ability to create an equally viable revenue stream.
- Has the above bullet been vetted and by whom? Experienced with the revenue stream and market volatility? * Many get this initial phase wrong/inaccurate and then they have to loop back many times.
- Have operational requirements been considered?
- Is funding plan aligned with the scope?
- What occurs when planned funding doesn't materialize?



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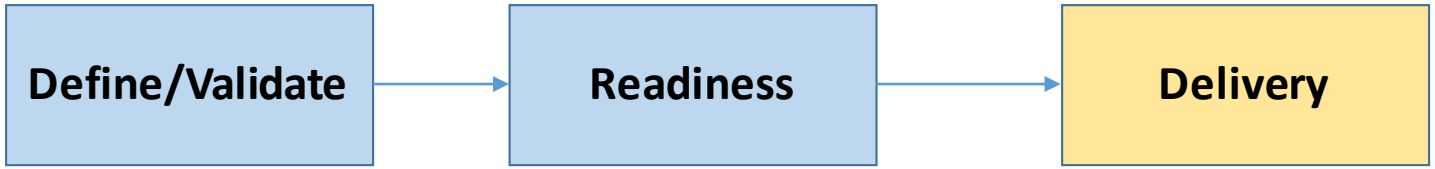
Part 3 - Capital development process

DELIVERY (P3)

(Procurement)

- Who is going to manage the procurement?
- Who will author the RFP?
- How will proposals be evaluated?
- What is the evaluation/selection criteria?
- What are the legal requirements?
- What financial, bonding, Insurance's are required?
- Liquidated damages (Y/N)?
- How will asset maintenance requirements be measured?
- How will asset quality (initial build) be measured?



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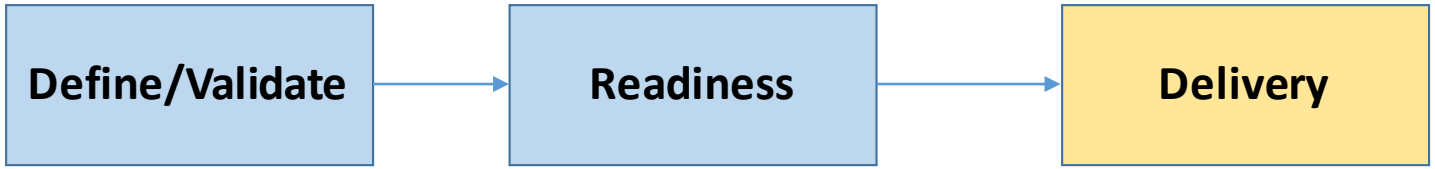
Part 3 - Capital development process

DELIVERY (P3)

(Procurement)

- What are the local, state politics?
- Will a prequalification process be used? How will it be handled?
- What is the commitment to SBE, veterans, local higher, etc?
- Role of sub contractors?
- Risk management approach to the project (performance, financial, market, other)?
- What flexibility does the owner have ("off ramps")?



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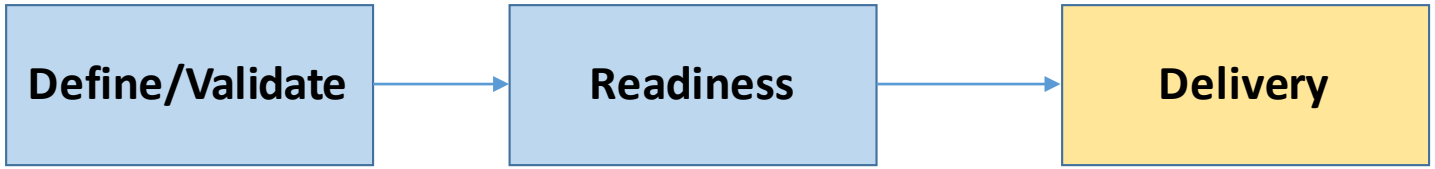
Part 3 - Capital development process

DELIVERY (P3)

(Delivery)

- What are owner expectations during design/construction?
- What are the rules and expectations for setting a GMP?
- Who oversees design and construction?



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Part 3 - Capital development process

END PART 3

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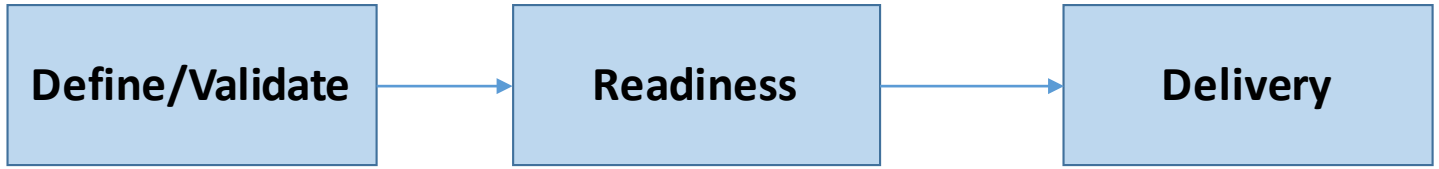
Part 4 - Key Takeaways

- Owners have most influence over outcomes during the Define and Readiness phase. Changes during Delivery phase have increasingly less impact at an increasingly higher cost
- Understand your organization's capabilities, culture, and ability to absorb change, versus what the project will require. Understanding any identified gaps will provide important insights to making appropriate delivery decisions
- Proper governance and measurement does not mean slowing down or bogging down design/construction progress but rather accurately places owner in control of capital activity
- Understanding how program structures and delivery methods work facilitates use of proactive measures to set up your organization for success



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