2016
FRA Rail Program Delivery
Meeting

Rolling Stock Procurements – Lessons Learned

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Purpose of this Presentation

- The purpose of this session is to:
  - Present why rolling stock procurements, particularly for Passenger Rail, can be challenging
  - Provide an understanding of the complexity of management and execution of design/build procurements
  - Present high-level recommendations on how to be better prepared for the management of rolling stock procurements

Preamble

- All remarks made during this presentation are based on observations made during years of oversight or advisory roles supporting rolling stock procurements

- No remarks or conclusions shall be attributed to any specific customer, vendor, or other stakeholders (unless specifically mentioned)

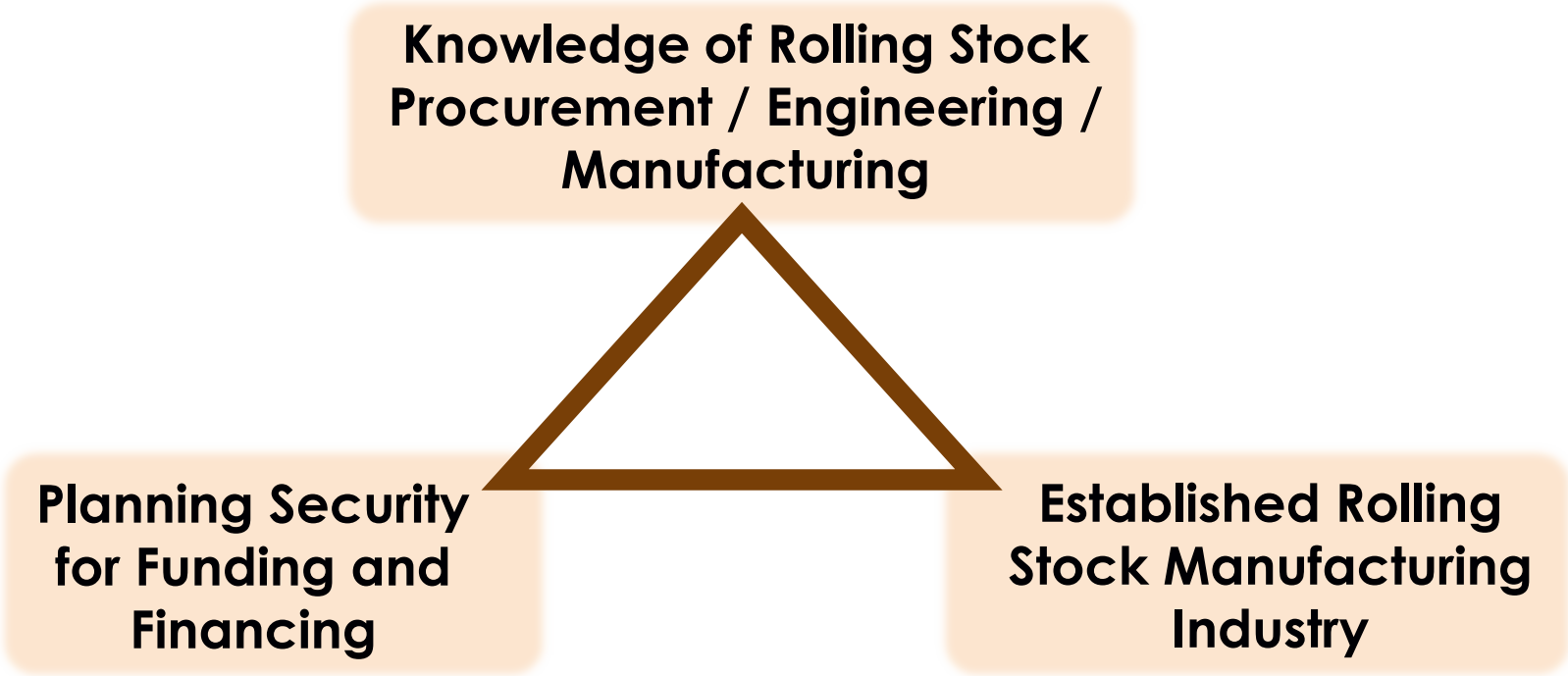
Why are Rolling Stock Procurements challenging?

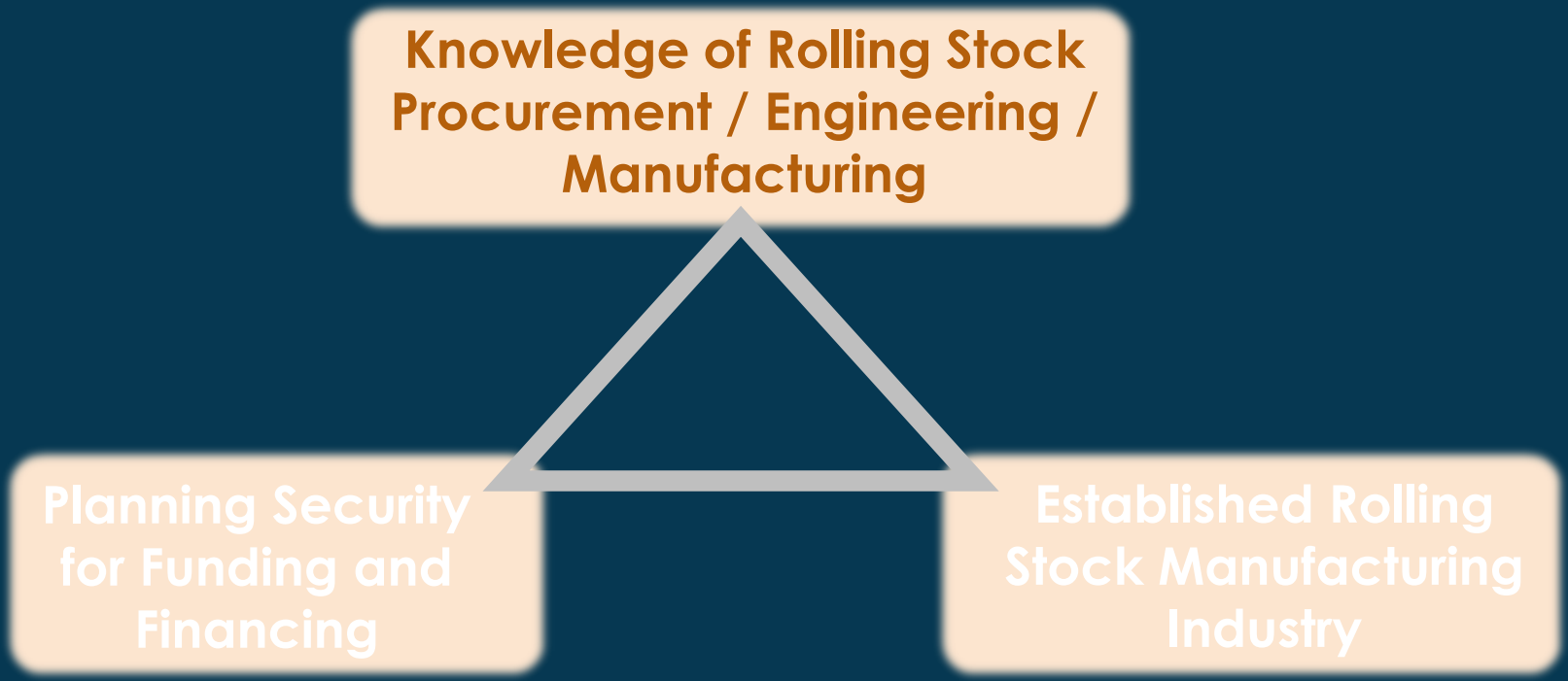
- In the Passenger Rail rolling stock market, procurements are particularly challenging for a myriad of reasons.

  A view from various perspectives:

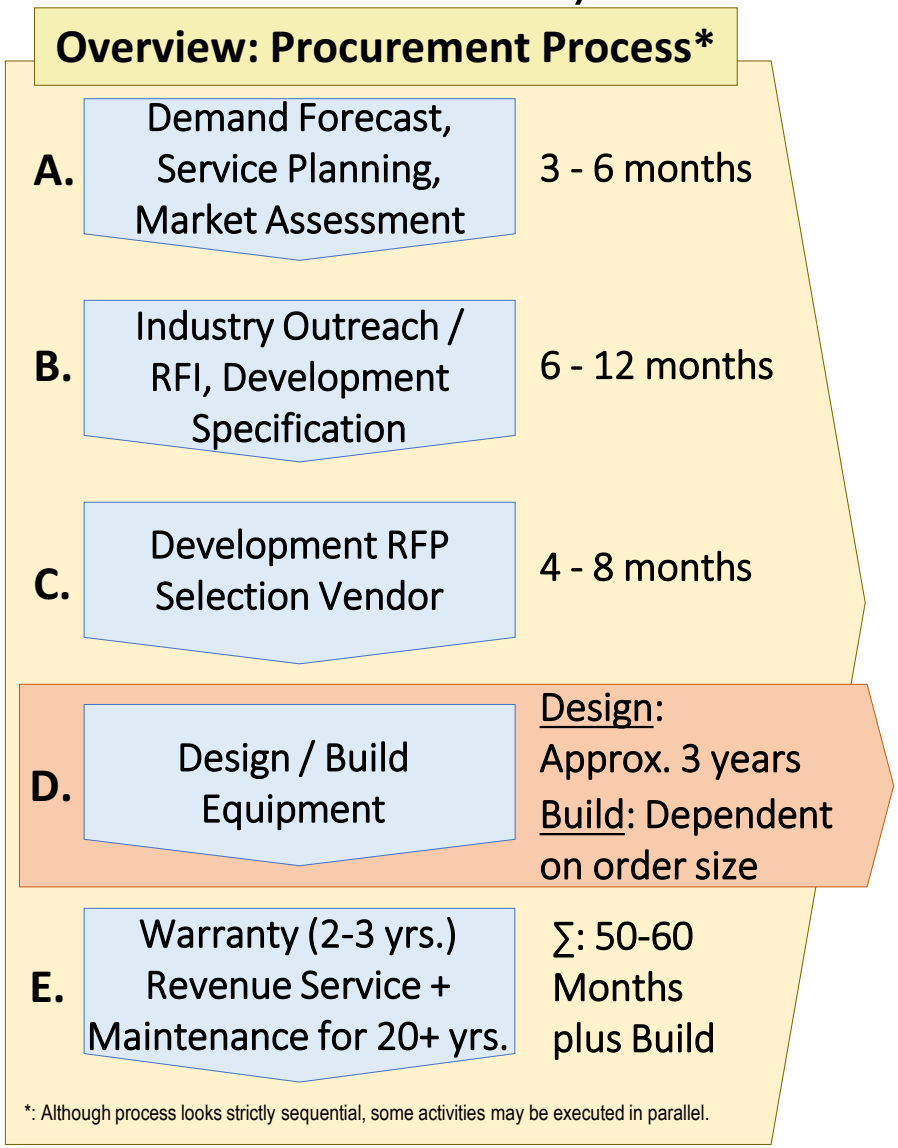
  - **Need for Rolling Stock Knowledge** – Customers (old and new) need deep rolling stock know how for procurement, engineering, manufacturing, operations, and maintenance
  - **Evolving Standards** – Increasing expectations for fully integrated U.S. based design/test/manufacturing expertise
  - **Unpredictable Funding** – Customers as much as vendors face unpredictable funding/financing security
  - **A difficult Market** – Fluctuating demand for new rolling stock and price competition impede industry stabilization.

Three high-level key success factors help achieve successful procurements




Knowledge of Rolling Stock Procurement / Engineering / Manufacturing
Planning Security for Funding and Financing
Established Rolling Stock Manufacturing Industry

Knowledge of the Complete Procurement Process is a Key Customer Responsibility



The **Customer** manages the overall process from fleet planning to operations and needs to link all required steps

➡ **7-8+ years**

The **Vendor** manages and executes the design and manufacture of the rolling stock as required in the contract

➡ **4-5+ years**

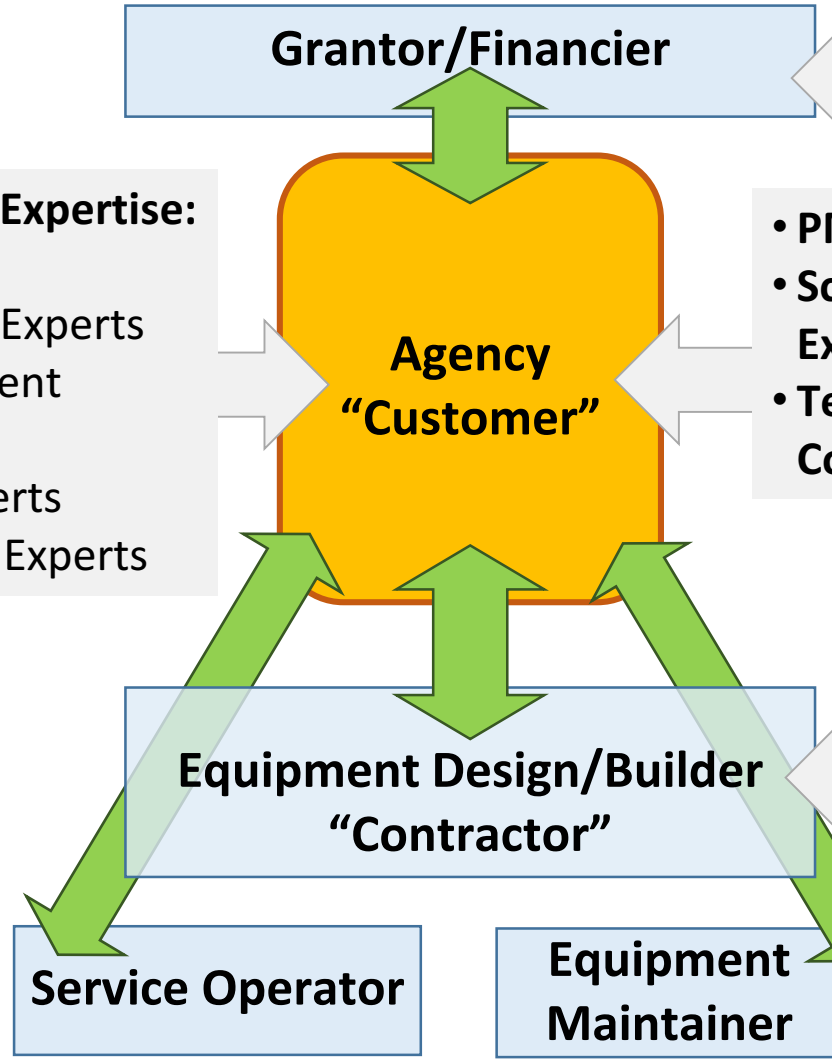
Throughout the procurement the Customer needs to manage various Stakeholders

Regulatory Framework:
- –FRA Office of Safety
- –ADA
- –Buy America
- –Etc.

Standard Setting Framework:
- –AAR
- –APTA
- –Etc.

Other Framework:
- –Host Railroads
- –Amtrak
- –Etc.

Functional Expertise:
- PM
- Technical Experts
- Procurement Experts
- Legal Experts
- Contracts Experts



A few examples…

- FRA Office of Safety – Customer / Vendor benefit from early involvement
- Service Operator – Understand them early and incorporate in RFP/contract/Customer plans
- Standard Setting Bodies – E.g. AAR and APTA working on new standards
- Equipment Maintainer – Plan years ahead to ensure maintainer availability, capability, contracts, facility equipment, costs, etc.
- Customer resources inhouse / external – Time to procure technical/schedule/contract experts
- Grantor – Grant requirements, reporting, cost eligibility, compliance with grant application/award, matching funds, etc.

Far before the RFP, the Customer can gather key industry intelligence

- Early Industry Outreach and Request for Information (RFI)
- Request for Proposals (RFP)
  - Key process step that determines the methodology for the vendor selection (among many other aspects)
  - Determines the relative importance of bidders' technical capability and their cost proposals.

Example 2-step procurement approach:

- Step 1: Submittal only Technical Proposals and with pass/fail selection
- Step 2: Only for technical acceptable proposals, submittal cost proposals, potentially 101 negotiations, BAFO, etc.

Prescriptive vs. Performance Specification

Prescriptive Specification:

Description of the technical scope of the equipment and the exact requirements

- Preferred if new equipment needs to be compatible with existing fleet
- Builds from established/ proven designs
- Much more detailed specification, easier to compare proposals

Performance Specification:

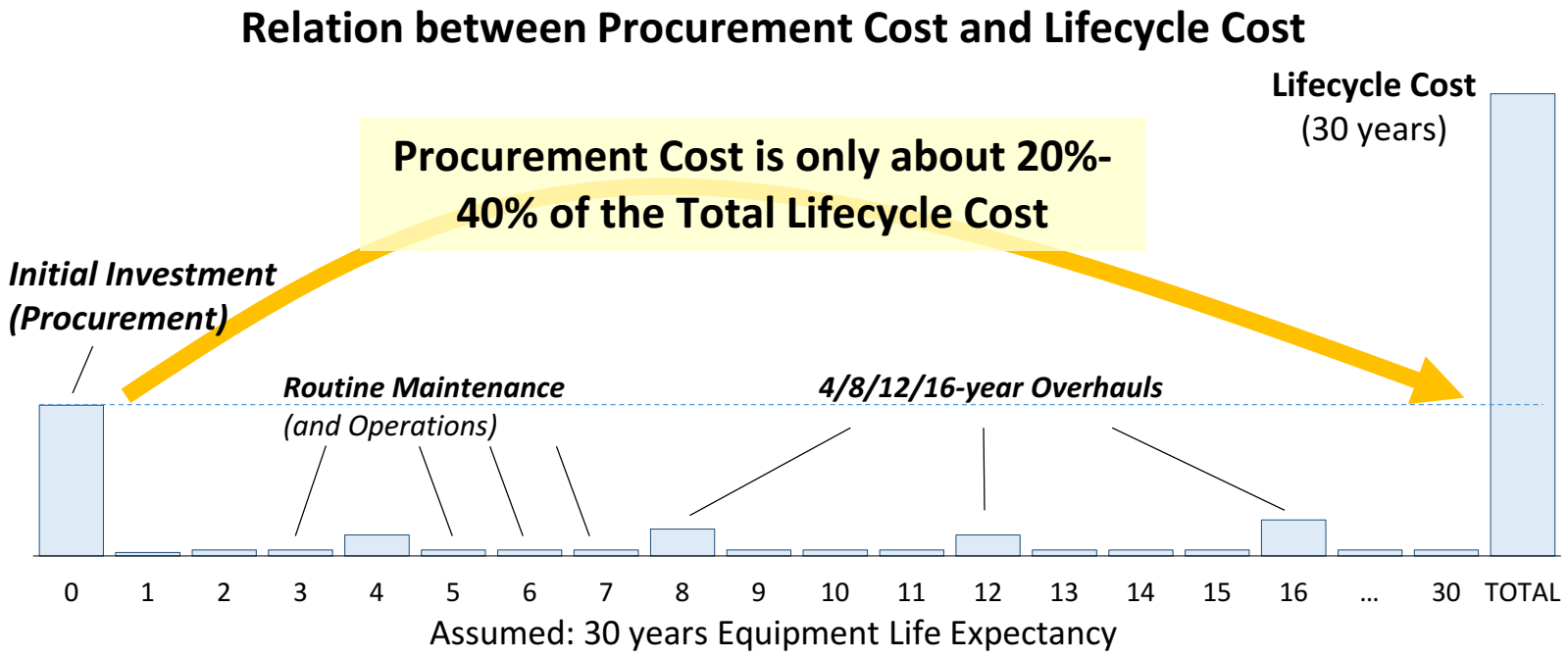
Description of the required performance of the equipment

- Allows builder to incorporate their proven off the shelf designs as well as innovations
- This may lead to reliability improvements, higher performance, and lower LCC
- Less detailed specification, but more complex proposal evaluation

Each Customer needs to tailor the specification to its specific needs – often with prescriptive and performance elements

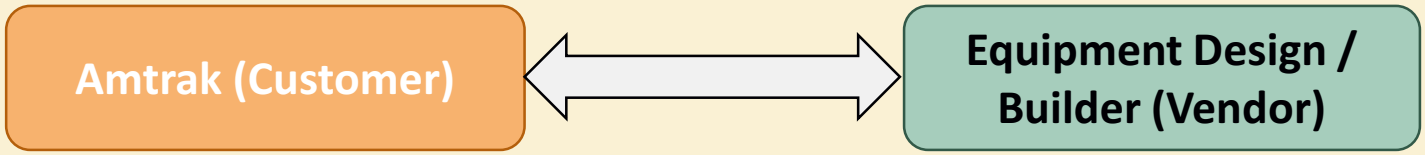
The Customer is not only managing a procurement, but a 20-40+ year investment

- The procurement is just the beginning of a 20 to 40+ year investment.
- Quality equipment with high reliability and maintainability lead to low Lifecycle Cost (LCC)
- Initial procurement cost is not the overall LCC cost driver



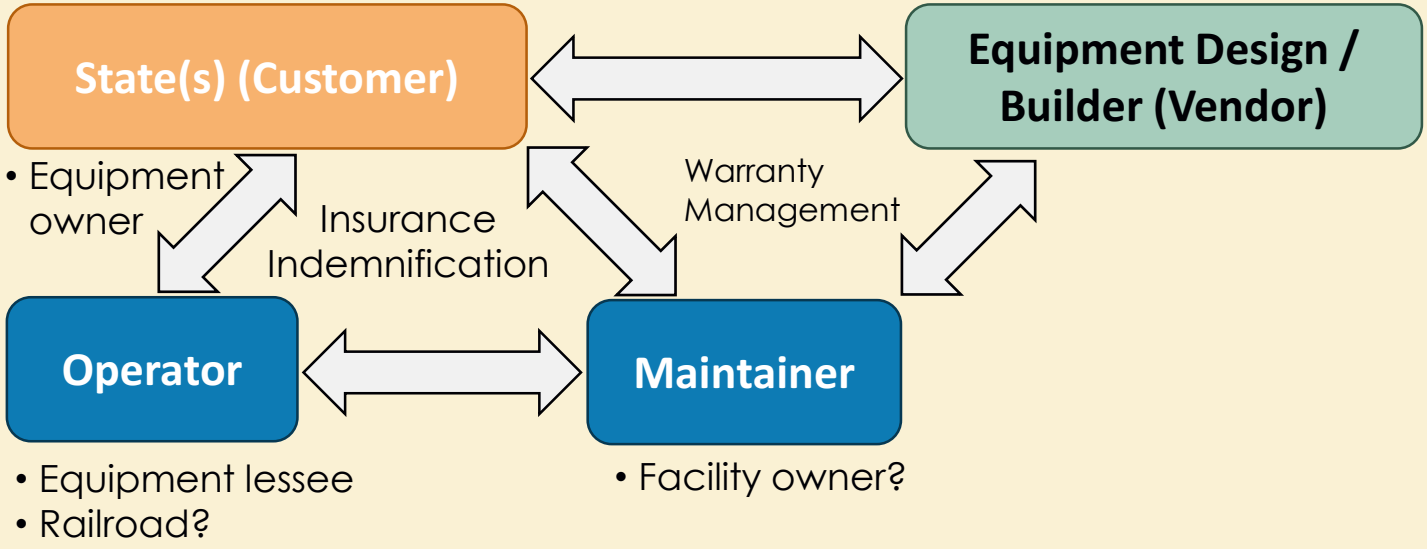
With recent State DOT Procurements the Stakeholder Model has significantly changed

Established Model: Amtrak (=Customer) and Vendor



- Equipment owner
- Operator
- Maintainer

New Model: State(s) (=Customer) and Vendor



The Critical Path Schedule is the central project management tool

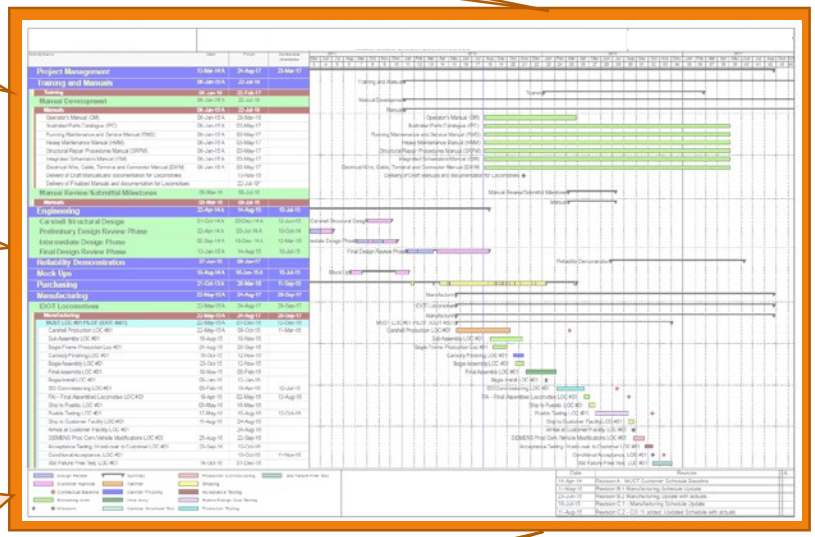
Schedule needs to be developed bottom-up based on resources, capacities, cost, etc. – NOT TOP-DOWN

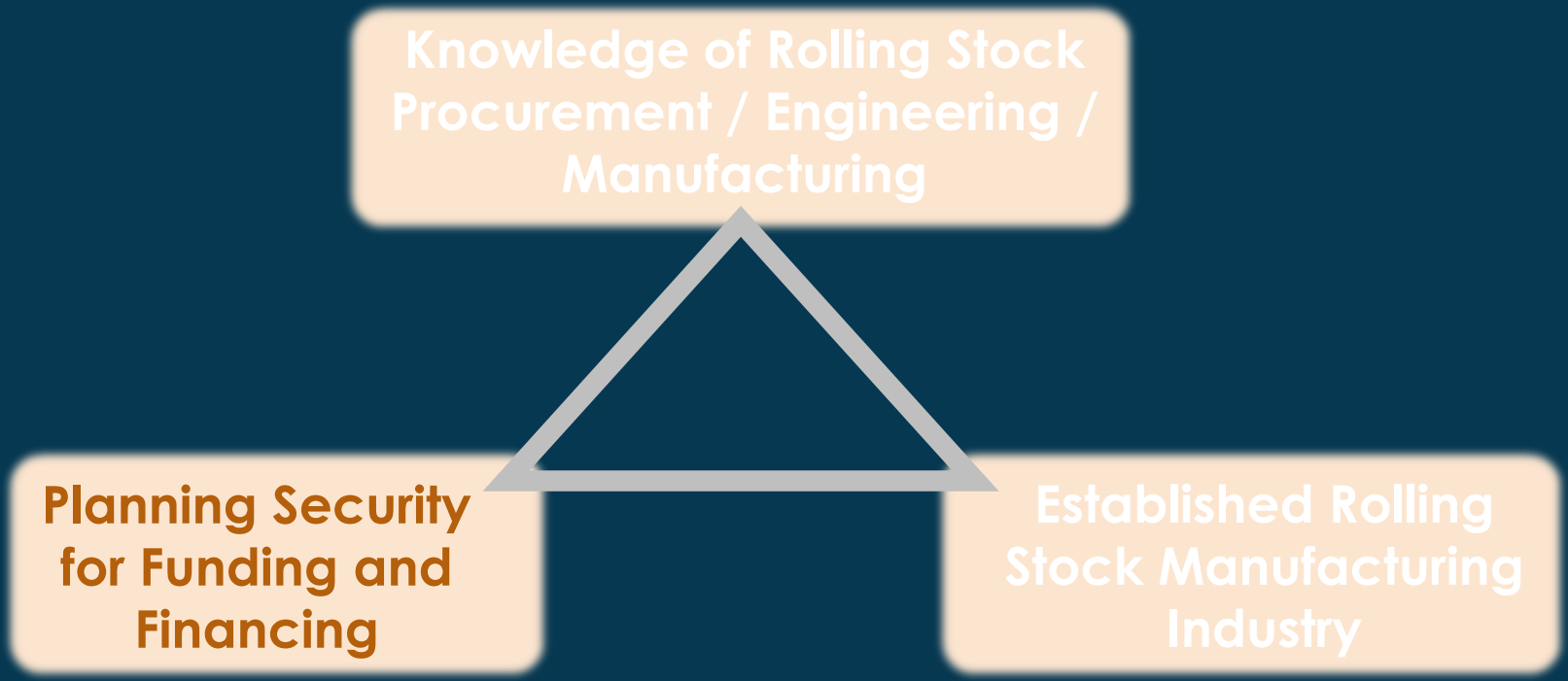
Independent Schedule Department / Expert

Critical Path is the longest logical path - determines shortest time for project completion

1. List of all activities to complete the project (work breakdown structure)
2. The duration of each activity
3. The dependencies between activities
4. Logical end points such as milestones or deliverable items

Industry standard CPM scheduling software, ideally linked to vendor systems (resources, costs, supply logistics, etc.)

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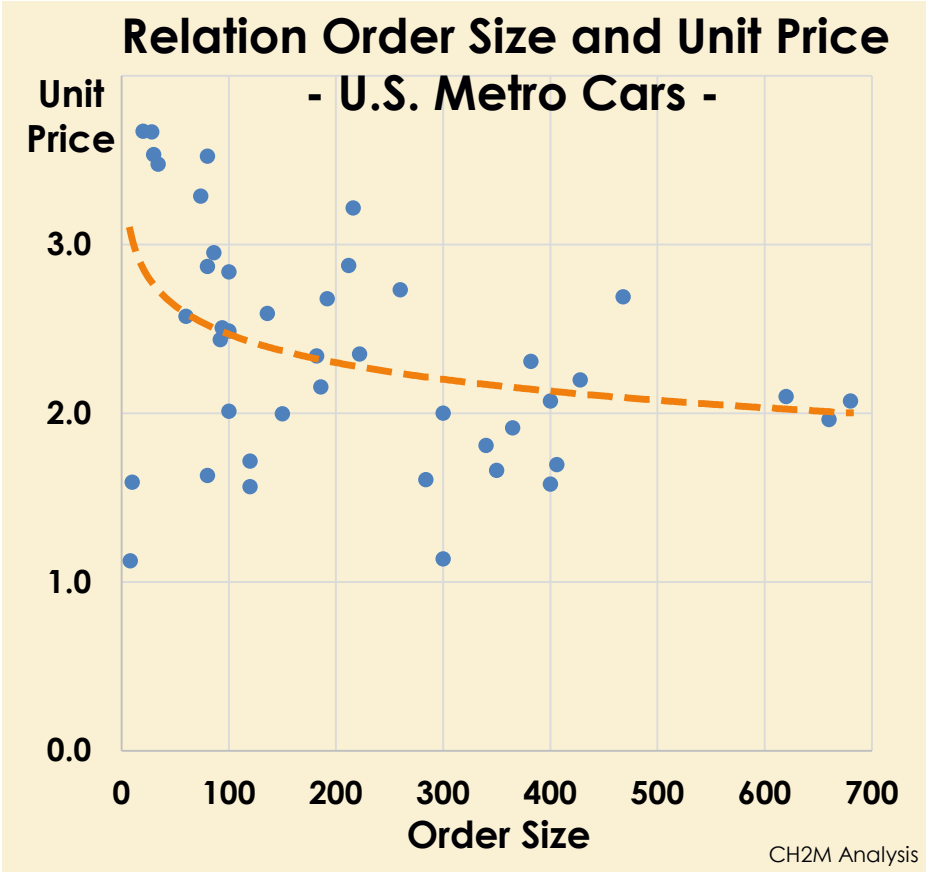
Funding Security has been an overarching Risk Factor to the Market

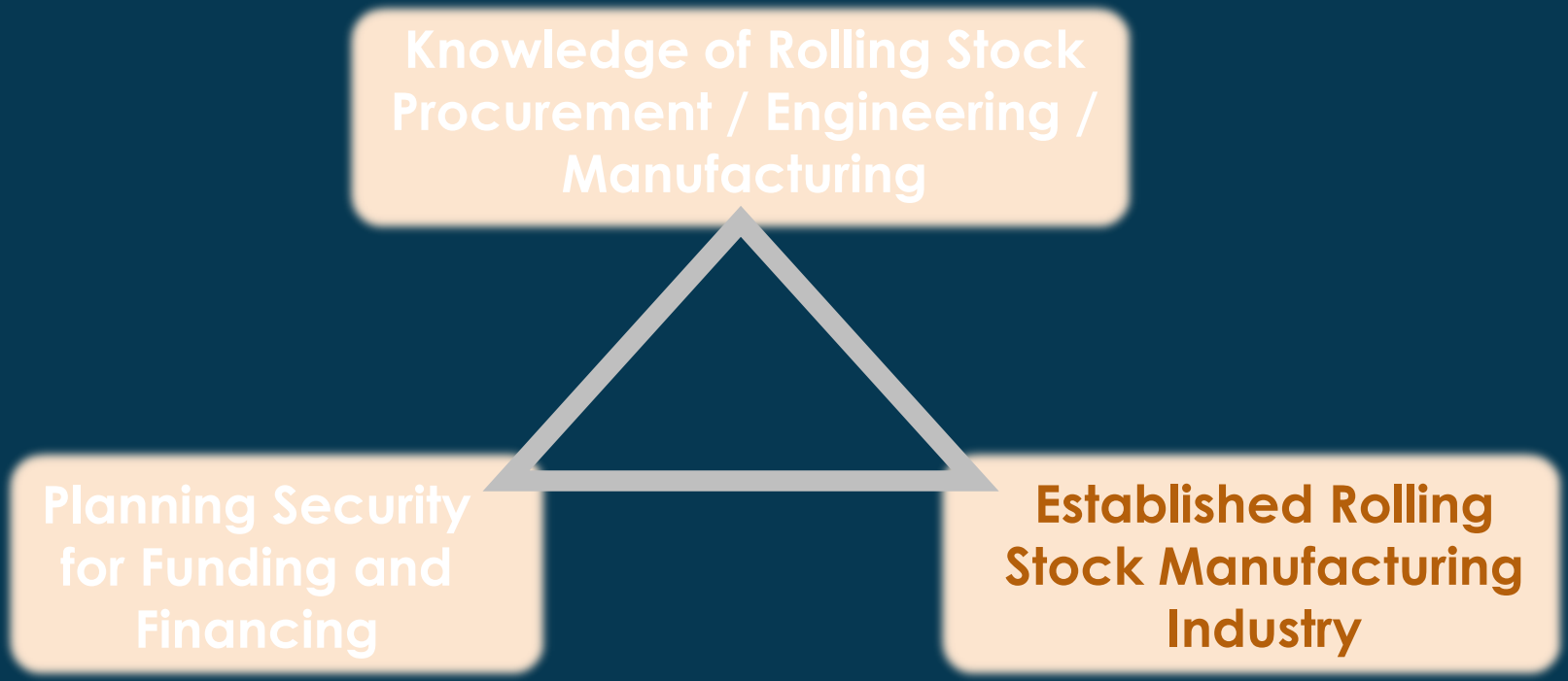
- Passenger rolling stock in the U.S. is funded with Federal or State funds. Only recently, other sources such a loans (e.g. RRIF) have started to become an established alternative
- Funding/Financing is part of a long-term strategic investment plan for equipment – timing is critical success factor
- Customers as much as the manufacturing industry benefit from predictable funding or financing.

Predictable Funding/Financing provides significant security to Customers and the Manufacturing Industry

Multi-State Procurements …

- Development of procurement documents (RFI, RFP, etc.) very challenging due to state-specific rules and regulations
- Extensive coordination required throughout the project
- Conflicts will come up as in all complex projects
- **HOWEVER** – monetary benefit of demand bundling and unit price outweighs the additional effort

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Various manufacturers offer cars and locomotives in the US passenger rail market

		Intercity Passenger Rail		High Speed Rail		Regional Rail		Metro Rail		Light Rail		Streetcar	
#	Manufacturer	Loco.	Cars	Loco.	Cars	Loco.	Cars	Loco.	Cars	Loco.	Cars	Loco.	Cars
1	Alstom		✓	✓	✓		✓		✓		✓		✓
2	Bombardier		✓	✓	✓	✓	✓		✓		✓		
3	Brookville equipment					✓							✓
4	CAF		✓										
5	EMD	✓				✓							
6	Gomaco												✓
7	GE	✓				✓							
8	Hitachi (AnsaldoBreda)								✓		✓		
9	Hyundai Rotem						✓						
10	Inekon Trams												✓
11	Kawasaki						✓		✓				
12	Kinkisharyo										✓		✓
13	Motive Power	✓				✓							
14	Nippon Sharyo		✓				✓						
15	Siemens	✓	✓			✓					✓		
16	Skoda										✓		
17	Talgo		✓										
18	US Railcar						✓						
19	CRRC								✓				
20	Stadler						✓						

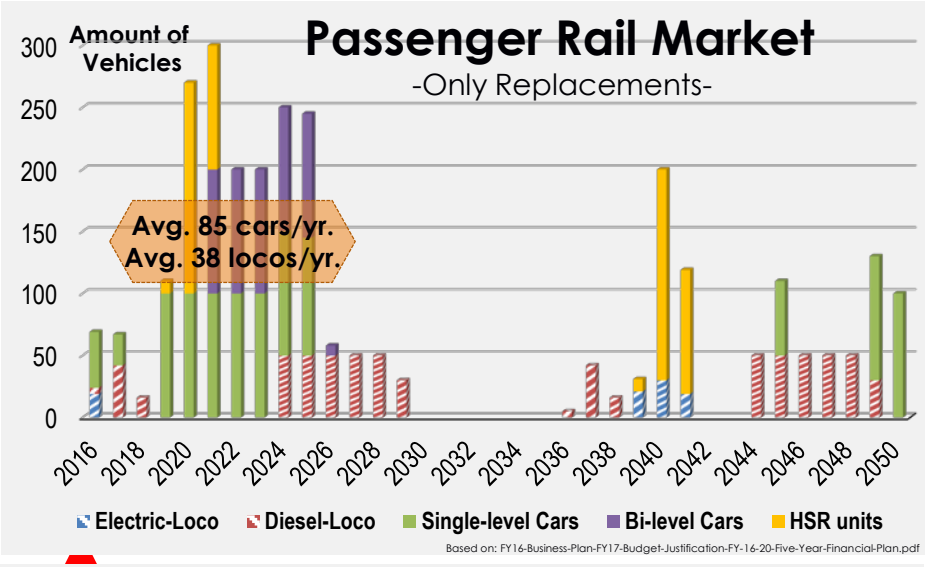
✓ Vehicle in service or in build

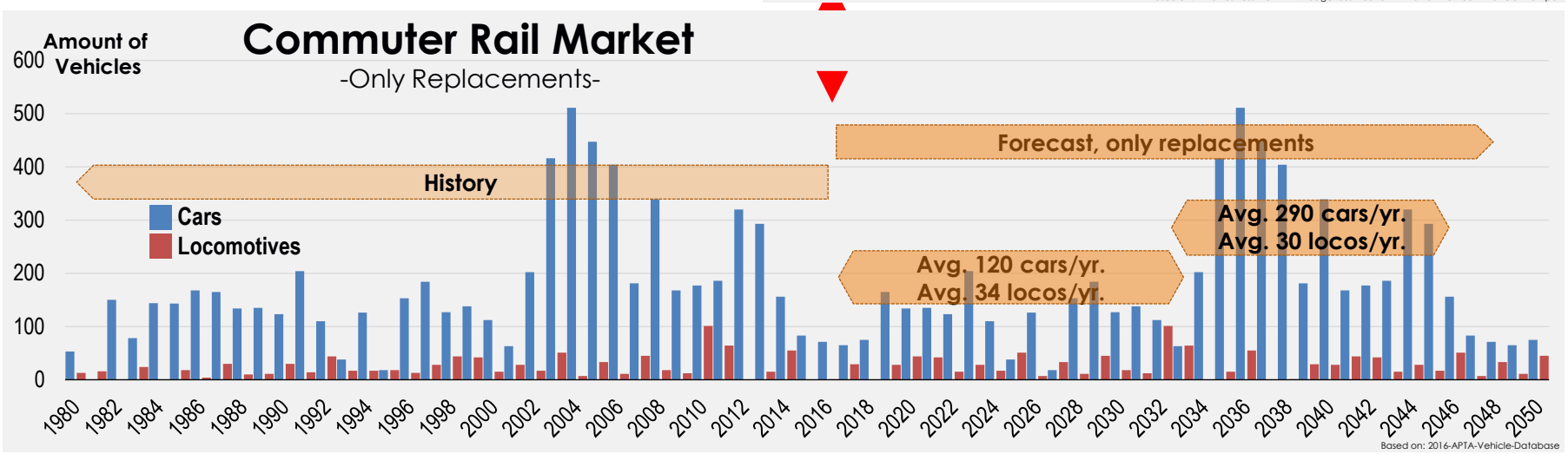
Offers vehicles internationally*

* Not specific to locomotives/cars

Overall, even a combined Commuter / Passenger Rail market is small and challenging

- Demand for Rolling Stock – Passenger Rail and Commuter Market
  - Overall, small market and demand
  - Strong demand fluctuation
  - Demand is also influenced by funding and financing
  - Benefits of demand bundling and standardization





The industry needs support through predictability and LCC optimization

- The manufacturing industry for Passenger and Commuter Rail rolling stock is challenged by:
  - An overall small market demand, strong demand fluctuation, and price competition
  - Unpredictable funding/financing plans
  - Likely manufacturing overcapacity
  - Increasing complexity, e.g. developing from "US assembler" to "US manufacturer"
  - Strategic market entries (and non-strategic exits)
- All this contributes to small profit margins and high risk projects

- The industry can most benefit from:
  - Customers having planning security
  - Customers follow a thorough quality driven approach away from strategic low cost bidding
  - Standardization supporting suppliers across all rail/transit modes

Where do we go from here?

Some concluding recommendations….

- The market is not going to fundamentally change
- We will need to manage the demand more efficiently = How do we / you do that?

1. Be a rolling stock procurement expert
2. Manage procurements under the LCC perspective – accomplish reasonable best prices
3. Think ahead – engage stakeholders and secure funding/financing **early**
4. Be a professional project manager
    1. Understand the logical scope and sequence
    2. Manage objective and thorough
    3. Hold vendor accountable

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Thank you!

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