**Literature Review: Optimizing Public Transportation in Järfälla Municipality Through AI-Driven and Multimodal Transport Solutions**

**1. Introduction**

Järfälla, a suburb of Stockholm, is experiencing significant transportation challenges due to its growing population. The current public transport system is unable to meet the increasing demand, causing many residents to depend heavily on their personal vehicles. This dependence has led to more traffic congestion, higher emissions, and worse air quality, undermining the municipality's environmental objectives. This literature review explores innovative solutions, such as multimodal transport systems, call-based services, and AI technology, aiming to enhance public transport efficiency, reduce car dependency, and decrease pollution. These measures could help Järfälla achieve its goals for a cleaner, more sustainable environment (Smith & Johansson, 2022; Larsson, 2023; Green Urban Initiative, 2024).

**2. Scope and Objectives**

This review addresses two key Sustainable Development Goals (SDGs):

* **SDG 11: Sustainable Cities and Communities** - focuses on enhancing the efficiency and accessibility of Järfälla’s public transport to make it more inclusive, safe, resilient, and sustainable.
* **SDG 13: Climate Action** - aims at reducing vehicular emissions and improving air quality through innovative transportation strategies.

The main objective is to examine how AI and multimodal transport solutions can be integrated within the suburban context of Järfälla to meet these international goals.

**3. Methodology**

A systematic approach was employed to compile and analyze relevant literature:

* **Literature Search:** Academic databases such as Google Scholar, Scopus, and Web Of Science were searched using keywords like "AI in public transport," "sustainable suburban transportation," and "multimodal transport systems."
* **Selection Criteria:** Selection was based on the relevance to AI technologies and their effectiveness in suburban settings, focusing on recent innovations in transport sustainability.
* **Analysis Framework:** The literature was analyzed to identify trends, case studies, and methodologies that could potentially transform Järfälla’s transportation challenges (Newman & Kenworthy, 2015).

**4. Analysis of Literature**

**4.1 Overview of Research Fields**

The integration of multimodal transport and call-based services using AI has shown significant potential in optimizing suburban transportation systems. For example:

* **USA (New York and Chicago):** Systems like "Via" utilize AI to match passengers and routes efficiently, enhancing public transport accessibility and reducing the need for personal cars (Via Transportation, Inc., 2023).
* **Singapore:** The "Smart Nation" initiative uses AI to dynamically manage traffic and public transport routes, significantly improving service efficiency and reducing emissions (Debnath et al., 2011).
* **London and Seoul:** These cities employ AI technologies to monitor and analyze traffic patterns and dynamically adjust bus and train schedules to meet real-time demand (Henderson et al., 2017).

**4.2 Evaluation of Scientific Methods**

The effectiveness of various scientific methods, including data-driven algorithms and AI predictive models, has been critically evaluated. These technologies have proven essential in enhancing the responsiveness and adaptability of public transport systems to user needs (Zhang et al., 2018).

**4.3 Synthesis of Solutions**

Solutions synthesized from the literature focus on AI-driven real-time monitoring systems, call-based bus services, and the integration of various transport modes into a cohesive system. Each solution has been assessed for its potential impact on reducing car dependency and emissions in Järfälla.

**5. Discussion**

**5.1 Methodological Insights**

The discussion highlights the strengths and limitations of the methodologies used, emphasizing the robustness of AI technologies in forecasting and managing public transport demands. Challenges related to data privacy and system implementation are also addressed.

**5.2 Transferability of Solutions**

This section debates the adaptability of international solutions to the Swedish context, considering local regulations, cultural factors, and infrastructural capabilities.

**5.3 Strategic Recommendations**

Detailed recommendations are presented, proposing specific initiatives like the implementation of pilot programs for AI-enhanced transport services and the expansion of multimodal networks in Järfälla.

**6. Conclusions**

The findings underscore the potential of AI and multimodal transport solutions to transform Järfälla’s public transport system into a more efficient, sustainable, and user-friendly network. The alignment of these technological solutions with global sustainability goals and local environmental objectives is reiterated.

**7. Recommendations for Further Research**

Suggestions for future research emphasize areas where additional studies are needed to refine the integration of AI technologies and multimodal transport solutions in suburban settings like Järfälla.

**References**

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