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Fleet Handbook

Preparing for a Trial Deployment of Hydrogen Fuel Cell Waste Trucks

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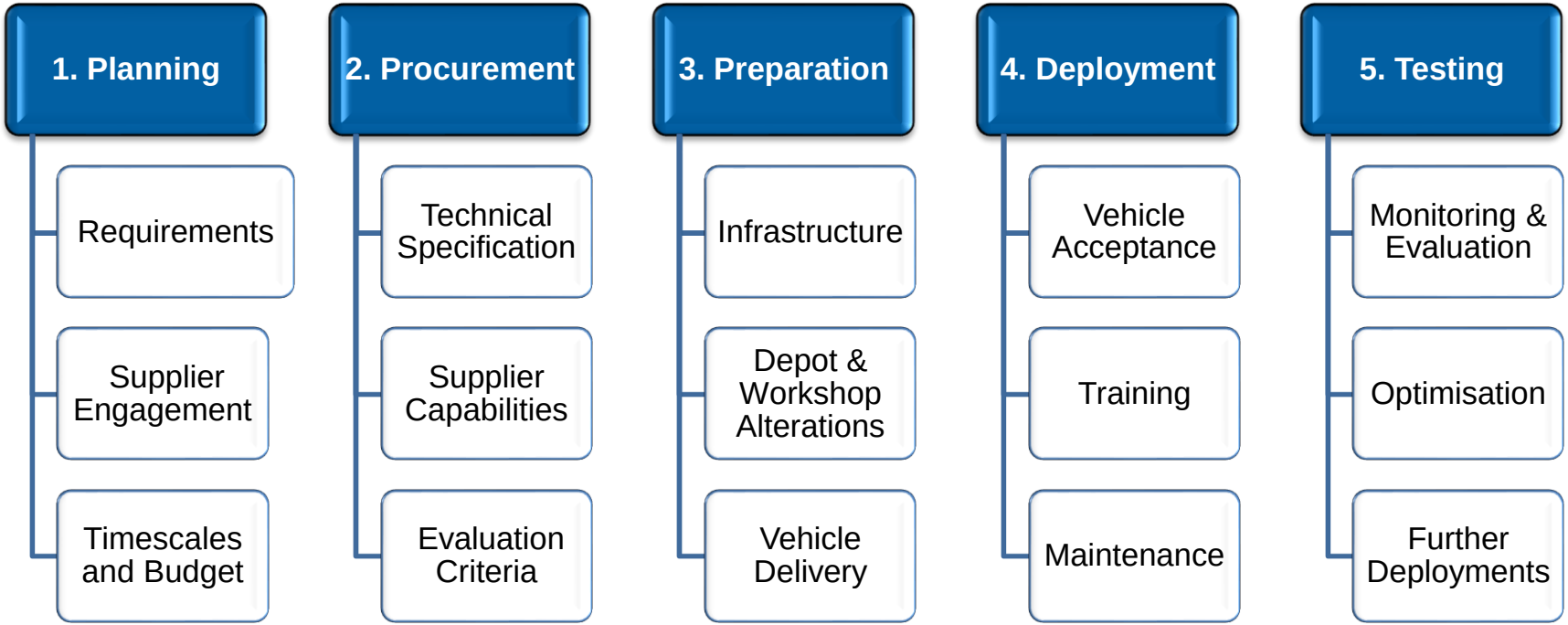
Development and Aims of Fleet Handbook

- **Review of existing handbook:**
  - Cover key points of relevance to fleets
  - Include learnings from HECTOR partners
  - Clarity of style and presentation

- **Aim of Handbook:**
  - *"to help fleet operators to specify, procure and deploy their first fuel cell waste trucks"*

Updated Handbook Structure



Content Summary

1. Planning

- Analyse vehicle requirements, operations, and round characteristics.
- Develop vehicle and infrastructure requirements.
- Identify and engage with potential suppliers.
- Determine a realistic budget and timescales.

Content Summary

2. Procurement

- Define output specifications – i.e. **what** you need the vehicle to do, not **how**.
- Use learnings from pre-procurement supplier engagement as a guide.
- Ask potential suppliers for supporting evidence.
- Consider a joint procurement framework with other fleets to consolidate orders.

3. Preparation

- Ensure that refuelling infrastructure is available nearby or is installed at the depot.
- Upgrade your depot and workshop for fuel storage and vehicle maintenance.
- Monitor the progress of the delivery of fuel cell waste trucks and infrastructure to ensure suppliers meet agreed timescales.

Content Summary

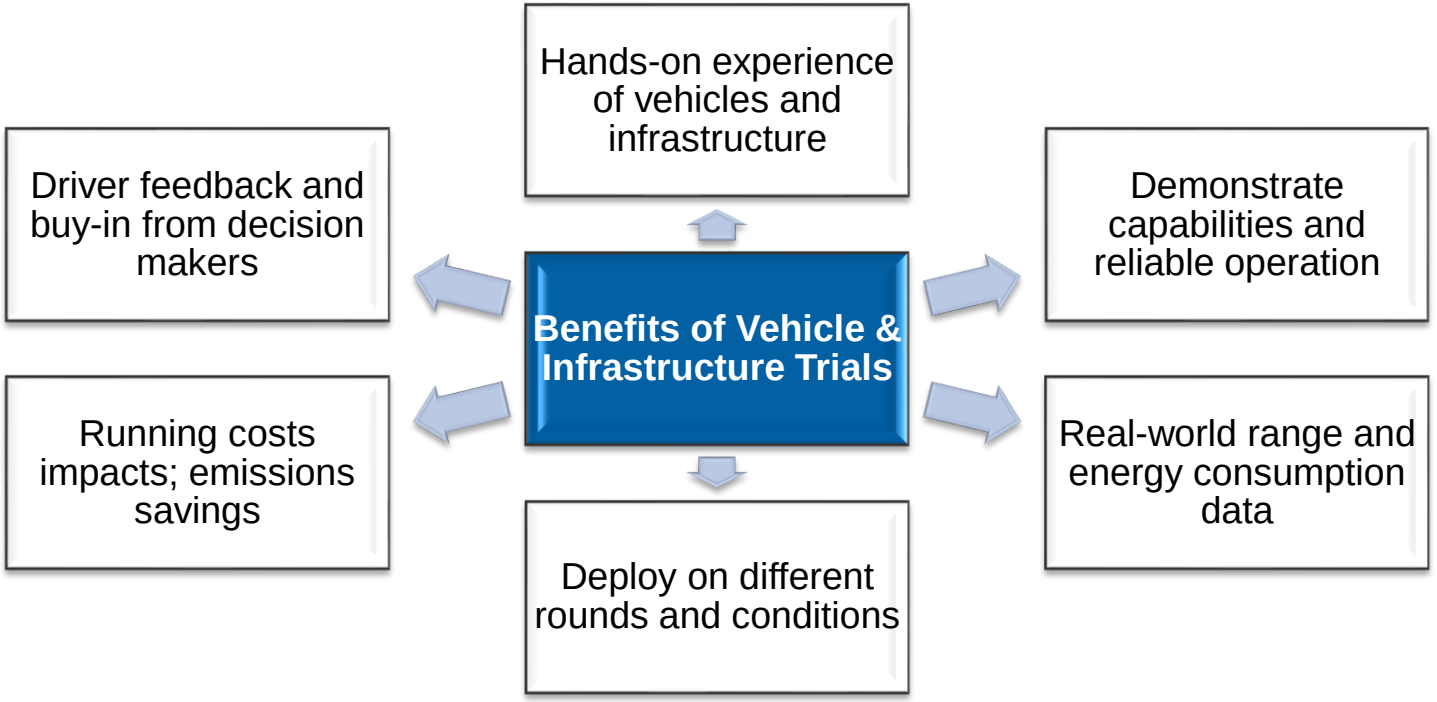
4. Deployment

- Build in time for testing and rectifying issues with vehicles and infrastructure before signing off procurement.
- Provide training for staff to operate and maintain the vehicles safely.

5. Testing

- Monitor and evaluate trucks across representative rounds and conditions to:
  - Optimise operations to better suit fuel cell vehicles.
  - Refine technical specifications for future procurement.
  - Develop a long-term strategy for fuel cell trucks and infrastructure.

Benefits of Trials and Testing



Timescales

➢ Updated based on HECTOR learnings

Phase	Task and Approximate Timescale
Planning	**3-6 months** for supplier engagement, detailed project planning, and business case.
Procurement	Varies significantly depending on public procurement processes.
Preparation	**3-6 months** for depot and workshop alterations. **6-12 months** for a temporary HRS (e.g. mobile or tube trailer); or **24 months** for a new HRS including electrolyser. **9-24 months** for vehicle build, homologation, and delivery.
Deployment	**Min. 3 months** to ensure reliability before signing off the vehicle (could take **up to 12 months**)
Testing	**3-12 months** after initial deployment phase.
Operation	Standard lease / rental period for a fuel cell waste truck (**5 years**). Expected operational lifespan for a fuel cell waste truck (**10 years**).

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Costs

- **Indicative estimates based on HECTOR learnings**
  - Vehicle costs would fall if scale increases
  - Green hydrogen currently sold below cost of production

Item	Approximate Cost (2019 to 2023)
Capital Costs	
Truck Purchase	€630,000 to €750,000 (3x diesel vehicle)
Depot Alterations	€25,000 to €50,000 (will vary significantly)
Maintenance Technician Training	€3,000 per technician
Driver Training	€1,000 per driver
Operational Costs	
Hydrogen Fuel Costs	~€15 per kg (€300 for 120 to 240 km)
Maintenance Costs	€7.000 to €10.000 per year (truck only)

Case Studies

- **Short case studies from HECTOR partners**
  - **WBD, Duisburg**: Pre-procurement supplier engagement
  - **Prezero, Arnhem**: Driver and staff engagement
  - **Groningen**: Infrastructure development
  - **Touraine Vallee de l'Indre**: Regulations and compliance
  - **AGR, Herten**: Post-deployment manufacturer support
  - **Aberdeen City Council**: Reliability and maintenance

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Thank you for listening

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