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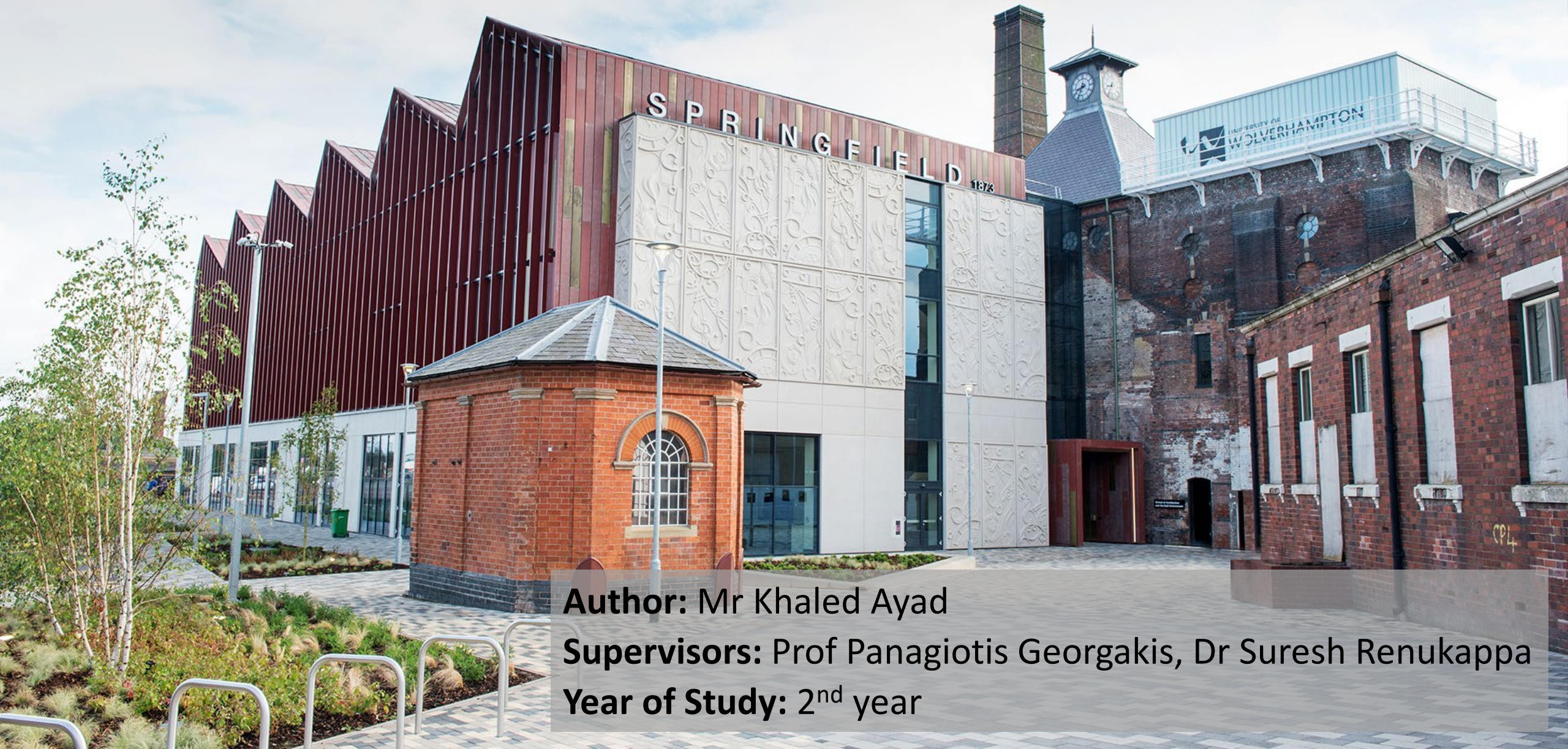
Enhancing Competitive Advantage Through Horizontal Collaboration in Urban Last-Mile Logistics



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Supervisors: Prof Panagiotis Georgakis, Dr Suresh Renukappa

Year of Study: 2nd year

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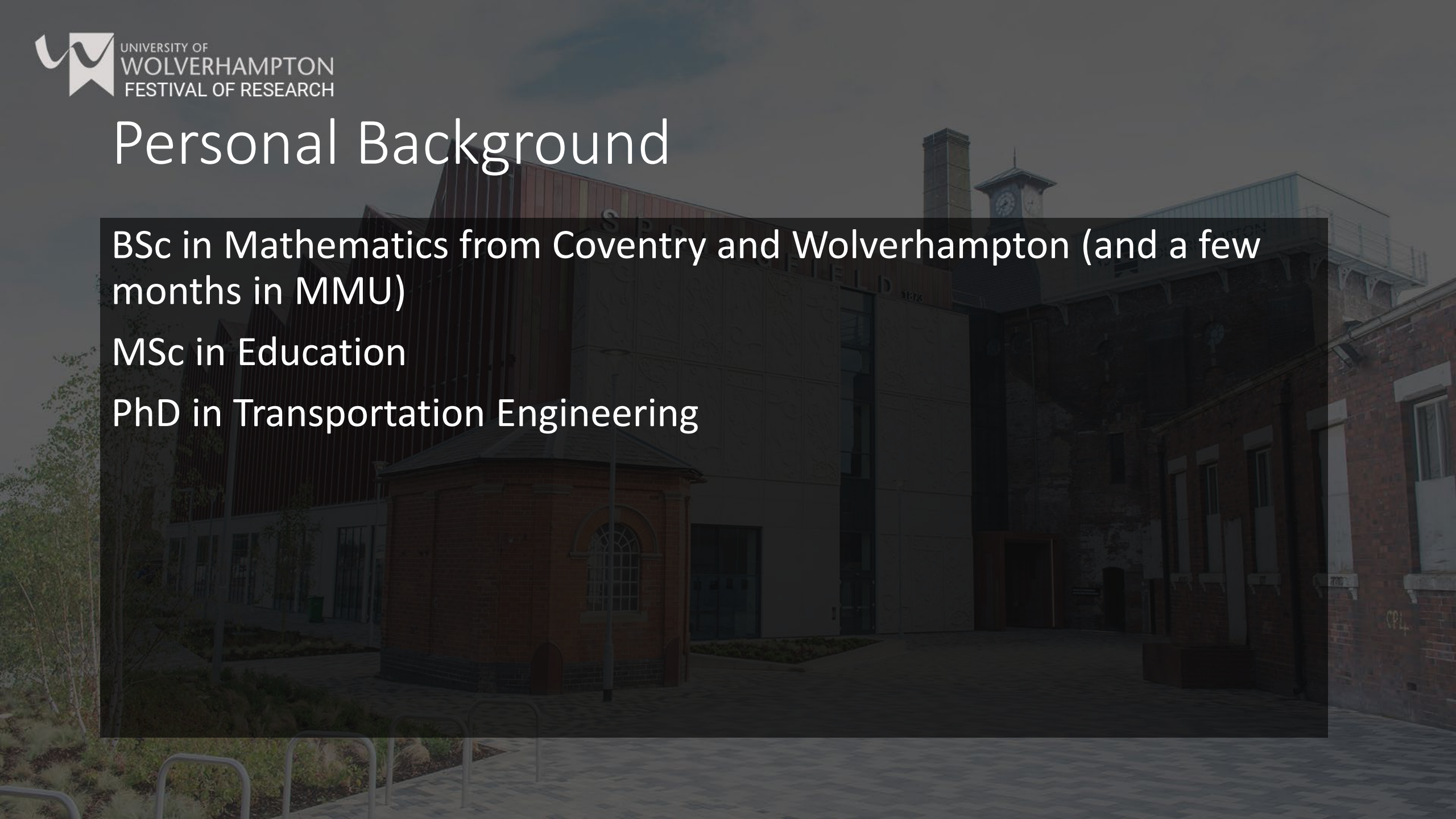
Personal Background



BSc in Mathematics from Coventry and Wolverhampton (and a few months in MMU)

MSc in Education

PhD in Transportation Engineering

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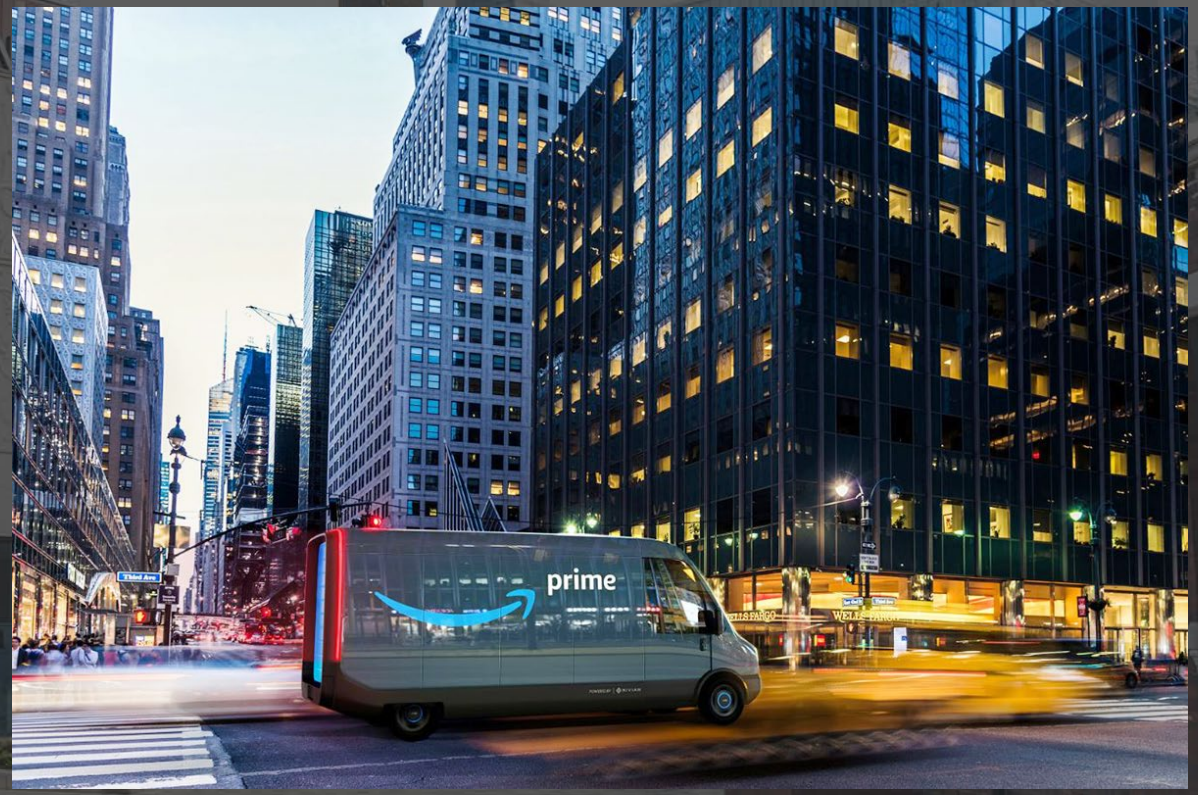
Background

E-commerce is exerting a lot of pressure on Last Mile Logistics

Last mile is the final leg of the supply chain where goods are delivered to the end customer:

- To the end-customers home
- From a store (e.g. Argos)
- Mid-point (e.g. Parcel Locker)

Costs about 28% of the total cost



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Introduction to Horizontal Collaboration

There are many strategies in place

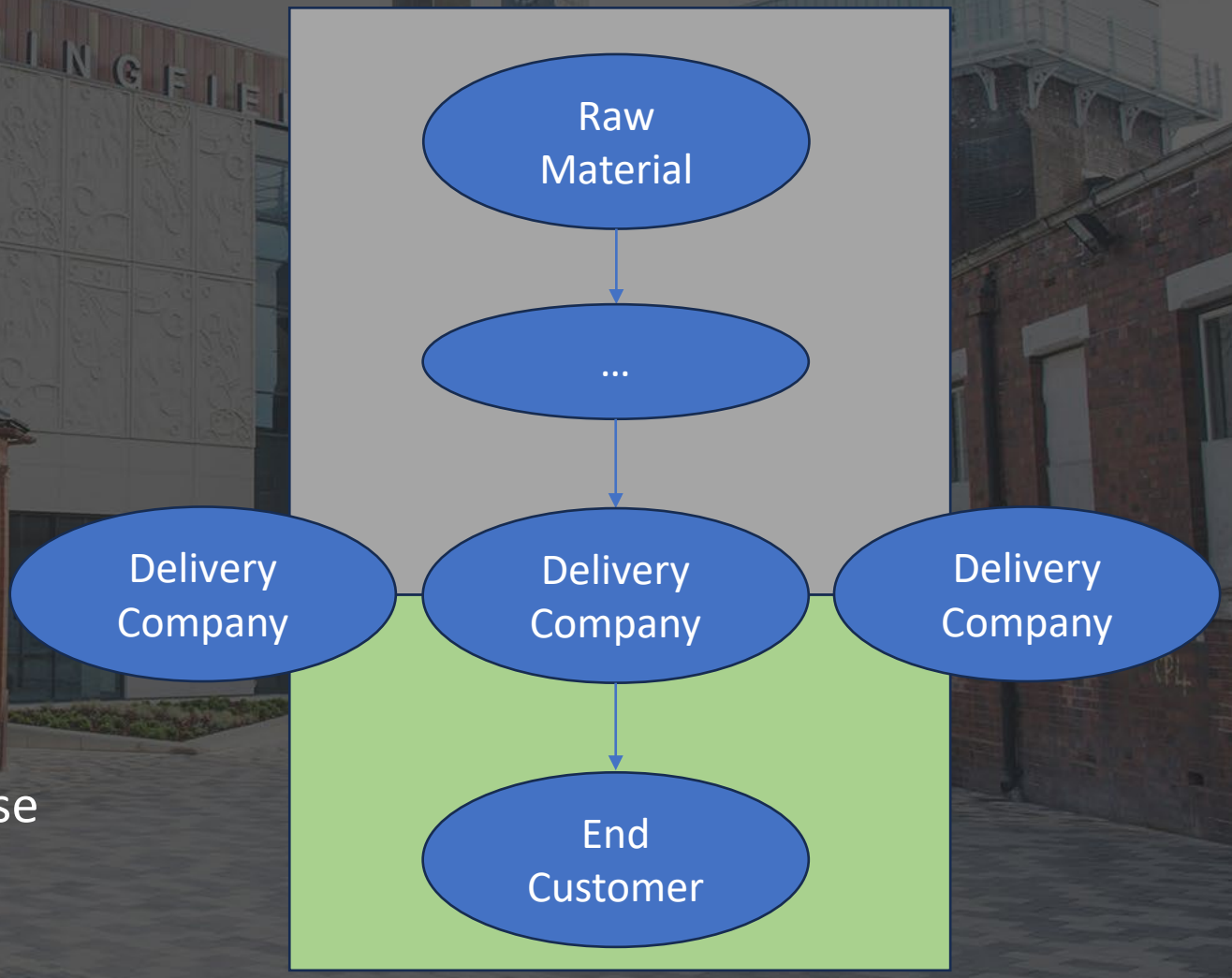
The purpose is to improve efficiency, save costs and work towards sustainability, among others.

Horizontal Collaboration:

The cooperation between organisations or entities at the same level within a supply chain, industry, or value chain.

This collaboration can involve sharing resources, knowledge, or processes to achieve common goals, reduce costs, and improve efficiency. (Gonzalez-Feliu, 2013)

In many cases (Holland), horizontal collaboration occurs between competitors or market participants that would otherwise be working independently.



Research Questions

1. What is the current outlook on HC in LML?
2. What are the main drivers for HC in LML?
3. What are the key strategies used, and which of them work best?
4. What are the challenges for HC in LML?
5. What are the existing research gaps, and what is the best approach to building a comprehensive framework?

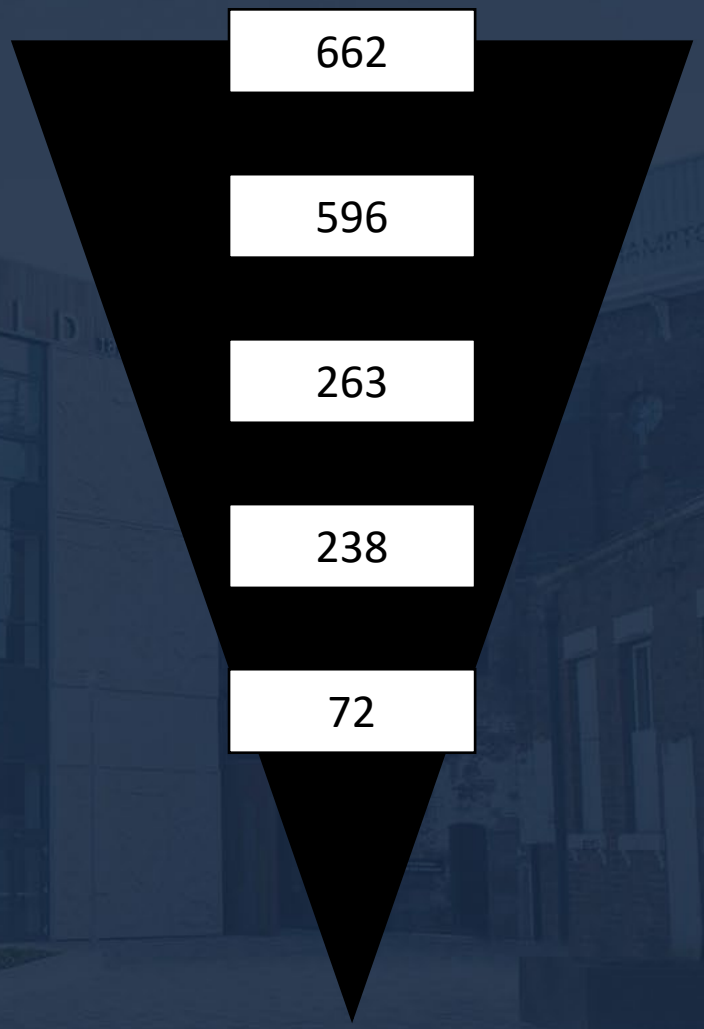
Literature Review	Semi-Structured Interviews	Data Analysis and Results

Methodology

- Followed the PRISMA method
- ("collaborative" OR "multi*") AND ("last mile") AND ("urban" OR "city") AND ("logistics" or "delivery")
- ScienceDirect; Scopus; Web of Science; TRID; Extra

Methodology

- From 2018 to 2022 – Pre-2018: 198, 2018-2022: 662
- Duplicates or unusable: 66
- Title and abstract refining
- Journal refining (e.g. Energy)
- Article reading
- 10.88% of articles relevant using the search term in those dates
- Also excluded non-English papers from initial search



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Methodology

- Information qualitatively and quantitatively extracted:

1. Main themes (QL)
2. Summary (QL)
3. Collaborative outlook (e.g. multiple stake holders, building partnerships etc.) (QL)
4. Horizontal, Vertical or Both (QL & QN)
5. Depth of discussion on collaboration topic (Very shallow, shallow, medium, deep, very deep) (QL & QN)
6. Strategies mentioned (QL & QN)
7. Drivers mentioned (QL & QN)
8. Challenges mentioned (QL & QN)

- Thematic Analysis used alongside Excel

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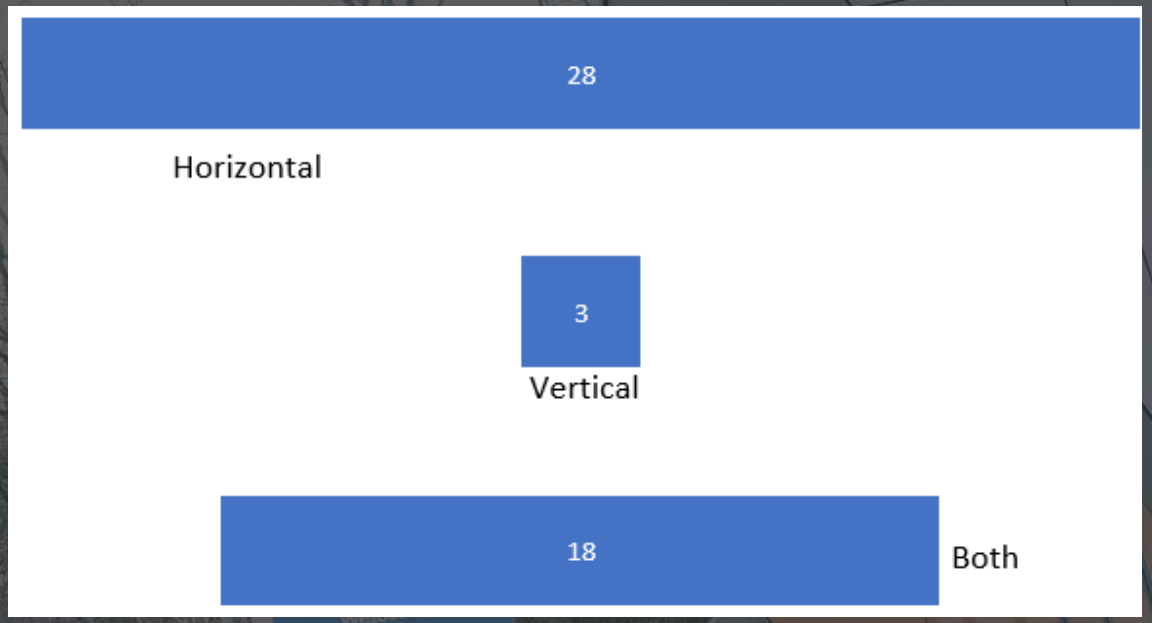
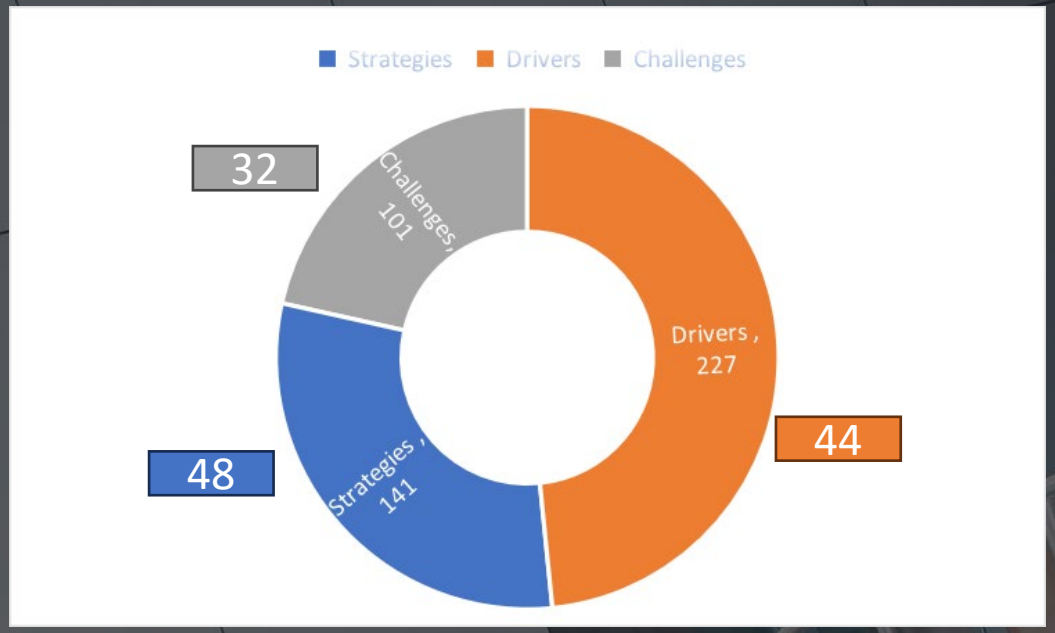
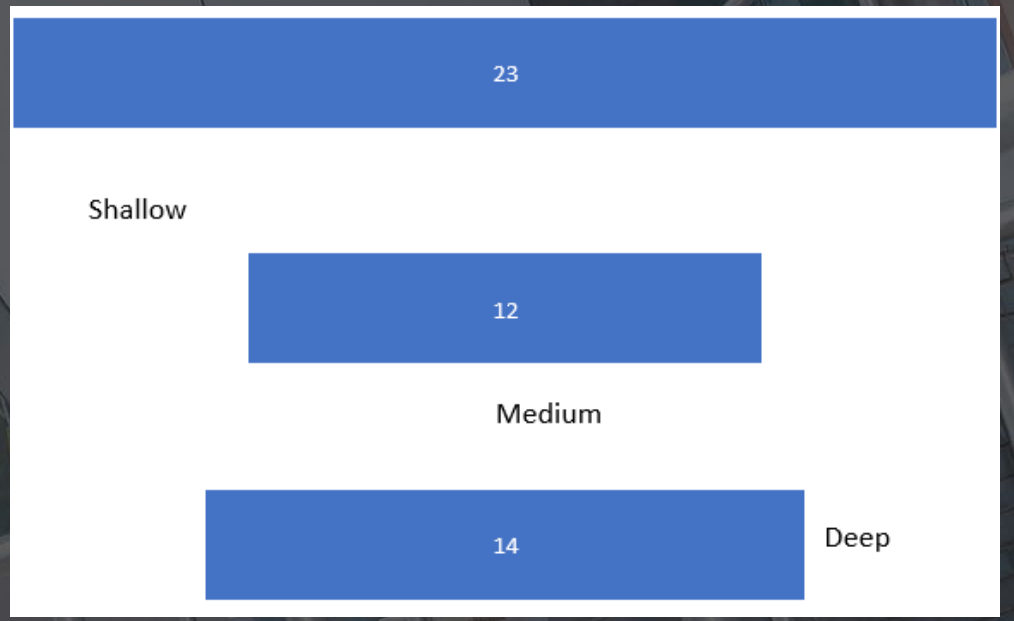
Quantitative Results







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Overall Outlook

- Morganti et al. (2014) - Among the first to highlight the challenges of meeting sustainability goals in the context of the rapid growth of e-commerce and urbanisation.
- Macharis (2014) and Papadolpilou (1998) - Advocated for the use of qualitative approaches.
- Gansterer and Hartl (2017) - Collaborative vehicle routing.
- Adetiloye and Awasthi (2023) – Stakeholder collaboration is key.
- Schlicher and Lurkin (2022) – Economic aspects.
- Kayikci (2018) – Digitisation.
- Verlinde, Macharis and Witlox (2012) – Urban Consolidation Centres.
- Miao (2022) – Data Privacy.
- HC is good. (??)

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Drivers for HC in Last Mile Logistics

- Local/ Regional development: Boosting regional growth.
- Customer satisfaction: Enhancing user experience.
- Vehicle utilisation: Efficient use of vehicles.
- Reducing environmental impacts: Sustainable operations.
- Operational efficiency: Streamlining processes.
- Emissions reduction: Lowering greenhouse gases.
- Sharing information and resources: Collaborative data exchange (depends which information).
- Better usage of the fleet: Optimising fleet operations.
- Decrease cost of non-core activities: Cost-effective operations.
- Greenhouse gas emission reduction: Environmentally conscious operations.

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Challenges of HC in Last Mile Logistics

- Excessive bureaucracy: Overwhelming administrative processes.
- Lack of data: Insufficient information for decision-making.
- Legislation: Regulatory constraints.
- Trust between partners: Ensuring mutual confidence, especially among competitors.
- Confidentiality: Protecting sensitive information.
- Compatibility of technology: Ensuring systems can work together.
- Mistrust due to unfulfilled obligations: Partners not meeting their commitments.
- Poor value sharing: Unequal distribution of benefits.
- Anti-trust regulation: Legal concerns about potential monopolies.
- Loss of brand identity: Concerns about diluting a company's unique brand.

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Strategies for HC in Last Mile Logistics

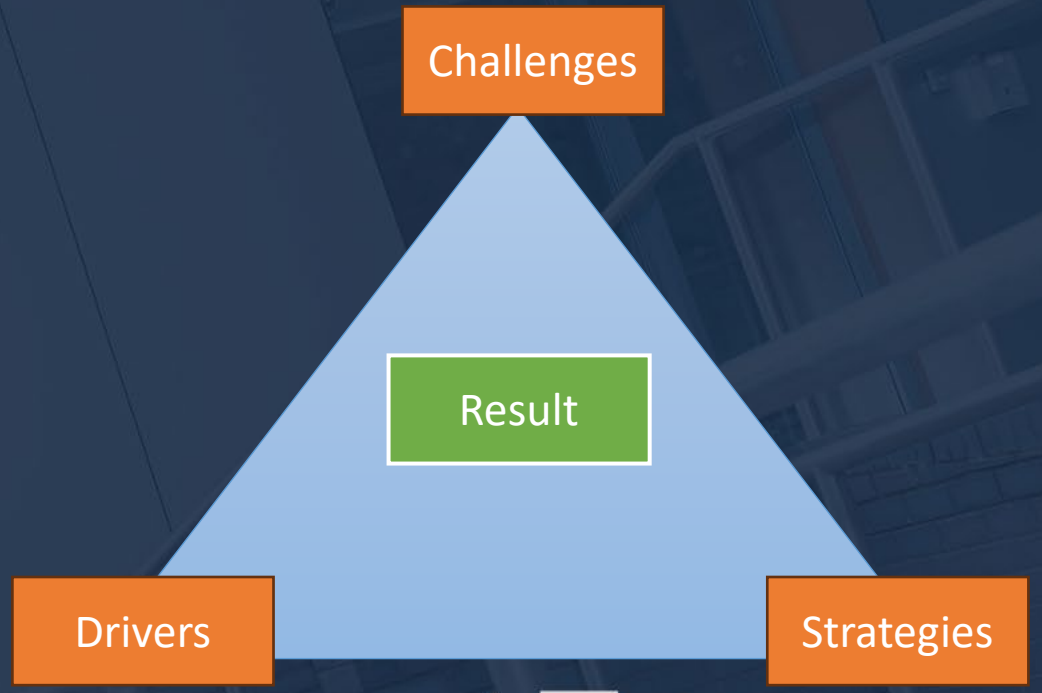
- Life Cycle Sustainability Analysis (LCSA): Holistic sustainability assessment.
- Demand Management: Regulating logistics demand.
- Traffic Management: Managing transportation flow.
- Collaborating among different actors: Enhancing supply/value chain collaboration.
- Using circular thinking in strategic planning: Sustainable logistics planning.
- Communication and planning between logistics firms: Trading last-mile tasks.
- UCC: Urban Consolidation Centres for efficient deliveries.
- Alternative product exchange options: Using collection and delivery points.
- Cooperative game theory: Collaborative decision-making model.
- Utilising ICT and ITS: Implementing Information and Communication Technologies.

Putting it Together

Challenges were linked to the relevant drivers and strategies that could help overcome them followed by a discussion on how.

Seven themes:

1. Economic and financial
2. Organisational and operational
3. Legal and regulatory
4. Technological
5. Social and cultural
6. Environmental
7. Strategic



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Economic and Financial

Challenge - investment costs
Driver – local/ regional development
Strategy – investing in infrastructure and technology
Result – more efficient operations offsetting initial investment
(Nathanail et al., 2021).

Challenge – depreciation
Driver – operational efficiency to slow it down
Strategy – regular maintenance and upgrade of equipment
Result – extend the lifespan of assets
(Mcdonald et al., 2021), (Gonzalez-Feliu, Pronello and Salanova Grau, 2018)

Challenge - profit sharing
Driver – local supplier collaboration
Strategy – clear and fair agreements
Result – resolve disputes and ensure all parties benefit
(Cleophas et al., 2019)

Organisational and Operational

Challenge - data sharing
Driver – sharing information and resources
Strategy – using secure data sharing platforms of white label companies
Result – all parties access data white maintaining confidentiality
(Merkert, Bushell and Beck, 2020); (Montoya-Torres, Muñoz-Villamizar and Vega-Mejía, 2016)

Challenge – trust
Driver – customer satisfaction
Strategy – setting aligned visions
Result – long-term relationship and mutual benefit
(Amiri and Farvaresh, 2023)

Challenge – individual decision making
Driver – resource utilisation
Strategy – co-ordinated decision making
Result – smoother operations
(Gonzalez-Feliu and Morana, 2010)

Environmental

Challenge - demand in highly congested areas
Driver – less road congestion and noise pollution
Strategy – invest in optimising delivery routes
Result – reduce congestion and improve service
(Nathanail et al., 2021)

Other themes are explained in more detail in the full paper

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Theoretical Frameworks Identified

- Transaction Cost Economics (TCE)
- Resource-Based View (RBV)
- Agency Theory
- Institutional Theory
- Stakeholder Theory
- Sustainability Theory

Conclusion

“The future of urban LML will be shaped by the extent of collaboration among stakeholders. By embracing HC and addressing the associated challenges, the logistics industry can move towards a more efficient, cost-effective, and sustainable future, benefiting all parties involved and creating a more resilient supply chain.”

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Thank You

Support the progressive integration of future technologies including AVs and delivery droids in last mile delivery solutions.

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