

The background features a large iceberg floating in the ocean. The tip of the iceberg is visible above the water line, while the much larger, submerged part is visible below. The sky is blue with some clouds, and the water is a deep blue. The overall theme is the 'iceberg metaphor' for Total Cost of Ownership (TCO), where the visible part represents the initial purchase price and the submerged part represents the hidden costs.

IABSC Total Cost of Ownership

Martin Plazyk
Sr. Financial Consultant
Vanderlande
Martin.Plazyk@Vanderlande.com

Why will TCO help me?

By using repeatable financial and operational **analysis**, we can **provide insights** into system performance and costs, **optimize designs** earlier, and **engage stakeholders** with facts regarding their Baggage Handling System.



Agenda

- ▶ Vanderlande
- ▶ What is TCO?
- ▶ How can it be applied?
- ▶ Application examples
- ▶ Lessons Learned
- ▶ Questions

About Vanderlande

Vanderlande's baggage handling systems move **3.7 billion** pieces of luggage around the world per year.



Its systems are active in over **600** airports



Global e-commerce players and distribution firms have confidence in Vanderlande's efficient and reliable solutions



Vanderlande is a leading supplier of logistic process automation for warehouses and distribution centers.



An iceberg floating in the ocean. The visible tip is small and rounded, while the submerged part is much larger and more complex in shape, illustrating the concept of hidden costs. The background is a blue sky with light clouds and a dark blue sea.

Total Cost of Ownership

A financial analysis of all costs associated with something

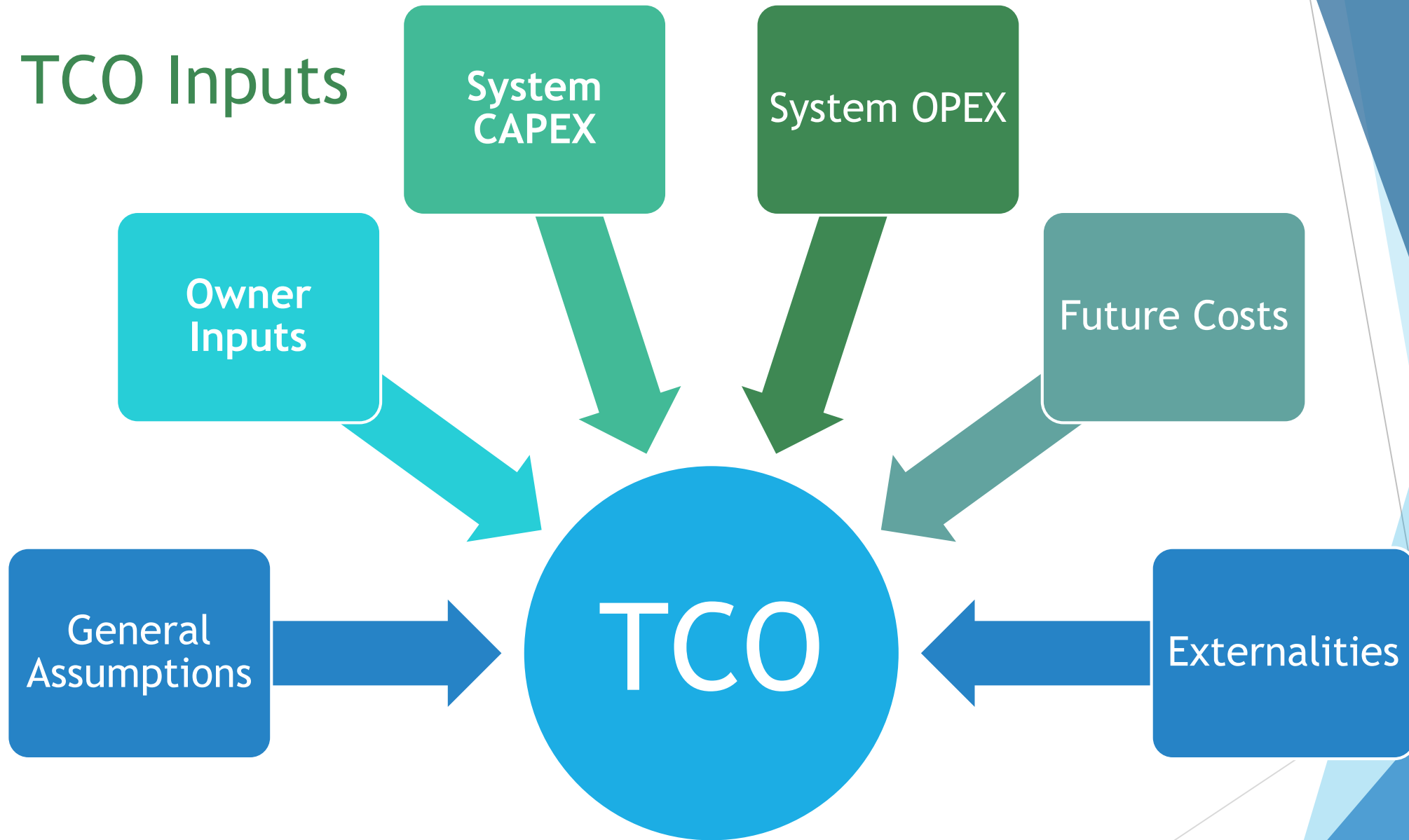


Total Cost of Ownership

Total Cost of Ownership



TCO Inputs



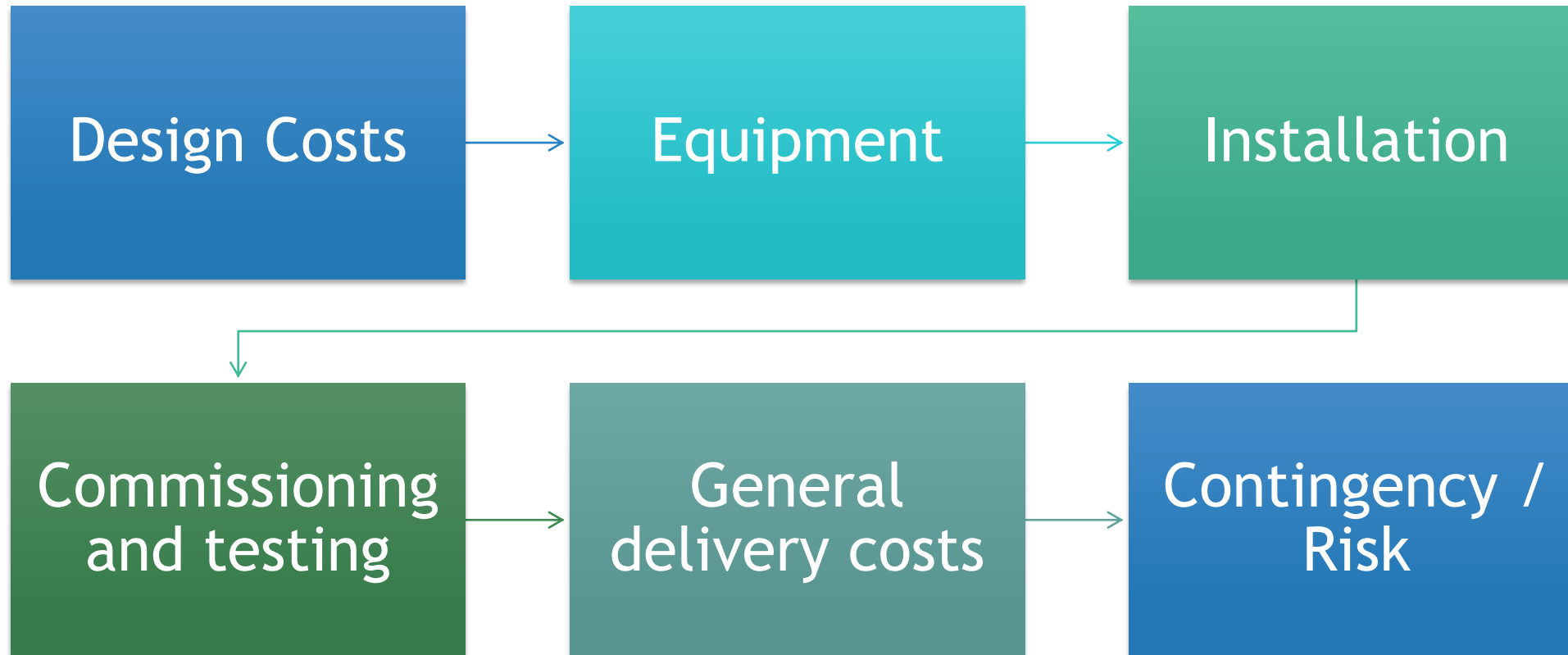
General Assumptions

- ▶ General information that lays the underlying ground work for the analysis



- ▶ System-specific budget categories
- ▶ Energy costs and rates
- ▶ Inflation expectations
- ▶ Time period

Capital Expenditures (CAPEX)



Operational Costs (OPEX)

Staffing

Management

Spare parts

IT and Support

Licenses and Fees

Energy

Space

OPEX Drivers

Environment

Technology
Choice

Service
Approach

Owner Inputs

Non-vendor costs

Use metrics

Missed Bag Costs

Depreciation

Discount rate

Any other customization

Future Costs

- ▶ Expanding the system
- ▶ Mid-life upgrades or refurb
- ▶ End of life costs



Externalities
(hard to
quantify)

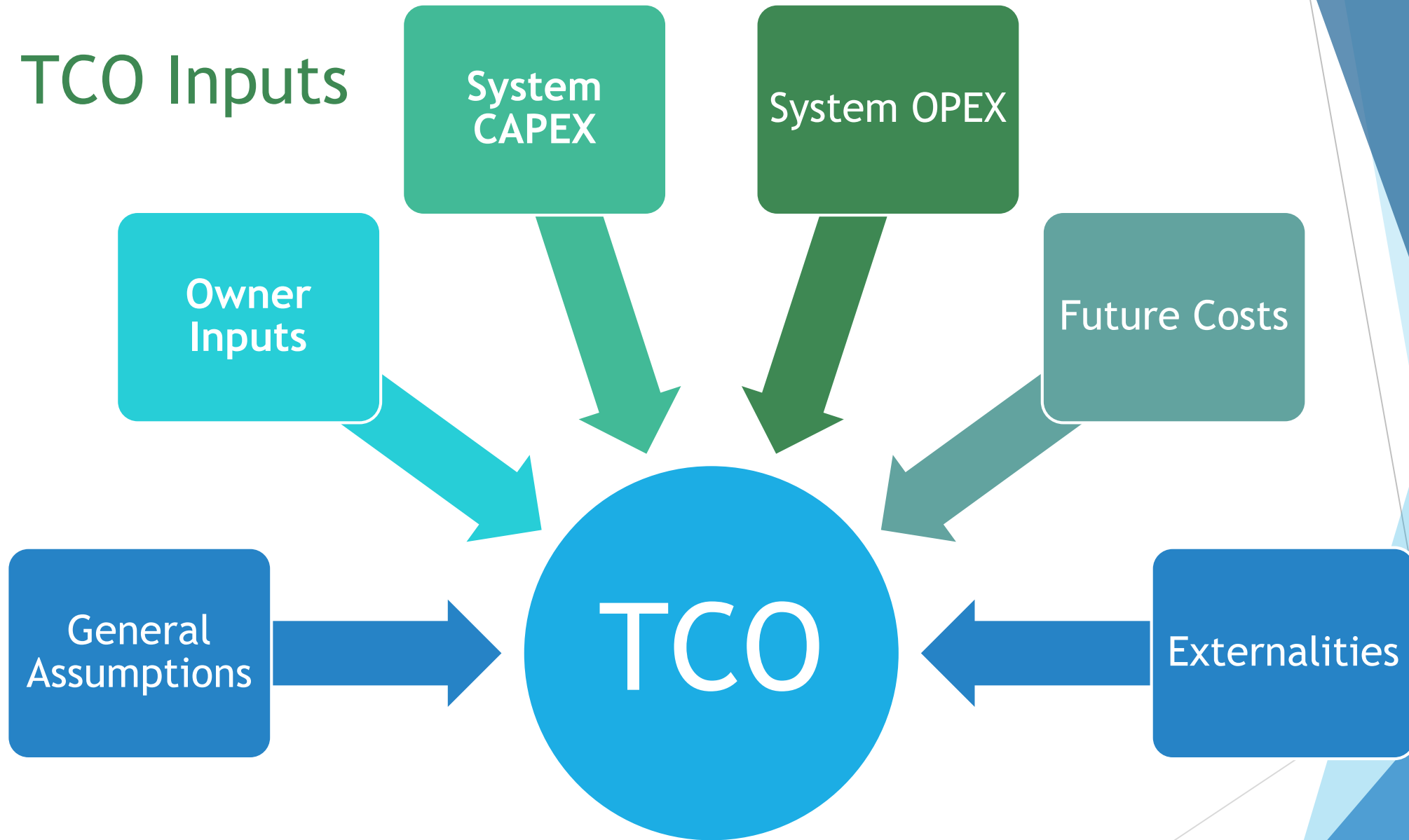
Passenger experience

Reputation

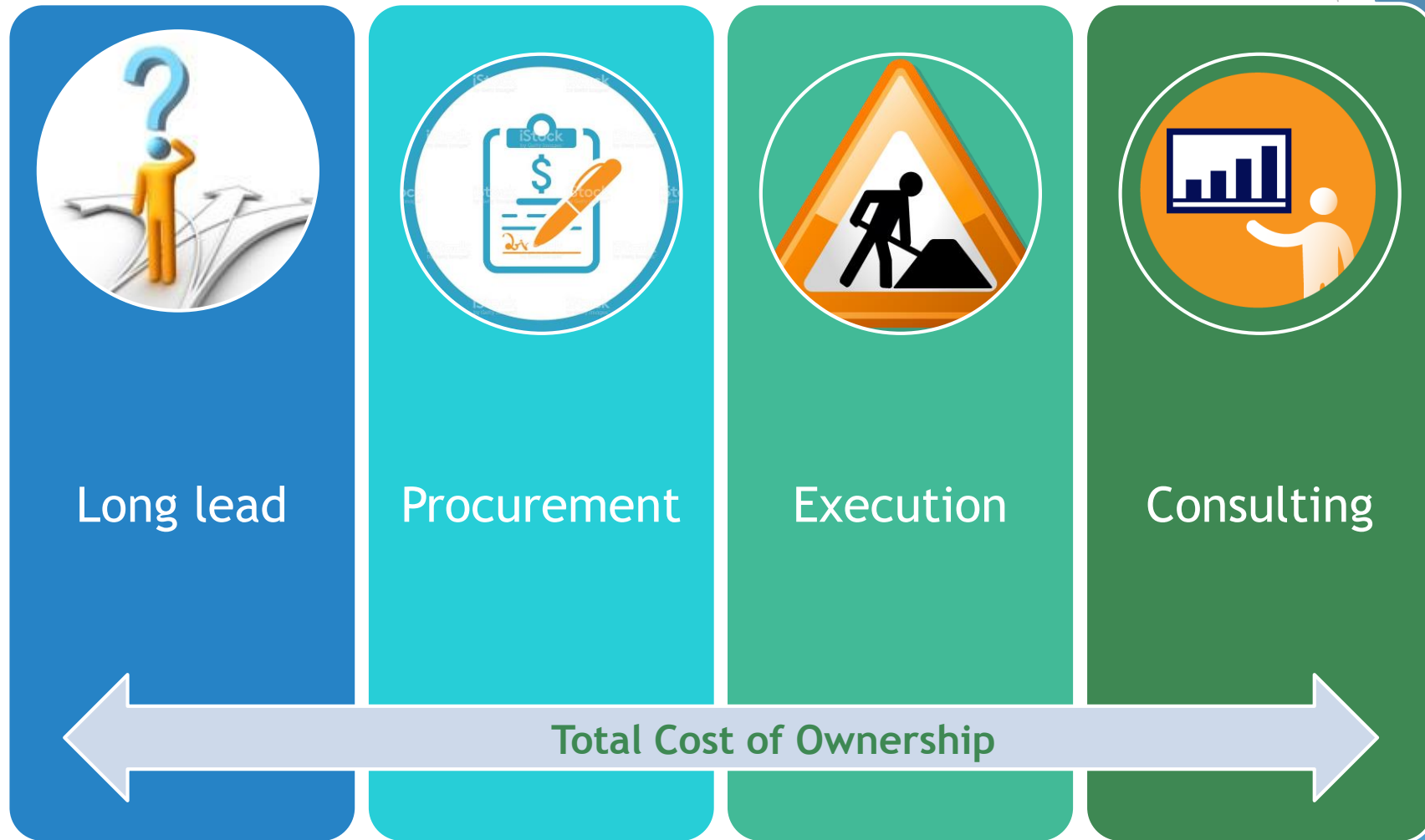
Satisfaction

Enabling infrastructure

TCO Inputs



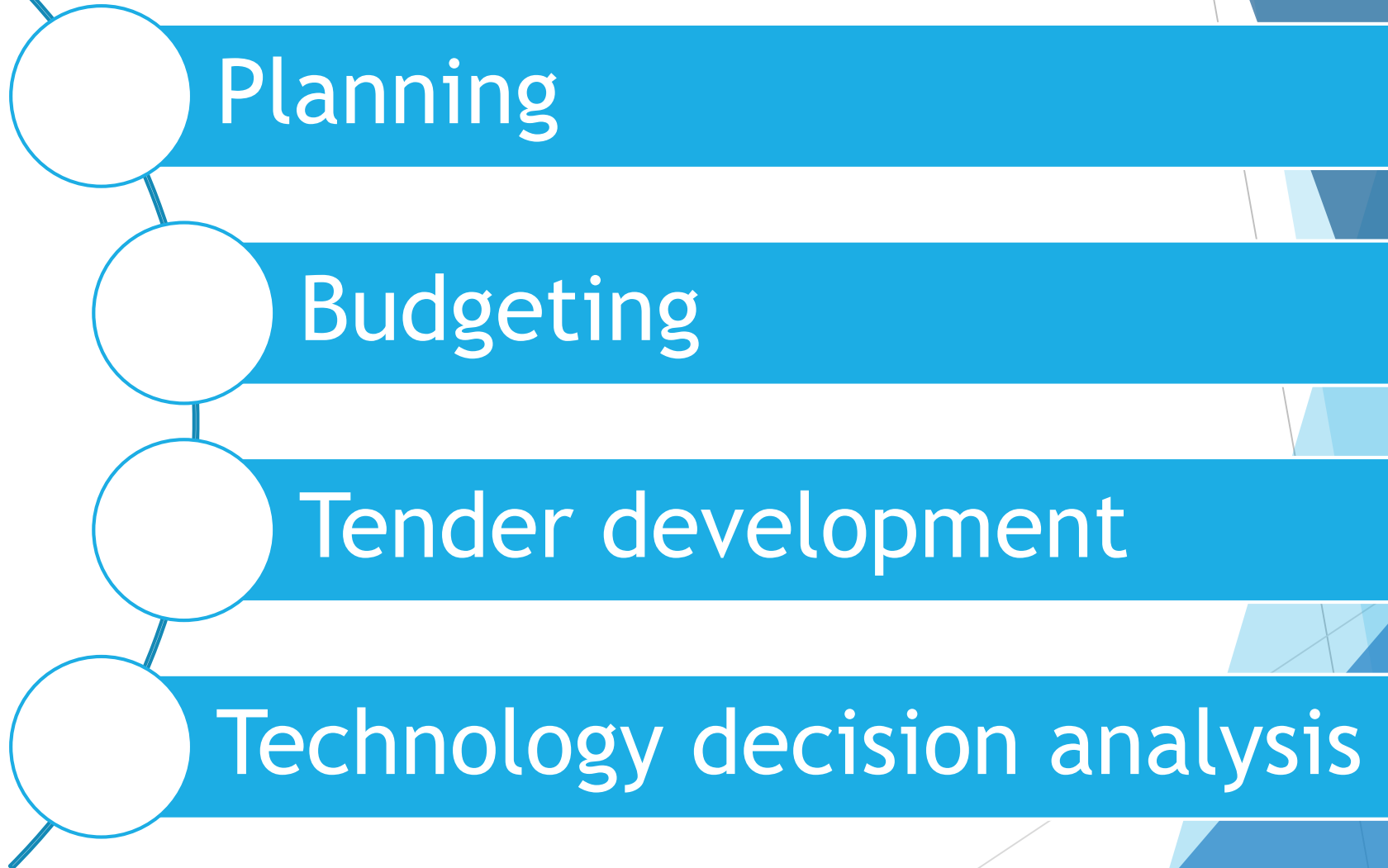
Areas of Implementation



Long Lead



Long
Lead



Procurement



Procurement

Design evaluation method

Proposal content

Technology decision reasoning

Framework for larger scopes of work

Execution



Execution

Design / build deliverable

Change order evaluation

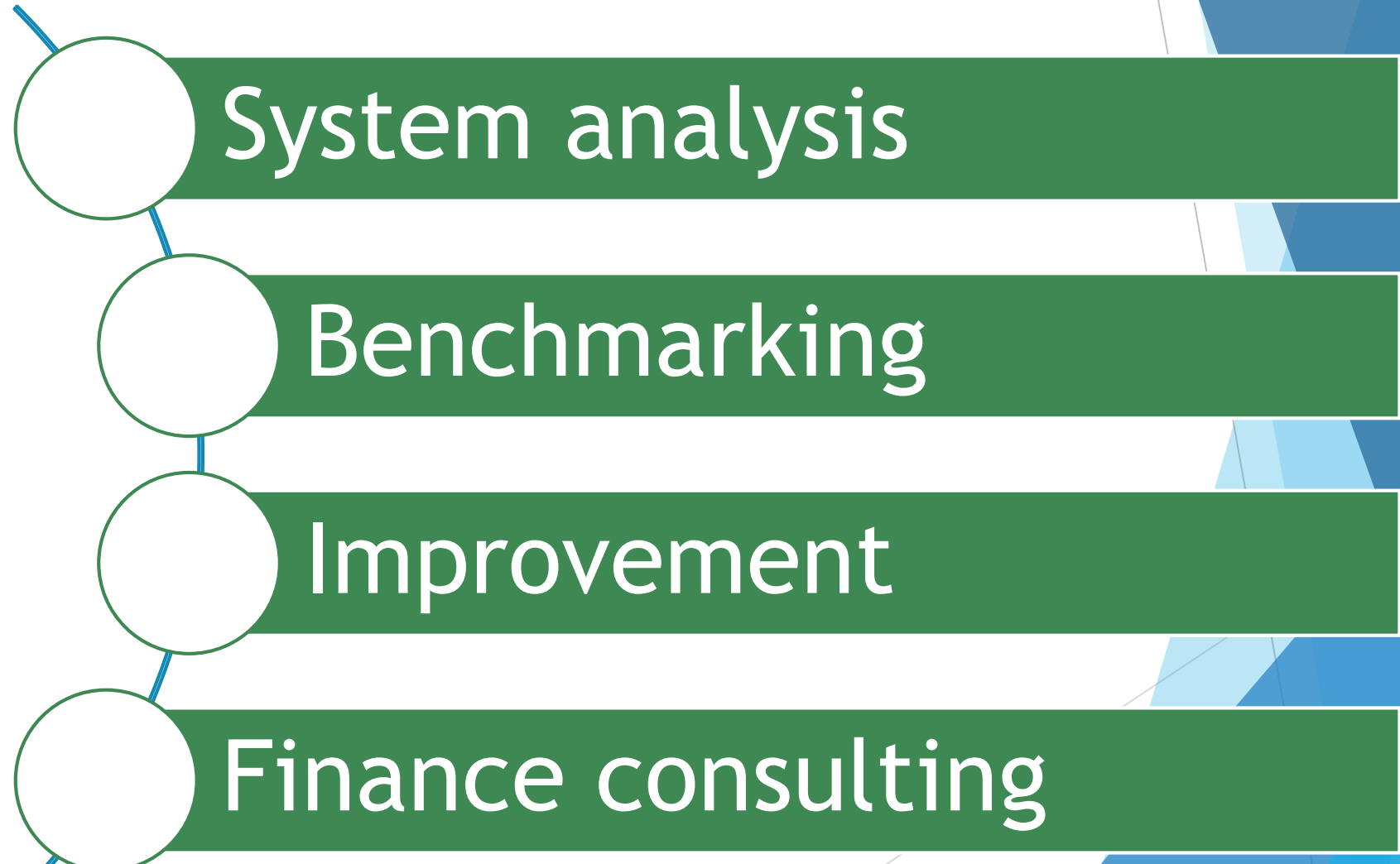
Customer service level agreement

Service expansion

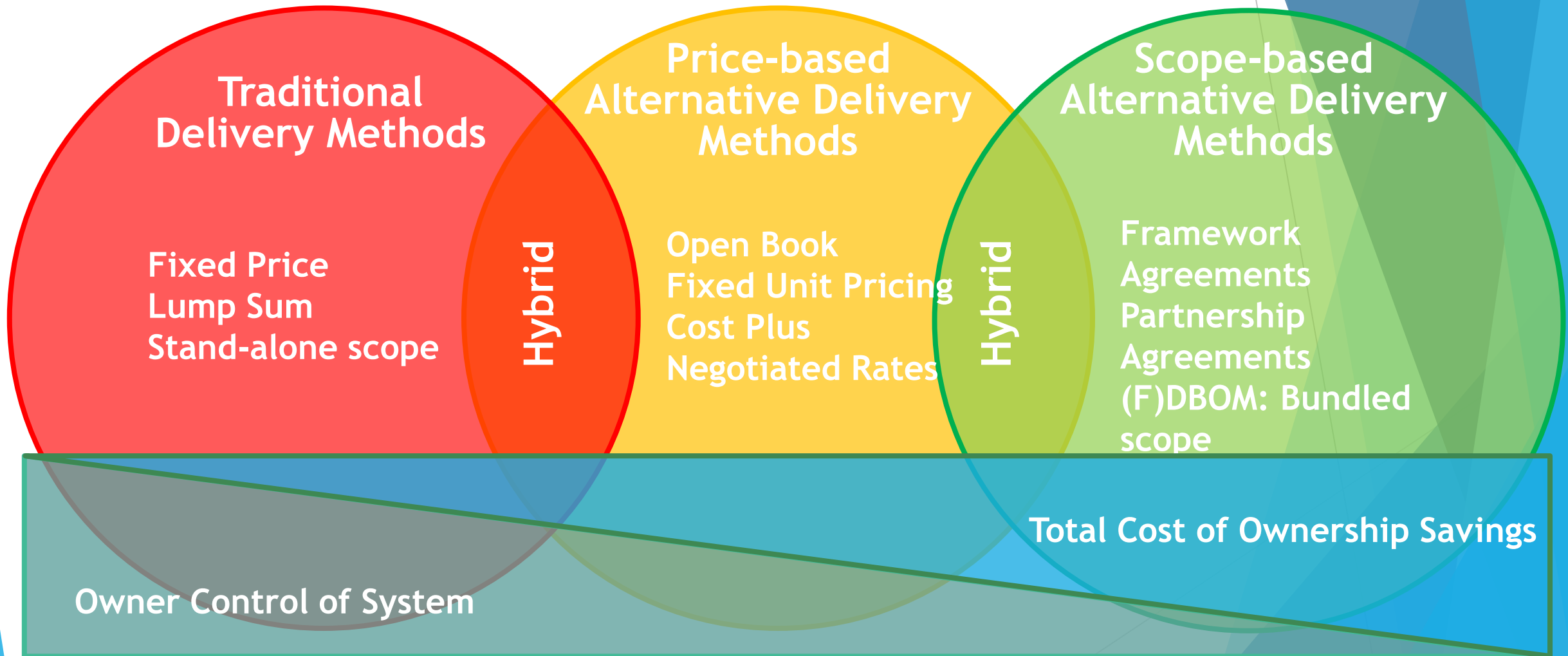
Consulting

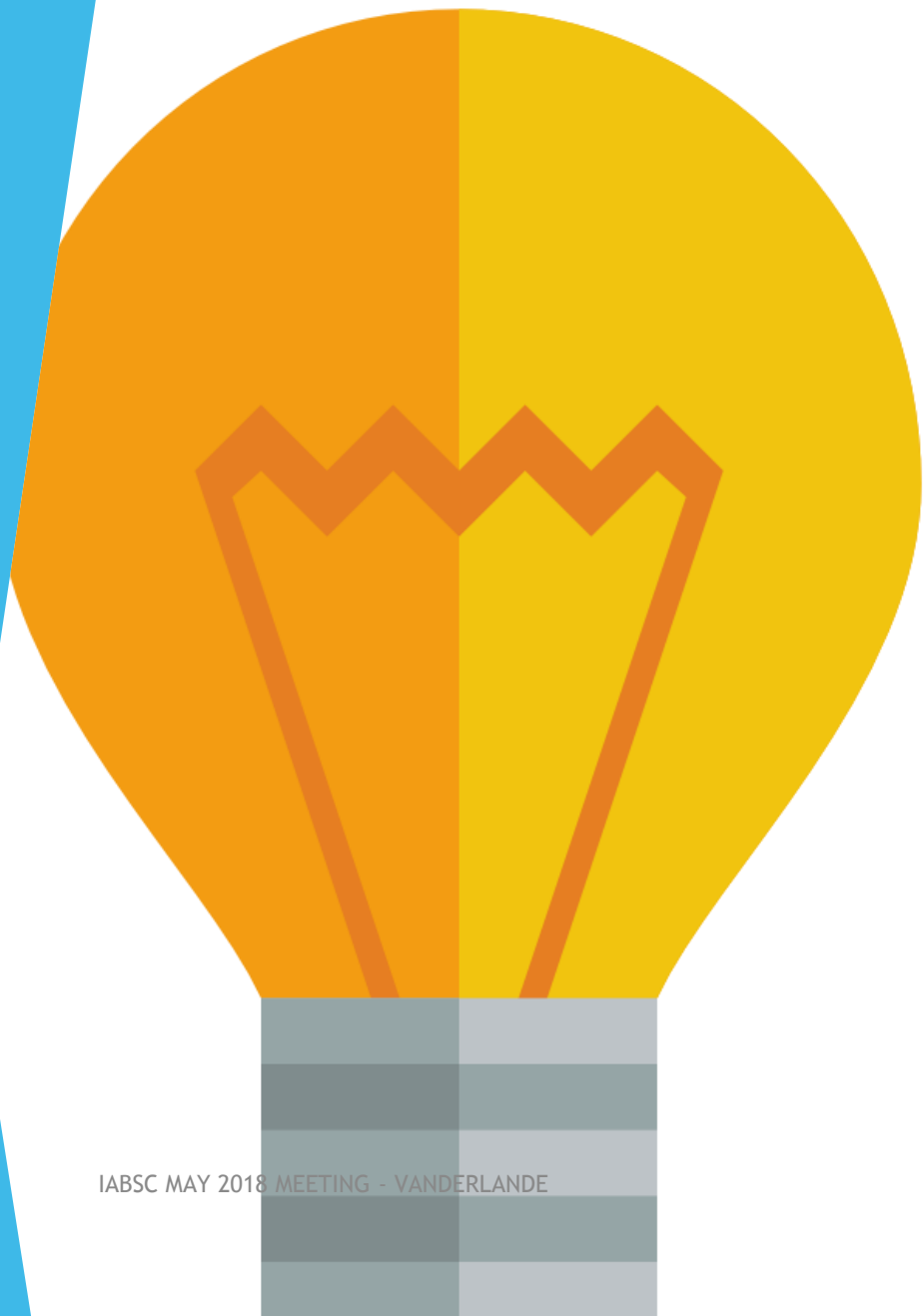


Consulting



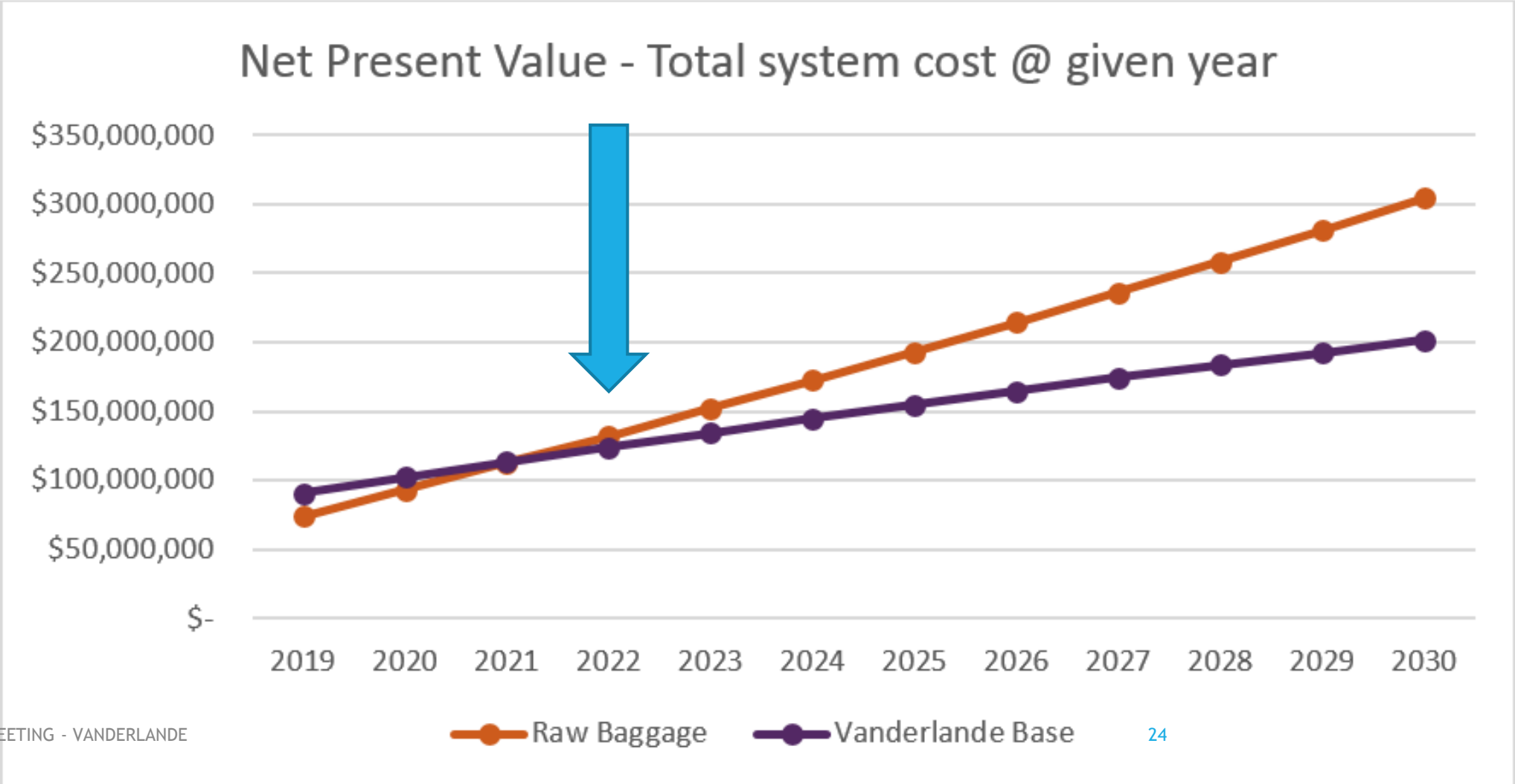
Spectrum of Service Delivery Methods





TCO Examples

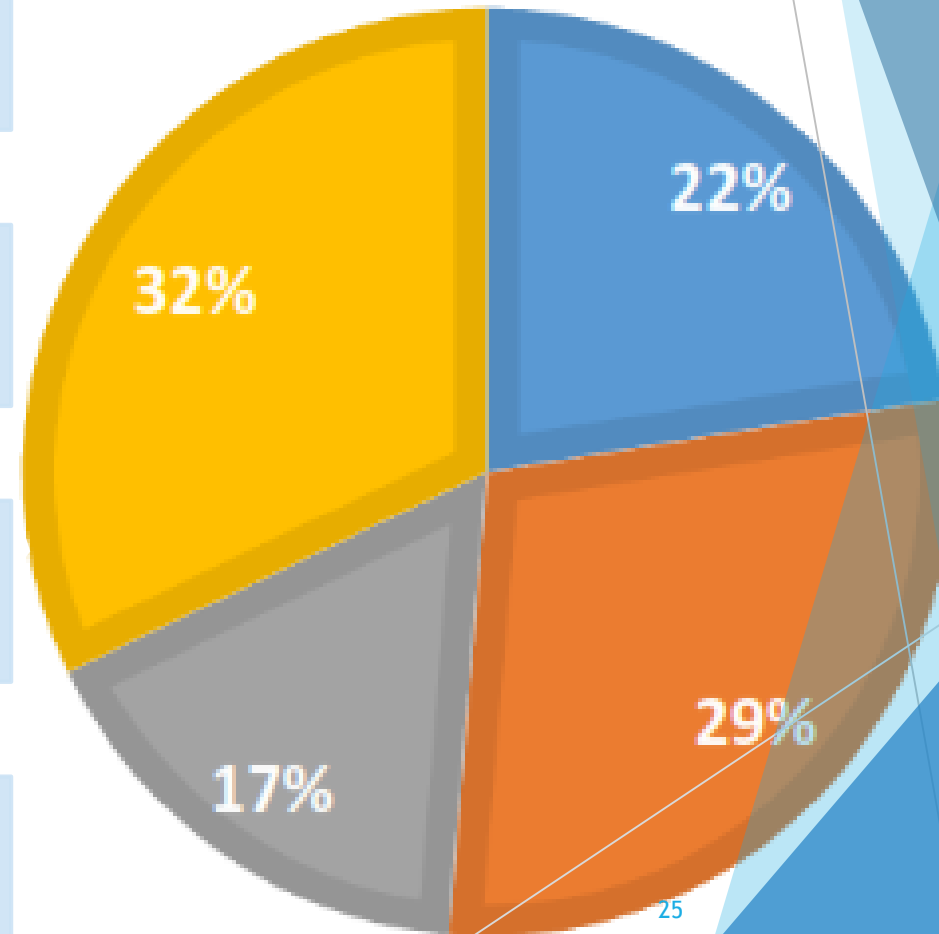
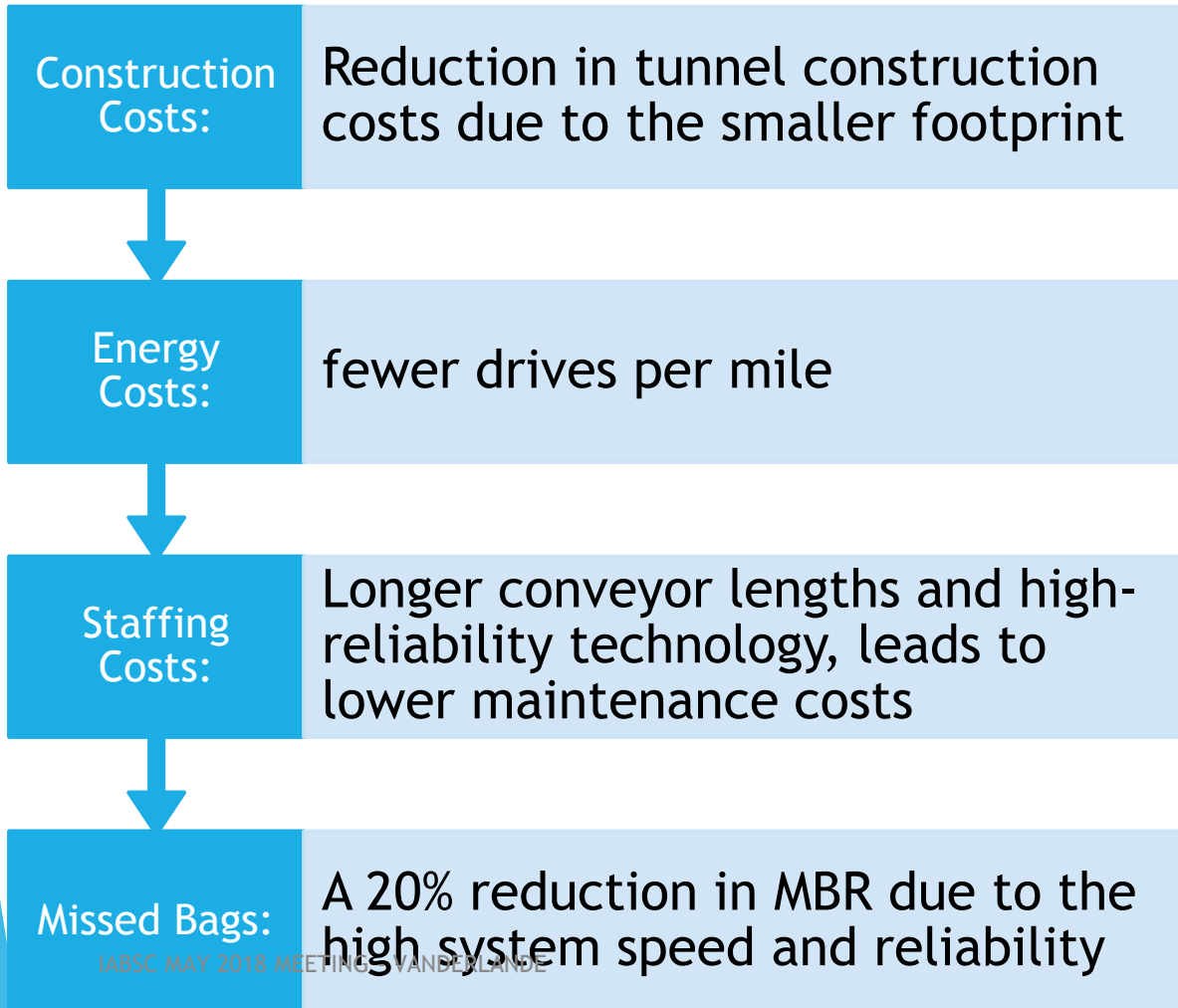
Raw Baggage vs. ICS: Break Even



TCO SAVINGS BREAKOUT

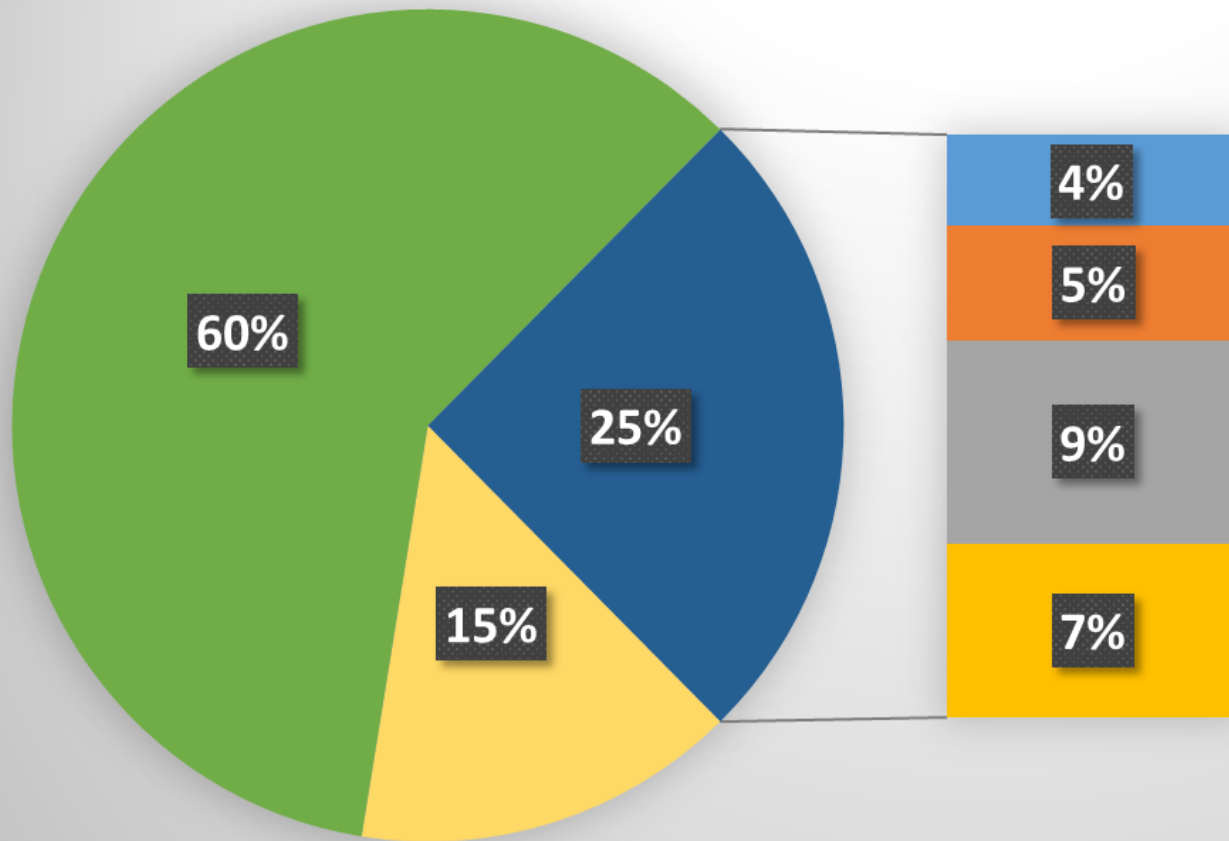
Example - ICS Tunnel

Energy Staffing Missed Bags Construction



Cost per Bag Analysis

Initial Cost per Bag (excl. depreciation)



- Energy
- Operations
- Spare Parts
- Service Manager
- Back office / operations
- Control Room Analyst / maintenance tech

Example - SCANNOJET

Security

- Increase analyst performance and reduces collusion potential

Performance

- Improved throughput per line

Floor Space

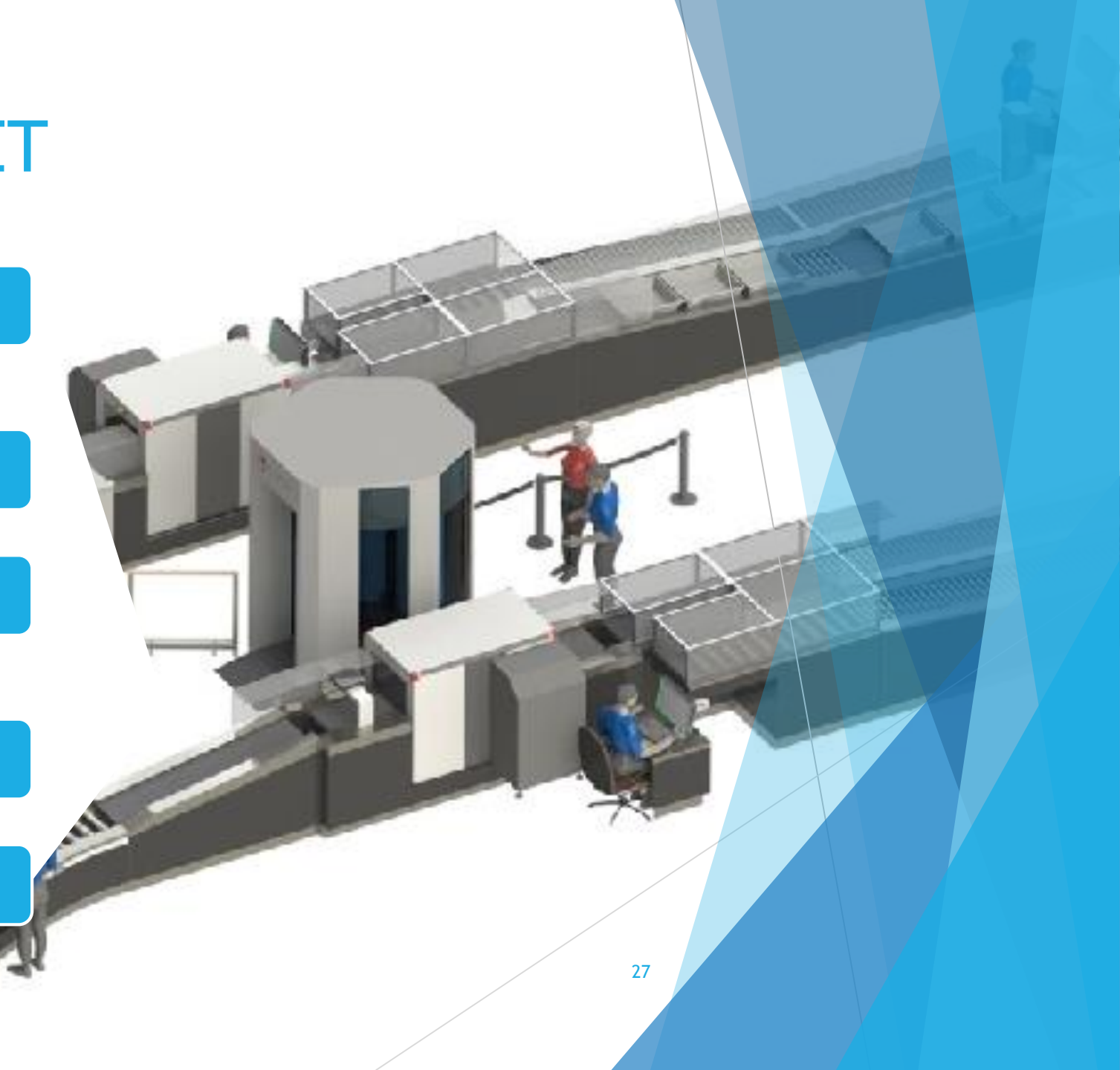
- 3 Sannojets can replace 4 traditional lines

Staffing Costs:

- Higher throughput per operator

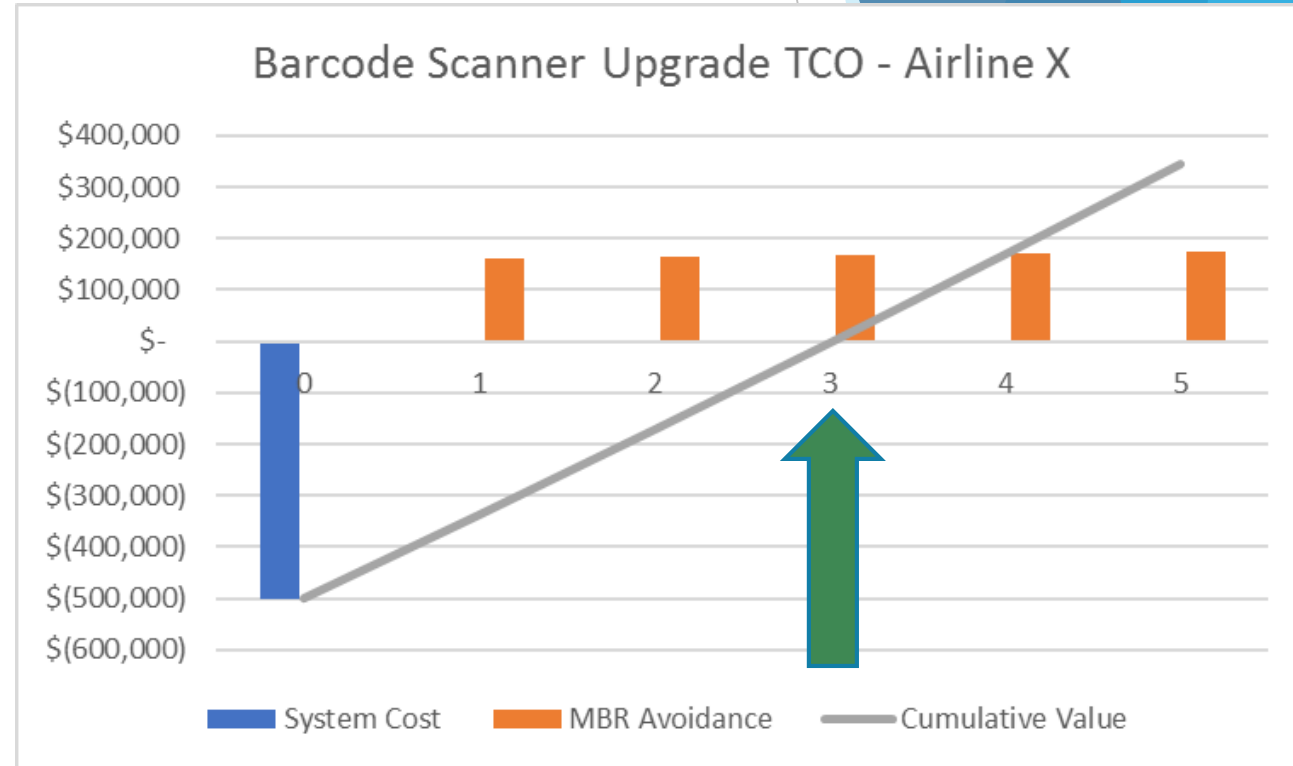
Experience:

- Reduces time spent in security, increases time spent spending



Barcode Scanner Evaluation

| Value | Number |
|--|---------------------|
| Missed bag cost | \$ 150 |
| PAX | 60,000,000 |
| % PAX @ Airline X | 60% |
| bags / pax | 1.5 |
| % bags under max TIS | 99.87% |
| % of bags over TIS max resulting in MB | 20% |
| # Missed Bags | 14,040 |
| Cost of Missed Bags | \$ 2,106,000 |
| Cost of Upgrade | \$ 500,000 |
| % Bags under max TIS - Improvement | 0.01% |
| # Missed Bags w/ Upgrade | 12,960 |
| Cost of Missed Bags w/ Upgrade | \$ 1,944,000 |
| Savings per year (\$) | \$ (162,000) |
| Break Even Year | 3 |



Tenders with TCO components

3. Total Cost of Ownership (TCO)

The Proponent shall include in its submission the information required by the GTAA to evaluate the Total Cost of Ownership. The GTAA shall do a subjective analysis based on the information provided by the Proponent. The evaluation shall consider a 20 year time line for TCO. The Proponent will be evaluated based on the following:

- Documentation of the following:
 - Total Cost of Ownership (TCO) excel documents (as provided by the

consider the cost influencers, **Whole Life Cost**, **Risk Allocation**, **Life and Operational Constraints**, **Scope and Specification Standards**

2.11 System Whole Life Cycle Cost

Supplier shall document the full project cost, detailing Scheme design, implementation, testing, documentation, handover and project execution.

The supplier shall document and demonstrate the whole life cycle cost of the system. The whole life cycle cost report shall be of rough order of magnitude and cover as a minimum the following aspects:

- CAPEX
 - Detail scope which is included i.e. anything above and beyond baggage system (Lighting, HVAC)
- OPEX
 - High level manning indication
 - Operators, technical, manual intervention etc
 - Predicted spares cost based on MTBF of equipment
 - Energy usage per year for baggage equipment
 - Licensing of software
 - Obsolescence costs for the system

10.2.1. Costs During Useful Life

10.2.1.1. Technical specifications of Baggage Holding System (BHS) are consisted of:

- 1) Details on competency of designed system as defined in System Performance Requirements of Specification with the following topics minimally:
 - System capacity
 - Duration of baggage handling from MTB to SAT1 (MTB-SAT1)
 - Readiness for utilizing of the System (System Availability) and propose table of payment factor in case system performance could not meet the system availability requirement.
- 2) Conditions and expenses of maintenance and repairing with conclusion on conditions and annual expenses for 10 years divided into maintenance cost with spare parts and maintenance cost with no spare part with the following subjects minimally:
 - Details of Master Preventive Maintenance Plan and conditions of Corrective & Breakdown Maintenance
 - Item/Quantity/Useful Price/Price of spare parts of core devices
 - List of Calculation of Annual Consumable Materials
 - Software and Firmware updating
- 3) Details of plans and costs of personnel and labors usage for operation and maintenance the system.
- 4) The costs of energy or utilities consumption of BHS proposed to this project

Lessons Learned

Ringed wall

Be explicit

Get people involved

Sensitivity Analysis

Embedding TCO into the Industry

- ▶ “An industry that incorporates standardized TCO analysis in every major design decision and customer interaction, with the goal of providing the customer the optimal solution for their business from both a technical and a business perspective”



Questions?

Contact: Martin.Plazyk@Vanderlande.com